The Newsletter of the Saskatchewan Soil Conservation Association

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Get Those Oats in Early!

By Juanita Polegi, PAg

Conservation Agrologist

"Wish we had seeded more oats on our farm", was one of the comments made by the Hon. Clay Serby, Minister of Agriculture, when he addressed the Prairie Oat Growers' Association Annual Meeting in December, 2001. Judging by the chuckles and the number of nodding heads in the near capacity crowd, there were a lot of producers who agreed with him. Especially with oat prices hovering in that $3/bushel range.

While the price of oats has growers excited, oats as a regular part of a rotation works well when winter wheat is also included in the rotation. The key to seeding oats and then winter wheat is to seed the oats EARLY! At the POGA meeting, a couple of researchers presented material that showed seeding oats early has a number of benefits.

Bill May, IHARF Agronomist, indicated all his oat research has been done under direct seeding. He indicated that seeding by the middle of May or earlier enables the oats to compete against wild oats. Seeding early is also one way of reducing the risk of rust. He finds that the earlier oats are seeded, the higher the test weight tends to be. When seeding is delayed, both the test weight and yield tend to decrease.

In terms of fertility, super high amounts of N are not usually required by oats. May indicated that if the soil residual N is greater than 20 lbs, not more than another 54 lbs/ac N is needed. In fact, a higher rate of N isn't likely to increase yield and usually decreases the test weight.

Seeding Rate has also been re-evaluated. Traditionally, oats have been seeded at low rates. May said a higher seeding rate, where about 300 plants/m^2 are seeded is better for a lot of reasons. Firstly, in fields where wild oats were a real problem, a higher seeding rate generally resulted in fewer wild oats. In fact, where wild oats were a problem, seeding rate was more important in determining the oats competitiveness than N rates! Test weight also tended to be higher with increased seeding rates. May is starting to look at how other agronomic practises can be used with high seeding rates to control wild oats in a direct seeding system.

Dr. Steve Shirtliffe, University of Saskatchewan, agreed with May that higher seeding rates enhance the competitiveness of the oats.

Shirtliffe said that delaying seeding in order to catch the first flush of wild oats will result in a decreased yield and milling quality. He suggested a better way to out-compete wild oats is to apply glyphosate pre-seeding and to use a low disturbance seeding system to seed the oats.

Come harvest time, Shirtliffe doesn't recommend a pre-harvest application of glyphosate. He said that test weight can drop by as much as 3 - 5 lbs/bu when an oats field is sprayed pre-

harvest. Kernel breakage can also increase. And perhaps most importantly, the millers don't want any glyphosate residues on their product!

Thom Wier, Extension Agrologist, SAF indicated that oats are susceptible to carry-over from several herbicides. Those with the greatest potential for damage in a succeeding oats crop include the trifluralins, imidazolinones and some of the "newer" Group 2 wild oat chemistry. Weir also indicated that dry weather may reduce the rate that these herbicides break down.

In the panel discussion on general oat agronomics, Weir related that he had once visited a field with areas of severe Sulfur deficiency. In those areas, there was as much as an 8 - 10 bu/ac reduction in yield. He commented that due to the variability of the S in fields, a soil test may not always show those areas where S is deficient.

Oats is one of the better crops to grow prior to seeding winter wheat. Getting the oats into the ground early not only ensures timely seeding of the succeeding winter wheat crop, but the oats crop will benefit as well. Early seeding will generally result in a more competitive oats crop with the potential for higher yield and quality.

President's Message - Ag Soils Sinks: Service or Commodity?

By John Bennett

SSCA President

There is a lot of talk about Greenhouse Gases (GHGs), global warming, the Kyoto Agreement and agricultural sinks.

The Marrakech Accord (COP 7), which Canada signed and the Federal Government indicates it will ratify, contains four provisions that will likely have a profound effect on farmers. The following article will briefly explain what these provisions are, their implications and offer some suggestions on how farmers add value and reduce risk on their farms.

First, ag soil sinks are accepted as a GHG mitigation strategy. This means that the nation can use the removal and the storage of CO_2 (carbon sequestration) by farmers as a method for reaching Canada's Emission Reduction (ERU) targets. COP7 defines these as Emission Removal Units (RMUs). It's useful to note there is no cap or limit to this potential excepting the adoption rate of Best Management Practises (BMPs) like reduced tillage, zero tillage or direct seeding systems that create ag soil carbon sinks.

Second, there are ERUs that will be tradable between countries that ratify the Kyoto Agreement.

Third, there is a base line that recognizes some, but not all, of the carbon sequestered since 1990. This means that the government will already take credit internationally for meeting some of its emission targets. It remains to be seen just what sort of recognition the farmers that have sequestered this carbon will receive.

Fourth, market mechanisms are to be used to facilitate balancing Emissions and Emission Reductions. The sulphur dioxide market that addresses acid rain is an example of an emission market.

Before we discuss the carbon market, we must first understand the nature of an ag soil sink. When a farmer changes to reduced tillage or zero till, he changes the dynamics of the carbon cycle. In simple terms, by using BMPs, we add organic carbon (plant residues created by photosynthesis) at a greater rate than we lose it (by oxidation). There is a limit to how much carbon can be stored. This limit is reached when the rate of removal matches the rate of loss. This is a new equilibrium known as "saturation". Also important to note is that sinks can be eliminated and the carbon returned to the atmosphere if the farmer reverts to tillage. This raises the question of permanence or for how long the carbon has to be stored.

Carbon sinks can be destroyed much more quickly than they can be created. This means that all the ERUs created after years of direct seeding can disappear with only a few years of tillage.

In scientific terms, an ag soil sink (RMU creation) can be a potential "source" of emissions if the soil is tilled. This is much the same as an underground oil reservoir that has the potential to become a "source" of emissions if it is pumped and burned. A fragile ag soil sink with tillage can also become a source. Maintenance of this ag sink or "permanence" is a very important consideration as we approach the market question.

Before we look at market options, we should try to understand the potential demand for RMUs and ERUs.

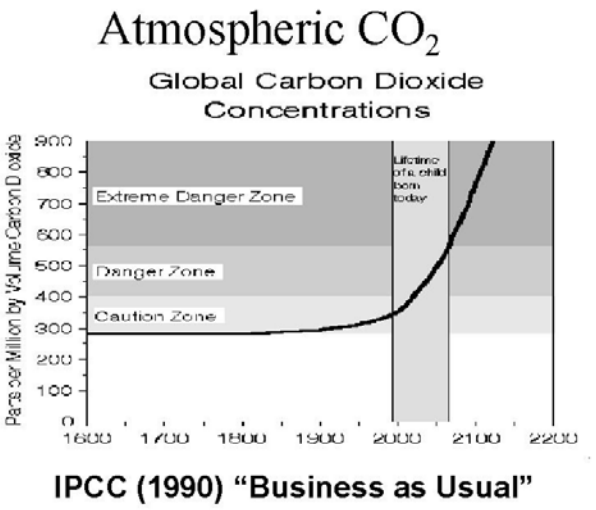

Figure 1: CO_2 Levels

The first portion of this graph reflects the measured CO_2 concentration in the atmosphere. The last part represents the projected levels. If global warming tracks this curve, we should conclude that the value of the both RMUs and ERUs will likely be greater in the long term than in the short term.

First, let's consider the implications of treating an RMU as a commodity:

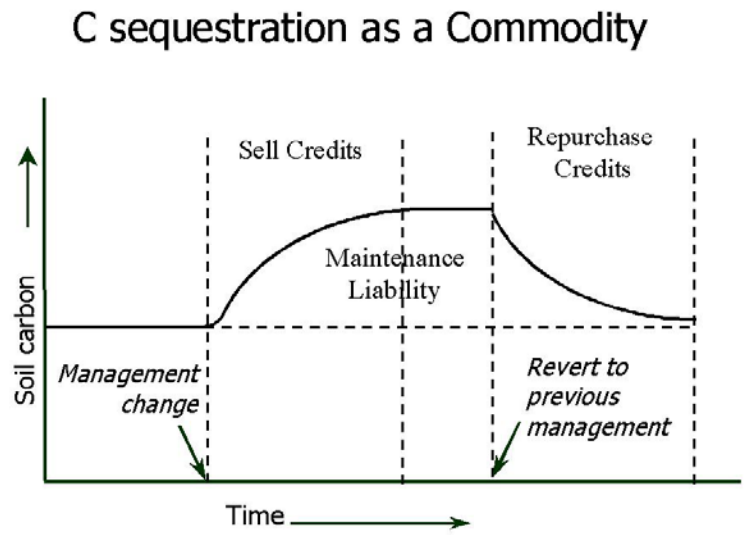

Figure 2: Sequestration as a Commodity

As carbon is being sequestered, RMU credits are created and sold. The farmer also creates a Maintenance Liability. Farmers need to realize the risk they assume since ag soil sinks can become a "source" of emissions in the future. When the ag soil sink is full or "saturated" and no further BMUs are created, the soil no longer has value but the maintenance liability remains. In the worst case scenario, the zero till system fails and the farmers returns to a tillage system. The sink then becomes a source of emissions and the farmer must return to the commodity market to purchase the RMU credits he once sold. At this point, it would be prudent to revisit the demand curve in Figure 1. This could be the typical sell low - buy high scenario. Should the farmer or land owner sell the land, the maintenance liability would probably devalue the land.

