The Newsletter of the Saskatchewan Soil Conservation Association

Issue 28 -- Winter, 2000

President's Message

By Greg Kane,

SSCA President

Hello to fellow SSCA Members. This is my first contribution to the Prairie Steward and I am very honored to do so. I have been on the Board since February of '95 and moved to the President's position at last year's conference. The high quality of the Board and Staff that the Association has been able to attract is truly a testament to its strength. It continues to be a vital source of information for producers that are interested in implementing direct seeding on their farms.

The gloomy picture that seems to dominate the news when it involves the ag sector is not something that I have to reiterate. The SSCA is also going through some tough times and unpleasant decisions may have to be made if a source of funding is not found in the foreseeable future. Our Executive Staff have been tirelessly seeking out any and all sources of revenue, and will continue so that SSCA will be able to provide the programs that have been developed over the years.

My first exposure to the SSCA was the Direct Seeding Conference held in Moose Jaw in 1993. That year people were turned away at the door as the facility was fill to the rafters. That was the level of interest in this system and I proceeded to gather as much information as I could. During the question and answer sessions I tried repeatedly to shoot down the whole concept. Gary Meier, who was then on the SSCA staff, was able to deal with my concerns. That summer at the farm production show, SSCA Director, Terry Pearse sold me my first SSCA membership and my friend Lee Moats, who was also an SSCA Director, guided me through my first year of direct seeding the next spring.

Carbon sequestration is a subject that the SSCA has been working on for the last two years and after attending a Soil Conservation Council of Canada workshop it appears that it has been time well spent. Our "Carbon Committee", Clint Steinley, Perry Leach and John Bennett have attended many meetings and made many presentations in western Canada and the U.S. At SSCA's Conference we have dedicated one session and one Bear Pit to carbon sequestration and direct seeding.

I'd like to welcome our new Board members. Lyle Larsen, Aylsham (Director-at-Large) Darryl Reynolds, Nokomis (Director at Large) and Arthur Murray, Glenavon (South East). Soon to be leaving the Board will be Garry Nolan; it's been great working with you Garry!

Our next Direct Seeding Conference will be held February 9 and 10 in Regina. This year covers a wide range of topics presented by very knowledgeable speakers. I hope to see you there.

Death by Core Funding

By Doug McKell,

SSCA Executive Manager

I think I'm slowly understanding the issue of core funding (or lack of) for non-government agriculture organizations. The solutions: I'm not sure.

A little over a week ago I had the opportunity to travel to a workshop convened by Soil Conservation Council of Canada that involved farmers and their conservation organizations from all across Canada. This was the first time total representation was achieved from across the country with a spirited delegation from Newfoundland in attendance. I'm always comforted that when you get a chance to hear from others like yourselves you find out you're not alone. Our problems are similar to their problems and our successes are being achieved elsewhere from similar efforts. The biggest issue, by far, is how to get the funds for non-government organizations to keep working.

We did get a chance to vent a bit at this workshop. One of my colleagues grabbed me Thursday evening and while whisking me towards the other end of the hall he informed me he had found someone who works with the federal Canadian Adaptation Rural Development Strategies (CARDS) program. I didn't need him to hold my arm after finding that out. The CARDS program was suggested to us as the most likely source of funds that would keep the SSCA going after March 2000. As we have been desperately searching for adequate funding, I solicited the help of our partners in conservation, PFRA and Sask Ag & Food, for their input and help in preparing a CARDS proposal. We spent the good part of three months putting together a proposal that we thought fit nicely into the goals of the CARDS environmental sustainability component. After all the numerous drafts were approved we sent the package off to have it reviewed by the CARDS committee. After patiently waiting for a few weeks we received a letter from CARDS. They completely rejected our proposal. Apparently we are not new and innovative and their policy is such that they do not support **core** funding. Not that we ever mentioned the word *core* in our proposal but, that's what the committee perceived it to request.

I don't buy the argument that we are not new and innovative. We have been promoting the same concept, low disturbance seeding, for a few years but the level of adoption is only at 30% of total seeded acres in Saskatchewan. Couple that with the fact that the technology and agronomics associated with this technique are constantly changing and I think there are a lot of new, innovative things going on with the low disturbance practice. Carbon sequestration through soil sinks is a good example.

So core funding is the biggest problem. And that is pretty much what this nice lady from Ottawa confirmed. Core funding seems to elicit the same response from most bureaucrats. They put their hands over their ears and keep repeating, don't ask for core funding. And when you talk to other non-government organizations they all have the same problem; getting the funds to keep their

people working. Core funding is the most pressing need of non-government organizations and it is the one thing that governments will absolutely not provide.

So if core funding is not allowed what is the suggested solution? Well, it was suggested to us by the CARDS people that we should submit to them other applications on a project-specific basis. Let's think about this process. They like what you have accomplished but you can't have funds that allow you to have experienced people in place who have developed and conducted successful projects and who could develop and conduct further successful projects. You have to lay off your people, come up with an idea for a project, submit a proposal and when you receive your acceptance notice go out and try to find people who have the expertise to do the job. You then have to train them (because the ones you have employed in the past have likely found other work) and hope they will be accepted by the people to whom you are delivering the message or product. Apparently these people will not become confused when they see new people at their door every couple of years. Then after your project is completed you lay your people off and go off in search of another program with funds that will allow you to go out and hire and train a whole new group of people who will conduct your next project. Sound like an efficient process to you? This idea would seem to work for organizations or government departments or universities that have a *core* of people who can deliver short term programs because they have funds or stable revenues from other sources. For organizations like ours, and many others across Canada, it's a nightmare and the kiss of death.

