The Newsletter of the Saskatchewan Soil Conservation Association

Issue 36 -- Summer, 2002

Seeding Trends 2002

"Looking Back - Looking Forward"

By Richard Szwydky, PAg

Conservation Agrologist

A hot, humid day greeted the crowd that gathered for Seeding Trends 2002 at the historic Seager Wheeler farm east of Rosthern. The event attracted approximately 650 people to the eighth annual field day that took place June 5th. The large crowd came from all four corners of the province, and the high attendance rate showed there is significant interest in the adoption of direct seeding techniques.

The day began with the arrival of the Honourable Clay Serby, Deputy Premier and Minister of Saskatchewan Agriculture, Food and Rural Revitalization (SAFRR). After touring the orchard, Mr. Serby made the announcement that the Seager Wheeler farm had been designated an Agri-Arm site.

Next on the agenda was a panel that featured three producers experienced in direct seeding. Darryl Reynolds of Nokomis, Ron Leonard of Harris, and Leo Grenier of Bellevue discussed two key issues, namely fertilizer management in drought conditions (with the opportunity to top dress) and crop disease in direct seeded systems. The panel also included Dr. Guy Lafond, a researcher with Agriculture and Agri-Food Canada, and Penny Pearse, a plant disease specialist with SAFRR.

The panel discussed the application of post-emergent nitrogen as a risk management tool, especially during drier years. This topic will be discussed at greater length in upcoming Prairie Steward issues. The producers also identified the need for increased awareness of disease identification and disease control methods. They reiterated that disease pressures in crops can be alleviated by practicing good agronomy methods, including lengthier crop rotations and balanced fertility packages.

Three concurrent sessions followed the panel discussion. Participants had an opportunity to tour the forage plots on the site, attend presentations on topics such as diseases and direct seeding and post-emergent fertility applications, or participate in a field demonstration on intensive fruit production in the orchard area.

The noon hour program included two keynote speakers: Dr. Ernie Barber, Dean of the College of Agriculture, University of Saskatchewan, and Dr. Larry Gutek, SAFRR. Both speakers discussed the theme "Looking Back - Looking Forward" as it related to the Seager Wheeler farm, and talked about the farm's impact on past, present, and future research at the University and in the province.

Following the noon hour agenda, attendees were transported to the demonstration sites. The afternoon began with an SSCA demonstration on the do's and don'ts of direct seeding. In a year that lacked snowfall and spring rains, we demonstrated the response of Harrington barley to differing rates of potash and determined safe seed place rates. It is important to note potassium plays a key role in regulating the opening and closing of the stomata on plant leaf surfaces, particularly in drier years. Initial results show that emergence is affected with higher seed placement rates of potash when compared to checks and side band placement.

The next demonstration profiled six high clearance sprayers. Representatives from Rogator, John Deere, Apache, Brandt, Flexicoil, and Case IH spoke about their machines and each made a pass down the half-mile stretch of field.

A new demonstration introduced at this year's event focused on post-emergent fertility application trials. The demonstration showcased the various implements that can apply fertilizer after the crop has emerged. The units on hand included a liquid coulter, a dry spreader, and a dribble bar that could also apply foliar fertilizer.

The highlight of the event was ultimately the direct seeding demonstration. Eleven different units were featured at the demonstration, where barley was seeded into canola stubble. The seeding pass made by each unit was flagged and will be signed. Individuals interested in a particular opener or drill are welcome to stop by and view the crop through to maturity. The drills and openers featured at the demonstration included Harvest Technologies side banding wing for liquid, Seed Hawk, ConservaPak, Ezee-On 7550 air drill, John Deere, Techno Till openers, Bourgault 5710 mid row banders, Flexicoil 5000 air drill, and Peacock Industries. Morris Industries entered the final two drills, the Never Pin and Express seeding units.

A tour of all the demonstration trials plus the University's variety trials is scheduled from 2:00 to 5:00 p.m. on Thursday, July 11th, 2002. Everyone is invited to come and view the results.

Seeding Trends 2002 received highly positive feedback from attendees and participants. As a result of this success, coordination of next year's field day has already begun. Seeding Trends is the major fund raising event for the Seager Wheeler Historical Society. We encourage everyone to visit the Seager Wheeler farm and attend Seeding Trends 2003.

Straight Ahead

By Don Horsman, President

I am writing this on May 31 with seeding just completed. On our farm, located south of Fort Qu'Appelle, we feel very fortunate to have had some moisture even if it came in the form of snow and with freezing temperatures. I certainly empathize with those of you who have had no significant moisture during seeding.

On the long weekend in May, our son and his girlfriend visited our farm. And, like our other sons' girlfriends, she was very complimentary to me. (I find this one of the benefits of having sons with nice girlfriends.) In this instance, she remarked on how straight I drove when seeding. So I told her about my other life when I taught mathematics and physics and how any two lines directed at a point approaching infinity are parallel and that, to drive toward this distant point, it is important to look ahead. While it is necessary to look back and check that we don't have disaster behind, it is most important to look ahead at the most distant point we can find.

After they had gone and I was alone on the tractor, I thought that this idea also applies to people and to organizations. Of course, I thought of the SSCA and how it is so easy for us to look behind us and pat ourselves on the back for past successes. In a spring like this, we can be especially proud of the growth of direct seeding over the years. As Canada considers the Kyoto Protocol, we can be proud of the work our organization, and especially John Bennett, Past President, has done on greenhouse gases. But it is also important for us to look ahead to where we want to go in the future. Where will the SSCA be headed in 2 years from now? 5 years? 10 years?

This fall, the staff and directors of SSCA will hold a planning session to look at where we have been, but more importantly to pick out a spot in the distant horizon. I ask that you as members of SSCA also think about the organization, where it has been and where it should go. Remember we have board members and staff all over the province who value input from our members. Let us know your thoughts so they can be considered in this important planning session.

By the time you read this I hope we all have had rain and the crops look promising.

Staff Changes at the SSCA

By the time this edition of the Prairie Steward arrives in the mail boxes, several staff changes will have occurred in the SSCA.

After spending 12 years with the SSCA as the South East Soil Conservation Agrologist, Bob Linnell left the SSCA on May 15. Bob has taken over the duties of Executive Manager of Winter Cereals Canada. Bob's experience as both an agrologist and producer will serve him well in his new role. We all wish you well, Bob!

Taking over from Bob, effective June 1, is Dave Larsen. Dave has written a bit about himself elsewhere in this issue. We welcome you aboard, Dave, and look forward to working with you.

Juanita Polegi has also spent 12 years as a Conservation Agrologist in the East Central Region. Effective June 1, she accepted the position of Assistant Manager. While she is based out of Indian Head, she will have an office in her home near Jedburgh. Her new duties include administration and working with producers on the Winter Wheat Core Grower program.

With the departure of Juanita, Travis Goebel will take on the duties of Soil Conservation Agrologist in the East Central Region. Based out of the Sask. Agriculture, Food & Rural Revitalization office in Yorkton, Travis will be responsible for delivering information to producers on direct seeding and conservation tillage, carbon sequestration and winter wheat production. Travis, a graduate of the University of Saskatchewan, was working for a private agriculture research firm before he came to the SSCA. In the next edition of the Prairie Steward, he will introduce himself. We look forward to having Travis as part of the Staff Team.

