AGRONOMY NEWS

Grasslands For Tomorrow

Volume 2, Issue 2 **Spring 2002**

CCSP "A Reality"

The four counties in the DU Winter Cereals Project area have embarked on the creation of a **no-till crop rotation demonstration farm**. The farm will be located one mile south of Forman, ND at the junction of Highways 32 and 11.

The **"CCSP"** or **Conservation Cropping Systems Project** is located on a quarter of land leased from Arlen and Sandy Hanson of Forman, ND. The Wild Rice SCD, in Sargent County, is the sponsoring entity and will be responsible for the financial management of the demonstration farm.

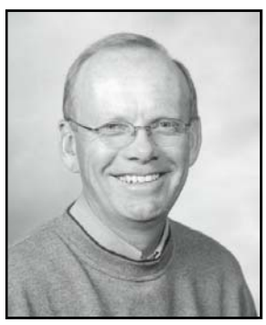
The Wild Rice SCD, in cooperation with the conservation districts in Day and Marshall Counties in South Dakota and Ransom County in North Dakota have created a board of directors to set the direction of the CCSP. Two farmers from each of the four counties and two members of the Wild Rice SCD make up the ten-member Board of Directors. The directors are:

Day County:	Kevin Anderson
	Ron Simonsin
Marshall County:	Joel Erickson
	John Rabenberg
Ransom County:	Pat Freeberg
	Doug Rotenberger
Sargent County:	Gerald Bosse
	Mark Wyum
Wild Rice SCD:	Joe Breker
	Kent Carpenter

The CCSP mission is "To evaluate profitable crop rotations and crop management strategies that are uniquely adapted to the climate in the project area. These strategies will strive to protect the natural resources of southeast North Dakota and northeast South Dakota through demonstration, research and education."

The objectives are to implement a Conservation Cropping System Farm to demonstrate and evaluate the profitability of various crop rotations in a no-till seeding system and to create an educational forum for the exchange of ideas, information, and issues regarding best management practices for no-till seeding systems, crop rotations, and non-point source pollution.

The Board of Directors has selected 10 to 12 rotations they hope to include in the demonstration area. They are also planning a demonstration of shank verses disk openers and a cover crop comparison with one of the four-year rotations.



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No-till cropping systems and rotations have historically been evaluated in both central SD and central ND. Average rainfall at these sites is substantially less than the four county project area. The extra rainfall in this geographic area and additional water conserved in a no-till cropping system has caused production problems for farmers trying to adopt a no-till seeding system. This has substantially slowed the adoption of no-till. It is believed that modifications to the crop rotations and associated management practices will allow farmers to be successful.

The Board of Directors continues to seek partners to assist in the funding and equipment needs of the CCSP. Please call a board member or the Wild Rice SCD (701-724-3247, ext.3) if you would like to participate in the project.

CCSP advisors include: Dr. Dwayne Beck, Dr. Marty Draper and Gary Erickson of SDSU; Jason Miller, SD NRCS; Dr. Blaine Schatz, Dr. David Franzen and Greg Endres from NDSU; Alan Ness and Ted Alme of ND NRCS; the Extension Agents and NRCS District Conservationists in the DU Winter Cereals Project area and Roger Knapp and Blake Vander Vorst, DU Agronomists.

Winter Cereal Sponsors

Ducks Unlimited

North Dakota Natural Resources Trust

South Dakota Game, Fish and Parks

Syngenta Crop Protection

Natural Resources Conservation Service (NRCS)

Day, Marshall, James River, Ransom and Wild Rice Conservation Districts

North Dakota Dept. of Health - 319 Program

NDSU and SDSU Cooperative

Winter Wheat Survival In Adverse Conditions

Editor's Note: This information was assembled by DU Canada for the fall of 2001 winter wheat plantings in western Canada.

Winter wheat is seeded in early September into a shallow seedbed; ideally the plant accesses enough water to germinate quickly and grows for 4 to 5 weeks. The next 4 to 8 weeks (October and November) allow the plant to vernalize (giving the plant the signal to flower next spring) and acclimate to the cold (harden off for the winter). This plant would be 3 to 4 leaf, have a tiller or two with developed crown tissue and would be ready to achieve winter wheat's maximum yield potential next spring.

The fall of 2001 in many areas was far from this ideal picture of winter wheat establishment. The results of fall's seeding efforts are variable but disappointing in many cases. Most producers have crop that emerged and grew to 1 to 3-leaf in wet areas around sloughs or in low spots. However, in a high percentage of each field, seeds are any where from lying in dry dirt not germinated, to sprouted and not quite through the ground. Even though conditions are not ideal, the crop should not be given up on yet. The following are some tips to keep in mind about how your crop will react given its stage at the end of this fall.