I guess I just don't understand the thinking process behind these government programs. My thinking comes from years of running a farm and in private business. In these operations if a business provided me with years of effective service at an acceptable cost, I would keep going back to them. I may check around to see if they were competitive but unless they went in a totally different direction than they had in the past, I think they would get my money. Why contract with someone else who has no track record and no people expertise in this business? With that thinking in mind, here's my suggestion for a really good government program. If you have a goal to achieve environmental sustainability (which all governments have, its listed in their state of the environment reports) and you have allocated funds to achieve that goal and you know of a group that has a proven, ten year track record of conducting successful and cost efficient environmental sustainability programs but you know they need funding to conduct these types of programs; then wouldn't it make sense to approach this group and suggest to work together in an effort to develop an acceptable plan to achieve your goal and then give them the mandate and resources to do the job? It just sounds too logical to me.

Ergot in 2000?

By Tim Nerbas,

SSCA Soil Conservationist

Will ergot be a problem for us in the 2000-growing season? If so, what should we do to minimize the risk? What should we do in our direct seeding systems? Ergot affected many farms across Saskatchewan in 1999. For many producers this is the first time their wheat (primarily) has been downgraded because of high ergot levels.

Ergot attacks cereals and both wild and cultivated grasses throughout the world. The disease is caused by numerous species of fungi in the genus *Claviceps*, with the most common and damaging one being *Claviceps purpurea*. Ergot affects only the flowering parts and the developing kernels. It is common in rye, but it can occur in wheat and barley. Oats are rarely affected. Recent outbreaks have occurred on the open-floreted, male-sterile wheat lines that are used to produce hybrid seed. However there is no data available that indicates certain wheat varieties grown on the prairies are either more or less susceptible than other wheat varieties. The bottom line: there are no resistant varieties.

The variety AC Barrie has been singled out as being extremely susceptible to this disease. However for virtually every HRSW variety one can find a producer somewhere in Saskatchewan who was affected by ergot. The key factor to remember is that in 1999, 50.9 % of the HRSW seeded acres in Saskatchewan were AC Barrie (CWB 1999 variety survey). Varieties such as CDC Teal, Katepwa, and Columbus accounted for only 26.9 % of the seeded acres combined. Therefore it is important to remember that the main reason we hear significant commentary regarding AC Barrie and ergot is because 1 in 2 fields were seeded to this variety.

So why was 1999 so bad? The short answer is that we had a cool wet spring and early summer followed by wet conditions during flowering in many areas. Wet, cool weather prolongs the flowering period thereby extending the infection period. Any other agronomic factors, such as herbicide injuries, which delay maturity or cause more open-floret physiology, would also favor ergot.

The disease begins in the spring from ergot bodies, which are present in the field from a previous cereal crop, or from grasses in ditches and along field boundaries. The first sign of ergot infection occurs at or soon after flowering. The infected florets exude a sugary substance referred to as honeydew. The honeydew contains a large number of asexual spores called conidia. Because the honeydew has a rotten-smelling odor a large number of flies and other insects are attracted to the infected heads. The insects become contaminated with conidia and inadvertently spread the disease to other healthy flowers. Rain splash and wind can also carry the conidia to other florets. New infections occur as long as flowering occurs. The purplish-black ergot body develops in place of the kernels.

So what can we do about it? For grain produced in 1999 grain cleaning is an option. Though this is an added cost, the cleaning process can often improve the grade significantly. For the 2000-growing season there are a number of practices which can be implemented:

1. Crop rotation - do not plant cereals back on cereal stubble. Rotate to crops outside the grass family like oilseeds and pulses. Fortunately ergot bodies do not remain viable for more than one year.
2. Plant ergot free seed - or use two-year-old seed. The viability of the ergot is greatly reduced by the second year.
3. Mow grasses before flowering - eradicate grasses so they will not serve as a host for ergot. Cut or graze hay at the heading stage if a severe ergot infestation is expected. Quackgrass and bromegrasses are quite susceptible to ergot.
4. Uniform stands - ensure that you use seed with good germination, seed at a uniform depth, maintain good seed to fertilizer separation, and use a balanced fertility program. Copper has been shown to help with ergot infection. However, because of the cost it is important to soil test your fields or take tissue samples next year to ensure copper is warranted.
5. There are no resistant varieties - pick your variety of choice based on agronomic factors other than ergot.

So there you have it, ergot in a nutshell. The potential for an outbreak in 2000 similar to 1999 is unlikely. But if the spring is wet again the possibility does exist. However if we implement some strategies for 2000 we can minimize the outbreak.

Tim's tidbits on ergot:

In the past ergot found in rye was often more valuable than the grain itself. Pharmaceutical companies used alkaloid compounds found in the ergot in medicines. They have served an important role in stopping bleeding and in the postpartitive contraction of the uterus just after childbirth. It has also been used in the treatment of migraine. However, today most of these derivatives are made from synthetic forms of the alkaloids. Ergotism is a symptom that occurs after humans or animals eat food with high levels of ergot contamination.

Ergotism has been responsible for many deaths throughout history. Various epidemics have occurred, for example in Spartan in 2430 BC, and in Europe in both 857 and 943 AD.

Disease symptoms that appear several hours after ingestion include a burning sensation and twitching of the extremities known as St. Anthony's Fire. Thirst becomes extreme, followed by cramping of the abdomen, vomiting, and diarrhea and twitching proceeds to convulsions. The pulse becomes weak and if the patient survives, limbs may become affected by gangrene because of constriction of the capillary beds. The extent of the symptoms is dependent on the amount of ergot ingested. As little as one ergot body in 1000 kernels can be considered unsafe.

Update on Precision Farming Research at Indian Head

By Bonnie Stephenson,

Communication Coordinator

In 1998, the first year of the IHARF/SSCA Centre of Excellence for Precision Farming Research, a canola - spring wheat - field pea - spring wheat rotation was established by separating the 308 acres into eight fields so that each crop was replicated twice. Infra red and remote sensing images were collected as well as yield maps. 308 permanent geo-referenced grid points were established and permanent pins inserted in the soil at each point in the spring prior to seeding.