Does Soil Conservation Pay?

By Blair McClinton, PAg

SSCA Executive Manager

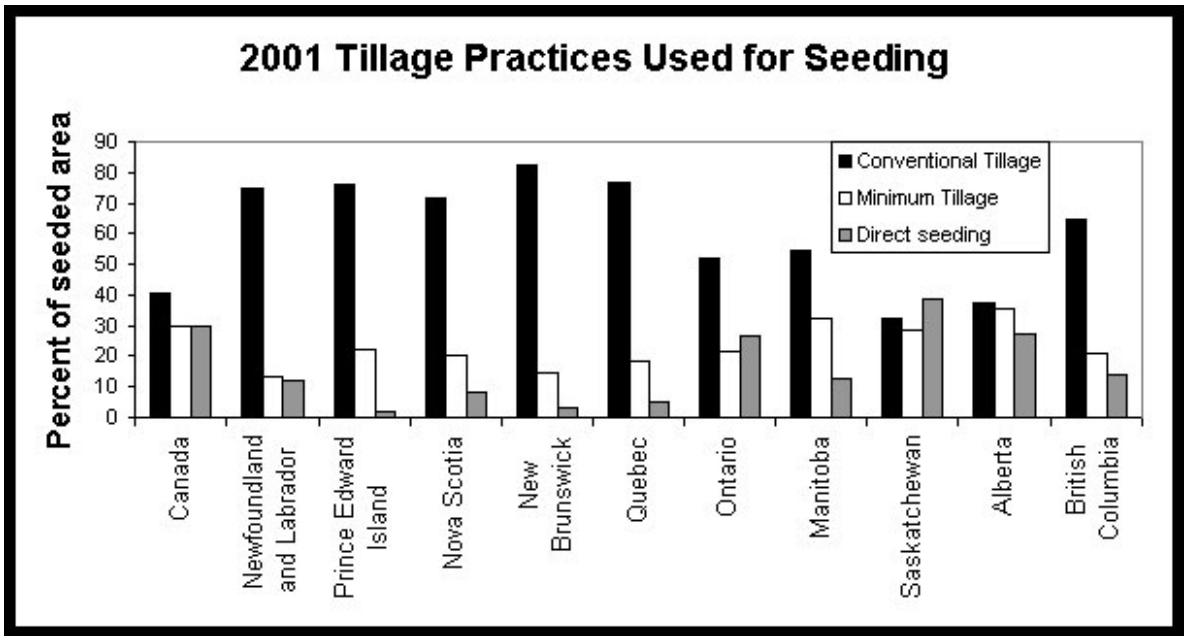
Does soil conservation pay? This was a pretty common question from farmers only a few years ago. It was difficult to answer yes when Roundup prices were in the $30 range. As Roundup prices fell and better seeding equipment was developed, more and more producers were able to justify soil conservation practices from a purely economic basis. By 2001, 70% of Saskatchewan's farmers said yes, soil conservation pays. According to the 2001 census, Saskatchewan farmers direct seeded 40% of the province's cropland. Another 30% used some sort of minimum till systems with the remaining 30% using conventional tillage. This adoption rate is the highest in Canada (Figure 1).

The spring of 2002 will go down as one of the coldest and driest on record for much of Saskatchewan. The drought also presented the biggest test for the effectiveness of direct seeding systems to date. From a soil conservation perspective, these systems performed very well. While the system may not have conserved enough moisture for good germination in many areas, at least it kept the soil in place. This spring, the erosion control benefits direct seeding was apparent on fields throughout Saskatchewan. Any fields without residue cover were very vulnerable to erosion and conventional summerfallow fields had the worst erosion problems. As was evident in the number fields that suffered from erosion this spring, there is still much work to be done. There is still a continuing need to help producers move towards direct seeding systems and reduce summerfallow levels.

Even government agencies have seen the financial benefits of soil conservation. In late summer of 2001, the Saskatchewan Crop Insurance Corporation was projecting a $500 million payout. However, they only received claims of around $300 million. Why the large difference? I believe that the moisture conserving soil conservation practices helped to maintain higher crop yields than was expected by either crop insurance or the farmers themselves. This $200 million crop insurance saving in 2001 was a good return on the $90 million governments invested in soil conservation programs over the past 15 years.

The federal government has recognized that soil conservation practices can also benefit the Canadian economy helping reduce greenhouse gases through carbon sequestration. They have recently announced a national program to demonstrate and promote best management practices for managing greenhouse gases like direct seeding, reduced summerfallow and more efficient fertilizer and manure management.

Best wishes with your harvest.


2001 Tillage Practices Used for Seeding
Percent of seeded area
90
80
70
60
50
40
30
20
10
0
Conventional Tillage
Minimum Tillage
Direct seeding
Canada
Newfoundland and Labrador
Prince Edward Island
Nova Scotia
New Brunswick
Quebec
Ontario
Manitoba
Saskatchewan
Alberta
British Columbia

Gone with the Wind

By Tim Nerbas, PAg

Conservation Agrologist

For most of us, May proved to be not only as windy as a politician, but also as dry as low-fat popcorn. The combination of dry topsoil and high winds made for some gray days on the prairies. Dusty sloughs and dropping water tables meant hauling water for cattle and even household use. Is it a return to the dirty thirties?

Most of us have heard the grim stories of the dirty decade. Even the 1988 experience is still fresh in many producers' minds. Yet despite these dismal reminders, soil erosion continues to plague our industry (Figures 1- 4). As one producer put it "I don't know how I'm going to get all my seeding done. I've got land from Saskatchewan, Alberta, and Montana!"

What would the skies have looked like this spring if all the land continued to be farmed using dirty-thirties style tillage? Thankfully the reduced tillage movement has begun to catch on. In 2002 over 70 % of the seeded acres in Saskatchewan were seeded using reduced tillage, 40% of which was low disturbance.

In 1994, soil researchers John Doran and Timothy Parkin described the topsoil as "the thin layer covering the earth's surface which represents the difference between survival and extinction for most terrestrial life". In Saskatchewan, it has taken 10,000 years for our present soils to develop. What a shame to leave this precious resource vulnerable to erosion events such as wind and water!

Research at Lethbridge found topsoil losses as high as 30 tonnes/ha during a seven hour-long erosion event (60 km/hr winds on a clay loam textured soil). While the biggest concern with such damage may be the difficulty to establish a crop, there are other costs as well. Ditches may need cleaning out, fence lines may need to be rebuilt - this is all in addition to the actual loss in organic matter and nutrients, and the damage to soil structure. Further, once soils erode, there is a tendency for them to easily do so again. In general, there is a loss in soil productivity.

An erosion loss of even one inch of topsoil is equivalent to over 150 tonnes of soil per acre. In the black soil zone that would include approximately 7 tonnes of organic matter, 400 kilograms of nitrogen, 300 kilograms of phosphorus, and 3 tonnes of potassium lost per acre. That's a loss of $1500.00 per acre just in nutrients and that does not even include the value of the carbon stored in the organic matter. Most would agree the value of our topsoil makes it worth saving.