Our second market option would be to consider Carbon Sequestration as a Service.

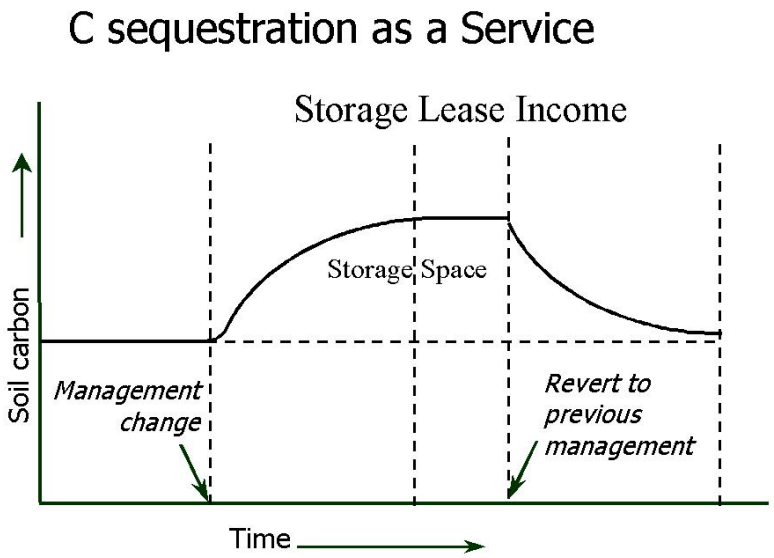

Figure 3: Sequestration as a Service

Farmers could lease, rent or lend carbon storage, in essence, providing a service. The service could be provided for a set period of time. This concept would provide a lower value in the short term but a greater value in the longer term.

Think of this in terms of a garage analogy. The Farmer is like the garage builder who creates RMUs with ag soil sinks (by building garages) and leases or rents the garages to Emitters (car owners) to store surplus emissions (the car) for a short period of time. At the end of the contract or term, the car owner may renew the lease to use the garage. Or perhaps the car owner no longer needs to use the garage. In that case, the garage is available for another car owner. When the ag sink is saturated, the farmer can no longer create RMUs (build any more garages) but he can still rent or lease them all. This would add value to the farm as long as cars need a place to park. Who know, perhaps the farmer will some day need the garage for his own car (emission reduction). The farmer's exposure to risk, then, would only be for as long as he agreed to provide the service.

Again, it is useful to look at Figure 1 to see how this value would accrue. Less value in the short term, but greater value in the long term.

Should the farmer or land owner decide to sell the land, the added value of leasing or renting the land would increase the value of the land. The ERU market would provide an arms length price discovery method upon which a lease or rental rate could be agreed.

To conclude, the Marrakesh Accord identifies the accounting unit for Emission Removals (RMUs) as different than Emission Reductions (ERU). Considering the Risk of Permanence, it would probably be prudent for farmers to enter contracts for storage that have a time limit. Treating sequestration as a commodity would provide short term value and result in long term

liability. Treating sequestration as a service would limit short term value but value could accrue as long as the sink was maintained. Market structure will determine whether sequestration will add value or increase risk for farmers.

Executive Manager's Report

By Blair McClinton, PAg

SSCA Executive Manager

2002 is the SSCA's 15th anniversary. Over the past 15 years, SSCA has been a very active group contacting up to 10,000 producers annually through various meetings, tours and field days. Over 12,000 producers have attended the 14 direct seeding conferences for an average attendance of 850. No too bad considering the first few conferences had fewer than 200 attending. A history of the first 10 years can found on our web site. (http://ssca.usask.ca/newsletters/issue22/ssca10.htm)

Member Meetings

In January, SSCA held a series of six member meetings to inform our membership on the latest information on soil sinks and Roundup-Ready Wheat. Over 100 members attended the six meetings. The meetings were well received by those attending with lots of discussion on these two issues. Overall, we were very happy with the attendance at the meetings and with the quality of the discussion. I have summarized the main points from the presentations below.

There were three presentations at each of the meetings:

- Update on International Negotiations - Blair McClinton, SSCA
- Soil Carbon: Risks and Opportunities - John Bennett, SSCA
- Roundup-Ready Wheat - Monsanto Canada

In my presentation, I pointed out that last year agricultural activities were formally accepted as a sink activity under the Kyoto Protocol. These agricultural activities can be under either cropland or grazing land management. Carbon sequestered in shelterbelts would fall under either of these activities since they don't fit the definition of a forest. Accounting for agricultural activities is on a "Net-Net" basis. This means a country can get credit for the annual difference between net emissions in 2008-2012 and net emissions in 1990. For example, since Canada had net emissions of 6 Mt/yr of CO_2 in 1990 and is expected have a net sink of 10 Mt/yr by 2010, the countries net emissions in 2010 would be 16 Mt/yr (10+6). The other significant outcome of the international meetings is the recognition that emission reductions are different from emission removals (sinks) and requires different accounting methods. To do this, a Removal Unit (RMU) was created for sink accounting. For more information, download the COP 7 report from the United Nations climate change site. http://unfccc.int

John Bennett's presentation focused on the potential risks to farmers to trade carbon. Two realities that we recognized were that the sequestration rate will eventually reach a new equilibrium where carbon is neither being gained or lost and that sinks are reversible. The risk of selling carbon credits is that while the buyer is able to offset their emissions, the farmer is left with the liability of maintaining the sink. If the land is tilled in the future, releasing the carbon,

the farmer now is the emitter and may face some penalty. Since the problem is likely to be a bigger concern in the future, the farmer could face buying back carbon at a higher price. To prevent this transfer of liability, SSCA has been advocating treating greenhouse gas removals as a service. In this instance, a farmer would agree to remove CO_2 from the atmosphere and store it for a fixed period of time (i.e. 5 years). This concept is similar to renting storage space. After that period was up, the emitter would have to either renew the lease or find another storage option. With this method, a farmer can lease out more storage space as the sink size increases. If the sink size decreases, he loses only the right to lease storage space. For more information visit the SSCA web site: http://ssca.usask.ca/positions/risk.html .

Monsanto's presentation was to provide our membership with an update on their progress, to date, with Roundup-Ready Wheat. Those attending were encouraged to ask questions and raise their concerns about this product. There was good and sometimes vigorous discussion on this topic. SSCA's members expressed concerns about marketing, grain handling and volunteer management. The members were also skeptical of the potential benefits. In the simplest terms, Monsanto responded by stating that they will not release Roundup-Ready Wheat until the issues surrounding marketing, grain handling and volunteer management are addressed. Monsanto has currently completed their first year of research to support their regulatory submissions for variety registration. Monsanto is sponsoring Agriculture and Agri-Food Canada to conduct agronomic research on the Roundup-Ready Wheat fits into different rotations and tillage systems. This includes development of a product to control volunteers. If you would like more information please contact your local Monsanto rep.

Good luck in 2002.

Nutrient Management Planning

By Rich Szwydky, PAg

SSCA Conservation Agrologist

As I was tearing down our display after another successful Crop Production Show, I reflected on the many questions and comments that producers from around the province had throughout the week. The most common questions asked revolved around producers re-evaluating their fertility program after a very dry growing season. How much residual N do I have remaining in the soil from the previous year? Can I cut out potash and sulfur from my fertility program to reduce costs? How much nitrogen can I seed place? All are valid questions.

Despite volatile markets and low commodity prices, producers still need to maximize crop yields and crop quality to achieve the highest net return per acre. In order to do this we need to manage our nutrients accordingly, making sure we supply the soil with what it needs using correct blends and correct rates. A soil test can provide this information, and the cost may be the wisest dollars spent by producers this spring.

Soil testing is an essential part of nutrient management planning, and is the most practical method of assessing nutrient value in the soil. Although testing is not 100% accurate, it does provide a reasonable estimate of the soil's nutrient availability. Soil testing also manages the risk by identifying yield-limiting factors and estimates the probability of crop response to added nutrients.

