

THE protector

WINTER 2003



SOIL CONSERVATION COUNCIL OF CANADA
CONSEIL DE CONSERVATION DES SOLS CANADA



PRESIDENT'S MESSAGE – Steve Broad

Hello and greetings from Soil Conservation Council of Canada. As I write this address the New Year is upon us. Many of you are likely looking for 2003 to be a kinder year than 2002. The weather extremes experienced in the growing season of this past year were felt across Canada but likely none worse than on the prairies. Climate change models tell us these extremes in weather are likely to become the norm rather than the exception for at least the near future. Hopefully the soil conservation practices that many of you have adapted are now paying dividends. Soil health is difficult to qualify. Long term sustainable production levels under extremes in growing conditions may prove to be a valuable asset and a yard stick by which to measure soil health.

The association has been busy refreshing the Taking Charge Teams in preparation for the next round in developing and expanding agriculture's role in GHG

mitigation. SCC has accepted the lead role in delivering the GHG Mitigation Program for Canadian Agriculture. Funded by AAFC under the Action Plan 2000 Program, demonstrations of the BMP's that mitigate GHG emissions from agriculture production will help producers adopt practices that will help Canada meet its Kyoto commitment. A workshop was held in early December to bring the TC teams and network organizations up to speed and develop a course of action. I am not sure if it was irony or coincidence that the workshop started on the eve of cabinet voting to ratify Canada's commitment to the Kyoto Accord.

One final note - the board was very fortunate to visit a number of interesting operations while in Montreal for the summer board meeting. Thanks to Daniel and all our hosts for organizing an informative field trip.

New Greenhouse Gas Mitigation Program for Canadian Agriculture Underway

By: Doug McKell – Executive Director, SCCC

The first national event conducted under the new Greenhouse Gas Mitigation Program for Canadian Agriculture (GHGMP) for the Soils and Nutrient Management areas took place December 10-12 in Edmonton. This national workshop brought together the key people across Canada who will be planning, conducting and administering the GHGMP. Once again the strength of the Soil Conservation Council of Canada (SCCC) was displayed as every province had at least two representatives in attendance among the sixty participants. Also in attendance was a significant contingent of specialists from Alberta Agriculture, Food and Rural Development. These people including: John Hermans (SCCC director), Tara Banks, David Neilson, Shane Chetner, Karen Haugen-

Kozyra, John Basarab, and others, provided the usual western hospitality as well as input into the workshop discussions. Many thanks to you all in Alberta.



Participants at the GHGMP National Workshop go through a group exercise.

Facilitating the workshop was Lee Pengally, who provided a unique and flexible approach to the event that provoked valuable discussion and sharing of ideas and concerns among the participants. Lee certainly has an effective way of conducting an adult learning/planning seminar. Our thanks go out to you as well, Lee, for a job well done. We couldn't believe the effectiveness of your

chimes in getting everyone's attention?

The GHGMP is a four-year, \$15m awareness program created out of the federal government Climate Change

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AGRICULTURAL POLICY FRAMEWORK MEETING AND TOUR COMES TO SASKATCHEWAN – Don Horsman

The Agricultural Policy Framework environment chapter advisory committee is composed of 15 members from across Canada. About half of those members are farmers; others are civil servants and managers of associations. The environmental chapter focuses on four areas - air, water, soil and biodiversity. This committee started meeting in May and has done so monthly since that time. The September meeting was held in Regina - the first day was a formal meeting and the second day was a tour of the Fort Qu'Appelle - Indian Head area.

The first stop of the tour was at Springbrook Farms near Fort Qu'Appelle. At this farm they milk approximately 100 cows, have about 100 beef cow-calf pairs and direct seed more than 3000 acres to a mix of crops including pulses, oilseeds and cereals. The manure from the livestock operation is spread on about 300 acres each year. Their water supply is from 2 sources, their own well piped about 2 miles and an outlet of the North Qu'Appelle Pipeline Association.