Some may argue this example was an extreme event; damage to this extent has never occurred before. "If we get normal conditions next year we will be all right." But it is important to realize that normal conditions are made up of average conditions combined with extremes.

For example, at the Waseca, SK Climate Station, 2001 was the driest year since 1937 (Table 1). 2001 was also the 3rd warmest of the last 95 years. In fact from October1, 2000 to June 14, 2002 there has only been 55 % of normal precipitation. Normal precipitation for this region is 397 mm per year.

Although the area has been fortunate in the last 50 years, having relatively stable precipitation each year, earlier in the century extremes were the norm. For instance there was only 45 % and 53 % of normal precipitation during the two-year periods 1917-1918 and 1928-1929, respectively. On the other hand, 14 of the past 95 years have seen more than 125 % of normal precipitation, compared to 13 years with less than 75% of normal precipitation. Such historical data emphasizes that "normal year" statistics actually include many years of abnormal and extreme conditions - conditions in which producers must maintain soil quality and attempt to grow a crop.

Another item that can be gleaned from the long-term climate data at Waseca is the warming trend: over one degree Celsius in the mean annual temperature. To put that in perspective during the last glacial age mean annual temperature was only about five degrees Celsius cooler than it is today. This emphasizes the need to use as many moisture conservation methods as possible. Research shows crops use moisture more efficiently to produce grain in a direct seeding system, and therefore greater yield is possible for each inch of water Mother Nature is willing to impart.

Weather extremes have always and will continue to be part of the agriculture business. It is tough on the nerves, but it needn't be so tough on our primary resource, the soil. It is crucial to plan with these extremes in mind so neither our spirits and nor our soil are gone with the wind.

Figure 1: Ditch filled with topsoil from wind erosion in 2002.

Figure 2: Ditch filled with topsoil from wind erosion in 2002.

Figure 3: Standing stubble filled with adjacent fields topsoil.

Figure 4: Ditch and bush filled with topsoil (2002)

Scroll down for TABLE 1

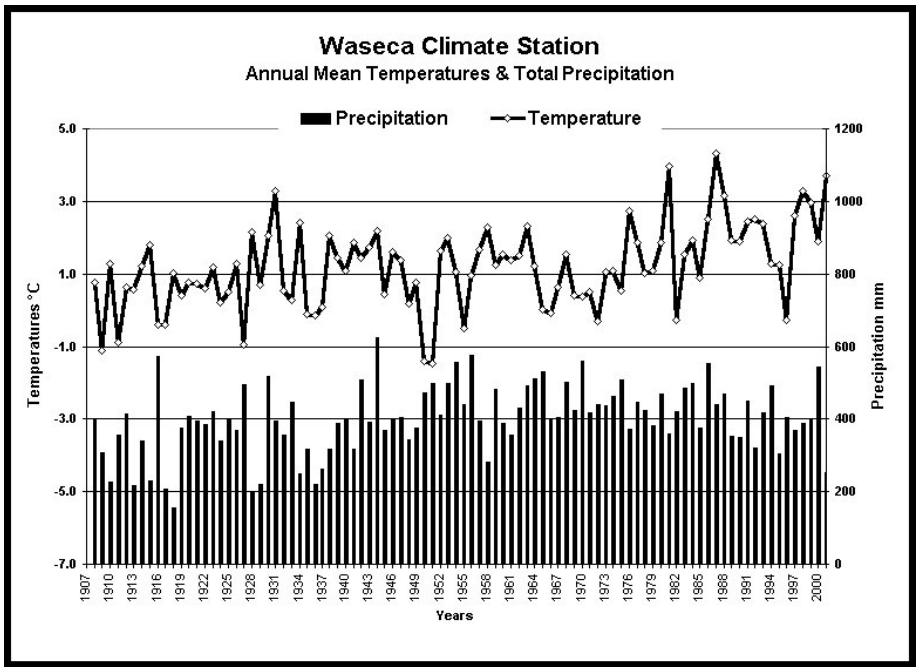


Table 1: Waseca Climate Station data from 1907 to 2001 (Data courtesy of Jim Maxwell).

Opener/Rotation Study Completed

Eric Oliver, PAg

Conservation Agrologist

The four-year Opener/Rotation Study located soutwestern Saskatchewan is now completed. The site, located at Aneroid, SK, an hour southeast of Swift Current, produced some expected and unexpected results. The study evaluated four single shoot openers (angle disc, knife, spoon and sweep) with different levels of soil disturbance. Four crops (peas, desi chickpeas, barley and durum) were used in the study in a cereal/pulse rotation. One of the unique features of this study was that each opener seeds a particular plot throughout the study. In this way, we are able to observe changes in weed densities over the length of the study as affected by each opener.

Over the four years, the angle disc consistently had the highest crop establishments, with the knife not all that far behind on some crops. Although all openers, even the sweep, benefited from a glyphosate burnoff, it was obvious that the lower the level of opener disturbance, the greater the reduction in crop establishment that occurred when there was no glyphosate burnoff.

As expected, the angle disc consistently produced the lowest weed densities over the four-year study (Figure 1). Compared to the other openers, the angle disc resulted in a significant reduction in weed densities the first year of the study. However, what wasn't expected was the knife taking

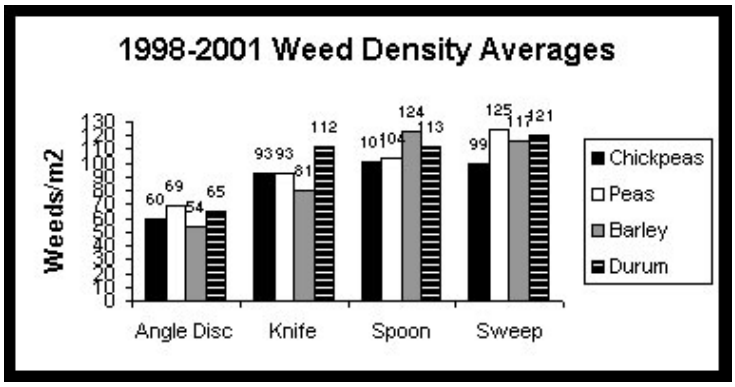


Figure 1: Average 1998-2001 weed densities of the four openers on all crops, burnoff treatment.

so long before realizing lower weed densities and improved yields. It appears that it takes a period of time, in this case at least three years before the weed seed bank in the soil is reduced enough to result in a reduction in weed densities. The four-year averages in Figure 1 do not indicate this trend. However, the average of the 2000 and 2001 weed counts does illustrate this trend of reduced weed densities with the knife (Figure 2). In addition, Figure 2 also shows the trend of openers with increasing levels of soil disturbance having a corresponding increase in weed densities. A longer study would likely reflect this in the long-term weed density averages. Another noticeable trend was that over time, on the no glyphosate burnoff plots seeded with an

angle disc, and to a lesser degree the knife, foxtail barley and some Canada thistle became established. However, the burnoff treatments using these openers essentially kept the incursion of these perennial weeds from developing.