Once the soil test is complete, the next step is to create a balanced fertilization program. As an ag retailer for the past decade, I spent a considerable amount of time reviewing soil tests and creating balanced fertilization programs for producers. To maximize yield and crop quality, we must provide the plant with adequate amounts of all essential nutrients. By providing the plant what it needs - at the correct time, at the proper placement and in the proper blend - you will ensure the production of a healthier plant with a well developed root system. Healthier plants will improve the crop's ability to cope with disease and pest problems. The crop's tolerance to dreaded environmental conditions such as heat and drought will also be significantly improved due to increased efficiency in the plant's water use. Most important, a healthy plant limits the impact of the above stresses on yield and profit potential.

When designing a balanced fertilization program, one has to always keep in mind Leibig's theory of the law of the minimum. This law states that crop yield is proportional to the amount of the most limiting nutrient. When this nutrient is added, crop production is raised until it is controlled by the next most limiting nutrient. Although nitrogen will always be the most important nutrient, it can only be effective if all other nutrients are in sufficient quantity to meet crop requirements. There are 16 elements known to be essential for plant growth. To maximize yields, all elements must be present in the correct amounts and the correct proportions to each other. Excess amounts of certain nutrients can affect the availability of other nutrients and cause deficiency symptoms.

The amount of fertilizer that can be seed placed is dependent on many variables. Cereals can tolerate more fertilizer in the seed row than the smaller seeded crops such as canola and flax. Ultimately too much fertilizer in the seed row will cause ammonium toxicity and lead to germination damage. Soil conditions such as organic matter content, texture, and soil moisture will ultimately affect the amount of fertilizer that can be placed with the seed this spring. Generally, a crop seeded on heavier textured soil with higher organic matter levels will tolerate greater amounts of seed placed fertilizer than coarser textured soil with lower organic matter levels. In addition, producers should also take into consideration seedbed utilization. The method of seeding (e.g. use of a disc, knife, hoe opener, or spread tip) and the amount of row spacing will also affect the amount of fertilizer that can be seed applied. The general rule of thumb is the higher the seedbed utilization, the greater amount of fertilizer that can be safely applied with the seed.

Everybody knows about the attributes of nitrogen and phosphorous to crop production. One must not, however, downplay the benefits provided by potash and sulfur. Unfortunately these products tend to be dropped from fertilizer programs when producers are looking to cut costs. Be aware that both elements are macronutrients and, as such, the plant does require them in large amounts. The incorporation of potash and sulfur into a fertilization program will ultimately result in improved crop yield and quality.

Have you ever noticed increased lodging in your crops? Are you seeing a higher incidence of disease or crops that cannot withstand drought? If so, your crop may be lacking in potash. With the exception of nitrogen, there is no other fertilizer nutrient required in higher amounts by plants than potassium. Generally our soils do contain high potassium reserves, however only a small fraction is plant available. It has been documented that cereals and oilseeds require 70 to 90 lbs/acre of potassium. Some high use crops such as barley require approximately 95 lbs/acre. Field peas require an astounding 135 lbs/acre of potassium. Potassium plays an important role in regulating the opening and closing of the stomata on plant leaf surfaces. This is particularly important, especially in drier years. When potassium is deficient, plant water losses increase and plants are more susceptible to water stress. Potassium serves a number of other functions in the plant, including disease suppression, straw strength maintenance, protein synthesis, and enzyme activation.

Sulfur is the third most limiting nutrient in prairie soils. The black, dark gray, and gray soil zones of the prairies, along with coarser textured soils, usually have lower reserves. Sulfur is required for protein production and in the formation of chlorophyll.

Sulfur deficiencies will be evident by the yellowing of the newest leaves. Other symptoms include short spindly stems and an upward cupping of younger leaves. Sulfur requirements vary from one crop to the next. For example, broadleaf crops such as alfalfa and canola need larger amounts than cereal crops. Make no mistake - the inclusion of this nutrient in your fertilization program will positively impact crop yield and quality.

Plans and Programs for the CLC

By Laurie Hayes, MSc, PAg

Manager, Conservation Learning Centre

Is winter really here? You sure couldn't tell it by the scant snow cover throughout the province. And these temperatures -- who needs a warm holiday away? Oh well, it gives us all something to talk about while we are planning the next year's activities!!

This summer we had a meteorological (weather) station operational. While it was great to have all that data, it was equally shocking when you evaluated it. The one measurement that is of great interest was the evapotranspiration. Evapotranspiration is the sum total of the moisture evaporated from the soil naturally and transpired from the plant. Between May 30 and October 22, 2001, the CLC received less than 6 inches of precipitation but lost over 20 inches of moisture to evapotranspiration. I'd say we lost. For those who have visited the CLC and seen the number of sloughs there are (~40), there were only two sloughs that had any water left in them by the end of October.

We did buy a "new-to-us" combine this fall -- a 1983 TR85 -- with a pick-up header and a straight cut header. We straight cut the wheat and flax (which were both preharvested with Roundup Transorb). The chopper and spreader did an excellent job on the flax. The PF3000 Ag Leader yield monitoring system was installed in the combine. It worked well -- the toughest part was getting the calibrations set. We were able to generate yield maps for the wheat, flax and canola.

Given the lack of moisture, yields (in bushels per acre) were acceptable: peas 35; flax 24; wheat 37 and canola 20. This can be attributed to a couple of factors: the accrued benefits of direct seeding, good residue "coverage" and timely rains.

We also harvested the first seed production of the second-year caraway. We yielded 240 kg on 1.4 acres. However, there were only 7 swaths and on the first one (of course, the heaviest one) we threw lots of seed out the back trying to set the combine (we used the old Massey). We finally got the combine set so that the seed wasn't being lost but we also collected a lot of straw in the hopper and the seeds were not fully disconnected from the head stems. We estimated that only 30-35% of the caraway bloomed this year and look forward to a good crop next year as establishment of the caraway is excellent. Crop Insurance continues to use our caraway patch in their efforts to develop methods to assess establishment.

In the precision farming project, we varied the rates of the N, P and S fertilizers. We did not tackle the variable application of pesticides. We have evaluated the yield map, but as we suspected would be the case for the first year of one crop on four different stubbles, the previous year's crops had an impact on yield. This, as well as the impact of the lack of moisture, makes it very difficult to draw any conclusions.

The projects that involved any variation in fertilizer this year did not show differences. In the 50-acre pea field, three fertilizer rates were applied: full rate (8# N 28# P), half rate (4#N 14#P) and no fertilizer. The plots were harvested separately and the yields were not influenced by the rate of fertilizer -- all three plots yielded 35 bushels per acre.

The same results were seen in the copper demonstration -- the inclusion of copper did not influence yield, regardless of the form or time of application.

This year we replaced a number of trees in different areas on the farm. The PFRA facility in Indian Head supplied us with over 200 trees: Colorado spruce, acute leaf willow, Walker poplar and green ash. The trees were watered every three or four days for two or three weeks and then it was left up to Mother Nature. Unfortunately, she did not co-operate -- it was not a good year to plant trees. All the spruce died as did about half of the green ash. Most of the poplars and all of the willows survived.

As is usual for this time of year, we are busy developing projects for the upcoming season. We will continue the precision farming project with wheat as the crop. We will also continue to collect meteorological data with the weather station and hope to utilize the sclerotinia model as an aide for timing fungicide application. We will be showcasing 45A77 canola with (hopefully) a Gaucho Platinum seed treatment (in addition to its other properties, it provides suppression for lygus bugs). We will be working with Monsanto and their seed division Dekalb to showcase a new Roundup Ready canola variety. We will also have a number of smaller demonstrations of flax, corn, coriander, dill, fenugreek and medicinal herbs.

We are in the process of developing a new project with Ducks Unlimited that would see the CLC expand into a new area -- grazing management. Ducks Unlimited will resource land that has been seeded to dense nesting cover (with cicer milkvetch as part of the mix), has bush and/or trees, and water present. PFRA will help with trenching to develop a piped water system to make water available to each paddock. The fencing and watering equipment will operate with solar-generated power. Together with a number of collaborators, a rotation grazing system will be set-up. There will be a check plot set aside for comparison purposes. The project is long-term and we anticipate hosting two field days, one in summer and one in fall.

Also with Ducks Unlimited, we will be participating in a winter wheat project this fall. SeCan and Syngenta will also be involved in the project.