A board member of the water pipeline association spoke to the tour group about the community pipeline utility. It began about 9 years ago with 17 members (outlets) and now has

about 60 members (outlets). The pipeline exists because of the work and cooperation of a number of groups. Under the initiative and leadership of Del McDonald (member), the Rural Municipality provided necessary bylaws and office work, the credit union provided a loan, and the PFRA provided some funding and water pipeline expertise.

The next stop was at Indian Head Agricultural Research Station. Dr. Guy Lafond, research scientist at the station, described the farm and its activities. Leaving the farm the tour passed land operated by the Indian Head Agricultural Research Foundation (IHARF) and Yann Pelcat, manager, explained the work being done on precision farming. Down the road from IHARF, Gerry Willerth, farmer, showed the advantages of shelterbelts and winter wheat. This led up to a very interesting presentation at the farm of Jim Halford. Dr. Lafond and Jim Halford discussed the benefits of direct seeding as it relates to soil quality, biodiversity, fertilizer management and the establishment of carbon sinks. They provided data comparing two fields adjacent to each other, one direct seeded for 20 years and one conventionally seeded until last year.

	20 YEAR DIRECT SEED	CONVENTIONAL *
1. Pounds total N/acre(top 8")	5759	4117
2. Potential mineralized N(lbs/acre)	112.7	62.4
3. Yield@60#N (bu/acre)	49.1	40.2
4. Protein@60#N	14.0%	11.6%

* — conventional tilled until 2001

They also pointed out that tractor fuel consumption in direct seeding systems often consume about 35% of that on a conventionally tilled system, and that on the Halford farm direct seeding has tied up 1.0 - 1.5 tonnes of carbon dioxide per year over the last 20 years. It was also noted that Jim's business manufacturing direct seeding drills (Conservapak) employs about 30 people. On the way back to Indian Head John Bennett, past president of SSCA, expanded on the remarks by Dr. Lafond and Jim Halford regarding carbon sinks. This led to much discussion over lunch at the research station and on the bus trip back to Regina.

NOTICE OF ANNUAL GENERAL MEETING

The annual general meeting of the Soil Conservation Council of Canada will be held in the Ramada Hotel, Abbotsford, BC on Wednesday March 19th. The meeting will commence at 8:30 am and will conclude by noon. A banquet will be held that evening where the SCCC annual Hall of Fame presentation will take place. A board of directors meeting with an update on the Greenhouse Gas Mitigation Program for Canadian Agriculture will take place Wednesday afternoon and Thursday for the Taking Charge provincial teams. On Friday (21st) a nutrient management tour of farm operations in the lower mainland area will be conducted for Taking Charge team members. Everyone is welcome to attend the AGM and paid members are eligible to vote on resolutions. Anyone wishing to receive an agenda for the AGM or to register for the banquet should contact the SCCC head office at Indian Head, (306) 695-4212.

CALL FOR HALL OF FAME NOMINATIONS

It's time again to be thinking about nominating those worthy of being inducted into the Canadian Conservation Hall of Fame. Established in 1990 by Soil Conservation Canada (SCC), the Canadian Conservation Hall of Fame recognizes contributions by Canadians to further the conservation ethic in Canada. Nominees for induction into the Canadian Conservation Hall of Fame need not be farmers or those directly employed in agriculture or soil conservation related activities. They can also be foresters, scientists, extension workers, educators, writers or anyone who through their dedication to promoting conservation has made a significant contribution. Their accomplishments and/or contributions may be on a national, provincial, regional or local level. The Hall of Fame is located in the Sir John Carling Building in Ottawa.

Rules Governing the Nomination

Nominations may be made by any member organization or any five members of the SCC and must be supported by documentary evidence as to experience and accomplishments of the nominees.

Nominations, including documentation are to be received at the SCC office NO LATER THAN February 28th to be eligible for consideration.

If you know of someone who is deserving of this award please contact the SCC office for a nomination form or for more information. Lets give credit to those who are working hard to protect our agricultural resources!