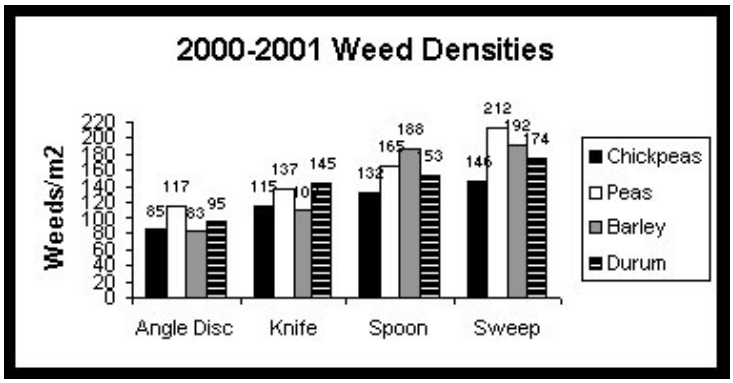


Figure 2: Average weed densities of the four openers on all crops from 2000-2001, burnoff treatment.

Crop rotation also had an effect on weed densities. Due to practically no options for broadleaf weed control in chickpeas (especially kochia and wild buckwheat) and the crop's poor competitive ability with weeds, it is no surprise that weed densities in chickpeas are high. This also affects the cereal crop following chickpeas. Another trend developed with peas. As noticed in previous years, there was a trend of lower weed densities in the cereal crop following peas. When the grassy vs. broadleaf weed densities were compared, it was evident that broadleaf weed densities were significantly lower in the cereal crop on pea stubble as compared to the other crops. This is very likely the result of the residual carryover from the herbicide Odyssey applied to the filed peas.

Yields have followed a similar trend as with weed densities. The lower the disturbance created

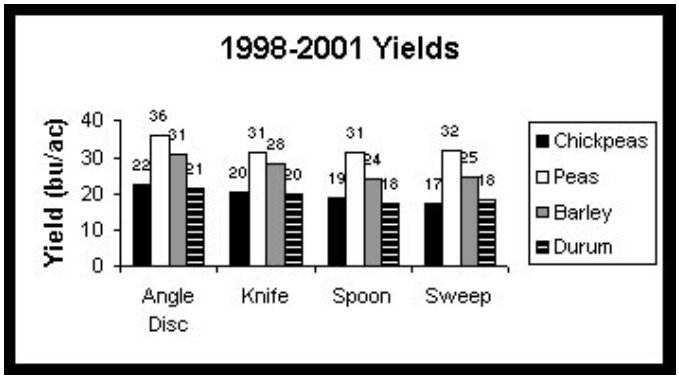


Figure 3: Average yields 1998-2001 with the four openers on all crops, burnoff treatment.

by the opener, the higher the potential the yield (Figure 3). As with the weed densities, the lower the soil disturbance opener used, the more important it is to use a glyphosate burnoff. Also

evident is that any advantage of sweeps is relatively short-term. The longer one uses sweeps, the higher the weed problems become and the lower the yields compared to lower disturbance openers. In addition, under dry soil conditions, the higher disturbance openers have significantly higher problems with the seedbed drying out. Under wet conditions, crop establishment is not generally affected by the level of soil disturbance from the opener.

As with the weed density figures, 2000 and 2001 appeared to be the ongoing trend that reflected the potential of each opener over time. The yields from the knife were becoming closer to those of the angle disc and it was becoming more evident as time went on, that the higher the

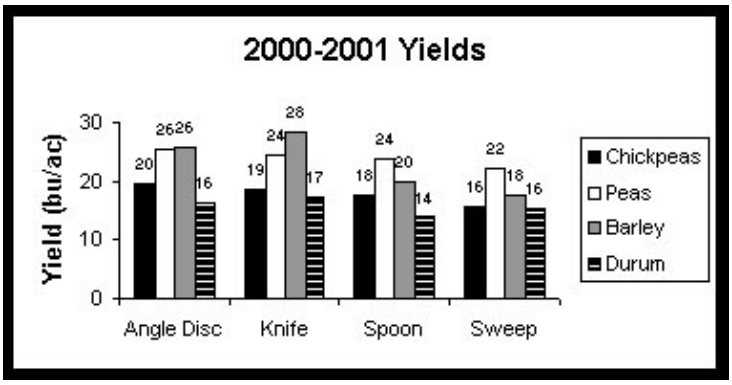


Figure 4: Average yields from 2000-2001 with the four openers on all crops, burnoff treatment.

disturbance of the opener, the more weed pressure occurred and subsequently, the less yield potential could be expected (Figure 4).

While the angle disc generally produced the best results overall, not all producers are prepared to opt for a low disturbance disc opener for direct seeding. What is important to note is that there are pro's and con's to each opener choice. While many producers opt for a sweep when switching to direct seeding, it is important to recognize that any potential benefits from this opener are relatively short-lived. In addition, adequate packing becomes more difficult and dry-down of the seedbed in dry years is severe. Not surprisingly, under wet conditions crop establishment is not affected a great deal by the opener. Under dry conditions, the level of soil disturbance significantly affects crop establishment. The lower disturbance hoe-type openers like the knife do provide higher yield potentials over time. However it will take a certain amount of time to realize that potential with knives. Low disturbance disc openers, such as was used in this study, have a great potential in the Dry Brown, Brown and likely the drier parts of the Dark Brow Soil Zones. However, the producer must realize a little different management and understanding of the strengths and weaknesses of disc openers before opting for this choice. Anecdotal evidence (that I witnessed first-hand) indicated that under severe dry spring soil conditions, as was experienced in 2001, the angle disc had trouble maintaining the desired depth in stony ground for deeper seeded crops like chickpeas or peas.

Crop rotations also have shown to play a significant role in the level weed problems that can be expected. The choice of crops and the herbicides available for the in-crop weed control also play a major role in levels of weed problems. In addition, all crops and all openers did benefit from a

pre-emergent burnoff with a glyphosate. However, the lower the level of disturbance of the opener, the more important this burnoff becomes. No matter what opener a producer chooses there are agronomic influences on the potential success of the opener. Producers also need to be aware of the long-term and short-term effects of a particular opener. However, this study does show significant advantages of low disturbance openers over high disturbance openers.

Wheatland Conservation Area and SSCA conducted the work on this project. Funding for the last three years was from the Agri-Food Innovation Fund (AFIF) and the first year by a combination of funding SAF, Southwest Regional Council of ADD Boards, SSCA, and District #4 ADD Board.

Drought Increases Direct Seeded Acreage

by Garry Mayerle, PAg

Conservation Agrologist

Low precipitation last growing season resulted in a big adoption of lower disturbance seeding practices. Many producers who saw first-hand last year the soil degradation of too much tillage and the soil conservation and moisture saving benefits of standing stubble knew they could not afford to put off the change to direct seeding.