With many different stages of crop in the field, growers are wondering what this will mean for next spring. The table below gives an indication of what to expect from different stages of crop. The information was provided by Dr. Brian Fowler, University of Saskatoon.

Stage	Date of Germination	Yield Factor 1=Low 10=High	Competition Factor 1=Low 5=High	Winter Survival FSI (514=best)	Rust Risk Non R Vars. (% Risk)	Maturity (Days Later)
Not Germinated (Just imbibed)	15-Oct	6 to 10	1	499	5%	0-10
Sprouted (Not yet through ground)	1-Oct	8 to 10	2	476	4%	0-8
1-2 Leaf	15-Sept	9 to 10	4	510	2%	0-4
3 Leaf + Tiller	5-Sept	10	5	514	1%	0

The ideal plant with 3 leaves and a tiller will have all of the winter wheat's yield potential intact, be highly competitive with weeds next spring and have the best chance of winter survival due to the crown tissue accumulated in the fall. The maturity will be optimal and as a result the rust risk should be low. This has full potential to be a successful winter wheat crop.

The 1 to 2-leaf plant will have much of its yield potential and will lose only a small amount of its winter hardiness, as long as a snow catch is adequate. Competition with early spring annuals will be slightly less so more attention should be paid to early germinating weeds. The maturity will be slightly longer and the crop will be susceptible to rust for a longer period as a result (assuming the crop has no varietal resistance).

The seeds that have sprouted and not yet emerged have lost slightly more yield potential and will be much less competitive with early weeds. Wild oats and broadleaves will have to be eliminated early to avoid further yield losses. Maturity will be extended further and rust will be given a larger window as a result. The biggest problem with this stage is it will have the lowest winter hardiness. The plant has exhausted most of the seed reserves and has not accumulated any new reserves from photosynthesis. This plant will need an adequate snow catch to help it survive prolonged cold in January and February.

The seeds that have not sprouted will have lost the most yield potential and will be the most susceptible to early weed competition. Their winter hardiness is better than sprouted seeds due to energy reserves still in the seed. This plant's maturity will be very long, probably only a week earlier to the same maturity as spring cereals. Again, rust will be more of a concern due to the extended window due to longer maturity.

For all stages of winter wheat, winter survival is important but as long as adequate amounts of snow are trapped for January and February cold spells, the crop should be able to survive.
(Continued on page 3).

Winter Wheat Nutrient Needs

The following table from the Western Triangle Ag Research Center, Conrad, Montana, shows the nitrogen requirement for winter wheat at various levels of protein. Applying nitrogen this spring will likely be necessary if you did not apply your nitrogen at seeding or last fall.

N Rate*	Yield	Protein	N/bu.
lbs N/Acre	bu/acre	%	lbs N/bu
30	28.8	8.74	1.0
50	33.9	9.83	1.5
70	38.4	10.80	1.8
90	42.4	11.66	2.1
110	45.9	12.41	2.4
130	48.8	13.05	2.7
150	51.1	13.58	2.9
170	52.9	13.99	3.2
190	54.2	14.29	3.5
210	54.9	14.48	3.8

*Fertilizer N + soil nitrate N in 3 feet of soil.

Several time of application options still remain for the nitrogen that needs to be applied. Many growers surface apply a majority of their nitrogen as early as possible in the spring to have better assurance of rainfall to incorporate the nitrogen and reduce loss.

Another option, when there is adequate soil nitrogen (approximately 40 lbs.) to reach the early joint stage of the winter wheat, is to apply a portion of the nitrogen at the late tiller to early joint stage. This may also cause a reduction in lodging as some growers noted last year. However, since the nitrogen is applied later, there is less probability of rainfall to incorporate the nitrogen.

Nitrogen needs to be applied early to stimulate tillering if winter wheat plant tiller counts are near zero coming out of winter dormancy and soil nitrogen levels are low.

Another nitrogen application window is for protein enhancement from flag leaf to post-anthesis or post-flowering stages.

Sulfur is another nutrient that has been showing deficiencies on a more common basis. Ammonium sulfate can be blended and spread with nitrogen products if soil tests identify a need. Nitrogen and sulfur are both quite soluble and readily move into the soil profile with rainfall.

To determine the amount of nitrogen to apply to this year's winter wheat fields, it may be a wise investment of your time to check the winter wheat protein premiums. Generally, protein price premiums above 12% are minimal for winter wheat, but discounts for protein levels below 12% can be hard to swallow.