Greenhouse Gas...from page 1

Action Plan 2000. The program will aim to increase the adoption of agricultural GHG mitigation practices by Canadian producers through demonstrating applicable farming practices on model farms. During the two days of the national workshop, participants started the planning process of developing these demonstrations through plenary and breakout discussions. The GHGMP will utilize the highly successful, provincial Taking Charge Team delivery process to plan and set up the demonstrations across Canada. Throughout the next few months the provincial Taking Charge teams will be conducting planning sessions with



Central Canada Taking Charge Team Leaders do some strategic planning.



Geoff Hughes-Games – BC – provides input during a Group Exercise.



Planning continues throughout coffee break

other producers in their respective provinces to formulate ideas on what types of demonstrations to setup, where they will be located etc. Once the demonstrations are up and



SCCC directors John Hermans and Jack Swainson discuss workshop with facilitator Lee Pengally

running, an extension program involving field days, tours and seminars will be initiated to promote the practices to other producers. Soil Conservation Council of Canada will be responsible for coordinating the Soils and Nutrient Management components of the GHGMP while a consortium of livestock groups including: Canadian Cattleman's Assoc., Canada Pork Council and the Dairy Farmers of Canada, will conduct demonstrations for the Livestock issue area. All four producer groups have also agreed to work together in an effort to conduct demonstrations that involve all three issue areas; soils, nutrient management and livestock. For more information on the GHGMP contact the SCCC office or any of the SCCC board of directors.

NEW FACES WITH THE GHGMP



Susan Hubbs, new Office Manager for the GHGMP at the SCCC Office – Indian Head.

Susan Hubbs – Office Manager

Sue will join the GHGMP under contract as the Soils and Nutrient Management program Office Manager. Sue brings a wealth of experience in office management to the program having spent almost twenty years as client service rep with Saskatchewan Agriculture and Food in Indian Head, SK. Sue will be responsible with assisting Doug McKell in administration duties, accounting/financial and preparing reports. Sue can be reached through the SCCC office in Indian Head.

Jerome Damboise – Project Coordinator, Eastern Canada

Jerome will be sharing his time between his duties with the Eastern Canada Soil and Water Conservation Service and the GHGMP.

Jerome brings a strong technical background to the program and will be responsible for working with the Taking Charge Teams in Quebec and Atlantic Canada in helping with program planning and reporting to the SCCC office.



“New Project Coordinators: Jerome Damboise, Grand Falls NB and Patricia Walker, AB join SCCC Executive Director – Doug McKell – at the GHGMP National Workshop. Jerome is the new Soils and Nutrient Management Project Coordinator for Eastern Canada while Patricia is the Project Coordinator for the Livestock area of the new program.

SCCC Directors Plan for New GHGMP

It is not often that SCCC convenes a summer board meeting. The heavy farm workload and trying to cram in a summer holiday usually makes it hard to get



SCCC director – Daniel Guay (with shovel) – explains the soil effects from Jocelyn Michon’s (on Guay’s right) continuous no-till corn practices at La Presentation, Que.

the group together between spring and winter. This July was the exception and the board made time to get together in Montreal as the new Greenhouse Gas Mitigation Program (GHGMP) for Canadian Agriculture was approved for implementation in early 2002. Executive Director – Doug McKell – had prepared a workplan that needed board approval before being submitted to Ottawa. The board spent a good part of the two days in Montreal being introduced to the goals and objectives of the new program and discussing how SCCC would be involved. McKell then outlined his workplan that would see SCCC administer over \$8m and have the regional Taking Charge teams utilize the funding to set up on-farm demonstrations of Climate Change BMPs across Canada. After two days of discussion and strategic planning the board approved the workplan and gave the go ahead to implement the GHGMP.

As well as planning the details of the new GHGMP the

board toured three farms in the Montreal area that included the types of practices that would be set up as on-farm demonstrations under the new program. Everyone was impressed with Jocelyn Michon’s practices which showed the benefits of a continuous corn rotation under no-till.

Other operations toured included ridge-tilling at the Gilbert farm and a modified manure spreader as part of a unique nutrient management plan. Saturday took the group to the MacDonald College grounds where Dr. Chandra explained their program to measure GHG emissions from corn under various soil management regimes. The final stop took us to

the water control structures near Bedford where showed us how the college was monitoring water quality under different cropping practices.