The school program grew again this year -- **2,147 students** participated in the activities at the CLC. One group in particular was extremely committed -- the Grade 11 class from Holy Rosary High School in Lloydminster got on the bus at 6:45 am to make the four-hour trip to the CLC!! In addition to the structured school groups, we hosted Girl Guide, Work Experience and Special Needs groups. The Carlton Comprehensive High School Outdoor School visited the CLC for the third year.

News of our program is spreading -- the Outdoor School program in Saskatoon phoned in November and wanted to come visit and learn about soils on December 7. Since it would be

difficult (certainly not because of the depth of snow!) to demonstration soil layers, etc. at that time of year, we have scheduled a tour for them, similar to what we offer Carlton, in the spring.

We said goodbye to Garry Brad this summer. We sincerely appreciate Garry's contribution that helped to build our program.

We say hello to Gord Byrne who quickly jumped into the fray this fall and we look forward to working with him in the upcoming year. His enthusiasm will ensure the continued success of the school program.

The CLC was nominated for two Canadian Agri-Food Awards of Excellence -- for Environmental Stewardship and Agricultural Awareness and Education. We thank all the organizations and producers who supported our nomination.

We once again thank our partners and sponsors for their continued commitment to the CLC.

The CLC's General Tour will be held Tuesday, July 23, 2002. We hope to see you there or just drop by any time for a tour. Have a great spring.

Annual Legume Forages in a Direct Seeded System

By Eric Oliver, PAg

SSCA Conservation Agrologist

Chem-fallow is an effective method of reducing tillage, reducing erosion and conserving moisture. Under dry conditions, wheat protein levels on chem fallow are not generally a problem. However, under good moisture conditions, often the protein content of wheat grown on chem fallowed cereal stubble is much lower than wheat grown on summerfallow or on a pulse stubble, even with recommended fertilizer rates applied. This problem with wheat protein creates a bit of a dilemma for those producers who wish to have some fallow in their rotation for risk management. While chem-fallow will continue to be an excellent soil conservation practice, other low input options need to be explored.

Greenfallowing, also known as green manure, has made some inroads in farming systems over the past 20 or 30 years although its growth in popularity hasn't been as great as chem-fallowing for that same time period.

What is Greenfallow?

A greenfallow crop is an annual legume crop that is allowed to grow for only part of the growing season, then terminated. Traditionally, this termination usually involved tilling the crop under, but in more recent times, herbicides have been used to kill the crop. The benefits of greenfallowing include nitrogen fixation that will be available for the crop the following season. Since the crop is terminated early in the growing season, it also allows soil moisture recharge from precipitation. These two factors provided producers with a reduced tillage option before it became popular. Annual legumes are effective as greenfallow crops because of their ability to fix nitrogen and their root system is concentrated in the upper two feet of the soil profile allowing soil moisture recharge from precipitation.

At first, field peas or lentils were used as greenfallow crops, then crop breeding with greenfallow specifically in mind produced annual legumes that grew quickly and had high nitrogen fixing capabilities. Indian Head lentils and more recently, AC Greenfix (a chickling vetch), are examples of varieties developed specifically for greenfallow.

Greenfallowing is a practice for farmers in the Brown and Dark Brown Soil Zones who want to have a certain amount of fallow in their rotation for risk management. In addition, there are also many farmers who are renting land that have a requirement that fallow be part of the rotation. For those producers, greenfallow can have a good fit in conjunction with chem fallow.

Greenfallow as an Option

Discing in the greenfallow crop will result in maximum benefit of the nitrogen fixed by the crop. However, desiccating a greenfallow crop results in about only a 10-20% drop in the soil N as

compared to discing once. Dessication has the advantage in that it leaves 20-30% of the residue on the surface for erosion control.

Greenfallowing does improve the soil quality and organic content of the soil as compared to chem fallow and especially when compared to summerfallow. Studies by Biederbeck et al have shown that wheat grown on greenfallow stubble increases wheat yield, improves grain quality with higher protein content and larger kernel size. These qualities affecting the cereal re-crop can certainly overcome the problem associated with chem-fallow. However, in a drought year such as encountered in 2001, the differences between greenfallow and chem fallow would not likely be significant. For ideal greenfallow production, the rule of thumb is, "If it's a dry year, seed early. If it's a wet year, seed later." In a dry spring you want to seed early to get the crop established to take advantage of the available soil moisture. In a moist or wet spring, you may want to seed later so you can spray out that first flush of weeds just prior to seeding your greenfallow crop.

The only problem with this rule of thumb is that if your crystal ball for predicting the weather is like mine, it's rather difficult to take advantage of until it's after the fact. However, if it is very dry at the time you wish to seed your greenfallow crop you may well be further ahead to chem-fallow instead.

AC Greenfix has proven to be one of the best varieties to use as greenfallow. It produces the greatest top growth and fixes the most nitrogen as compared to the only other registered greenfallow variety (Indian Head lentils) or other pulse crops. Greenfix also has better heat tolerance and drought resistance as compared to other pulse crops.

A general rule of thumb for estimating N production of AC Greenfix is that for every 1000 lbs of top growth, about 40 lbs of N is gained in total by the soil when it is disced in or desiccated. Plot studies at Swift Current showed that with timely rains, Greenfix can fix as much as 210 lbs/ac of N after seeding into wheat stubble.

The nitrogen fixed by greenfallow has considerable value, even without considering the higher grain quality and protein of the cereal re-crop. Assuming 46-0-0 costs $299/tonne and that a greenfallow crop fixes 50 lbs/ac N. This would amount to a value of $14.75/ac of N fertilizer. 75 lbs of fixed N would provide $22/ac value and 100 lbs/ac of fixed N would provide $29.50/ac value. Although there are costs to seeding the greenfallow crop, how high these costs are depend on the cost of the greenfallow seed and inoculant. The goal, of course, is to keep the input costs as low as possible.

An annual legume study conducted by Bryan Nybo with Wheatland Conservation Area at Swift Current, found that under average to well above average precipitation years (1998-2000), the average forage yield of some annual legume crops was between 1.9 and 3.3 tons/ac forage yield and relatively high levels of protein. If the total amount of N is accounted for, this means that there would be approximately 113 to 182 lbs/ac of N. During the severe drought of 2001, Dr. Biederbeck evaluated the performance of AC Greenfix (chickling vetch) at six locations across southwest Saskatchewan. The precipitation from April 1 until the sampling date (approximately two months later) ranged from 1.5 inches to a high of 3.5 inches. Even so, the forage yield taken

from this greenfallow crop at these sites ranged from 720 to 1600 lbs/ac, averaging 1200 lbs/ac over the six sites. If the greenfallow crop was desiccated and using the 1200 lbs/ac value, it would provide the soil with an average of 53 lbs/ac of legume N. Not bad for a drought year and low forage production. This additional N would likely be more than enough for a cereal crop the following year.

Another Greenfallow Option

Although the producer will obtain the greatest N supply from greenfallowing by discing it in or desiccating the crop, removing it for forage is another use for greenfallow. While this would remove about 75% of the N that could be supplied by the greenfallow crop, it is still worth evaluating.

Removing the crop as forage provides an additional supply of good protein feed that the producer can use for his own livestock operation or sell. The provincial cattle herd is expected to dramatically increase over the next eight years so forage supplies will also need to increase. As noted above, the potential of forage yield can be very good under average to above average moisture conditions. But even under a severe drought year as in 2001, forage yields can be worthwhile. A greenfallow study at Aneroid, Saskatchewan, found some surprising forage yields (Figure 1). However, it should be noted that the greenfallow treatments were not seeded until late May and in combination with the drought, the forage was not removed from the plots until early August. In addition, there were a lot of weeds in the treatments, especially in the Greenfix plots. In hindsight, the greenfallow crops should have been seeded much earlier to take advantage of soil moisture that was available in late April and early May.

Although the farmer will often need to add some fertilizer when seeding the cereal or oilseed crop the year following greenfallow when the top growth had been removed for feed, don't get too hung up that this is another input expense after all the hassle of growing a greenfallow crop. Remember that that forage you removed has value, as does the nitrogen that was fixed in the soil.