In the fall of 1998, soil samples were collected at each point for a detailed soil nutrient map and a full soil salinity geo-referenced map was made of the entire site. In the spring of 1999, a second salinity map was done and further soil samples were taken at selected sites in order to determine soil moisture levels as well as measurements of surface roughness and crop residues. Measurements were taken to try and correlate their values to data collected from the Radar Sat. During the growing season, plant and weed counts, disease assessments and collection of grain samples for nitrogen determination were done around each pin. Additional infra red and satellite images were also collected and all fields were yield mapped at harvest.

Funds from Agri-Food Innovation Fund (AFIF) and Canadian Adaptation and Rural Development Saskatchewan (CARDS) allowed us to expand research at the site in 1999. The AFIF funds allowed us to hire a full time technician and a summer student, acquire more remote sensing images, survey of the site with a salinity meter (EM38) and establish some measurements for the monitoring of deep nitrates. The CARDS program gave us the opportunity to conduct a comprehensive weed and disease survey and hire Paul Bullock, Noetix Research Inc. to analyze the information that was gathered. This analysis will help to assign management units to each field and from there to develop an appropriate variable rate application fertilizer program. Slide pictures were taken of every quadrat where weed counts were done. This will allow us to do image analysis on each quatrat and to determine the accuracy of image analysis for doing weed counts. The image analysis is being conducted by Dr. Trever Crow of the University of Saskatchewan and his graduate student, Harry Ingleby. Another component of the proposal is the feasibility of using robotics to do weed scouting in the field. This is coordinated by Ron Palmer of the University of Regina with his graduate student, David Wilke.

In 2000, a detailed prescription map for nitrogen requirements will be done on the site in order to establish a variable rate map. The extensive collection of data will help us identify cost-effective ways of assigning management units to a field without having to resort to extensive soil sampling. These units will allow us to more fully understand the variability in a field and determine how to work with this variability to achieve maximum profitability.

Crop Rotations Should be Planned

(continued from last issue)

By Ken Sapsford, P.Ag.

SSCA Soil Conservationist

In the last issue of the Prairie Steward I started to look at crop rotations. In there I covered a number of weed control options that can be tied into a rotation. I will continue to look at the disease implication of this rotation and a few additional weed control options.

I was looking at a 4-year crop rotation with Cereal - Pulse - Cereal - Oilseed. This rotation can be used in all soil zones, as the specific crops that are plugged into the rotation will vary according to the region. This rotation has some advantages:

1. Volunteer weed control is made simple, as it is easy to remove a broad leaf out of a cereal crop and a grassy weed out of a broadleaf crop.
2. Crop diseases are kept in check as all crops have a 4-year span before they are planted back on the same piece of land, provided there are two different cereal crops used. Sclerotinia is the one disease that can carry across between pulses and oilseed crops so it has to be watched in wet years.
3. Crop residues are easy to manage, as there is always a low residue crop, pulse or oilseed following a high residue crop, cereal. This helps avoid large residue build up that may cause plugging problems with seeding equipment. It also protects the soil with enough residues to avoid erosion.
4. Soil fertility is enhanced with the inclusion of a pulse in the rotation. This can either reduce some of the required fertilizer input or increase yield and/or protein in the following cereal crop.

It was once believed that disease would be worse in a direct seeded crop than in conventional till and that the disease would stay around on the field longer because the straw is decomposing at a slower rate. At Indian Head research station Dr. Karen Bailey showed that disease was definitely worse on a direct seeded field with no crop rotation. This was wheat on wheat and the tanspot and septoria were worse on the direct seeded field compared to the conventional till wheat on wheat stubble. When she looked at wheat on oilseed or pulse stubble, the degree of disease infestation was the same whether the field was direct seeded or in conventional tillage.

Dr. Bailey rated a number of factors as to how they affect disease:

1. Environment - If the year is wet and humid and ideal for disease growth we will see disease in our crops.
2. Rotation - A poor crop rotation will have higher incidence of disease than a good rotation

3. Location in field - The field borders are more likely to be infected with a disease than the centre of a field. This is due to the neighbouring crop. Even if you have a good crop rotation there are 8 fields adjacent to it (1 on each side and 1 on each corner) and some of these fields could have had a similar host crop last year.
4. Tillage system - This had the lowest rating of any of the factors she looked at in disease rating.

Of all the factors, the one with the biggest impact on disease and the one we have control over is rotation.

Some of the diseases that were a problem in a given year may not be controlled by rotations but rotations may have an impact on their severity.

Ergot

Ergot is caused by a fungus that can infect all cereals and grasses. It is usually more severe in rye and it is seldom found in oats. The ergot fungus survives from year to year as sclerotia that have fallen to the ground or as sclerotia sown with seed. The incidence of ergot varies from year to year and it depends upon how closely the spore release coincides with the flowering period of susceptible plants.

If you had ergot in a cereal field last year you know that you will have sclerotia in the soil because they are lighter than the grain and many of them blew out of the combine with the chaff. We can't avoid ergot with rotation because the spores will blow in with the wind from the field borders but we may be able to reduce its severity by not planting a cereal crop on that field next year. Ergot sclerotia can only survive one year in the soil so the oilseed - cereal - pulse - cereal rotation will help reduce infection.

Sclerotinia

Sclerotinia has a similar life cycle as ergot but the sclerotia stay viable in the soil for a longer period of time. The crop rotation of oilseed - cereal - pulse - cereal will not reduce the incidence of Sclerotinia significantly as it is recommended that we have a 4 year break in having a host crop in rotation. All pulse and oilseed crops can be a host. Sclerotinia does usually not affect flax but it can be a host that will allow for the disease to remain on that field. We don't have enough crop selection to choose from to avoid Sclerotinia. We can improve our rotation with the inclusion of a winter cereal that will extend the rotation to 5-years from our 4-year rotation. Our rotation would now be oilseed - cereal - winter cereal - pulse - cereal. This rotation would give us two years of no host for Sclerotinia. This will not eliminate the disease from the rotation but it will help.

