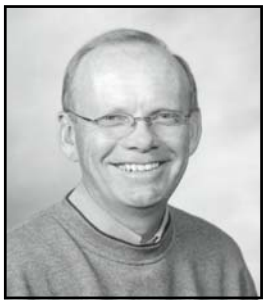
AGRONOMY NEWS

Grasslands For Tomorrow

Volume 5, Issue 1 **March 2005**



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CSP

Ducks Unlimited commends the North Dakota and South Dakota Natural Resources Conservation Service (NRCS) offices for including winter cereals as a wildlife enhancement practice for the Conservation Security Program (CSP) watersheds. This practice will benefit waterfowl and other ground nesting birds such as pheasants because spring tillage and seeding operations do not occur with winter cereals.

The NRCS CSP Winter Cereal Enhancement Job Sheets for both states can be found at the following web sites:
www.nd.nrcs.usda.gov/programs/CSP/csp_2005.asp

www.sd.nrcs.usda.gov/programs/2005watershed.html

The winter cereal payment rate is $10 per acre in both states. NRCS in North Dakota has determined that producers must commit a minimum of 15 percent of their cropland acres to a winter cereal (such as winter wheat or rye) to be eligible for the winter cereal enhancement payment.

The winter cereals must be planted into standing crop residues and cannot be grazed the year planted. They must be harvested for grain or forage the following year and if harvested for forage, harvesting cannot occur before July 15. (See ND CSP watershed map on page 6.)

Producers who are not currently within a CSP watershed may want to start to become familiar with the CSP program, knowledge of the program could put you in a higher payment tier with the adoption of the proper practices.

Winter Cereal Sponsors

Ducks Unlimited

North Dakota Natural Resources Trust

South Dakota Game, Fish and Parks

North Dakota Game & Fish Department

Natural Resources Conservation Service

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

North Dakota Dept. of Health 319 Program

NDSU and SDSU Cooperative Extension Service

2004 Dickey County Winter Wheat Management Study
By: Blake Vander Vorst
Cooperators
Larry Anderson and Marty Visto

Seven cultivars of winter wheat were planted 10 miles east of Ellendale, ND on the Larry and Jane Anderson farm on September 15, 2003 with the assistance of Eugene Elhard. All varieties were seeded at 900,000 PLS/A at a depth of 1.5 inches and the seed treated with Raxil MD. Starter fertilizer (10-34-0) was applied at 15 GPA in a deep band between the seed spread 5 to 6 inches with Anderson triple shoot openers. The cultivar Falcon received 60 GPA of starter fertilizer in reps 2, 3 and 4 unintentionally. The extra 45 GPA equals an additional 50 lbs/A of nitrogen in the 3 replications. The winter wheat was seeded in barley stubble with a 7.5 foot Horsch Anderson air plot drill with a 15-inch shank spacing.

UAN nitrogen (45 GPA or 135 lbs/A actual) was applied using stream bars provided by Concord Environmental for an 80-bushel yield goal using 2.25 lbs of nitrogen per bushel. Larry Anderson applied Roundup Ultra Max at 22 oz/A on August 21, 2003 as a preplant burn down. Roundup Original Max plus Alliance (22 oz + 16 oz/A) was applied on July 21, 2004 as a preharvest burn down. Marty Visto applied the nitrogen and fungicide treatments. Dr. Marcia McMullen, NDSU, took the field disease notes.

Soil Test Information:
Nitrogen:
0 – 6": 15 lbs / Phosphorus 9 ppm / pH 6.3
6 – 24": 9 lbs / Copper 0.44 ppm / Chloride 92 lbs

Nitrogen Treatments:
N @ Seeding = 45 GPA UAN + starter deep banded with the seeding operation
Early = 45 GPA UAN on April 3, 2004
Late = 45 GPA UAN on May 2, 2004
Split = 20 GPA + 25 GPA UAN on April 3 and May 2, 2004, respectively
Rainfall after application: April 20 = 0.25; May 5 = 0.25; May 11 = 1.05; May 12 = 1.00

Fungicide Treatment:
Stratego (5 oz/A) was applied with Starane herbicide on May 19, 2004.
Folicur (4 oz./A) + BB5 NIS was applied on June 11, 2004 to winter wheat at Feekes 10.51 growth stage

Treatment	Septoria leaf spot	Leaf Rust	FHB
Millennium	30	0.07	0.16
Harding	15	0	0.16
Jerry	18.3	2.7	0
Wesley	28.3	4	0.4
Falcon	50	0	0
Jagalene	28.3	2	0.3
Expedition	66.7	6	0.3
LSD 0.05	**6.5**	**1.8**	**0.1**

Table 1. Response of cultivar treatments in Split N plots to % severity on the flag leaf for Septoria, leaf rust and the fusarium head blight index.

