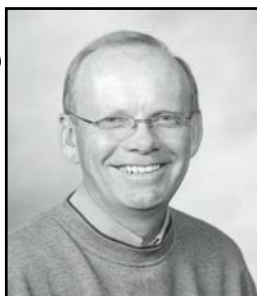


AGRONOMY NEWS

 *Grasslands For Tomorrow*

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2004-2005 Winter Wheat Nitrogen at Seeding Management Study

Blake Vander Vorst

Cooperators

Kevin Anderson and Larry Anderson

The winter wheat cultivar Wesley was planted east of Ellendale, ND (Dickey County) and Andover, SD (Day County) on the farms of Larry and Jane Anderson and Kevin and Donna Anderson, respectively, in mid-September of 2003 and 2004. CDC Falcon was also seeded at the Ellendale site in 2004. All cultivars were seeded at a depth of 1.5 inches and the seed treated with Raxil MD. The PLS seeding rates are in Table 1.

Table 1. Seeding rates in PLS/A.

Location	2004	2005
Ellendale, ND	900,000	1,200,000
Andover, SD	1,500,000	1,200,000

Table 2 lists the date of application for the early and late nitrogen treatments. The split had part of the nitrogen applied at the early

date of application and part at the late date of application.

Table 2. The dates of the early and late nitrogen applications.

Location	Early		Late	
	2004	2005	2004	2005
Ellendale	April 3	April 1	May 2	May 3
Andover	March 29	April 1	April 27	May 3

FSA Schedules CRP Signup

A Competitive CRP general signup is scheduled from March 27, 2006 through April 14, 2006.

Winter Cereal Sponsors

Ducks Unlimited

Bayer CropScience

Syngenta Crop Protection

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*

Table 3 provides the starter and nitrogen fertilizer information. The 2005 winter wheat trial sites also had 3 pints/A of TJ Wheat Micromix added to the 10-34-0 starter. The starter was applied in a deep band between the seed spread 5 to 6 inches with Anderson triple shoot openers. The winter wheat was seeded in barley stubble at the Ellendale site and spring wheat stubble at the Andover site with a 7.5 foot Horsch Anderson air plot drill with a 15-inch shank spacing.

Table 3. Fertilizer rates and nitrogen time of application.

10-34-0 GPA			28-0-0 GPA					
Treatment	2004	2005	04-Seed	04-Early	04-Late	05-Seed	05-Early	05-Late
N-Split	15	15		20	25		27	27
N-Late	15	15			45			54
N-Early	15	15		45			54	
N-Seeding	15	13.5	45			54		
N-Check	15	15						

Table 3 provides the amount and time of Urea Ammonium Nitrate (UAN or 28-0-0) (45 GPA = 135 lbs/A and 54 GPA = 160 lbs/A actual) application with the drill or post applied with stream bars provided by Amity Technology. Yield goals were set at 80 and 85 bu/A for 2004 and 2005, respectively, using 2.25 lbs of nitrogen per bushel. The Andersons applied Roundup as a burn down prior to planting each year. Marty Visto applied the post nitrogen and fungicide treatments at Ellendale and DU and SDSU applied the nitrogen and fungicide treatments at Andover. A pre-harvest burn down was used each year at the Ellendale site.

Soil Test Information:

Soil test information is available for each site. Nitrogen amounts in the top two feet have averaged approximately 25 pounds at both sites each year.

Fungicide Treatment:

Each year the Andover site had seven different fungicide treatments and a fungicide check. Headline, Tilt and Folicur have been used separately and in combination in these treatments. Each year one-half of the Ellendale plots received fungicide treatment and the other one-half were untreated. Stratego and Folicur treatments were applied in 2004 and Quilt and Folicur in 2005.

Figure 1. Wesley yield response to time of nitrogen application at Ellendale, 2004.

