Soil conservation given high priority by producer groups

The Saskatchewan Soil Conservation Association (SSCA) was formed to “encourage soil conservation by promoting crop production systems which reduce soil degradation and maintain economic viability.”

Through the '70s and '80s, soil conservation has come to be seen as important throughout the Great Plains. Regionally or provincially based producer groups have formed in Alberta, Montana, Manitoba/North Dakota and, most recently, in Saskatchewan.

Provincial or state based organizations have uniquely advantaged positions when it comes to dealing with big government, big business, or international groups such as Ducks Unlimited.

The SSCA has supplied responsible members to the Soils Technical Committee of the ADF and to the Tillage and Special Soils Problems subcommittees of SACSA. It has responded to initiatives such as the PFRA draft for a Conservation Reserve and the SWP's Soil Conservation-Policy Options and Implications. As well, it has sent representation to meetings such as Dr. Art Olson’s forum on Agricultural Research and Technology Transfer. Most of the directors of SSCA are involved on other levels in soil conservation organizations such as with the SOS program, the many PFRA conservation groups or with the University’s Innovative Acres project.

It is the future intention of SSCA to provide:

1) an information forum—member to member, member to scientist, scientist to scientist—that hopefully will cover the province by the trickle-down effect.

2) a responsible body of conservation advice to policy makers who lack the practical knowledge of the farmer.

3) a body of farmers who not only are interested in research, but who also are willing to commit resources to further research and to cooperate with scientists.

4) a liaison between the various conservation efforts. People who talk to each other learn from each other, and that is needed if scarce resources are to be preserved.

5) further enthusiasm for the long-term conservation effort.

To ensure our long-term prosperity, we must continue to give soil conservation a high priority rating.

Your involvement, input, and active participation will be of benefit to present and future generations.

Nomination are sought for board of directors of SSCA

The Saskatchewan Soil Conservation Association has become a viable and important organization for the promotion of soil conservation. For the past year an interim board of directors has taken responsibility for getting SSCA through the initial organizing phase. Now it’s time to elect the new board of directors. The following points regarding specific positions should be considered carefully.

**Director:**

1. The constitution states that each director shall be elected for a two-year term. This first election will see three directors elected for one-year terms and three for two-year terms. Next year, directors will be elected for two-year terms in the regions which elected directors for one-year terms this year. This will provide...
continuity in subsequent years as there will always be three returning directors.

2. For this election the regions North East, West Central and South East will elect directors for one year. The North West, South West and East Central regions will elect directors for two years.

3. Any full member is eligible to become a director.

4. Nomination papers for a director must be signed by three full members resident in the region.

5. All nomination papers must be forwarded to the SSCA office by September 30, 1988.

6. Ballots will be forwarded to all regional full members by October 31, 1988.

7. All voting will be complete by December 31, 1988.

8. Only full members in each region are eligible to vote for the director of their region.

**President:**

1. The constitution states that the president-elect will automatically become president. However, because there is no president-elect as yet, an election must be held for president.

2. Brett Meinert has been president for the past year and has done a great job. He is not eligible for re-election as president.

3. Five full members must sign the nomination paper for the position of president. (These members don’t have to be located within one region.)

4. The September 30, October 31 and December 31 dates apply in this case as well.

5. Full members from all regions will vote to determine the SSCA president.

**President-elect:**

1. The president-elect will assume the office of president at the annual meeting in 1990.

2. Nomination papers for the president-elect must be signed by five full members (not necessarily from one region).

3. The September 30, October 31 and December 31 dates apply.

4. All full members will have the opportunity to vote for the candidate for the office of president-elect.

**NOTE:** All present board members are eligible for election to the new board of directors, as are any other full members. Start now to make sure your region elects a strong director.

Send all signed nomination papers to:
SSCA Office, Room 110, Kirk Hall
University of Saskatchewan
Saskatoon, S7N 0W0

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**Indian Head Experimental Farm - Past, Present and Future**

**Experimental Farm continues its vital role in agriculture**

by Dr. Guy P. Lafond

The Indian Head Experimental Farm played a crucial role in its early beginnings by providing technical assistance in both plant and animal husbandry to the new settlers. There was an abundance of rich fertile soil and some very eager and ambitious settlers ready to confront this new land.