If we continue to look at this 5-year rotation as to its weed control options, we find it has some benefits there as well.

This chart is similar to the one I had in the last Prairie Steward but this time I have included some specific crops and added Winter Wheat as my 5th crop. Many farmers have been seeding

winter wheat on canola stubble but some also have been seeding it on barley stubble. The advantage of barley stubble is the increased straw cover helps insulate the soil so we are not completely dependent on snow cover for the survival of the winter wheat. Many times the only weed control that is required for winter wheat is a fall application of 2,4-D to control the winter annuals. The winter cereals get off to a very early start in the spring so the need for in crop weed control may not be needed. Don't assume that you don't need in crop weed control, field scouting is required and you may need to spot spray for weeds like wild oats.

If you like to get into longer-term rotations to assist in weed control and disease management some farmers are looking at including forages in rotation. One example may be:

Year 1 - Smart canola under seeded with alfalfa (use Pursuit to control weeds in canola and give some residual weed control in alfalfa stand)

Year 2 to 5 - Alfalfa - This will help break disease and weed cycles

Year 5 - Remove alfalfa with glyphosate sprayed prior to second cut while there is good regrowth

Year 6 - Seed competitive cereal crop that can be sprayed with a broad leaf herbicide to control alfalfa (oats may be good as there should be very few wild oats)

Continue with annual crop rotations for a few years. You may want to include a Roundup Ready canola in the rotation if dandelion or other perennials have developed while the land was in alfalfa.

There is no perfect rotation. However taking the time to plan your rotation may reap you some benefits. Any increase to production that is achieved from additional management is all profit. There is no input cost to management besides the time you put into it. Like everything else, the more you put into it, the more benefit you receive from it.

Sandy Soils, Direct Seeding and Winter Triticale: A Formula for Success

By Juanita Polegi,

SSCA Soil Conservationist

Winter triticale, a cereal, has caught the eye of at least one cattleman in east central Saskatchewan. Ed Anaka, who farms north of Yorkton in the Gorlitz area, seeded his first fields to winter triticale in May, 1998 and is pleased with the crop so far.

"We became interested in winter triticale because of the crop's ability to provide pasture within about 6 weeks of seeding. On our light land and in dry springs, having pasture early in the spring is very important," said Ed.

Winter triticale will usually produce vegetation for 2 years. But with proper weed control, fertilizer and grazing or mowing management, the stand can be viable for 3 years or more. Ed said, "We've learned that by applying nitrogen and preventing the triticale from going into the shot blade stage, we can keep it vegetative and productive for a longer period".

The triticale featured in the photos was direct seeded into oat stubble in May, 1998. The seeding rate was one bushel per acre in a mix with 2.5 bu/acre oats and 0.5 bu/ac peas. He also applied 60 lbs actual N in a side band at seeding. Ed likes to direct seed his forage crops. "I feel that direct seeding is good for the forages because of the greater moisture retention in that system", explained Ed.

In August, Ed cut the green feed mixture. By that time, the oats already had kernels in them and the triticale was about 8 inches high. After the cutting, the triticale recovered nicely and had about 6 inches of growth going into the winter.

The feed analysis was a pleasant surprise to Ed when he received it. "My replacement heifers were receiving only the oat/pea/triticale green feed but they were doing really well. When the feed test results came back, the second cut alfalfa had 18.6% available protein while the green feed had 20.3%."

This spring (1999), Ed sprayed the triticale with 2,4-D and applied liquid nitrogen at about 60 lbs actual per acre. On June 3, the winter triticale was 2½feet tall and shooting out tillers. By July 21, the triticale was fully headed and stood above Ed. Ed will let this crop mature so that he can sell the seed.

In addition to his cow-calf operation, Ed is a forage seed producer. He sold some winter triticale seed this spring to customers who wanted "instant pasture". A neighbour of Ed's, Al Claiter, was one of his customers.

Al seeded the triticale on 95 acres at 2 bu per acre without any nurse crop. Fall rye had been on the field in 1998 and manure had been spread on it in the fall. Al applied 80 lbs of 34 - 0 - 0 following seeding.

Once the triticale was up, Al put 40 yearling heifers and 15 cow-calf pairs on it. Al says, "I swear by it for pasture. The cows would eat the stuff right down to the dirt and still they didn't want to move even though the grass in the next pasture was knee deep". Al kept the herd on the triticale for most of the summer.

Next spring, Al wants to seed some of the triticale with a few pounds of oats to compare a pure stand to one with a little bit of a nurse crop. He says, "I thought the triticale was a little slow coming out of the ground. Perhaps with a few oats, the oats would emerge first and there'd be some grazing for the cattle before the triticale emerged."

The versatility of winter triticale is creating a lot of interest among producers. Its ability to grow on lighter land and take advantage of early spring moisture, its ability to compete against winter annuals and wild oats and its productivity make it an attractive option for the cattle and grain producers alike.

For more information on winter cereal production, contact the Winter Cereals Canada head office in Yorkton (782 - 8188).

Alfalfa and Smart Canola

By Juanita Polegi,

SSCA Soil Conservationist

Alfalfa. Smart canola. Both crops can be grown pretty easily on the eastern side of the province. And since Pursuit is registered for use on seedling alfalfa, many producers are seeding the two crops together. While both crops appear to do well when intercropped, there are really no guidelines for the seeding rate of the canola, the fertility, and timing of the cutting of the alfalfa to ensure a vigorous stand the following year.