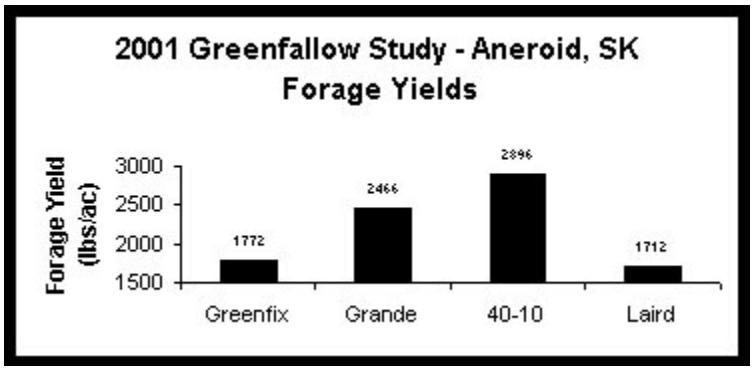

Figure1. Greenfallow Studies at Aneroid, Sask. 2001

If the greenfallow forage yield was 3000 lbs/ac (1.5 tons/ac), there would be about 26 lbs/ac N in the soil from the greenfallow treatment. In most cases, the farmer can use a narrow single shoot opener and still be in the safety zone when applying 25 lbs/ac N with the seed of the cereal crop. This may be very important if the farmer cannot or doesn't wish to convert to a double shoot opener enabling him to apply high levels of fertilizer.

Although AC Greenfix has the highest N fixation and top growth production of the specific greenfallow crops, it has not been recommended to be used for cattle feed. The seed of this chickling vetch contains a neurotoxin. Although one would take Greenfix for forage at flowering stage, there is still a concern in using this crop for feed. The USDA National Grazing Research Trials are presently evaluating the safety and feed value of AC Greenfix. NDSU Carrington Research Extension Center in Carrington North Dakota have been evaluating AC Greenfix as part of their annual forage as hay trials. Their results from 1995-2000 indicated that Greenfix had excellent forage quality with crude protein ranging from 22-26%.

Summary

Greenfallowing can offer producers more options in a direct seeding system. It can certainly result in reducing tilled summerfallow acres. Desiccating the greenfallow crop has the potential of providing large amounts of N for the cereal or oilseed crop the year following. Even in dry years, providing the greenfallow crop was seeded early, there can be significant amounts of N fixed with relatively little cost.

Other benefits to a greenfallow crop are the increase in soil quality and organic matter and the reduced risk of erosion. Using the top growth as a potential feed source is another benefit.

In addition to grain quality, kernel size has also been shown to be larger on greenfallow than on chemfallow. This is not to say that greenfallow will completely replace chem-fallow, but it has tremendous potential as a rotational crop for those farmers that require a form of fallow in their management system.

2002 Direct Seeding Conference a Major Success

Farmers from across western Canada met at the Regina Exhibition Park, February 13 and 14, to attend the SSCA's 14th Annual Direct Seeding Conference. The success of this year's conference is evidence that even in light of the poor farm economy, farmers recognize the value of attending our conference in helping them to gain an edge with their crop production system.

"The purpose of the conference was to bring farmers together to get the latest information on direct seeding and how to implement these practices on our farms," said SSCA president John Bennett. "It's a forum for farmers to have their questions answered by researchers, industry experts and other farmers," said Bennett.

This year's conference featured keynote speaker, Dr. Douglas Powell, an assistant professor in the University of Guelph's Dep't. of Plant Agriculture. He is also Director of the Food Safety Network at the University. Dr. Powell discussed the implications of biotechnology for all farmers.

In total, 23 people delivered presentations at the Conference. The presenters included researchers who provided some of the most recent research findings on cropping issues and farmers who related their experiences managing weeds, integrated livestock and cropping systems and diverse rotations. The theme of this year's conference was "Direct Seeding: Optimizing Production Systems". Session topics included Economics, Beginning Direct Seeding, Advanced Direct Seeding, Rotation Diversification Options, Integrating Livestock in a Direct Seeding System, Forages for Everyone and New & Emerging LDS Issues.

Once again, the concurrent, informal evening "Bear Pit" sessions were well attended. Participants chose to attend one or all of the four sessions: How to Start Direct Seeding, Integrated Pest Management, Fertility Management and Soil Carbon. These sessions provided farmers with the opportunity to have their questions answered by the panelists and each other in less formal, smaller groups.

The trade show had a number of exhibitors showing the latest in crop production technology and information related to direct seeding. The trade show continues to be a major attraction of the conference.

The SSCA Annual Meeting was also part of the Conference. Members had the opportunity to meet the Board, review the SSCA financial statements and discuss the future direction of the SSCA.

Extra copies of the conference proceedings may be purchased from any SSCA staff member for $10. Plans are already under way for the 2003 annual meeting and conference in Saskatoon.

The Saskatchewan VRT Project

By Garry Mayerle, Cory Willness, Dennis McIntosh

The Saskatchewan VRT Project is performing field-scale investigations in Northeast Saskatchewan to assist producers in the adoption of variable rate nitrogen applications. Currently, farmers apply constant rates of nitrogen and this results in over application in some areas, which harms the environment, and under application in others, which reduces profitability. The VRT Project has found that variable rate fertilization reduces production risks and improves profitability. Project leaders Dr. Dan Pennock, Dennis McIntosh, and Cory Willness have teamed up to develop a practical method to implement variable rate fertilization on Saskatchewan farms.

Background

The Northeast Agricultural Research Foundation (NARF) is a non-profit organization established to encourage and direct the development of agriculture research for producers in Northeast Saskatchewan. Work completed to date has focused on using yield mapping systems to evaluate on-farm research trials. Examples of field-scale research that the producers have tested includes fungicides, micronutrients, weather station disease modeling, soil sampling systems, and alternative crops. Recently NARF has decided to support the Saskatchewan VRT Project as its top priority.

Dennis McIntosh is a long-standing NARF board member that was determined to find the solutions to make site-specific management of N fertilizer work on his farm. He has been farming for 25 years a few miles north and west of Melfort. His drive to reduce crop lodging, increase uniform maturity and use fertilizer efficiently may have been sparked by his education in chemistry. Dennis also has the computer and technological expertise to put the various hardware components, and the software in the system together and make it work. In his quest to make this work on his farm he has traveled and networked with experts across North America who are attempting to find the same answers he is.

In 1998 Dennis began some field scale research trials on his farm with NARF. Dennis hoped to be able to use aerial photography and topographic based soil testing to establish nitrogen management zones. He started out with 2 fields establishing small management zones using grey-scale photography. As he applied the anhydrous Dennis felt he should be overriding the rates that the prescription map was feeding to his applicator. The results that cropping season were evaluated against fixed rate strip trials also laid out in these fields. During the growing season the lodging indicated to him that there were problems with the zones that had been laid out. These observations were also confirmed with remote sensing techniques. The yield maps used to quantify the results of the management zones against the strip trials showed that the procedure was working on a large portion of the field. However in the remaining areas there were serious enough errors that when these numbers were converted to financial returns there had been no benefit to this management zone approach.

The seat of the pants method

Dennis decided to use his "intuition" or gut feel for the rates of N he felt should be applied based on the observations and data which he had collected in the 25 years he had farmed these 9 quarters. He felt his intuitive interpretation of soil N status was probably more reliable than the guidelines obtained from an extensive site-specific soil testing program. All the technology was already in place on his equipment to capture and record these rates. If this approach proved profitable maybe one could work backward or reverse-engineer to come up with a predictive analysis that could be standardized for others to use.

The term Dennis uses to describe this method is the "seat of the pants" method. It is based on the familiarity that farm operators acquire with their land over a number of cropping years. It is based on observations throughout the seasons, grain yield and crop residue produced, soil characteristics, and even past histories that only the human mind can manage. Dennis refers to these as virtual images or maps the human mind has created. He is in a sense capturing and converting these images into a digital format that our GIS software can handle thorough the seat of the pants N application method.

To get started at this procedure Dennis toured the field by ATV bringing to mind the field characteristics that he thought would impact how much N he should apply. For the startup passes he placed pin flags of different colors at various field locations to help jog his memory when he was actually in the tractor seat adjusting the N application rate. He says, "Given some experience, the rate patterns soon imprint and it's possible to develop a high level of consistency between different passes across the field."

One of the problems Dennis encountered with the term "management zone" was that others seemed to be trying to develop application parameters based on only 1 or 2 factors that vary across a field. He prefers to view each field as a collection of many small management squares arranged in a grid. Each square or grid location in a field can be as complex as a mini-ecosystem and may respond differently to specific management practices than neighboring grid cells. He calls each of these grid locations a **logical management unit (LMU)**.

On-farm research is a requirement

Dr. Dan Pennock is a professor and researcher with the soil science department at the University of Saskatchewan. He reported at the recent Site Specific Management Conference in Edmonton that "Site-specific management has turned out to be a lot more site-specific than researchers originally assumed." This has made it difficult to develop recommendations for site specific management within a given region. It supports the need for on-farm research. Dan suggested that "producers need to work with researchers and professional agrologists to ensure that the on-farm research they conduct will answer the questions that the producer wants answered."