The plowing of this new prairie soil resulted in the release of large amounts of nutrients capable of producing exceptional yields. It was quickly realized, however, that continuous cropping was not capable of sustaining economic yields. Consequently, the practice of summerfallow was adopted in order to correct the shortfalls of continuous cropping as it pertained to limited moisture, weed problems and a reduction in available nutrients. This provided a realistic solution to the settlers, ensuring their survival and some prosperity.

It soon became evident that this practice of summerfallow also had some serious shortcomings; the major one being that it left the soil vulnerable to wind and water erosion. The combination of limited moisture and high winds resulted in devastating scenes of wind erosion. It was realized that this removal of soil through wind erosion resulted in a net reduction in the productivity of the soil. The effects were not as dramatic on soils with thick topsoils, but on soils with thin layers of topsoil the reduction in productivity was more noticeable. Unfortunately, the options open to the settlers to correct this...
problem were virtually non-existent.

The P.F.R.A. Act, enacted in the ’30s, set out to research practices that could correct some of the shortcomings experienced with summerfallow. Researchers like Ted McCurdy were hired to study these problems. After many years of research, corrective measures such as strip cropping and trash management were suggested. Interestingly enough, trash management represented the most feasible option for arresting wind erosion. Through experimentation and hard work it was concluded that if between 30 and 50 per cent of the trash could be maintained on the soil surface until after the seeding of the fallow fields, soil erosion could be reduced to negligible levels. Today, proper trash management is still the key to minimizing the devastating effects of wind erosion.

As years went by, the combination of basic and applied agronomic research, coupled with the technological developments of herbicides and inorganic chemical fertilizers, led to a renewed interest in continuous cropping. Not only could this enhance the productive potential of the land, it also provided a corrective measure to wind and water erosion. By continuous cropping, soil was vulnerable to wind and water erosion for much shorter periods of time than before. In theory, it sounded very good; in practice, shifting from a fallow cropping system to a continuous cropping system represented a huge leap of faith. Shortcomings were also identified with this system; the major one being weed control. The registration of 2,4-D did not protect the farmer against wild oat and other grassy weed infestations.

The Indian Head Experimental Farm showed much foresight by initiating a study in 1947 to examine the long-term effects of 2,4-D on soil and on crop production. Forty years after its inception, the study is still undergoing scientific investigation and is the only one of its kind in North America and possibly the world. Interestingly enough, 40 years of continual 2,4-D use has not resulted in a reduction of crop yields or an accumulation in the soil. The microflora in the soil is capable of breaking down the chemical.

The investigation of continuous cropping led to the question of how crop rotations would affect productivity. In 1957, Ted McCurdy and Ed Spratt, two researchers at the Indian Head Experimental Farm, initiated a study which involved 14 different rotations. Some rotations included continuous cropping, with and without fertilizers; two- and three-year wheat fallow rotations; rotations with green manure crops; forage crops; and some mixed continuous cropping rotations with wheat, barley and flax.

After 30 years of existence, the economics and long-term productivity of these rotations have been studied and published. Currently, we are busy investigating how these rotations affect various physical and chemical parameters of the soil. The most interesting finding at present is that organic carbon (C) and organic nitrogen (N) were highest in the continuous wheat treatments and the treatments with forages included. Organic C and N decreased as the frequency of fallow increased. The levels of organic C and N are good indicators of the fertility of the soil and also the nutrient supplying power of the soil.

It was also found that the properly fertilized continuous cropping rotations responded much better to added inorganic nutrients than rotations that were not fertilized properly and/or included fallowing in them. This is a good indication that proper crop management combined with proper fertilizer management can ensure long term fertility of the soil.