Table 1 indicates Expedition and Falcon had the most Septoria and Expedition and Wesley had the most leaf rust.

Treatment	Septoria leaf spot	Leaf Rust	scab
Fungicide	2.5	0	0.14
No Fungicide	34.4	2.9	1.92
LSD 0.05	**10.6**	**1.7**	**0.1**

Table 2. Effect of fungicide treatment on diseases on Split N plots across all cultivars.

Table 2 indicates the effectiveness of Stratego and Folicur split fungicide applications in suppressing leaf diseases and scab.

Treatment	Septoria leaf spot
Check	56.5
Split N	34.4
LSD 0.05	**6.6**

Table 3. Septoria leaf spot response to Split N application verses the check (no N) in plots untreated with fungicide.

Table 3 data reveals a 22.1% reduction in Septoria leaf spot severity on the flag leaf in Split N plots verses the Check (no N) in plots untreated with fungicide. Nitrogen affects the health of a plant and its ability to withstand disease.

Pounds of Actual N	Yield Bu/A	% Protein
90	94.4	9.9
135	112.1	11.5

Table 4. Effect of nitrogen rate on yield and protein across all cultivars and fungicide treatments.

Yield was reduced by 17.7 bu/A as indicated in Table 4 for the 90-pound nitrogen rate compared to the 135 pounds. The 45 lbs of nitrogen/A divided by the 17.7 bu/A yield loss indicates 2.5-pounds of nitrogen per bushel was required to achieve the higher yield. This is in line with University guidelines for the pounds of nitrogen required to grow one bushel of wheat.

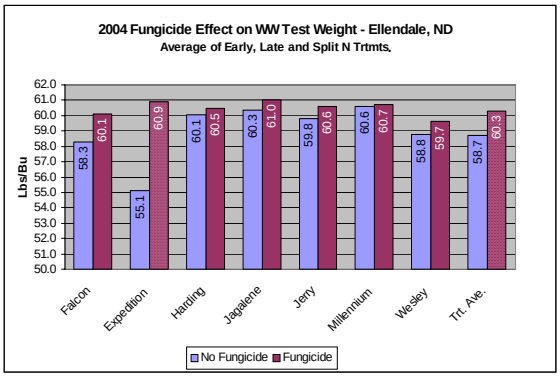

Figure 1. Individual cultivars test weight response to fungicide treatment across early, late and split nitrogen applications.

Cultivar test weight response to fungicide application is shown in Figure 1. There was a significant increase in test weight (1.6 lbs/bu) when averaged over all cultivars.

Figure 2 shows that fungicide treatment significantly increased yield of all winter wheat cultivars. There was a 10.3 bu/A yield increase for fungicide treatment when averaged over six cultivars.

The Wesley plots in Figure 2 received 135 pounds of nitrogen at planting and another 135

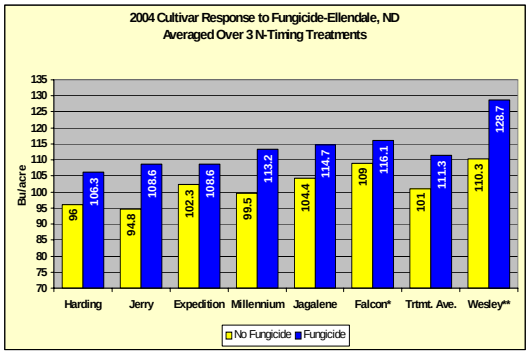

Figure 2. Individual cultivars yield response to fungicide treatment across early, late and split nitrogen applications.

pounds of nitrogen with the post-applied nitrogen timing treatments. These Wesley plots received two times the amount of applied nitrogen compared to the other six cultivars. The yield of the Wesley (110.3 bu/A) did not increase appreciably with the extra nitrogen when no fungicide was applied. However, a nitrogen-fungicide interaction occurred as yield increased to 128.7 bu/A when the nitrogen rate was doubled and fungicide was applied.

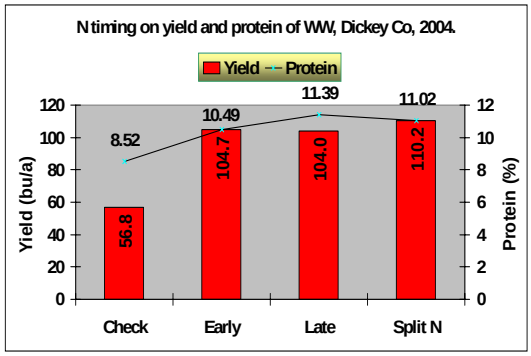

Figure 3. Effect of nitrogen time of application on yield and protein across six cultivars and fungicide treated and untreated plots.