In the spring of 1999, at the East Central Research Foundation farm near Canora, Ernie Patrick (Extension Agrologist, Sask. Ag & Food) and myself set up some trials that would address these concerns.

Two plots were established. The first is designed to look at canola seeding rates and the effect these have on alfalfa establishment. The alfalfa seeding rate was kept constant at 8 lbs. per acre. The Smart canola rates were 3 lbs. 5 lbs. and 7 lbs.

Treatments #1, 2 and 3 were seeded to pure alfalfa and each treatment established well. Treatment # 1 will be cut next summer. Treatment #2 was cut in July, no second cut was taken. Treatment #3 was allowed to grow all summer and then a dormant cut was taken. Treatments # 4, 5 and 6 had the various rates of canola seeded with the alfalfa. The canola was harvested from these plots in early September. The alfalfa was not cut. Next summer, a visual assessment of the alfalfa stand in each treatment will be conducted. All treatments will be cut twice, once in July and once in August. An economic analysis will then be conducted to determine which treatment brings the most returns per acre over a 2 year period.

The second plot is designed to look at seeding and fertility rates. In Treatments #1, 2 and 3, the canola was seeded at 3 lbs. 5 lbs. and 7 lbs. per acre, the alfalfa at 8 lbs. 80 lbs. of N, 25 lbs. of P_20_5 , and 15 lbs. S was applied to each treatment. In Treatment #4, the same fertilizer was applied to 8 lbs. of alfalfa, no canola. In Treatment #5, 18 lbs. N, 25 lbs. P_20_5 and 15 lbs. S were applied to 8 lbs. of alfalfa, no canola. Treatments #6, 7 and 8 each received 40 lbs. N, 13 lbs. P_20_5 and 8 lbs. S. Canola seeding rates were 3 lbs., 5and 7, and 8 lbs. alfalfa. No fertilizer was applied to the 3 lbs., 5 lbs. and 7 lbs. of canola and 8 lbs. alfalfa in Treatments 9, 10 and 11. Again, the alfalfa will be assessed in the spring and an economic analysis of the returns per acre over a 2 year period will be conducted next fall.

This project was made possible through funding from Cyanamid and the assistance of the ECRF staff.

High Disturbance vs. Low Disturbance Seeding Trials

By Juanita Polegi, P.Ag

SSCA Soil Conservationist

What effect will seeding directly into standing stubble have on a number of crops? How will that compare to cultivating prior to seeding those same crops? These are some of the questions posed by Dr. Brian McConkey of the Semi-arid Prairie Agriculture Research Centre (SPARC) at Swift Current prior to setting up the High Disturbance vs. Low Disturbance Seeding Trials at the East Central Research Foundation (ECRF) farm near Canora. A wide variety of crops were selected for this study. "I wanted to use a variety of crops with different seed sizes to determine how the different seed sizes responded to the 2 tillage methods", said Dr. McConkey. In the spring of 1998, half the plots were cultivated while the stubble on the other half was left standing. The crops, including mustard, corriander, fenugreek, lentil, field bean and peas were then seeded using a Seed Hawk drill. This drill has a 2-knife system that puts the fertilizer down the first knife with the second knife placing the seed above and to the side of the fertilizer trench.

When the results were tabulated that fall, it was shown that there was very little difference in plant populations between the two seeding systems. The difference in yield, however, was very striking. Dr. McConkey said, "On average, the low disturbance system had a 17% increase in yield over the high disturbance system. The two crops with the largest yield differences were barley and lentil. The barley seeded in the low disturbance system yielded 12 bushels more than that seeded under high disturbance. Lentils seeded under low disturbance yielded 400 lbs. more than the high disturbance lentils."

In 1999, the project took on a little different look, becoming the Rotational Benefits Study. The study is also being conducted at Swift Current and Redvers. The objective of this project was to determine how different cereal crops respond to various rates of nitrogen on different stubble. The crops seeded were Canada Extra Strong wheat, barley and Hard Red Spring wheat across the stubbles in the High vs. Low Disturbance trials. The cereals were seeded with the Seed Hawk and a blend of fertilizers was applied at seeding with the nitrogen rate varying from 35 lbs. actual N to 65 lbs. actual N. Dr. McConkey said two interesting points have been determined to date. "One finding so far is that cereals do not appear to like corriander stubble. Another interesting point is that wheat was most responsive to N fertilizer when grown on pea stubble. This is despite the fact that wheat on pea stubble had higher yields at low fertilizer N application than on other broadleaf stubbles".

The question yet to be answered is how do different cereals respond to different broadleaf crop stubbles. Dr. McConkey indicated that once this question has been answered, it would help to determine how much money should be spent on fertilizer.

For more information on these projects, contact Dr. Brian McConkey at 778-7281. His email address is mcconkeyb@em.agr.ca

Brian will also be speaking at the SSCA Annual Conference Feb. 9 & 10, 2000 in Regina. His topic is "Carbon Sequestration and Direct Seeding."

Ergot Crisis Not Caused by Direct Seeding

By Garry Mayerle, P.Ag.

SSCA Soil Conservationist

ERGOT reared its ugly black head this past season to haunt and plague wheat production in most areas of our province. Could *all* the crop residue that direct seeding accumulates on the soil surface have been a factor in unleashing this newest pestilence? The question being voiced is, "Should we encourage more tillage to help reduce the risk of another such infestation next year?"

To honestly answer this question you must first understand a bit more about ergot and the processes that caused all those toxic black bodies in many wheat samples. Ergot is not a new disease, it has in fact been around for hundreds perhaps even thousands of years. The black ergot bodies are produced by a fungus. It is this stage of the fungus that over winters and under wet soil conditions in the spring produces tiny mushroom like structures that produce spores. (There are similarities to the black sclerotia produced by the sclerotina stem rot of the canola pathogen that producers have become so familiar with in the last few years.) These spores infect the florets of grasses, winter cereals and early seeded crops. Within 5 days the florets produce a sticky ooze containing more spores which can be spread by insects, and rain splash to other florets. Eventually this ooze is replaced by the black ergot body where the seed would normally be.