In the northeast there has continued to be a slow but sure shift to low disturbance seeding the last number of years. As individual farms needed to change seeding equipment or saw the benefits of cutting back on labour or tillage equipment, there were gradual acreage shifts. But for the 2002 growing season there has been a very significant increase in direct seeded acres. These acreage changes are largest in areas where yields were cut significantly by drought conditions during last growing season.. Producers have heard the message long enough and knew what they needed to do to keep their soil at home. They also knew that should they face another dry spring, they could conserve precious soil moisture by cutting out tillage. This dry windy spring we have just gone through in the northern grain belt of Sask. has reinforced these very concepts. Even the shortage of capital expected from these dried out areas in the 2001 growing season could not stem this significant shift to direct seeding. Probably if anything, it caused it to swell as producers decided that if they were going to play the game, they better play it to the best of their ability which meant lower disturbance seeding.

Several environmental circumstances made it easier for those making this switch to make even last minute decisions a success. First, we had low quantities of residue to deal with in most places because of the dry 2001 growing season. Producers seeded right into standing stubble without worrying about how they had handled the residue. Second, this spring stayed cold throughout most of the seeding season and there was just no point in doing the normal pre-seeding burn down. Third, many soil tests were coming back with high soil N levels making it easier to safely seed-place all the required fertilizer with relatively narrow openers.

Now that this switch has been made, it is likely that the benefits of direct seeding will keep many of these acres under a low disturbance seeding system even when moisture levels return to normal. It is important to remember that some of the main principles or "pillars" (as SSCA calls them) of direct seeding will still apply in most years.

One principle to remember is that there are great benefits to managing residue properly. Nowadays, most of the newest direct seeding equipment can handle quite heavy residue without bunching. For those running retrofitted seeding tools, handling residue properly is still important, especially if we return to more normal moisture levels. Even in dry years, getting whatever residue is produced spread evenly across the field will ensure more even seeding conditions. Getting that chaff spread out somewhat behind the combine has significant benefits no matter

what seeding system you are in. Following the rule of "no piece of loose residue longer than the effective shank spacing on your drill" still fits for most seeding tools. Even if the residue is attached stubble, the rule probably applies for high disturbance openers but for low disturbance openers you will be able to stretch this rule to 1.5 times or maybe a bit more. If you are harrowing in your system, I certainly question the need for harrowing when low amounts of residue are produced. Harrowing during a dry spring certainly increases the potential for dust to be blowing off your field. Heavy harrows have a fit for managing heavy residue or soils that crust and crack but they are very aggressive and in dry conditions, they can make the soil very vulnerable to blowing.

To make low disturbance direct seeding work, you must be prepared to do a pre-seeding burn-off and some in crop pre-harvest and or post-harvest Round-up application. Most years there are going to be benefits from the burn-off on all or at least part of your spring seeded acreage. This spring was rather unique in that hardly any Roundup was applied pre-seed. Only a few acres received a post-seed burn-off. As a result, it is already evident that dandelions and some quack grass have benefited from this missed burn off. The way to hedge against this kind of a spring, where growing conditions are just not conducive to a burn-off, is to continue to pre-harvest 1/4 to 1/3 of your acreage in rotation every year. If this doesn't work for you, try to make up the difference with some post harvest Round-up application. Direct seeders comment that these fields may not need a burn-off especially if they are seeded earlier in the growing season. In circumstances where neither a burn off or the Round-up application in the fall was possible, try to keep your dirtiest fields in crops which have options for aggressive in-crop control of the hard-to-kill weeds such as dandelions, quack grass, Canada thistle, sow thistle and hawk's beard.

Coming into this dry spring, the goal of many producers was to keep some stubble standing and not stretch their budget too far. For some, that meant changing from full sized sweeps on their air seeder to cutoff sweeps or spoons. This enabled them to reduce the amount of soil disturbance by 25 to 50%, taking their chances on getting enough packing out of coil packers. It seems that this was relatively successful if the coil packers were used without harrows. Harrowing this spring tended to pulverize enough dirt to set up the opportunity for soil to blow.

Whatever seeding tool producers used to lower soil disturbance at seeding time, it is expected that most of these acres will continue to be direct seeded as the many benefits of low disturbance seeding were experienced first-hand. Following some of the recommendations listed will put new direct seeders in an even better situation to take advantage of less soil disturbance in their seeding systems!

Which Stubble is Best Suited for Winter Wheat Production?

By Juanita Polegi, PAg

SSCA Soil Conservation Agrologist

A question that is often asked is, "Can we seed winter wheat into pea stubble?" The standard answer is "Nope." Does that stop producers from seeding winter wheat into pea stubble? Nope. So, Ducks Unlimited Canada decided some research needed to be conducted that would evaluate the suitability of various stubbles for winter wheat production.

Drs. Byron Irvine and Doug Derksen, from the Ag Canada Research Centre at Brandon, undertook the project 3 years ago. The objectives of the research were to study the effect various stubbles had on winter wheat yields and to evaluate the impact of weeds on winter wheat yields.

In order to reduce risk to the winter wheat seedlings, the winter wheat must be seeded early in the fall. That means the field in which it's to be seeded must be harvested early. Traditionally, winter wheat is seeded into barley and spring seeded canola stubbles. With the introduction of fall seeded canola and its potential to be in the bin one to two weeks earlier than spring seeded canola, it was included in the rotation. Since peas are often the first crop harvested, they, too, were included in the rotation.

Two different rotations were designed and each was established at 2 sites, each with a different soil type and different weed populations. The first rotation was pulse-canola-cereal; the second was pulse-cereal-canola. Winter wheat yields have done well in all cases. The peas have averaged 40-50 bu/ac which Dr. Irvine describes as respectable for the area. The dormant seeded or fall seeded canola has not fared so well.

In the 3 years of the project, the dormant seeded canola has run into some real problems. In two of the three falls, the weather was wet and warm into mid-November enabling the canola to germinate and begin growth. In the third fall, 4 inches of rain were received just before freeze-up. As Dr. Irvine mused, "Is this just a run of bad luck or is dormant seeded canola just not suited to Manitoba?"

On the clay-loam site, the winter wheat out-yielded the spring wheat by 50% but on the loam site, winter wheat yielded only 25% better than the spring wheat. In describing the differences in yield, Dr. Irvine said it isn't because the winter wheat is so great, it's just that the spring wheat is such a poor competitor against the weeds. The number of weeds, in winter wheat, at the loam site was almost 10 times the number at the clay-loam site in some years. As Dr. Irvine points out, no two fields are alike. While the clay-loam site had many more weeds, most of them were broad leafs so they were relatively easy to control in the winter wheat. No wild oat herbicide was applied at either site on the winter wheat.

In terms of pea following winter wheat and spring wheat, Dr. Irvine indicated that the pea yields were just about identical on both stubbles.

So what does it all mean? After only 3 years of study, it is still unclear if it is feasible to routinely plant winter wheat and pea stubble. The researchers are still very much interested in the effect of pea stubble on winter survivability of winter wheat. They and researchers at Melfort and Indian Head, with the help of Ducks Unlimited Canada, will be expanding the scope of the study to develop a more accurate indication of the amount of snow trapped and retained by the pea stubble. Other crops, such as silage and alfalfa, may also produce stubble suitable for planting winter wheat in a timely manner if snow can be managed effectively. No doubt producers will continue to seed winter wheat into peas, especially in years where the harvest is late. While this practice will likely increase the risk of stand loss due to low snow cover, it remains to be seen if the reward is greater than the risk. In just a few years, Drs. Irvine, Derksen, Lafond and Kutcher will be able to provide a better estimate of the risk associated with that practice.