Figure 3 compares yield and protein response for time of nitrogen application averaged over fungicide treated and untreated plots and the six cultivars. Protein increased significantly for each time of nitrogen application segment from 8.52% for the nitrogen check to 11.39% for the late or May 2 nitrogen application. The split nitrogen application (April 3 and May 2 @ 110.2 bu/A) yielded significantly more than the early (April 3 @ 104.7 bu/A) and the late (May 2 @ 104.0 bu/A) nitrogen applications when averaged over fungicide treated and untreated plots and varieties.

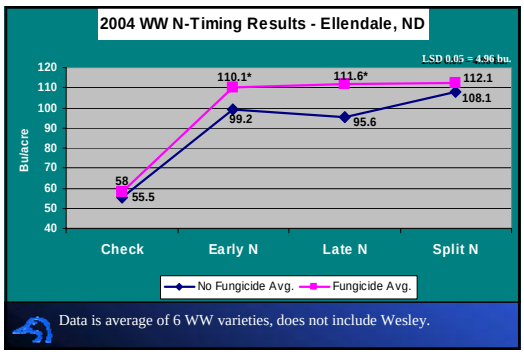

Figure 4. Effect of nitrogen time of application and fungicide treatment on yield across six cultivars.

Figure 4 compares time of nitrogen application yields for fungicide treated and untreated plots averaged over the six cultivars. Fungicide application did not significantly increase yield for the nitrogen check or the split nitrogen application. However, a significant yield response to fungicide application was exhibited by the early and late nitrogen applications as yields increased by 10.9 and 16.0 bu/A, respectively.

The split nitrogen application without fungicide (108.1 bu/A) yielded more than the early (99.2 bu/A) or late (95.6 bu/A) nitrogen applications. Whereas, the nitrogen time of application did not make a difference in yield when fungicide was applied (Early 110.1, Late 111.6, and Split 112.1 bu/A). This is one year of data and it will be interesting to see if there is any consistency in the nitrogen time of application treatment yields from year to year.

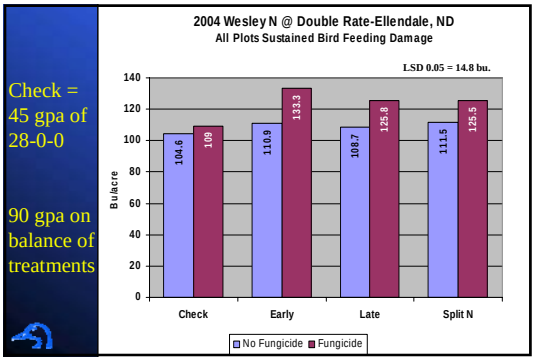

Figure 5. Effect of nitrogen time and amount of application and fungicide treatment on yield of the cultivar Wesley.

Figure 5 indicates yields for nitrogen time of application treatments to the cultivar Wesley for fungicide treated and untreated plots. Wesley plots received 135 pounds of nitrogen at planting and another 135 pounds of nitrogen with the post-applied nitrogen timing treatments of early, late and split N. The check received only 135 pounds of nitrogen at seeding. Yields were not significantly higher for the additional nitrogen in the untreated fungicide plots (104.6, 110.9, 108.7, and 111.5 bu/A). However, yields increased significantly with fungicide and additional nitrogen regardless of time of nitrogen application (133.3, 125.8 and 125.5 bu/A). A fungicide was necessary in addition to the extra nitrogen to increase winter wheat yields.

Protein data from Figure 3 and yield data from Figure 5 indicate the 80 bushel yield goal was to low for the 2004 growing season. Additional nitrogen was needed to maximize winter wheat yields and protein.

Nitrogen Management Summary

Most research reveals early spring nitrogen application results in the highest winter wheat yields. Research from Mohall, ND (McKay), Andover, SD (Draper, Vander Vorst) and Ellendale (Vander Vorst) in 2004 indicates split-applying nitrogen (at breaking dormancy and the 4 to 6 leaf) may produce results equal to or greater than all early spring applied nitrogen. The 2004 results are from one year of data.

A soil test is a good place to start in managing your winter wheat nitrogen program. Two factors, winter injury and timing of precipitation, can have a profound effect as to when nitrogen should be applied. Current research indicates that at least a portion of your spring nitrogen needs should be applied early unless you have completed nitrogen applications in the fall at seeding or after seeding. The winter wheat varieties straw strength is also a factor to consider when selecting the time to apply your nitrogen.

Your ability to visually evaluate what is happening to a winter wheat plant, a base knowledge of the fields nitrogen program and the impact of nitrogen at various stages of growth are all important considerations in spring nitrogen management.