Cory Willness is an agrologist with the Co-op Agronomy Centre at Naicam and a member of the NARF management board as well. He also promotes on-farm research. Cory was the catalyst that lit the fire for the Saskatchewan VRT Project in the winter of 2001. He says, "Dennis' work is impressive because he has single handedly put together a working solution for variable rate fertilizer application using field scale machinery and equipment along with readily available GPS technology and software." "He already has a successful implementation of variable rate

fertilization that farmers, researchers, and agrologists can learn and build on." Cory says that because the VRT Project has used field-scale machinery and equipment and on-farm research for evaluation, the transfer of information and techniques to other producers will be smooth.

New nitrogen prediction methods are needed

One of the key issues that the VRT Project team has identified as a hindrance to the progress of variable rate fertilization is that there isn't a reliable method of determining how much nitrogen will be released from the soil throughout the growing season. This particularly applies to the northeast region of Saskatchewan that has many soils with high organic matter contents and generally higher moisture availability. Dr. Pennock confirms that the scientific literature indicates "variable rate fertilizer prescriptions based on measured values of plant available nutrients (using standard soil testing procedures) have generally been unsuccessful."

One of the focuses of the VRT project is to determine an accurate method of predicting mineralizable N. This is the amount of plant available N that will be released from the soil and taken up by the crop throughout the growing season. The project team is evaluating 3 different methods of measuring mineralizable N in soils at the Central Research Site of the VRT Project. They feel that this will be key in coming up with accurate N recommendations needed to write prescriptions for the LMUs. By including a zero N rate test strip in their trials the project team has found there are LMUs that are receiving too much N under the constant rate application methods we currently use.

Several producers to begin on-farm testing

The next phase of the project is to test and evaluate the seat of the pants method on other farms in Northeast Saskatchewan. This phase is set to begin in 2002. Other producers equipped with yield mapping systems to assess their results will be putting down trials on their farms. They will all be running fixed rate strip trials including a zero N rate strip. SSCA members Ed and Marguerite Beauchesne, Terry Gates and Al Moskal are among the producers that will be carrying out on-farm trials this year. This is the first step in taking the technology to Saskatchewan producers.

Morris Special Edition Air Drill

On his own farm Dennis will be going to a 1 pass seeding system this spring applying NH_3 at seeding time. He has chosen a Morris Special Edition air drill with their new coulter-style fertilizer banding units. The seeding unit will be equipped with a custom version of variable rate application technology that is state of the art. Dennis says that after working for 6 years to develop prescription N applications he will be using this seeding and fertilizing system on his entire farm this coming spring.

Dennis has been seeding with a minimum tillage program until now. Usual operations included banding NH_3 with knives before seeding with an air seeder. Sometimes he needed a tillage pass to manage residue. He expects to cut costs with 1 pass seeding and that should raise his profit margin. He is particularly excited about some of the new features of the Morris angle-disk

fertilizer coulter. He has a mixture of soil characteristics and feels he needs a mid-row banding system that is more versatile and rugged than older coulter designs that are on the market. Dennis says "I think the combination of the rubber soil retaining wheel that improves NH_3 capture and the tine option to reduce soil and straw buildup will give much better results over a wider range of soil types and moisture conditions".

The Future

Site specific management is at a turning point where economics and environmental sustainability are now driving the adoption of this technology. Successful implementations of SSM will carry an immense value to Saskatchewan producers in the next few years. Partnerships such as the Saskatchewan VRT Project may be one of the most effective ways to overcome the obstacles to SSM implementation so that we can become leaders in the adoption of this technology on our farms. The VRT Project began on a Saskatchewan farm and the project leaders and supporters are hopeful that the benefits of this work will soon impact many other Saskatchewan farms.

Swine Manure Carryover in a Cereal/Pulse Crop Rotation

By Bryan Nybo, PAg

Wheatland Conservation Area

The rapid increase in hog production has led to producer and public demand that swine manure be handled in an environmentally sustainable manner and that manure be applied to the soil with the least possible nutrient escape and odour. PAMI has worked to develop technology which addresses these concerns and, along with Wheatland Conservation Area, realized the need to further examine the agronomic benefits that exist with the use of swine manure as a fertilizer. As barns continue to grow so does the demand for locally grown, quality feed such as peas and barley. With surrounding land required for both production of feed and removal of manure, there is a need to know how one effects the other in a cropping rotation. Wheatland (WCA) would like to encourage the cooperation between farmer and hog producer to show them how a symbiotic relationship will benefit their long-term sustainability. WCA would also like to further prove the value of swine manure as a fertilizer and to show producers how it can be effectively used in a pulse crop rotation.

In the fall of 1998 swine manure was injected at three different rates (3000, 6000, 9000 gallons per acre (gpa)). Urea was also deep banded with a Flexi-coil 5000 air drill using a double shoot stealth opener. The Urea rates were 50, 100, 150 lbs/acre of actual N. An analysis of the manure showed the amount of actual N in the urea was very close to that of the manure. No additional fertilizer of any type has been applied to the soil since the fall of 1998.

The first year of the study dealt with the injection process and odour management. A producer tour was held in the fall of 1998 to demonstrate the equipment in action as the manure was injected. The tour group was impressed with the equipment and the absence of odour throughout the afternoon.

The next two years of testing looked at how durum responded to the various treatments. The third year of the study looked at how chickpeas, peas, and barley respond to possible nutrient carry over from 1998. From this data we determined which of these crops has the best fit in a rotation involving various rates of swine manure

Results from this study were impressive. Durum yields and proteins in 1999 were as good or better when fertilized with swine manure as compared to their urea counterparts (Figure 1). In 2000, there was enough carry over nutrient in the 6000 and 9000 gal/ac swine manure and the 150 lbs/ac urea treatments to significantly increase durum yield and protein (Figure 2).

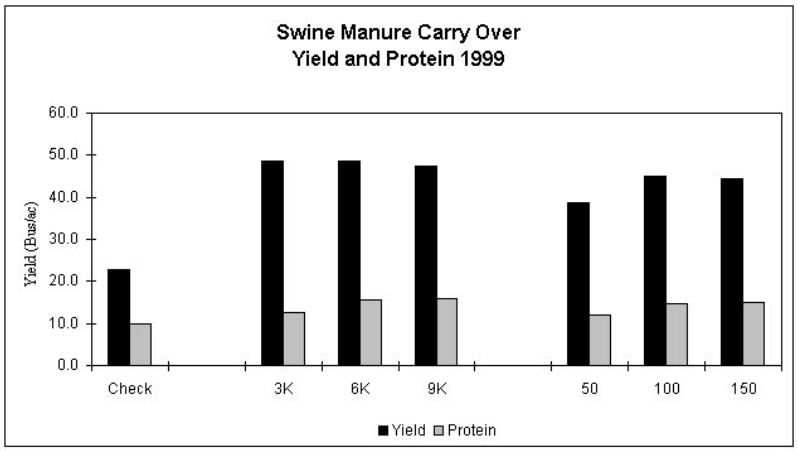

Figure 1. 1999 Durum yield and protein.

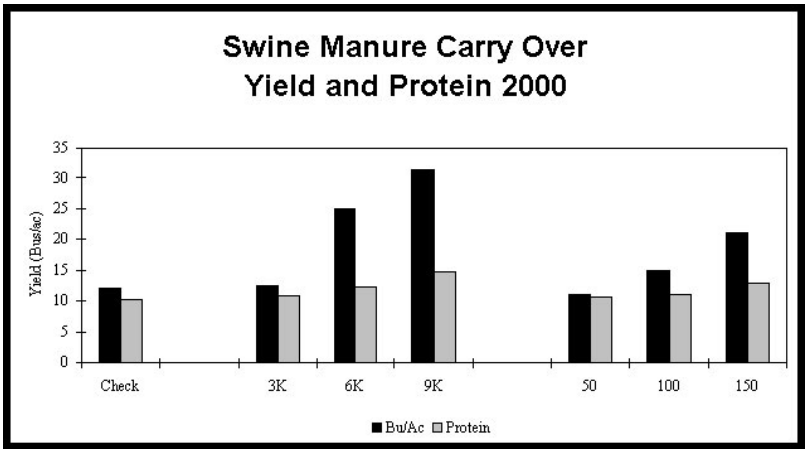

Figure 2. 2000 Durum yield and protein

In 2001, there is enough nutrient carryover from the 9000 gpa treatment to positively affect yield in barley, and negatively affect yield in the pulses (Figures 3 and 4). Response in the peas and chickpeas were similar. Barley yields drop significantly on plots receiving 6000 and 3000 gpa of swine manure as well as all the urea treatments, yet remaining significantly higher than the check that received no manure or urea (Figure 3).