Nitrogen can be applied using different sources and application methods in the spring. The volatility from greatest to least is urea (46-0-0), urea ammonium nitrate (28-0-0), and ammonium nitrate (34-0-0). The dry products are generally broadcast spread but can be surface banded. Liquid can be broadcast sprayed or be applied using stream bars which is another form of surface banding.

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Winter Wheat Survival In Adverse Conditions **(continued from page 2)**

Three important things to keep in mind for your winter wheat crop next spring:

1. Do not be too quick to give up on a winter wheat stand. The crop may look ragged but it will usually produce more than a re-planted crop. Twenty plants per foot squared is ideal, however, half of those numbers will produce an adequate crop. Crops with large bare spots may be in need of re-planting. Delaying the decision until mid May, the crop will have time to recover and you will still have time to re-plant if necessary.

2. Next spring, weeds should be taken care of early (broadleaf weed control will most likely be necessary; monitor for wild oats and be prepared to spray if necessary) to preserve the yield potential of the crop. Crops that are less competitive can turn out very well but may need help from herbicides.

3. Fertilizer should be applied as planned as soon as possible in the spring. This should be done by the first week in May. Early fertilizer gives winter wheat plants the nutrition they need to produce a healthy stand. If the worst-case scenario occurs and the crop is winter killed, you will still probably need the fertilizer for the crop you re-plant.

The crops in the field that don't have perfect emergence and ideal staging are at a disadvantage, but with proper, timely management and moist, cool spring weather an excellent winter wheat crop is still a good possibility.

Crop Status In The Dakotas

The winter wheat crop established well and was acclimated with cool nights in the DU project area . The crown development was optimal with most winter wheat reaching the 2.5-leaf to 3-tiller growth stage prior to dormancy. Soil temperatures at the crown (three-fourths to 1 inch soil depth) have not been at the critical level (5 to -5 degrees F) this winter where there is adequate residue. The lowest soil temperature at the 4-inch depth in bare soil at Britton, SD has been 12 degrees F and 14 degrees F at Carrington and Minot, ND . The crown depth soil temperature at Mandan, ND ranged from 7 to 12 degrees F on March 1 to 3 but were between 23 and 26 degrees F by March 15. The most critical time remaining for the 2002 winter wheat crop appears to be after it breaks dormancy this spring when it will be most vulnerable to ice and cold temperatures. Fields observed prior to March 1 were in good condition.

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Determining Winter Survival

The following method can be used to determine if dormant winter wheat plants are alive and likely to resume active growth in the spring.

1. Remove the top 3 inches of soil containing the plant crown (typically located 1 to 2 inches below the soil surface).
2. Thaw out the samples and warm to room temperature.
3. Wash the roots with cool water to remove the attached soil.
4. Trim the top growth to within 1 inch of the crown and the roots below the crown.
5. Rinse the crowns in cool water.
6. Place 10 wet crowns in a plastic bag, inflate and seal the bag.
7. Place the bag in a lighted room, but not in direct sunlight.
8. Observe the crowns in 2 days, rinse with cool water and re-inflate the bag.
9. After 4 days, the crown should show about 2 inches of new growth.
10. Plants that are not growing after 6 days should be considered dead.
11. Some plants may grow poorly and develop molds that live on dead or injured plants.

Remember, winterkill can be a very localized event, so select sample areas carefully and don't try to extrapolate results too widely.

(Information taken from a NebGuide publication from the University of Nebraska.)

Correction

In the Winter 2002, Volume 2, Issue1, an error was made in the Conclusions section of the article "Results of Winter Wheat/Fungicide Trials-Lisbon, ND, 2001."

On line 3 in the Variety Responses paragraph in the Conclusions section it should read "Arapahoe, Crimson and Harding had the most tolerance to fungal leaf spots." CDC Falcon was inadvertently put in place of Harding in the newsletter.

CCSP Hires Farm Manager

Joe Breker, CCSP Chair, and Larry Lindberg, NPS 319 Watershed Coordinator, announced the hiring of Walt Albus, Oakes, ND, to be the Conservation Cropping Systems Project Farm Manager.

Walt has a strong background in research and no-till farming practices and will be a tremendous asset to the CCSP. Walt has been the manager of the Oakes Irrigation site and managed a remote sensing research project dealing with irrigation and ground water quality. Walt has also farmed during this time as well as worked as an agronomy manager for a local agronomy service center.

Larry and Walt will be responsible for the management of the CCSP.

On the left is Walt Albus and on the right is Larry Lindberg.