CORRECTION:
Dr. Marcia McMullen was the author of the article "Ransom/Sargent County Winter Wheat Fungicide Trial—2004" that appeared in the last issue. Volume 4, Issue 5 of the Agronomy News.

Ransom/Sargent County Hard Red Spring Wheat Variety Trial, 2004

By: Dr. Joel Ransom and Scott Meyer

This variety trial was established on the Randy Mairs farm a few miles south of Lisbon, with the objective of evaluating currently available HRSW varieties for their adaptation and yield potential in Ransom and Richland Counties. Initially this experiment was designed to evaluate these varieties with and without fungicide. Due to problems with the fungicide application, however, only the data from the plots that did not receive fungicide are reported here. Plots were replicated 3 times and consisted of 7 rows with a 6 in spacing, 12 ft in length and were planted April 14th. A seeding rate of 1.2 million seeds was used for all varieties. Weeds were controlled with a single application of Puma, Bronate and Starane. Plots were fertilized with 170 N as urea a week after seeding.

Yields were high, averaging more than 75 bu/A (Table 1). Protein content was good across varieties, averaging 14.4%. Test weight, however, averaged less than 60 lbs/bu.

When using these data for selecting a variety for use in southeastern ND, you should also review the results from other sites across the state and the results of other years. Data from multiple sites and years can help in selecting varieties that are not only high yielding in a good year but perform consistently well over a wide range of environments. Variety trial results from other locations can be found at http://www.ag.ndsu.nodak.edu/aginfo/variety/index.htm. The financial support to conduct this trial from Ducks Unlimited is gratefully acknowledged.

Table 1. Test weight, protein content and yield of selected HRSW cultivars, Ransom County, 2004.

Variety	Test Weight (lbs/bu)	Protein (%)	Yield (bu/a)
Alsen	58.8	14.4	78.8
Briggs	59.2	14.8	83.2
Dapps	58.7	16.3	81.2
Freyr	58.0	15.1	82.4
Granite	55.8	15.2	74.4
Granger	59.7	14.2	76.6
Hanna	61.0	13.9	80.9
HJ98	55.5	14.4	72.7
Ingot	61.3	13.7	75.9
Knudson	59.2	13.6	80.5
Norpro	58.0	14.8	73.8
Oxen	57.2	13.8	78.2
Oklee	62.0	14.2	78.9
Parshall	59.8	14.4	76.0
Reeder	55.7	14.5	73.4
Steele, ND	57.3	14.7	80.4
Trooper	57.3	13.5	82.1
Argent	58.3	14.8	70.1
AC Vista	53.5	12.7	66.7
Average	***58.2***	***14.4***	***77.2***
LSD 0.05	5.0	2.0	16.1

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Ransom/Sargent County Pea Variety Trial, 2004

By: Dr. Joel Ransom and Scott Meyer

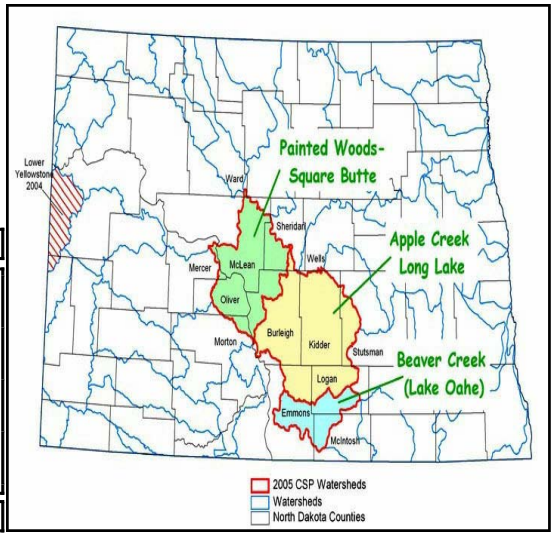
This pea variety trial consisted of 6 varieties. Plots were replicated 3 times in a randomized complete block design and consisted of 7 rows with a 6 in spacing, 12 feet in length. They were planted on April 14th and were inoculated with a commercial inoculant on April 19th. No fertilizer was applied.

The unusually cool spring and summer weather favored pea development this year. All varieties performed well, averaging more than 55 bu/A (Table 2). Varieties did not differ statistically for yield and test weight. Test weight was above 60 lbs/bu for all entries.

The financial support from Ducks Unlimited to conduct this trial is gratefully acknowledged.

Variety	Test Weight (lbs/bu)	Yield (bu/A)
Stirling	63.7	65.1
CDC Mozart	63.8	59.1
DS Admiral	63.3	55.0
Cruiser	62.7	55.5
Carneval	63.2	59.0
Majoret	62.3	59.3
Average	***63.1***	***58.8***

2004 and 2005 North Dakota Conservation Security Program Watersheds



Agronomy News
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