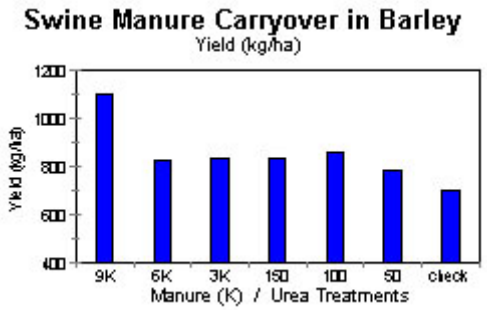

Figure 3. 2001 Barley yield .

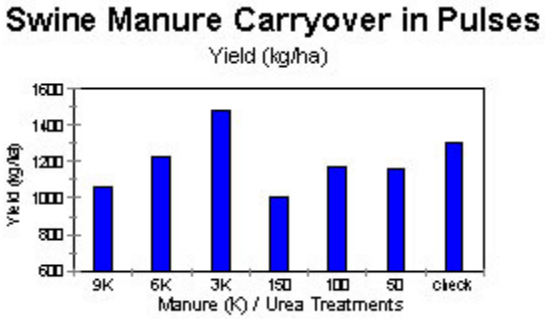

Figure 4. 2001 Pulse yields.

Pulse yields increase significantly as manure application rates decrease (Figure 4). The same trend occurs with the urea treatments although the differences are not significant. This negative yield response appears to be the result of poor nodulation in the pulses due to additional nutrient carryover and a soil moisture deficit from previous crops. Plots receiving high rates of manure and fertilizer in 1998 produced high durum yields in 1999 and 2000 (Figures 1 and 2). These high yielding crops may have created a moisture deficit for the third year pulse crop in 2001, a year already plagued with drought.

This test shows that seeding a pulse within three years of applying swine manure, can be detrimental in a dry year. We also see the 9000 gal/ac rate has enough nutrient carry over to affect yields in barley. To achieve optimum yield in a third year cereal, however, would require supplemental nutrients, as would the remaining treatments.

Treatment	2001 Barley Yield (kg/ha)	2001 Pulse Yield (kg/ha)	Nodulation Rating (0-8)
9K (9000 gpa manure)	1100 a	1062 c	4.4 a
6K (6000 gpa manure)	831 b	1231 b	5.4 b
3K (3000 gpa manure)	833 b	1484 a	5.4 b
150 lbs/ac Urea	834 b	1004 c	5.0 b
100 lbs/ac Urea	859 b	1169 bc	5.5 b
50 lbs/ac Urea	790 b	1158 bc	5.0 b
Check (no manure or Urea)	702 c	1299 b	5.2 b

Effect of Stubble Management on Subsequent Crops

By Tim Nerbas, PAg

Conservation Agrologist

Since the time of the Palliser expedition, we have long recognized that a lack of moisture is a way of life on the prairies. In Saskatchewan, snow represents as much as 1/3 of the annual precipitation. Tall stubble not only traps more snow compared to short stubble, but it also decreases evaporation at the soil surface. Several studies have shown that leaving stubble as tall as practical can increase both water use efficiency and grain yield.

While we can do nothing to influence precipitation, there are a number of management techniques that can impact how effectively our crops use the water they receive. Standing stubble increases snow trapping and the amount of snow trapped is directly proportional to the stubble height. Thus, leaving tall standing stubble increases the total water supply to the subsequent crop. Tall standing stubble also aids in reducing both wind speed and solar radiation, which in turn helps reduce evaporation and keep the soil cooler (Cutforth and McConkey, 1997). Yet the tall stubble does not appear to reduce plant photosynthesis.

At Swift Current, seeding wheat into tall (> 30cm) stubble increased grain yield and water use efficiency by approximately 12% compared to wheat seeded into cultivated stubble (Table 1). Standing stubble reduced the evaporative demand for water at the soil surface throughout the growing season. Tall stubble increased the proportion of soil water that was used productively by the crop (as reflected in increased water use efficiency and yield).

Table 1: Grain yield and water use efficiency for spring wheat grown on cultivated, short, and tall stubble at Swift Current through the period 1992 -1995.

Treatments	1992	1993	1994	1995	1992-1995
	Grain Yield (Bus/ac)				
Cultivated	26.5	47.4	27.2	35.3	34.1
Short	29.3	50.8	30.4	37.2	36.9
Tall	30.4	54.5	30.7	38.8	38.6
	Water use efficiency (bus / ac / in)				
Cultivated	2.17 b*	4.19	2.75	2.29	2.80 b
Short	2.36 ab	4.50	3.01	2.37	2.98 a

Tall	2.58 a	4.58	3.07	2.58	3.19 a

* - Numbers followed by the same letter are not significantly different.

In 1999, a three-year study at farm scale was implemented near Swift Current. The objective of the project was to assess the effect of stubble management on the microclimate, water use and seed yield of canola. The first two years of the study showed a significant modification of the microclimate by tall (> 30cm) stubble compared to cultivated plots. Canola seeded into tall stubble with extra nitrogen fertilizer (above soil test levels) was the most efficient in using limited water (Table 2). Canola seeded into tall and short stubble with soil test recommended fertility were the next best. The cultivated plots had the lowest water use efficiencies. Fall seeded or early spring seeded Brassicas used water more efficiently than spring seeded Brassicas.

Table 2: The effect of stubble height and seeding management on the mean seed yield of Argentine canola (c.v. Arrow). The results are mean averages from two years of research at Swift Current (adapted from Cutforth et al., 2000).

Treatments	Seeding			
	Late Fall	Early Spring	Late Spring	Mean Yield
Tall Stubble	39.2	32.5	27.6	33.1 (b)*
Tall Stubble + 34 lbs. extra N	42.3	39.8	29.2	37.1 (a)
Short (Fall)	34.8	29.9	26.3	30.3 (b,c)
Short (Spring)	36.3	31.6	25.5	31.2 (b)
Cultivated (Fall)	31.2	27.3	24.7	27.7 (c,d)
Cultivated (Spring)	N/A	29.1	24.9	27.0 (d)
Mean Yield	36.7 (a)	31.7 (b)	26.4 (c)	

* - Numbers followed by the same letter are not significantly different.

Adequately fertilized crops not only use water more efficiently but also tend to be more effective in extracting water and nutrients from the soil (Campbell et al., 1993). Long term tillage research conducted at the Scott Research Station shows that water use efficiencies in direct seeding systems have steadily increased compared to conventional tillage. However it is critical that fertility and weed control needs of the crop are met. Otherwise benefits anticipated from these other management techniques like tall standing stubble will not be met.

The microclimate effect from tall standing stubble is reflected in soil temperatures close to the surface. Soil temperature at the 5-cm depth was always lower in tall stubble treatments versus the cultivated treatment. The differences were most pronounced on the warmest days and during the middle of the day. Results tend to indicate that the stubble management influence on microclimate is most pronounced early in the season. The improved microclimate and greater moisture retention of the tall stubble were cumulatively responsible for the higher yield potential. It should be noted that the advantage of tall stubble decreased with delayed seeding.

Although we continue to farm in a climate where moisture deficiencies are the norm rather than the exception, there are a number of management techniques that can improve our chances for success. Doing everything possible to increase available soil water at seeding, and ensure that it and growing season rainfall are used efficiently, will improve crop yields and the bottom line.

Remember: this is a system and as such, it requires a systems approach to provide the conditions for success.

Management for Dummies The Unabridged "Coles Notes" Version

By Bob Linnell, PAg

Conservation Agrologist

There are a lot of desperate people out there who are spreading a bunch of information around that I figure fits into the categories of *Myths, Half-truths and Outright :Lies*. I know, I know, I have written about this sort of thing before, but lately there have been a whole flock of them appearing on the horizon. Things like " you don't have to put any phosphate with your winter wheat at seeding time because you can wait until emergence time in the spring to see if anything survived, and then go out and fertilize because you have a better idea what the price and market is going to be". This is definitely a "no-no".

Despite what some people think, you cannot grow winter wheat to its potential if you don't place the necessary fertilizer ingredients where they will do the most good. For Phosphorous, this means placement in the zone where early establishment of roots is taking place. The plants must have adequate amounts of phosphorus to develop sufficient roots to sustain the plant into the winter until it "wakes up" again in the spring and grows to maturity.