Through touring these types of practices it is expected the SCCC board members (who are also



SCCC Board members learn about the conservation strategy – ridge tilling – from the Guilbert brothers near St. Dominique, Que.



Assistant Professor – Peter Enright – explains a water control project which is part of the Brace Centre program near Bedford Que.

Taking Charge Team leaders) will get a better understanding of what will



Dr. Chandra Madamootoo – Director of the Brace Centre, MacDonald College Research Farm – demonstrates his GHG monitoring program on their corn plots.



SCCC Executive Director – Doug McKell – goes over his GHGMP workplan with the board

be required in planning and setting up effective demonstrations of GHG mitigation practices. These types of farm operations will be identified or created and promoted across Canada through the next four years of the GHGMP.

SOIL CONSERVATION COUNCIL OF CANADA VISITS FARM SITES IN ATLANTIC CANADA

Doug McKell of the Soil Conservation Council (SCC) of Canada visited farm sites in Atlantic Canada, the SCC TAKING CHARGE teams and the provincial Soil and Crop Improvement Associations in New Brunswick, PEI and Nova Scotia between September 10th to September 14th, 2002. The Eastern Canada Soil and Water Conservation Centre (ECSWCC) hosted Doug for the visit, arranged meetings in the three provinces and seven on-farm visits. Doug's whirlwind tour covered almost 1900 km of the three provinces (and many hours of good discussions in the van on the road!) by the time he returned to Saskatchewan on September 14th.

The purpose of Doug's tour was twofold: first, to visit with three of the TAKING CHARGE teams in the Atlantic region and speak to them about the upcoming SCC Greenhouse Gas (GHG) mitigation program and secondly, to visit some of the potential farm demo sites for that program.

In PEI, Doug visited both Blaine Diamond's and George Webster's farms. Blaine Diamond's potato farm showcases many best management practices, particularly those related to soil conservation. Blaine also participates in a pilot program as a member of one of the Agri-Conservation Clubs on PEI.

George Webster's farm, Maple Plains, is an agri-conservation and ecological best practice demonstration site. George co-operates with the Bedeque Bay Environmental Management Association in demonstrations (i.e. buffer strips, strip cropping, grassed waterways) on his farm.

In New Brunswick, Doug visited Bonar Morton's, Keith Barnes, Bill Martin's and John Schenkel's farms, which present a range of Best Management Practices focusing upon nutrient management, crop rotation, manure management, feed management and wetland management for runoff treatment. Doug also visited briefly Carol Versteeg's farm in Hardwoodlands, NS for a meeting with the Soil and Crop Improvement Association of Nova Scotia. Doug also heard a summary of on-farm visits which took place the day before he arrived with the New Brunswick TAKING CHARGE team who visited several potential sites that could be used to demonstrate a range of practices that could promote soil carbon sequestration.



The tour underlined the diversity of farming operations in the Atlantic region, the wide range of production practices and the challenges facing producers.

David Coburn, Doug McKell, Dwayne Hicks (Taking Charge Team NB), Nicole McLaughlin and Jean Louis Daigle at the entrance to the Coburn GHG Demo farm.

CANADIAN FARM WRITER'S VISIT SCC DEMO SITE IN NEW BRUNSWICK



The Canadian Farm Writers is an association of journalists from across Canada who write in farm journals, newspapers and other farm media. Their annual field

Doug McKell addresses the group at the Coburn farm during the Farm Writer's Tour of Atlantic Canada

tour was in New Brunswick this year. Amongst the farms they visited were two very interesting sites, David Coburn's farm and Reg King's farm. Doug McKell of the Soil Conservation Council of Canada was present at the Coburn farm and spoke briefly to the media of the Coburn SCC demo site, the value of composting as a Best Management Practice and of the SCC GHG mitigation program.

Coburn's Poultry Farm, which is a SCC demo site near Keswick Ridge, New Brunswick, is a 25,000 egg layer operation. The farm uses a computerized feed mill to ensure that proper rations are provided, and adds a deoderase feed supplement. This eliminates over production of manure and reduces the ammonium by 50%.