Present:

In 1988, we are still faced with the problem of soil degradation and soil erosion. We have a much better understanding of the processes involved with soil degradation and also a better understanding of the impact of soil erosion. We know what practices encourage these problems and what can alleviate them. However, what we don't know is how to integrate all of this information into a comprehensive production package. This is essential if we want farmers to make changes in their production practices. Farmers should be given all the pros and cons of these new crop production systems and a list of possible remedies should problems arise.

The ability to predict possible problems requires that a systems approach to...
research be adopted. This is the approach that is currently being employed at the Indian Head Experimental Farm. A new 12-year study was initiated in 1986-87.

The main objective of this study is to examine in as much detail as possible, the interaction of tillage systems (zero, minimum and conventional tillage) with various crop rotations. Three four-year rotations will be used. The first rotation includes fallow, spring wheat, spring wheat, winter wheat. The second rotation includes spring wheat, spring wheat, flax, winter wheat; and the third, spring wheat, flax, winter wheat and field peas.

Detailed studies will be made on soil fertility, leaf and root diseases, soil-plant water relationships, plant development, weed control and changes in weed populations. These measurements should permit us to identify potential problems arising from shifts in tillage systems. As problems are encountered, new research projects will be initiated to address these problems.

Other facets of agriculture are also making significant contributions to crop production. Plant breeding is still a vital component and current varieties seem better suited because of their shorter stature (for reducing lodging) and their improved disease resistance. It is well recognized that our modern varieties have higher water use efficiency than the older varieties. This means that more grain can be produced on a given unit of water, providing the nutrient requirements are satisfied.

Dramatic changes and innovations in machinery designs have made the adoption of new tillage practices more feasible. Airseeders can now till, seed and fertilize all in one pass, minimizing unnecessary tillage operations. This new technology conserves soil moisture and theoretically should lead to improved plant establishment and yields. There is a pressing need to look at concepts such as seeding rates and row spacings in a variety of crops. The Experimental Farm is in the process of developing a plot seeder for this purpose and new projects will be initiated in 1989 to study these concepts.

There is always interest in alternate crops and part of the mandate of the special crops agronomist, Doug Derksen, is to develop integrated weed control strategies for these new crops. These strategies include crop rotations, tillage and/or herbicide treatments. Other important work being carried out by his section is recropping. This involves the investigation of herbicide use on subsequent crops under various tillage systems. With changes in tillage systems, use of certain herbicides to control weeds will increase and consequently there is an urgent need for this information.

Changes in tillage systems can also mean changes in the spectrum of weeds, especially perennial weeds such as quack grass. A study was initiated by Doug Derksen in 1986 to address this problem. A systems approach is also being used in this investigation. This involves determining how tillage systems, crop rotations and herbicides affect quack grass growth and development. Hopefully strategies can be formulated for more effective control of this weed.

The Indian Head Experimental Farm is also responsible for maintaining, increasing and distributing breeder stock of old and newly released varieties produced by Agriculture Canada plant breeders. Depending on the crop and varieties, the increase is either done at Indian Head or contracted to individual seed growers in Western Canada.

**Future:**

It seems to be getting more difficult every year to predict overall trends in agriculture and agricultural research. However, the Indian Head Experimental Farm is committed to the development of crop production systems that directly address the problems of soil degradation and soil erosion. This commitment will more than likely span the next decade. It is quite likely that as our knowledge of these systems expand, shifts in research emphasis may occur. But regardless of these shifts, our goal will still involve the improvement of these novel crop production systems. We are optimistic that the Indian Head Experimental Farm can regain its status as a leader in Agricultural Research.

We encourage the local producers and producers in southeastern Saskatchewan to attend our field days so that they can get a better appreciation and understanding of agricultural research.
Soil conservationists take message to local schools

During National Soil Conservation Week, April 11 to 17, Vasile Klaassen, PFRA's Area Soil Conservationist in Weyburn, spent one day at the Torquay school informing the students about soil conservation issues. She used a variety of demonstrations, activities and films to get the soil conservation message across to all different grade levels.