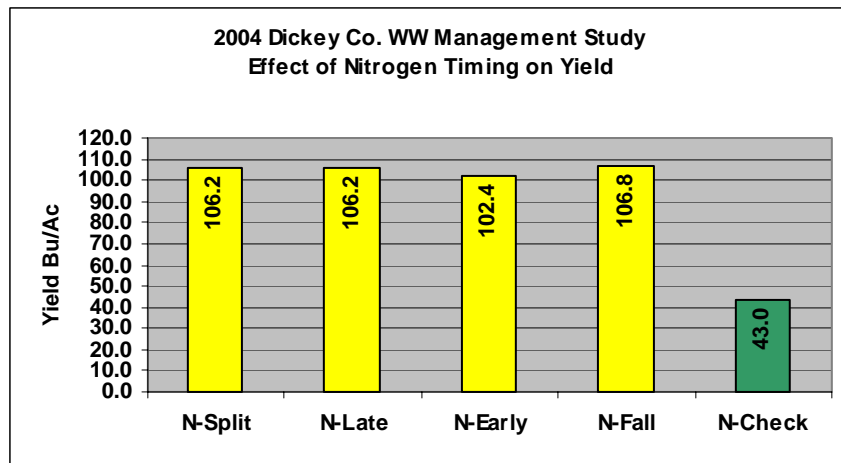


Figure 2. Wesley yield response to time of nitrogen application at Andover, 2004.

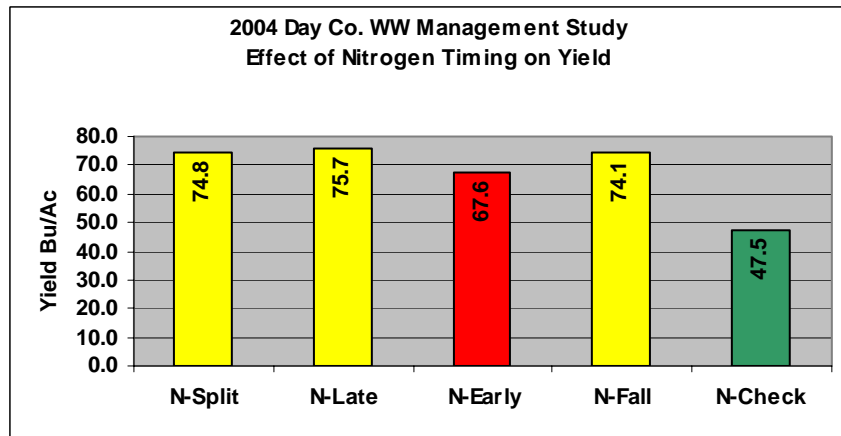


Figure 3. CDC Falcon and Wesley yield response to time of nitrogen application at Ellendale, 2005.

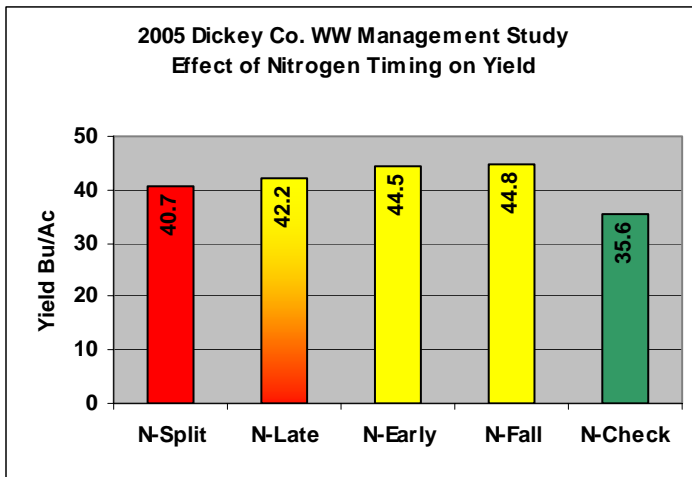


Figure 4. Wesley yield response to time of nitrogen application at Andover, 2005.