The farm also produces organic peppers and apples. The unsold products along with the manure from the layer operation are all composted in an in-vessel composter system. This system involves the confinement of compost materials in a building located on the edge of the farm. Carbon dioxide, methane, and nitrous oxide are all by-products of the composting process. To reduce these as much as possible, David carefully manages his in-vessel system, monitoring the amount of air flow and temperature of the compost. Aerobic composting systems emit less total greenhouse gases than anaerobic systems.

When visiting the Coburn farm one is struck by the absence of odour and by the efficiency of each of the operations on the farm. The journalists were very impressed by the high level of scientific management on this farm and by its intensive, obviously positive environmental management.

Reg King's dairy farm is on moderate to steep sloping land and historically, it had been a challenge for him to reduce soil erosion from his fields in a corn and forage rotation. Some of his fields are so steep that it was difficult to drive a wagon load of visiting journalists across the fields without tipping over! Reg has been a pioneer on Environmental Farm Planning and implementing innovative Best Management Practices and strip cropping of his fields across the slope some time ago. This has successfully minimized soil erosion from his fields.

The Canadian Farm Writers were very impressed by all the positive, proactive conservation work they saw on these two excellent farms. A number of the journalists produced several articles afterwards in their media about these two sites in particular, and about the positive conservation practices in agriculture they had seen on tour.

LONG-TERM DIRECT SEEDING EFFECTS: CAN WE MEASURE THEM AND ARE THEY ECONOMICALLY IMPORTANT?

– **Guy P. Lafond, Indian Head Research Farm**

Making changes in farming practises requires commitment, time and resources. Producers are interested in knowing the long-term benefits of these changes and especially their economic impact. We had the opportunity in 2002 to get some indication of the magnitude of the long-term agronomic and economic benefits of direct seeding.

We measured the response of spring wheat to nitrogen fertilizer on two fields with very different direct seeding histories i.e. 20+ years vs 1 year. The test areas were close enough together to eliminate differences in precipitation as a controlling variable. We used one rate of phosphorus fertilizer (20 lbs P₂O₅/ac). Table 1 provides some general information about the two sites and also some pertinent agronomic information. Both areas were seeded to canola in 2001.

The results from the 2002 study demonstrate clearly that agronomic and economic benefits with direct seeding do accrue over time and have a significant impact on economic performance (Table 2).

The first important observation is the overall yield when no nitrogen fertilizer N is applied. On the long-term zero tillage area (L-T ZT) the yield was 42.6 bus/ac vs 26.2 on the short-term zero tillage area (S-T ZT).

The second important observation is that maximum yield was obtained with 53 lbs N/ac (60 kg N/ha) on the L-T ZT versus 80

lbs N/ac (90 kg N/ha) on the S-T ZT.

The third observation is that the protein content of the 0 N treatment on L-T ZT (13.3%) was higher than the protein content of the S-T ZT with 107 lbs N/ac (120 kg N/ha).

The fourth important observation is that the net returns were higher for the 0 N treatment on the L-T ZT than for any other N treatments on the S-T ZT area.

The fifth observation is the highest return recorded for the L-T ZT area was \$83.51/acre versus \$42.82/acre for the S-T ZT area.

The results of this study give rise to a number of very important agronomic questions. When the spring nitrate-N levels are compared between the two areas, the differences

are small, relatively speaking (Table 1). According to soil test recommendations, the amount of nitrogen required for both areas are similar i.e 39-50 lbs N/acre for the L-T ZT vs 50-60 lbs for the S-T ZT area and yet the outcome was dramatically different both in terms of grain yield and grain protein. This implies that new refinements to our soil test recommendations for nitrogen fertilizer are required. It is also apparent that



Plots near Indian Head show the benefits of long term direct seeding.