Response from the students and staff was enthusiastic and Mrs. Klaassen was asked by one of the teachers to take the children out for a field trip in June. This one-day event was a pilot project for Mrs. Klaassen and she now hopes to make school visits a regular part of her busy work schedule.

Dave Bueckert, a director from the West Central region of SSCA, also visited several schools in his region. Dave indicated that the enthusiasm was high and both teachers and students were interested in receiving more information relating to soil conservation.

Symposium to focus on land and water management

A Prairie and Northern Region Symposium will be held November 8 and 9, 1988, at the University of Regina.

The keynote address will be made by Dr. Harry M. Hill, PFRA, who will speak on Integration of Land and Water Use.

The purpose of the symposium is to focus on the interactions pertaining to land and water management which affect the biologically rich, but sensitive, transitions between dryland and open water. These zones offer important challenges in wise use. Careful management can change their status from marginal to prime use. This symposium will offer a better understanding of the bio-physical nature of these transitions and the consequences of various management options.

The symposium is sponsored by the Water Studies Institute and the Canadian Plains Research Center.

For more information contact Mr. G. Sephton, symposium chairman, at (306) 780-5104, Regina.

Coming Events

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Event and Location</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 14</td>
<td>Kindersley Soil Conservation and Pulse Crops Tour</td>
<td>Barry Rapp 463-2696</td>
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<tr>
<td>July 14</td>
<td>Estevan Soil Conservation Tour</td>
<td>634-5637</td>
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<tr>
<td>July 15</td>
<td>Saskatchewan Irrigation Development Centre Open House, Outlook</td>
<td>867-9951</td>
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<td>July 19</td>
<td>Davidson Soil Conservation Tour</td>
<td>567-2806</td>
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<td>July 20</td>
<td>Wheatland Conservation Area Tour</td>
<td>Dean Smith 773-9029</td>
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<td>July 20</td>
<td>Scott Research Station Field Day</td>
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<td>July 22</td>
<td>Alfalfa Seed and Leafcutter Bee Tour</td>
<td>787-7712</td>
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<tr>
<td>July 22</td>
<td>Saskatchewan Forage Council Annual Meeting, Moose Jaw</td>
<td>787-7712</td>
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<tr>
<td>July 23</td>
<td>Moose Jaw Area Forage Tour</td>
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Residue conservation important for areas with light crops

In a year with light crops in most areas of the province, farmers must maintain as much trash on their fields as possible. The following table provides information relating to residue conservation with various tillage implements.

### Residue Conservation with Various Tillage Implements

<table>
<thead>
<tr>
<th>Tillage Implements</th>
<th>Residue Reduction By Each Operation (%)</th>
<th>Residue Conserved After 4 Operations (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide blade cultivator (90 cm or 35 in. sweeps)</td>
<td>10</td>
<td>50 - 60</td>
</tr>
<tr>
<td>Rod Weeder</td>
<td>5 - 10</td>
<td>no data</td>
</tr>
<tr>
<td>Heavy duty cultivator (40-45 cm or 16-18 in. sweeps)</td>
<td>20</td>
<td>30 - 40</td>
</tr>
<tr>
<td>Heavy duty cultivator with rodweeder</td>
<td>20</td>
<td>30 - 40</td>
</tr>
<tr>
<td>Heavy duty cultivator with harrows</td>
<td>40</td>
<td>15 - 20</td>
</tr>
<tr>
<td>Field cultivator (25-30 cm or 9-12 in. sweeps)</td>
<td>20</td>
<td>30 - 40</td>
</tr>
<tr>
<td>Field cultivator with harrows</td>
<td>40</td>
<td>15 - 20</td>
</tr>
<tr>
<td>Discer</td>
<td>35 - 65</td>
<td>10 - 15</td>
</tr>
<tr>
<td>Tandem disc-offset disc</td>
<td>30 - 70</td>
<td>5 - 15</td>
</tr>
<tr>
<td>Moldboard plow</td>
<td>90</td>
<td>no data</td>
</tr>
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</table>

Source: Scott, Swift Current and Lethbridge Research Stations.