The conditions that favor the ergot fungus are: wet soil conditions in the spring and early summer, wet conditions during grass and cereal flowering, and longer flowering periods. Wet, cool and cloudy weather can cause flowers to remain open longer and be more susceptible to infection. Poor fertility and or herbicide injury often keeps flowers open longer. Non-uniform cereal crops provide more hosts for the continuation of the oozing stage causing more spores to be released. Copper deficiency can also cause flowers to remain opener longer letting more spores enter.

Penny Pearse, plant disease specialist with Sask. Ag. & Food, says that this year has been one of those years when environmental and crop maturity conditions coincided to get wide spread ergot infestation. Besides the wet weather favoring the fungus it also favored the increase of small insect populations to spread these sticky spores. Weather played a much greater role in the ergot outbreak this year than all of the reduced tillage we have been practising. It has been many years since we have had such a major infestation. The risk of all these weather factors lining up so closely again next year is low. But still many of these ergot bodies now have ended up falling on the soil surface. What can we do to avoid the infestation they might cause next year?

Firstly, ergot bodies in contrast to the sclerotia bodies of sclerotina stem rot of canola survive in the soil for only 1year so rotating away from cereal crops for a year is very effective in reducing ergot production. The problem we could face next growing season if weather conditions favor spore production is the spores produced by these ergot bodies moving by wind onto adjacent cereal fields. Since part of the disease cycle often includes grasses a second method of reducing

ergot infestation is mowing grass stands in ditches etc. next to susceptible crops before they head or flower.

Thirdly, do all you can to ensure uniform stands including using seed with high germination, seeding at consistent depths, high seeding rates, and using a balanced fertilizer program. If you have copper deficient soil the addition of copper will reduce ergot infestation. Copper deficiencies are most commonly found on light loam or sandy or peaty land.

Fourthly, if an infestation is observed at harvesting time, the highest levels of infestations are most likely to occur close to grassed areas so storing these areas of the field separately may reduce down grading on the rest of the production. Also leaving these areas standing as long as possible may increase the chance of wind shaking the ergot bodies out of the heads.

A fifth way to reduce ergot infestation is to bury ergot bodies 1.5 inches deep . This will keep spores from being released. This of course does not have very good fit with direct seeders. Pearse suggests that to produce spores these ergot bodies need wet soil and under a direct seeding system the bodies are so close to the surface that the chance of having sufficient moisture for spore release is less than if the bodies were buried at a shallow depth.

The general consensus among researchers on crop disease under direct seeding is that good rotations have a bigger impact on reducing disease than your tillage system whether it is a conventional system, a minimum tillage system, or zero till. Randy Kutcher plant pathologist with the Melfort Research Station concurs with this commenting that his observations on sclerotina in canola are that there was no statistical difference in occurrence of the disease under these tillage scenarios. He suggests that this may apply to ergot as well.

If you are direct seeding or contemplating beginning direct seeding following a good rotation and a balanced fertility program should be adequate protection against diseases.

Common Tansy

By Garry Mayerle,

SSCA Soil Conservationist

Common Tansy continues to spread in ditches and fence lines. Very little is known about how we can control it on annually cropped land and why it has not already become a major problem. Direct seeders may be ignoring this potential weed problem!

Common tansy was a native European plant introduced to North American as an ornamental. It is an aromatic perennial with stiff stems standing 1.5 to 6 feet tall. Flowers are numerous, yellow, 0.25 to 0.5 inches in diameter, and arranged in flat-topped dense clusters. It is a prolific seed producer and spreads primarily by seeds but can also reproduce from rootstalks. These established rootstalks can become quite long, woody, and hard to kill. Seeds can be spread significantly with snow drifting. It is recognized as a dangerous weed in pastures because some plants produce a substance toxic to cattle and horses.

Clark Brenzil, Weed Control Specialist with Sask. Ag. & Food suggests that it is a weed similar to Scentless Chamomile. It is located in Saskatchewan mostly in the northeast corner. It does not tolerate tillage. Even minimum tillage with one pass a year with sweeps will probably provide adequate control. A small project carried out by Roy Button on a stand of common tansy established to evaluate commercial uses for the pyretherin content indicated that 1 to 3 L/ac of Roundup had very little control of the stand! However, others suggest that it may be more susceptible at the seedling stage.

Competition can certainly reduce the vigor of common tansy. Dan Cole weed specialist with Alberta Agriculture suggests that cropping practises such as fertilizing to soil test recommendations, using competitive crops, and using high seeding rates should all be effective in suppressing common tansy in low disturbance production of annual crops. Cole's research has been done with common tansy in pasture land where he has tried several different herbicides in conjunction with mowing and fertilizing. One of his suggestions to control the spread of common tansy is to mow the ditches where it is prevalent while the flowers are still yellow. The seed will not be viable at this stage. Escort, an industrial herbicide with the same active ingredient as Ally, has a registration for controlling common tansy in ditches.

Some long term direct seeders have been watching this weed for a number of years and there is no report yet of it becoming a major problem. It needs continued surveillance to determine what if anything effects establishment in direct seeded fields. If problem patches develop, options for control need to be tried immediately. There may be a great long term benefit to the use of both Escort and mowing to try to reduce the spread of common tansy.

Several weed control experts are concerned that the potential for it to become a problem weed for direct seeders like scentless chamomile exists.

Farmer Helping Farmer Database

By Eric Oliver, P.Ag.