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Nicole McLaughlin is the new Program Coordinator for the Eastern Canada Soil And Water Conservation Centre

NEW COORDINATOR TO RAISE AGRICULTURAL AWARENESS OF CLIMATE CHANGE IN EASTERN CANADA

The Eastern Canada Soil and Water Conservation Centre (ECSWCC) has just recruited Ms. Nicole McLaughlin to coordinate the activities of their Climate Change Action Fund (CCAF) Agricultural Awareness Partnership Project. She is replacing Ms. Caroline Pagé. The purpose of this project is to increase the awareness of producers and the public of greenhouse gases and to promote management practices that could be utilised to reduce emissions.

Nicole has just defended her master's thesis at the University of Guelph in agrometeorology. She has a good understanding of the issues involved with climate change and greenhouse gas emissions from agriculture as her thesis topic compares the effects of different agricultural practices on nitrous oxide emissions. She has good communication skills and won third prize for best oral presentation at the American Meteorological Society's conference in May 2002. She acquired a keen understanding of agricultural practices and issues that face farmers while working on her home farm as well as other farms in the Atlantic and in Sweden. These qualities and experiences will be valuable to the ECSWCC in its role in promoting awareness of climate change issues and the practices that may reduce greenhouse gas emissions in the agricultural sector.

The ECSWCC is a partner in this climate change agricultural awareness project with the Prairie Farm Rehabilitation Administration (PFRA) of Agriculture and Agri-Food Canada, the Canadian Cattlemen's Association (CCA), the Soil Conservation Council of Canada (SCCC) and the Canadian Federation of Agriculture (CFA). This partnership project is funded under the CCAF program.

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measuring for residual nitrate-N levels can only provide a partial answer to the N fertilizer recommendation. The other important question is, within the L-T ZT area, can we find areas that differ significantly in productivity and would we expect differences in the response to nitrogen within those different areas. This requires new approaches and methods since the approach using soil testing may not allow proper separation or delineation of these management zones. These results also point to the need to refine our approach to overall land management.

Acknowledgement: This study was made possible with the cooperation of Jim Halford of Vale Farms Ltd, the Indian Head Agricultural Research Foundation, Saskatchewan Agriculture Food and Rural Revitalization, N.M Paterson Co and Agriculture and Agri-Food Canada.

Variable	Long-Term Zero Tillage Field	One Year Zero-Tillage Field
Spring Wheat Variety	CDC Teal	CDC Teal
Seeding Date	May 28th, 2002	May 28th, 2002
Harvest Date	September 16th, 2002	September 16th, 2002
Herbicide Use		
Pre-Seeding Burnoff	May 24th, 2002 Round-Up at 1.0 li/acre	May 24th, 2002 Round-Up at 1.0 li/acre
In-Crop Herbicide	Buctril M (1 li/ha) + 0.2l/ac MCPA Ester - June 24th	Buctril M (1 li/ha) + 0.2l/ac MCPA Ester - June 24th and Horizon 0.095 li/ac - July 5th.
Pre-Harvest Round-Up	September 6th Round-Up at 1.0 li/acre (applied by air)	September 4th Round-Up at 1.0 li/acre (applied by ground applicator)
Seeding Implement	ConservaPak Seeder on 12" spacing	ConservaPak Seeder on 12" spacing
Spring Soil Test NO ₃ -N (kg/ha) 0-30cm	55	41
Spring Soil Test PO ₄ -P (kg/ha) 0-30 cm	60	25
Spring Soil Test K (kg/ha) 0-30cm	895	1200
Spring Soil Test SO ₄ -S (kg/ha) 0-30 cm	73	69
Soil pH	7.9	8.0
Salinity Rating	Non-saline	Non-saline
Target N levels for 42 bus/ac assuming average growing season precipitation (kg/ha)	39 - 50	50 - 63
Soil Texture	Clay loam	Clay loam