For more information on this project, contact Dr. Byron Irvine at (204) 726-7650 or birvine@em.agr.ca or Dr. Doug Derksen at (204) 726-7650 or derksen@em.agr.ca

Fall Seeding Forages

By Janice Bruynooghe, MSc

Executive Director

Saskatchewan Forage Council

The decision to establish a perennial forage stand raises a number of questions including, "What forage species and variety should I seed?" "What is the proper seeding rate?" "Do I use a cover crop?" and one of the more common questions, "When is the best time of year to seed a forage stand and have guaranteed success?" Many producers consider fall seeding as a viable option for establishing a forage stand.

The key to a choosing a seeding date is sowing forages to coincide with moisture and weather conditions that will ensure germination and establishment. (Sounds like an easy enough task!) Spring seeding of forages generally provides good moisture conditions, however, for some producers a fall seeding date may present several advantages for their operation. A fall seeding date may allow for more time to concentrate on the task at hand, including proper calibration of equipment and seedbed preparation, at a time when other fieldwork has been completed. In some areas, land may not be accessible in the spring due to flooding or soil types that remain wet into the summer months.

Fall seeding dates may vary from year to year depending again upon moisture and the weather. Under good growing conditions, there may be an opportunity in some years to seed forage crops in the early fall. Success will depend upon rapid establishment of seedlings and development to the stage where they are able to survive the winter. Grasses are better able to withstand winter conditions than seedling legumes, therefore it is recommended that alfalfa be sown no later than mid-August. In the Brown soil zone, grasses may be sown as late as mid-September.

Late fall seeding (from October 15 until freeze-up) targets a window of opportunity prior to freeze-up while late enough to prevent germination from occurring until the following spring. The main advantage to choosing a late fall seeding date is the benefit of early spring soil moisture conditions from snow melt. Concerns with warm weather after seeding include the potential for seed germination and damage to the seed as temperatures fluctuate.

No matter what time of year a forage stand is sown, successful establishment depends upon a number of variables including the use of quality seed, proper seeding depth and rates, and good weed control. A firm seedbed will allow for good seed to soil contact and result in rapid germination of the forage seeds. Clean, unworked stubble provides a good seedbed, while often providing improved moisture conditions for seeding success. Agronomic practices that encourage soil moisture conservation, improved soil fertility and health, and prevention of soil erosion will all assist in getting you closer to your goal of a well established forage stand.

Seed drills - Direct seeding forages into standing stubble

Forages1 - Successful forage stand establishment

Prepare in Advance to Seed Winter Cereals

By Juanita Polegi, PAg

SSCA Soil Conservation Agrologist

If you're thinking that the fall of 2002 might be the year for seeding some winter cereals, then the time to begin planning for that seeding operation is now. It takes a little organization to be ready for fall seeding.

Which field are you planning to seed to winter wheat? That should be the first question you ask yourself. To ensure that the crop survives the winter, the field has to have some standing stubble. The Snow Trap Potential Index, developed by Dr. Brian Fowler of the Crop Development Centre in Saskatoon, is a useful tool to use in determining the suitability of the stubble for seeding winter wheat. Measure the height of the stems (cm) multiply that by the number of stems per m^2 and divide by 100. If the answer is greater than 40, there is sufficient stubble for the winter wheat. Less than 40 and the potential for trapping snow to protect the little winter wheat seedlings is uncertain. A number of the fields I visited in the fall of 2001 had winter wheat seeded into canola stubble. Cereal stubbles also work well for winter wheat. Pea stubble does not usually meet the +40 index so is not a good choice. Bare summerfallow should not even be considered.

If a spring wheat field is where the winter wheat will be seeded, there must be 7 to 10 days between harvesting the spring crop and planting the winter one. That length of time ensures the death of the mite that carries the Wheat Streak Mosaic Virus, a serious pest of winter wheat.

How much of a "window" will you have for seeding? Timeliness of seeding is the next factor to consider. The general rule of thumb is that winter wheat should be seeded between August 25 and September 10. At the SSCA Annual Conference in February, Ducks Unlimited Canada, together with Sask Power, released the new Weather*man-ager*. It's a management tool that provides 53 years of weather records and has been developed to predict the probability of crops reaching maturity based on different seeding dates. So, if you've seeded oats on the 10^{th} of May, you can get an idea of what the likelihood will be of having them off and in the bin in time to seed the winter wheat.

Will the seeding equipment be ready for seeding about the time harvest is gearing up? You will need to have the seeding equipment ready to roll by the end of August or you're going to be taking time away from greasing the combine to get the seeder ready. Another factor to consider is whether you can direct seed with your own equipment or will you have to borrow or lease some equipment? Those arrangements need to be made well in advance.

Does your regular seed supplier have winter wheat seed? Check your Seed Grower Guide for sources of seed. Some of the newer varieties are very popular so you will want to book your seed well in advance of seeding.

How will you fertilize the crop? Will all the fertilizer be applied at the time of seeding? Or will it be broadcast the following spring? Do you have enough trucks available to haul fertilizer while seeding the winter wheat when you may also be hauling grain from the field? Solving the logistics problems before the seeding and harvest operations begin will save a lot of stress!

And finally, if the soil is dry, will you seed? The previously mentioned seeding window is critical for successful establishment. If conditions are dry, don't wait for moisture to seed. We usually receive some moisture in the fall and it doesn't take much to germinate the winter wheat and get it growing. You have to be prepared to get the winter wheat into the ground in the seeding window. Waiting for moisture increases the risk of a poor stand.

There are many agronomic and economic advantages to growing winter cereals, as evidenced by the increasing number of producers growing the crops successfully. These are the folks who have figured out well ahead of seeding how they are going to get that seed in the ground.

Environmental Farm Management: How will it affect you?

By Arthur Murray, Director

South East Region

At the S.S.C.A Annual Conference in Regina in February, some of you may have heard a speaker talking about Ontario's experience with setting up an EFP (Environmental Farm Plan).

When I first heard of this subject I thought "Oh no! Not more government regulations." Well it turned out it's not as much government dictated or as many regulations as you might think. Farm leaders in Ontario realized that a proactive approach was necessary and therefore an agenda was developed by farm organizations to discuss how they as an industry would address environmental concerns. Participation in Ontario's EFP program is voluntary. The spring of 1993 marked the first EFP workshops and by the fall of 1996, over 7500 farms had already enrolled. To date there are over 20,000 farms enrolled in the program, which represents half of the farm acreage in Ontario.

The goal of Ontario's EFP is to set in motion a process which will encourage every farmer to conduct farming activities in a manner which respects the environment. The EFP agenda defines Best Management Practices as well as providing on-farm risk assessment, and encouraging the development of action plans.

The 23 topics identified in Ontario's EFP are: Soil and Site Evaluation; Water Wells; Pesticide Storage and Handling; Fertilizer Storage and Handling; Storage of Petroleum Products; Disposal of Farm Wastes; Treatment of Household Wastewater; Storage of Agricultural Waste; Livestock Yards; Silage Storage; Milking Centre Wash Water; Noise and Odour; Water Efficiency; Energy Efficiency; Soil Management; Nutrient Management in Growing Crops; Manure Use and Management; Horticultural Production; Field Crop Management; Pest Management; Stream, Ditch and Floodplain Management; Wetlands and Wildlife Ponds; and Woodlands and Wildlife.