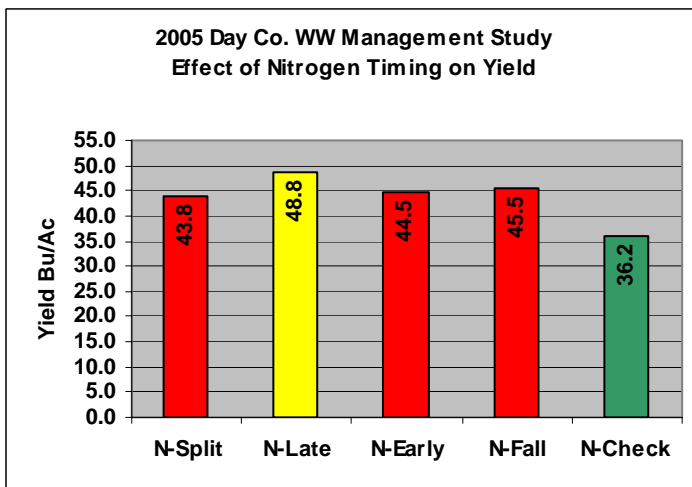
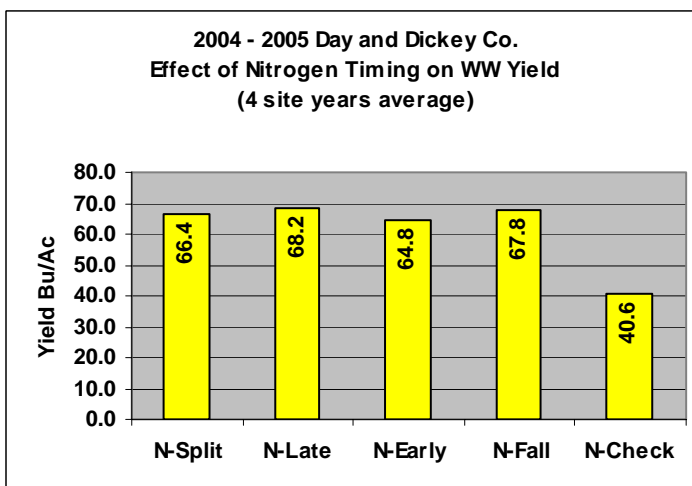


Figure 5. Effect of nitrogen time of application on winter wheat yield at Ellendale and Andover in 2004 and 2005.



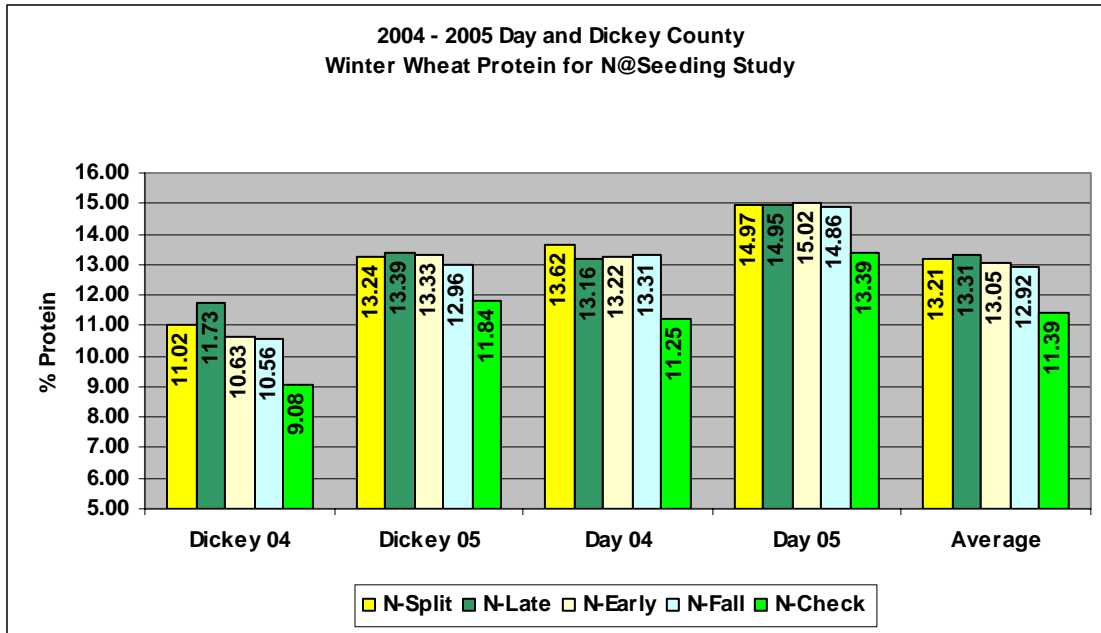
2004 and 2005 (Figures 1 to 4). There was no significant yield difference between the nitrogen treatments receiving nitrogen at Ellendale in 2004 (Figure 1). However, the early nitrogen treatment yield appears to be slightly depressed in comparison to the fall, late and split applied treatments at Ellendale. This also occurred at Andover, SD in 2004 (Figure 2) and may have been caused by the lack of significant precipitation following the early nitrogen treatment. The early treatment at Andover, SD was significantly lower in yield than the fall, early and late nitrogen treatments (Figure 2). The lower yield trend was similar for the early nitrogen treatment at both locations in 2004.