Treatment	N Rate (kg/ha)	Yield (bus/ac)	Protein (%)	Gross (\$/ac) ¹	N Fert cost (\$/ac) ²	N Margin (\$/ac)	Other Var. & OH costs (\$/ac) ³	Net (\$/ac)
LT - ZT	0	42.6	13.3	\$169.55	\$0.00	\$169.55	\$114.53	\$55.02
	30	44.8	13.7	\$183.68	\$7.29	\$176.39	\$114.53	\$61.86
	60	49.1	14.0	\$205.73	\$14.58	\$191.15	\$114.53	\$76.62
	90	51.5	14.2	\$219.91	\$21.87	\$198.04	\$114.53	\$83.51
	120	49.8	14.4	\$216.63	\$29.16	\$187.47	\$114.53	\$72.94
ST - ZT	0	26.2	10.9	\$87.77	\$0.00	\$87.77	\$114.53	-\$26.76
	30	32.9	11	\$112.52	\$7.29	\$105.23	\$114.53	-\$9.30
	60	40.2	11.6	\$141.50	\$14.58	\$126.92	\$114.53	\$12.39
	90	47.9	12.3	\$175.79	\$21.87	\$153.92	\$114.53	\$39.39
	120	47.7	13.1	\$186.51	\$29.16	\$157.35	\$114.53	\$42.82

1 Gross return = grain yield * price with protein premium – (freight + handling [1.47/bu])

2 Fertilizer cost = \$277/mt urea (\$0.273/lb N)

3 Variable and overhead costs, except for N fertilizer, according to SAF costs of production for direct seeded spring wheat Black soil zone

“W.R. POOLE “ – WESTERN WHEATGRASS



In memory of Bill Poole, and in recognition of his dedication and support of Ducks Unlimited Canada's(DUC) native plant materials development program, DUC has released its Western Wheatgrass ECOVAR' under the variety name “**W.R. Poole**” – Western Wheat grass.

Bill was one of the founding staff member of DUC's Native Plant Solutions, and dedicated his efforts towards developing an array of commercial supplies of ecological varieties of native grasses.

Western wheatgrass (*Agropyron smithii*) is a cool season, rhizomatous perennial grass found throughout grassland regions. It bluish color stands out and is easily identified in a sward. Its aggressive spreading root system and resilience to adverse and saline soil conditions lend itself well for use in re-vegetation projects throughout a range of soil types, making it a valuable inclusion in soil conservation and reclamation plantings.

Western wheatgrass is also highly palatable, and holds its nutritional values into the fall grazing season.



WR Poole Western Wheatgrass was named after former SCCC president – Bill Poole – for his dedication to conservation efforts across Canada.

W.R. Poole
Western wheatgrass truly epitomizes ‘ Bill’s’ nature and persistence and parallels the presence Bill displayed in a room full of people.

As commercial volumes of this species are planted throughout the landscape, and its progeny persist in holding down the ground, Bills contributions to soil conservation and habitat protection will persist in perpetuity.



Plots of the WR Poole Western Wheatgrass near Swift Current SK where much of the breeding took place. Pictures courtesy of Dr. Grant MacLeod, Ag Canada, Indian Head.

CHECKOUT THESE WEBSITES

www.nbfarm.com/nbscia The home site for the New Brunswick Soil and Crop Improvement association. Their latest newsletter is available on this site.

www.agri-ville.com Lots of ag related stories, information and chat sites on various ag topics.

www.nacdnet.org The US National Association of Conservation Districts. Contains information on US Agriculture Policies as they relate to conservation issues. Also has information from some of the many conservation districts and associations across the US.

www.agr.gc.ca/policy/environment/eb/public-_html/ebe/climate.html The federal government of Canada's site for Climate Change information.

FERTILIZER NITROGEN AND NITROUS OXIDE EMISSIONS

– Adrian Johnston, SCCC Board Member and Reynald Lemke, AAFC – Swift Current

Fertilizer nitrogen (N) is the most commonly applied fertilizer product in Canada, balancing the N deficiencies



that limit crop production. In 2000, 83% of all N fertilizer sold in Canada was used in the Prairie Provinces of Manitoba, Saskatchewan and Alberta. In this region, the vast majority of the N is applied using in-soil bands either prior to, or at the time, of seeding annual crops. Extensive agronomic research has clearly demonstrated that band applications reduce N losses and improve the efficiency of N use by crops, optimizing economic returns to the farmer.