About here, I introduce a personal bias about fertilizing winter wheat. I maintain that with careful seed and fertilizer placement you can place all your fertilizer in the ground at time of seeding. The phosphate should go in regardless, but the nitrogen, being carefully placed away from the seed, is in the soil and the roots only tend to get a minimum start and stay pretty much away from it. The danger here is that too much N will get to the seed and prevent it from developing good winter hardiness. It is management, but it isn't difficult. All it takes is a bit of time and attention to detail.

Another favourite of mine has been the "it doesn't cost anything much to summerfallow, because I already have the tractor and the cultivator and just by burning a bit of fuel, I can have a clean looking field". I think that most of you readers have by now figured out that it really does cost you something to summerfallow. The figure is between $5 and $7 per acre per pass. Combine that with the loss in moisture from the fallow pass and you have more cost to accrue to the practice. At this point, you also have to remember to split the income from that one crop year into 2, because you are only getting a crop every 2 years. Makes summerfallowing an expensive venture by most estimates. Maybe what Minister Vanclief needs is a slight lesson along those lines. But then, maybe he doesn't have a farm anymore and doesn't have to worry about farm economics. I digress.

I listened recently to presentations from a fertilizer manager and crop consultant who does soil sampling and analysis on a fee-for-service basis. This particular service includes the use of some software that can show a response curve with the adjustment of the various nutrient ingredients.

This is graphically illustrated by the level of grain in the bin going up or down depending on moisture predictions, level of added nutrients and others. I think the poor fellow doing the presentation had a "zinc fetish" as he spent a great deal of time explaining in detail what happens to yields with the addition of various amounts of zinc.

The producers in attendance were abnormally polite and patient with the presenter, and waited to ask questions till the end of the seminar. When asked how to place the zinc in the ground and the cost of doing so, the presenter spent even more time explaining "all about zinc." His take-home message was to look very closely at the requirements and response to zinc for the coming year. Well, folks, it doesn't really matter about a minor ingredient if you haven't looked after the providing of the major nutrients first. This conclusion was overlooked in the presentation.

"You can make more money growing grass than just planting the land to grain" is one of the topics I have heard a lot of times in the past few weeks and months. This may be true. I say maybe because it takes a while to establish that grass and at some cost as well. The year or two that it takes is a direct hit on the income column and the input costs can be quite substantial, depending on the species you select to grow.

The type and productivity of the land is often a forgotten factor as well. Relatively poor quality land is selected more often than highly productive land as measured by the realized income from the grain it has produced in the past. This poorer land is also the most likely not to succeed as a good producer of grass or forage just because of the sometimes extra salinity or the poor water holding capacity on the other end of the scale. This makes it particularly difficult to predict returns from forage sales or feed stocks inventory if you are producing this for feed use on your own farm.

Try pricing out grass seed and see how that compares to other crops as you are making up your mind whether to divert this land into grass or not. A $4 per pound seed cost at a seeding rate of 10 pounds is something that a producer may not be altogether ready to spring for, when he is not that sure just how and what technique to use in the seeding process. It is wise in any enterprise to do your homework before you launch into it with both feet. Some people have had to re-seed and that can cause stress.

"Oats is the key crop to grow this coming year" is another bit of advice I have been given of late. One of our regular readers telephoned me recently and asked what I was going to write about this issue. It seems he read an article I wrote in last year's issue of the same time frame, in which I made the suggestion by asking the question -"Is this the year for barley?" His statement was "boy, were you ever right on that one". I might be hesitant to recommend oats as the "Cinderella" crop for 2002. It isn't a heck of a deep-rooted crop, compared to barley. Barley has a huge set of roots compared to oats so oats may not be the best crop to look at seeding in the dry areas. Looking at the predicted prices, I don't see much improvement on what we are getting right now, in fact they are liable to slip in relation to other crops on the menu. So, if you can live with those prices and net returns for your own farm, then go ahead.

We are talking about management here, and heavens knows I can be just as bad at being a manager as the next person, so my advice is take the time to research your options. Make the best

use of your time when things are quiet and try to set things in motion to place yourself and your farm in a position where you can take maximum advantage of things offered to you.

Marketing has changed tremendously over the years and it has been proven prudent to do the best job of marketing you can. This is what management is ultimately all about.

Don't take to heart all these handy-dandy catch phrases you hear at the "senate" table of past farmers and near farmers in town without doing your homework and investigating the relevance. Most direct seeding producers have set things and seeding plans in motion already, as a result of previous cropping rotations, and are not as liable to adopt some of these half-truths.

Contacting Equipment Manufacturers

By Juanita Polegi, PAg

Conservation Agrologist

If you didn't have the chance to attend the SSCA Conference 2001 to pick up a copy of the Proceedings or worse yet, your spouse tossed out your copy during the annual cleaning-of-the-office day, then you don't have Bob Linnell's list of equipment manufacturers and their addresses. That list is really useful, especially if your spouse also tossed out all the equipment brochures you've collected over the years.

In addition to the telephone numbers of these companies, many have supplied the SSCA with their web site addresses as well. Visiting the web site is an excellent way to view all the latest equipment updates in the comfort of your own home. And unlike a brochure, you don't have to find a spot to put it when you're done looking at it!

The following is the list of manufacturers we have available now. If we've missed anyone, let us know.

Ag Depot

(306) 545-2622

Ag-Chem Equipment Canada Ltd.

(306) 222-2872

Agri-Tech Manufacturing Ltd.

(403) 824-3737

BCL Land View Systems Inc.

(780) 448-7476

Bourgault Industries

(306) 275-2300

www.bourgault.com

Bourgault Tillage Tools

(306) 275-4500

www.tillagetools.com

Brandt Industries

(306) 525-1314

www.brandt.com

Centrak Controls Inc.

(306) 246-4687

Conserva Pak Seeding Systems

(306) 695-2460

www.conservapak.com

Creative Enterprises Inc.

1-888-458-5756

Degleman Industries Ltd.

(306) 543-4447

Dutch Industries Ltd.

(306) 781-4820

www.dutchind.com

E.X.C.E.L. Innovations

(306) 931-3383

Everwear Ag Products Ltd.

1-877-413-4729

Ezee-On Mfg. Ltd

(780) 632-2126

www.ezeeon.com

Fab Tec Manufacturing Ltd.

(306) 534-2213

Farm Land Specialty Products

1-888-268-8251

www.farmlandspecialty.com

www.keyagventures.com

Flexicoil

(306) 934-3500

www.flexicoil.com

Gaber Distributors

(204) 937-4321

Gen Mfg. Ltd.

(403) 345-3414

www.wearpoints.com

Gray Seeding Systems

1-877-413-GRAY

Gustafson

1-800-880-9481

www.gustafson.com

Harvest Technologies

(204) 725-0705

www.harvestechnologies.com

Haukaas Manufacturing. Ltd.

(306) 355-2718

John Deere Limited

(905) 945-9281

www.deere.com

K-Hart Industries Ltd.

(306) 378-2258

www.khartindustries.com

Kyle Welding & Machine Shop

(306) 375-2271

Mandako

1-888-525-5892

Morris Industries Ltd.

(306) 933-8585

www.morris-industries.com

Phoenix Rotary Equipment Ltd.

1-888-891-9929

R.Roth Enterprises

(306) 658-4401

www.thehandler.com

Redekop Manufacturing company

(306) 931-6664

Rodono Industries

(403) 784-3864

Schulte Industries Ltd.

(306) 287-3715

Seed Hawk Inc.

1-800-667-4295

www.seedhawk.com

Setter Manufacturing Division

(204) 773-2218

Skayman Openers

(204) 764-2290

Swede Industries

(306) 622-4428

Technotill

(780) 352-9890

Valley Packing Systems

(306) 338-2718

www.valleypacking.com

Wiebe Remote controls

1-888-327-6347

ManDak-2002

By Bob Linnell, PAg

Conservation Agrologist

The Manitoba-North Dakota Zero-Till Farmers Association recently held their 24th annual workshop and trade show in Minot N.D. The organizers and management of the event were delighted with the 450 plus farmers who attended.

Featured speakers included Dr. Jill Clapperton from AAFC, Lethbridge, who spoke about her research aimed at understanding how soils function biologically and how we can more effectively manage the long term health and productivity of our soils. Speaking as well, were scientists from ARS-USDA in Mandan N.D., who spoke on cropping systems issues.

Dr Jeff Schoenau of the University of Saskatchewan presented a paper on manure management in Zero-till systems.

The evening rap sessions were popular again and were well attended as this was the place where farmers were able to get a lot of their individual questions answered.

The trade show was greatly reduced this year from the past, but did include many smaller displays, while not displaying the large machinery that has been included in previous years.

Next year's workshop will be held in Brandon Mb. near the end of January

More information can be obtained by connecting to the SSCA website, and linking to Mandak from there.