The goal of the EFP is to be voluntary and self-directed while encompassing all farming philosophies; relevant to all communities; provide farmer-to-farmer delivery; provide risk reduction; have financial incentives; and give awards/recognition for innovation. Although Ontario recognizes that complete compliance may take years, it is important that the development of farm plans begin as soon as possible.

The process starts with a workshop involving 12-20 farmers. Several weeks later they return to a second workshop, with their individual EFP action plans. These are then reviewed by a panel of local farmers. Review by a panel of local farmers, who are in charge of EFP delivery, is more effective and less threatening to farmers thus encouraging higher participation. Government has

found that environmental self-assessment by business in any industry is effective. The EFP is a due diligence defense, in case something does go wrong.

The federal government has proposed that all farms complete an EFP within the next 5 years. There isn't much doubt that it is coming, and therefore, we should be aware of the issues we are likely to face. Alberta has already started a pilot project to get their farmers on the road to an EFP. Some of the benefits Alberta farmers see in completing an EFP are; increased awareness of risk on the farm; positive reinforcement for doing things right; and providing a plan to reduce risks. They also see this as giving them an increased understanding of improvement options, as well as providing a safe venue to understand legislation requirements.

The implementation of EFP has been recognized across Canada as being beneficial to both the environment and the farming industry. Therefore, it is the farmers who recognize that this environmental farm plan is in their best interests.

Dave Larsen Joins SSCA Staff

It is with great privilege that I enter into the Saskatchewan Soil Conservation Association as Conservation Agrologist for the South East. It is a privilege not only because of the opportunity to promote sustainable agricultural practices, but also because of the opportunity to work with producers to refine the conservation and production techniques.

I come to the SSCA with an applied research background. I served as manager of what is now the South East Research Farm for four years. At the South East Research Farm I conducted numerous research and demonstration trials on all dryland field crops. I worked extensively with pulse crops, especially peas and dry beans. The small and large plot tests included disease trials, variety trials, minor use herbicide registration, agronomy and adaptability tests. Research plays a vital role in the development of our industry and I maintain an interest in tracking the latest research results from research staff and area producers. Transferring this knowledge will be one of my priorities as a Regional Soil Conservationist.

Prior to working for a living I attended the University of Saskatchewan were I obtained a Bachelor of Science in Agriculture with a major in Agronomy/Soils. I originally hail from Redvers where my parents operate a mixed grain/cattle operation. I am still involved in the farm as a source of cheap reliable labour.

I am looking forward to meeting with area producers through field days and demonstrations throughout the summer. I also look forward to touring the area to see the fine examples of the benefits of direct seeding as well as addressing the direct seeding concerns and questions producers face.

Tom Mathieson Fills Northeast Director's Position

By Garry Mayerle, PAg

Conservation Agrologist

The Saskatchewan Soil Conservation Association welcomes Tom Mathieson, producer from the Watson area, to fill the North East regional director position. The association appreciates and thanks the outgoing director Don Kelsey for his efforts and commitment to the board.

Tom earned a BSc. in Agriculture from the U of S and is a member of the Sask. Institute of Agrologists. He has worked in a number of professional positions including: Regional Farm Management Specialist with SAF, Field Agrologist with DU, and several winter positions with chemical companies to name a few. Tom and his wife Joanne came back to the farm in 1976. Tom is the third generation on this farm where he and his family live. Joanne taught elementary school before they started their family, and is a partner in the farm. They have 4 children. Holly, Jeff, and Brad are already working away from home. Chantelle is going into Grade 12.

Tom says his father was direct seeding with discers in the 60's. Later he direct seeded with a hoe drill. It was high disturbance and 25% of the acres were summerfallowed. Brome alfalfa hay was seeded in the rotation for the cattle. Tom started seeding with the hoe drill, switching to an airseeder with sweeps and eliminated summerfallow in the mid 80's. He moved to more low disturbance seeding in the early 90's with an air drill. Tom says, "I have often said one of the best farming decisions made was to go to low disturbance seeding with on row packing. If I could do anything different, I would have skipped the air seeder and moved directly from the hoe drill to the air drill."

The soil in Tom's area is clay loam but is quite abrasive. The drill Tom uses is a Morris Maxim with a Gen 54 tip on a Morris Acura Point Opener. (See photo.) This Gen 54 has a carbide tip and short wings giving approximately a 2.5" spread pattern. Tom expects to get 4 times the wear from this opener as compared to the 3" spread tip he used in the past. The drill has 10" shank spacing and 3.5" rubber packers. Tom seeds at 4.5 mph. He knifes in NH_3 in the fall.

Tom harvests with a Massey rotary combine equipped with a Kirby chaff spreader and factory chopper. He straight cuts flax and wheat and swaths barley and canola all 30 ft. wide. He is pretty happy with the residue handling behind the combine except in windy or tough conditions. He prefers not to harrow. He says harrowing in the spring creates dust which eliminates the effectiveness of a pre-seed burn-off. Tom uses custom high clearance sprayers for pre-harvest applications. He has observed sprayers equipped with crop dividers in front of the tires flatten less crop leaving a lot less material to have to go through the seed drill next spring.

Of course the sprayer is an important piece of equipment on the direct seeded farm. Tom runs a Bourgault 120' field sprayer. This is 3 times the width of his 39' drill so in the past seed drill overlap provided a great tram line. Just this spring he purchased an Outback GPS guidance system that so far seems to be working great. Tom also comments that the large 830 gal tank size is important as he farms by himself and he can cover a quarter section at 5 gal/ac with one tank. Tom is especially proud of one field of peas he 1 pass seeded into 12" tall cereal stubble. He says all his fields should look like this. (See photo.)

Crop rotation is another part of the grain production system that must be considered to successfully direct seed. Tom alternates cereal and broadleaf crops. His options for broadleaf crops are flax, linola, and canola as well as peas for a pulse crop. He also has begun to include a forage crop in his rotation. He established meadow brome with direct seeding in 20" rows three years ago. He waited to seed till the end of June. This gave him some time to get a better chemical weed kill. Grass seeds, like meadow brome, do better shallow seeded after a rain and into warm soils. Tom expects to get 3 to 4 years of good production off this field before rotating it back into an annual crop. He feels that with 2 applications of 1L of Round-up each in the fall and then including Select or Assure in the in-crop mix, the meadow brome should be disappearing. He has direct seeded into old hay stands in the past and it worked well, as long as it rains!

Tom says that the Sask. Soil Conservation Association has provided him with information and contacts that have helped him develop a more profitable farm. Tom, you now have the opportunity to make sure that the association keeps up that tradition of helping many others develop more profitable farms.

Busy Season for the Conservation Learning Centre

By Laurie Hayes, M Sc, PAg

Well, the season is not starting out any better than last year. To date (June 14), we have had less than 1.5 inches of rain. All crops were seeded into moisture but, again as last year, the wind has had a negative impact. We are pleased for the other areas of the province that have received rain and we are hopeful that it will start here soon.