SSCA Soil Conservationist

So what is this Farmer Helping Farmer Database? You have probably seen the notice in the Prairie Steward or perhaps heard about it during a meeting. Essentially, it is a database of names of farmers and a listing of the direct seeding equipment, crops, weed control techniques, crops grown in their rotation, and residue management. We use this database to put you in contact with other farmers who have experience in the requested item. In this way, farmers can utilize the experience from other farmers and use that information as another tool in their decision making process.

How does this work? You may be thinking about trying a new crop and would like to talk to a few farmers who have grown that crop in your soil zone or soil type. Perhaps you are looking to purchase new openers or a certain direct seeding drill and would like to find out how some other farmers liked them or even what problems they might have encountered. Perhaps you are looking for farmers who have made certain modifications to existing equipment to make them into direct seeding equipment. We can put you in contact with these farmers.

How do I go about using this service? Simply contact your local regional SSCA staff person or use the 1-800 line. Just ask them to make a search for the item or items you are concerned about. We do a database search and supply you with the names and phone numbers of those farmers who have the experience you are looking for. You can then contact these farmers and talk to them directly. Not only do you benefit from this service, but also, there is no charge for this service.

It must be stressed that the names in this database are not released for commercial purposes. They are released only to farmers so they can contact and benefit from other farmers. To date we have 920 names on the database from all over the province. This means there should be at least a few farmers who are relatively close to your location and soil type.

In summary, the following can be searched for on this database:

Direct seeding drills and air seeders, openers, row spacing, soil type, packers, fertilization and weed control techniques, crops used in rotations, alternative crops, forages, precision farming equipment, and residue management.

Corn Growing Update

By Bob Linnell,

SSCA Soil Conservationist

Two production efforts were made this past summer towards the establishment of a potentially viable corn production system in Saskatchewan. This is not an altogether new idea for Saskatchewan, as several producers, mainly in the south, have grown corn in past years, primarily for cattle feeding. Similar efforts have been tried, both in Manitoba and Alberta They met with varying degrees of success, and were almost always searching for a suitable variety to meet their specific needs.

Recent releases of new varieties of short season dryland corn have come into play that have direct application for the prairie market, especially the southern parts, where sufficient heat units enable chances of successful production. One variety, known as CanaMaize, out of Manitoba was widely distributed to prairie producers who were interested in somewhat larger acres, but still on a "trial basis", and completely at the growers' risk. A fair bit came into the southeast growing area that I am most familiar with. Some successes were recorded, but with a very wet, cool spring and summer, most producers felt it just did not have a fair chance, and some are probably going to try it again. They said they learned a lot and we hope they are able to apply the knowledge for next year. They all said, "the neighbors sure as heck were interested".

Another variety, Cargill 1077, was tried on a more limited basis, with the same rules, and showed equally as variable results. I spoke with a good number of the growers that felt that "they would like to try it again in a normal year". Frost in the fall proved to be a downfall for most, as they predicted it might be during the spring extended planting season. One grower harvested his crop at about 35% moisture and dried the grain by running it through the drier 3 times to treat it in a gentle manner. His final realized yield was 70 bus/ac.

On reviewing all the comments and evaluations from this production experiments and trials, I found a number of similarities, as follows: Seeding rate is important. Recommended rates of 50,000 plants per acre may be slightly high for good yield. This works out to about 25-26 Lb./Ac of seed. A slightly lower rate of about 23 Lb. Seemed to give more yield, probably because the plants were able to set and fill 2 cobs per plant versus the higher seeding rate which produced only 1 cob for most plants. Fertilization was important to get the crop off to a rapid start and sustain the rapid growth rate to allow for proper maturity and physiological development. A fertilization rate slightly higher than used for above average target yields of spring wheat seemed to be the best, under this year's growing conditions. Weed control became important, as was expected. Anyone who experienced less than desired weed control in the crop, usually tried to guess what weed control product or scheme would work best from the menu of items they had access to in their local herbicide outlets.

A lot of producers were not aware of new weed control products available for the proper treatment of corn, as listed in the Saskatchewan Guide To Crop Protection books, published each year and distributed through extension office outlets all over the province.

In summary, it could be described as a good first experience with a crop that is new to a lot of producers, but those who took a serious look at what they produce and what they get for it, showed corn as a crop that bears another look. Economics, it seems, are still the engine that makes us look at what we do on the farm and this is a good thing.

We hope 2000 shows results that are favorable to you as producers, and that corn will eventually become one of your rotation crop decisions to help you survive it the future.

Conservation Learning Centre Update

By Laurie Hayes

CLC Manager

The past few months at the CLC have been very busy. With the late seeding, our spraying season was also extended and, of course, our harvest was also very late. Fortunately, we had good weather when we needed it.

Generally, the incidence of disease throughout the farm was very low. A number of patches were again drowned out this year, causing havoc with our ability to obtain yields on many plots. We started harvest with the barley at the end of August and finished with the flax and canola October 20 - 21. We hired a neighbour to combine our barley, wheat and 40 acres of peas. The other 100 acres of peas we picked up straight with the 8' Sund pickup on our Massey combine and are very pleased with the job. The canola and flax was harvested by Brent Serviss, one of our board members, using his 9610 John Deere.

All peas (Espace, Alfetta and Croma) yielded over 40 bushels per acre. The Fleet feed barley was a very nice crop this year, yielding ~65 bushels per acre. Our wheat crop (AC Elsa) was significantly better this year, yielding 40 bushels per acre. There was no wheat midge damage (did we hit the window this year?) and we also escaped ergot infestation (it was seeded June 1). There is however some frost damage. The 46A73 canola yielded 25 bushels per acre. The flax yielded very poorly; it was seeded June 10 and we had difficulty getting a grip on the weeds. It also froze before it was harvested.

The year was fairly successful. There were no major problems. The new equipment worked well but we had some problems with the application of liquid fertilizer. Some fields received less fertilizer than we had planned (peas 50% less; flax and wheat 30% less). We suspect problems with the single piston pump on the liquid cart.