Increasing atmospheric concentrations of the greenhouse gasses nitrous oxide (N_2O), carbon dioxide (CO_2) and methane (CH_4) have been documented in the scientific literature. We are concerned about this because all three gases absorb long-wave radiation thereby increasing the amount of heat trapped in the earth's atmosphere. In addition, N_2O is involved in the destruction of stratospheric ozone, which shields the earth from biologically harmful ultra-violet radiation. Current estimates suggest that agricultural activities are responsible for 10 to 15% of Canada's human-induced greenhouse gas emissions, largely from N_2O and CH_4 . Efforts are underway to verify and improve these estimates, and identify ways to constrain or reduce emissions.

Most of the N_2O evolved from soils is produced when soils are wet and have an accumulation of mineral N (nitrate (NO_3^-) and/or ammonium (NH_4^+)). Under these conditions soil microorganisms become oxygen starved and utilize specific forms of mineral N instead of oxygen, leading to the formation of the unstable N forms N_2 and N_2O . This soil accumulated mineral N can come from applied fertilizer, manures, legume crops, or the breakdown of crop residues. To minimize these N losses it is recommended that soil N levels be monitored using soil testing, and nutrient additions be timed to coincide, as much as possible, with crop demand. Placing nitrogen fertilizer in bands generally improves N use efficiency, increasing its agronomic, economic, and environmental value.

In an attempt to estimate GHG inventories for a country, the Intergovernmental Panel on Climate Change (IPCC) has established a loss factor which is applied to N fertilizer. This factor comes from a set of research results which they have adopted as representing fertilizer N management. This loss estimate is 1.25% of fertilizer N applied, meaning that for Canada in 2000 we were looking at 1.25% of 1.38 million metric tonnes. This accounts for a major component of the GHG contribution coming from agriculture.

A number of researchers working in soil and fertilizer N management questioned this 1.25% loss value, and suggested that we should develop some estimates for N loss from fertilizer N use in the prairie provinces. This

resulted in an industry-government sponsored project evaluating N_2O emissions from side-banded and mid-row banded N placement common to "one-pass" fertilizer/seeding application systems used in western Canada. The research, being managed in Saskatchewan by Dr. Reynald Lemke of AAFC Swift Current, and Manitoba by Dr. David Burton at the University of Manitoba, addresses a number of questions including:

1. How much N from fertilizers is lost directly as N_2O under western Canadian conditions?
2. Does fertilizer N source (anhydrous ammonia vs. urea) influence direct losses of N_2O ?
3. Does application time (spring vs. fall) influence direct losses of N_2O ?
4. Does fertilizer placement (mid-row vs. side-row banding) influence direct losses of N_2O ?

Based on the results of the Saskatchewan research to date:

- There appears to be no evidence to suggest that N_2O emissions are markedly higher from N applied as anhydrous ammonia compared to N applied as Urea.
- Fall application of fertilizer N does appear to increase potential N_2O loss during the following spring, however losses during the growing season were often lower than spring applied N, resulting in minimal differences when compared on an annual basis. It needs to be clarified here that there was limited snow cover at most sites during the spring of 2000 and 2001, thus the potential for N_2O loss was also minimal. Under higher snow packs, loss of N_2O from the fall applied N treatments could be substantially higher during the spring thaw period.
- Mid-row banded N released more N_2O than side banded N during the first year of the study (May 2000-April 2001), but no differences were observed in the second year (May 2001-April 2002).
- In the first two years of this study, N_2O losses associated with the application of N were minimal at all locations. Calculations indicate that the percent N lost directly as N_2O ranged from approximately zero to 0.4 %.

In summary, the ongoing research indicates that fertilizer N losses as N_2O emissions are considerably lower under western Canadian management and environmental conditions than the 1.25% currently recommended by the Intergovernmental Panel on Climate Change (IPCC). It is anticipated that continued research will lead to a more appropriate estimate of fertilizer and soil N contribution to N_2O emissions, and a more accurate estimate of agriculture's contribution to greenhouse gasses.

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Date in brackets is expiry date for term of office. NT means no term for that position

TCTL Denotes Taking Charge Team Leader for their province