Another busy season is underway. Our first tour is June 15. We are hosting a delegation from China interested in learning everything they can about direct seeding. The tour is coordinated by PFRA who is taking this group to a number of facilities and events including PAMI, Bourgault and the Western Canada Farm Progress Show. To cap what they are seeing in the manufacturing end, they are coming to the CLC for a field demonstration. We will be seeding two sections, one with the Edwards hoe drill and one with the Flexicoil air drill. We look forward to the visit.

Other tour dates include:

July 14?Agricultural Institute of Canada - Agricultural professionals from across Canada

July 30 Provincial Council of ADD Boards

The CLC's annual **General Tour** is being held on **Tuesday, July 23**. We will begin the day with a producer panel. We have invited a number of local producers who have either retrofitted equipment for direct seeding or who operate some of the less-known "brands". They will discuss how they made changes and the pros and cons of their seeders. In the afternoon, we will proceed with the general tour.

Just a short highlight of new projects at the CLC:

- Forage varieties of barley and oats
- AC Superb wheat
- Golden German millet
- Saskatchewan Forage Variety Testing Trial
- Soybeans (2 varieties)
- New varieties of dill, coriander and fenugreek
- SSCA - Timing of "preseed" burnoff
- Canola varieties: DKL 3345, 2733 Invigor, 45H21 (RR), 45A77
- Titan seed treatment (canola)
- Corn (2 varieties)
- Aqua blue liquid copper fertilizer
- Precision agriculture (wheat) (second year)
- Caraway (third year)

as well as our established projects - woodlot, shelterbelt garden, dense nesting cover, native plants study and forage gardens. In addition, researchers from Agriculture and Agri-Food Canada continue their plots evaluating nitrogen fertilizer use, disease and landscape and aster yellows incidence in field crops and vegetables.

This summer, the CLC will be implementing a containment system for our liquid fertilizer and fuel tanks. Type of containment (concrete pad, plastic-lined clay trench or metal system) has yet to be chosen but we hope to have it in place by mid-summer.

The Conservation Learning Centre is very pleased to be included in the Saskatchewan Agri-ARM (Agriculture-Applied Research Management) Program. Agri-ARM connects eight regional applied research and demonstration sites into a province-wide network. The mission is to conduct producer-driven applied research and demonstration, with results that extend beyond the farm gate to increase the value of crop production and improve agricultural sustainability. The focus is increasing the value from crops and enhancing production efficiency and environmental stewardship in the region.

Saskatchewan Agriculture, Food and Rural Revitalization, Agriculture and Agri-Food Canada, the College of Agriculture at the University of Saskatchewan, the Provincial Council of Agriculture Development and Diversification Boards and local producer groups are all partners in the organization and provide in-kind, financial, scientific and/or administrative support to the network.

We look forward to involvement in many new and exciting province-wide projects and welcome any suggestions for projects.

Drop by this summer and check out our Maize Maze!!

Pre-harvest Herbicides

By Thom Weir, PAg, CCA

Extension Agologist, SAFRR

Should you swath ?? Or desiccate your crop?? Or what about weed control in your crop?? This article will discuss the advantages and disadvantages of Pre-Harvest **glyphosate** and desiccation with **Reglone**.

Firstly, let's look at the differences in the two operations. Pre-harvest applications are geared for control of perennial weeds such as quack grass, Canada thistle, sow thistle and dandelion. These weeds are of increasing importance in direct seeding systems. The late summer timing is especially effective for Canada thistle. Canada thistle is most vulnerable to a **glyphosate** application at the bud stage. At this stage, the root reserves are at their lowest, translocation to the roots is rapid and the plants have a large leaf surface to absorb the chemical.

Preharvest may also aid in crop drydown and evening of maturity. This, however should not be the major reason for using this tool. The speed at which the crop will die down is very weather dependant and a period of cool, wet weather following application can still result in a 2 week + interval until the crop is ready to harvest.

Desiccation with **Reglone** on the other hand, is used specifically to aid in the rapid drydown of crops. The use of a desiccant will speed up the natural drying of a crop and allow for earlier, easier harvest of the field. Desiccation will not, however give you anything more than top growth burndown of perennial weeds.

Pre-harvest **Glyphosate**

Note: All glyphosate products are not registered for preharvest applications. Please consult specific labels for application recommendations.

Glyphosate should be applied at 1 L/ acre. Water volumes should be a minimum of 5 gallons of water. The use of 10 gallons is recommended in situations where heavy crop canopies exist and where control of dandelions is being targeted. Application should be made under low wind conditions as **glyphosate** drift can cause significant damage to neighbouring crops, gardens or shelterbelts.

The proper timing of application of **glyphosate** is important as too early an application may result in reduced yield and an application too late will give less harvest management benefits. Consult with Monsanto for per staging of the various crops.

All crops that are normally fed to livestock as seeds, crop residues (straw and chaff) or screenings are cleared for use as crop feeds. Label rates and intervals to harvest must be followed.

It is not recommended that seed from fields treated with **glyphosate** in a preharvest application be used for seed. While work has been done that indicated that applications at or after the 30% moisture level of crops does not effect germination, seed labs are consistently able to detect seed lots treated with **glyphosate** by germinating seeds exhibiting poor and distorted growth. This may result from the fact that most fields have depressions where maturity is delayed. These areas will have moisture above 30% when the majority of the field is at or below 30% and the field is treated.

Glyphosate should be applied two hours prior to a rain for maximum effectiveness. **Roundup Transorb** has a rainfastness of one hour.

While some glyphosates are registered for use on malt barley, some maltsters are reluctant to accept barley treated with **glyphosate**. Check with your elevator or malt plant for details on restriction. If you choose to apply, ensure that the least ripe area of the field has reached the 30% moisture level.

Dessication with Reglone

Reglone should be applied at 0.6 - 0.8***l*** / acre in a minimum of 10 gallons of water. The use of higher water volumes is recommended in situations where heavy crop canopies exist. The higher rate should be considered when heavy weed growth exists. The use of the surfactant **AGRAL 90** or **Agsurf** is required to be added at 0.1% of spray volume (1***l*** / 1000 ***l*** of water) for maximum results. As **Reglone** is a contact herbicide and is not translocated, the better the coverage, the better the effects of **Reglone** will be.

Too early an application may result in reduced yield and an application too late will give less harvest management benefits. Again consult with Syngenta.

Argentine Canola should not be treated with **Reglone** unless the crop is severely lodged. Losses due to shattering can result.

All crops that are normally fed to livestock as seeds, crop residues or screenings are cleared for use as crop feeds.

If applied at the proper stage, there is no adverse effect to **Reglone-**treated crops used for seed.

An interval of 15 minutes is required between application and rainfall for best results.

Notes: When heavy crops are encountered or where weed density is high, the application of **Reglone** under cloudy conditions or in the evening will result in increased efficacy and quicker drydown. Water volumes and application rates under heavy canopy will also increase the effects of **Reglone**.

Utilizing the tools that are available can help you manage valuable harvest time as well as optimize weed management.