After harvest was complete, it was time to get down to the business of seeding. On October 26 - 27, we seeded 35 acres Arrow, 20 acres 46A73 and small test plots of 2631 LL and 3640 LL, all coated with Extender, at ~5.5 pounds per acre. Again we had problems with the liquid application. Applied fertilizer rates per acre were:

Arrow: 41 lb N 10 lb P 7 lb S liquid and 12 lb N 2.6 lb P 2 lb S granular

46A73: 53 lb N 13 lb P 9 lb S liquid and 12 lb N 2.5 lb P 2 lb S granular.

Recommended rates are 75 lb N, 28 lb P and 13 lb S. Next spring we will need to top up the fertilizer. Four days after seeding, we got four inches of thick, wet snow. While the weather since that time has been unseasonably warm, it has not been warm enough to trigger germination.

Our school program continues to be a resounding success. This year 1471 students visited the CLC - a 48% increase over 1998. There is a shift in the distribution of the ages / grades attending - there are more Grade 9 and 11 classes participating in the program. There are already 15 classes booked for next spring and the majority of them are Grade 11 classes.

A new component was added to our program this year. Carlton Comprehensive High School has piloted an outdoor school program for Grade 11 students. The participating students hike, bike, camp and canoe through the semester and get credit for Geography, Physical Education, Biology, Communications and Work Experience. They biked out to the CLC and camped there for three days. Many thanks to Greg Perrot (PFRA) and Barb Hanbidge (DU) for their time and knowledge during the three-day program. The program covered the development of soil from glaciation through to land use issues, including impact on wildlife. As we were harvesting canola at the time, Brent explained the concepts of combining and let the students crawl all over his combine. The students that were interested were also given an opportunity to operate the combine. Special thanks to Brent for his contribution. Now they all know the difference between a tractor and a combine!! As well, the herb group was busy harvesting burdock and valerian roots and the students pitched in and learned a few things about herb production.

This fall we also participated in the provincial science teachers' conference (~65 participants) held in Prince Albert. We had our booth set up for the two-day conference and gave a presentation on the CLC and the programs that we have to offer to science classes throughout the province. In the conference packages, we included our brochure and brief overview of our school program, similar to that which we submitted to a previous Prairie Steward. Through this conference, we broadened our circle of contacts and booked new schools for the program next spring.

We are very pleased to have been nominated for the Outstanding Agriculture Ambassador award, a program through Agriculture in the Classroom that recognizes the promotion of agriculture awareness among students and/or colleagues through agriculture-related lessons and demonstrated use of agriculture resources. The winning nominee will be announced at Western Canadian Agribition November 26 - 28.

All in all, it has been another successful year at the CLC. The crops did well (don't ask about the horseshoes) and our school program continues to attract attention. Here's hoping that next year will bring the same successes.

South Central Crop Research Continues

By Bob Linnell,

SSCA Soil Conservationist

Research continued this past summer into crop diversification issues in the Mossbank and Coronach areas of south central Saskatchewan. A normal year would produce less than desired crop residue after some crops were grown, especially low residue crops like pulses and oilseeds. Two years ago, a study was begun to help farmers manage residue by looking at rotations including wheat and these crops that may be new to the area. A portion of the study conducted under the Agri-Food Innovation Fund included looking at low disturbance seeding systems as they applied to crop rotations.

In 1998, fairly extensive methods were undertaken to try and measure differences between a number of treatments on each of the plot sites. Aerial photographs, plant root simulators, protein samples and soil nutrient measurement samples were all tried along with visual looks of the field scale plots. Field days were held at which time farmers in the area visited the field and could see for themselves what the treatments were and the early results estimated.

Some surprising things emerged from this first year of the study, especially in terms of the most economical combinations of seed rates and fertilizer rates in the plots. Some equipment limitations were experienced when larger amounts of fertilizer were to be placed in close proximity to the seed. This would have meant seedling damage under normal moisture conditions. In particular, wide differences were noticed in the protein contents of durum from strip treatments as close as one combine header width.

1999 saw the continuation of this re-cropping study after oilseeds and pulse crops, but under wetter than normal crop conditions with some adjustments in fertilizer application time, there were very good yields experienced in the Mossbank trials. While complete results are unavailable at time of printing, early indications show yields of around 56 bu. per acre in some treatments. This year of high rainfall also produced some flooded out areas in the plots. In general, plot treatments that had higher rates of fertilizer applied showed a corresponding increase in yields. Grain protein samples were drawn as last year, but results are unknown yet. Actual yields were determined using a PFRA weigh wagon at each field site. Area farmers stopped as the harvest progressed to witness the procedure. Frost was a factor at the Coronach site and affected yield and quality as well as maturity, but yields again seemed to vary with the seed rate and fertilizer level.

More detailed results will be published soon and winter meetings will be held with the area farmers to discuss these and other results and programs.

Farmgate Signs Available

By Bob Linnell,

SSCA Soil Conservationist

SSCA active members now have an opportunity to show off their membership in this Association to the entire world. Pictured opposite is a sample of the sign being made available beginning immediately.

The signs are in highway reflective green and silver with black outlines on aluminum back for long life. They are 45 by 60 cm (18x24in) and have the member's name or farm name included in a panel at the top.

PRICE for these signs is only $65 (Canadian). This price includes your name, taxes and postage with sign mailed directly to you. Please allow 8 weeks for delivery.

ORDERS are to be mailed to Bob Linnell, SSCA, P.O.Box 2003, Weyburn SK S4H 2Z9 or faxed to 306-848-2454. Make cheques payable to SSCA.

Please print neatly the Exact name to be placed at the top of the sign in the space following.
Name_____.

Be the first in your area to **proudly show off your membership in the SSCA.**