CDC Falcon and Wesley were planted in the 2005 Ellendale plot and the yields reflect an average of the two cultivars (Figure 3). The fall, early, and late nitrogen treatments had similar yields. The split nitrogen treatment yielded less than the fall and early nitrogen treatments. The late nitrogen treatment yielded significantly more than the fall, early, and split nitrogen treatments at Andover in 2005 (Figure 4).

Figure 5 is the average yield of both locations and years. A statistical analysis has not been run on the combined data. It is interesting to observe the small difference in yield among the four nitrogen treatments, split, late, early or fall. The early yield is depressed slightly, but again, probably due to the lack of significant rainfall in April of 2004 and marginal rainfall in April of 2005. Rainfall was plentiful in May shortly after the late treatments were made in both years. N-Fall is the same as N-Seeding in these studies and in this report.

Figure 6 compares the protein levels for each nitrogen treatment for Ellendale and Andover for 2004 and 2005. The last set of bars is an average of the four-site years. The protein trends are in line with expectations in that the later the nitrogen is applied the higher the protein. The nitrogen applied at seeding will likely have protein levels that are slightly lower than the spring treatments when yields meet or exceed the fertility yield goal.

Figure 6. Time of nitrogen application effect on winter wheat protein at Ellendale and Andover in 2004 and 2005.



The Dickey 04 protein data shows larger differences in protein levels for the nitrogen-timing treatments. Winter wheat yields (100 bu. +) greatly exceeded the fertility yield goals (80 bu) allowing the protein differences to express themselves. The 2005 yields were below the fertility yield goals and thus limited any protein differences to be expressed.

Summary and Conclusions

The first two years of data from the two locations show that winter wheat yields are similar regardless of when nitrogen is applied. The fall application with the drill at seeding in a deep band is yielding the same as the three stream bar-post applied nitrogen treatments in the spring. Conversely, the winter wheat yields from surface applied spring liquid nitrogen treatments applied in bands with stream bars appear to be equal in yield to the fall deep-banded nitrogen at seeding.

The slightly depressed yields from the early nitrogen treatment show how important rainfall timing, temperature, residue levels and surface moisture are in determining the success of surface applied nitrogen. Most University soils specialists do not recommend the use of surface applied nitrogen in no-till fields with heavy residue cover. However, the two years of data does reveal that surface applied liquid nitrogen with stream bars can be an effective method to apply nitrogen in the appropriate conditions.

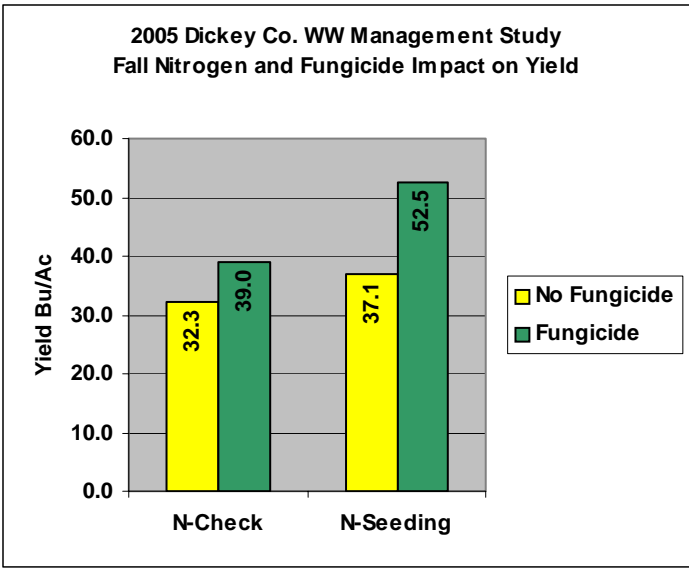
There may be fall or early spring moisture events during individual years that cause leaching of the nitrogen when applied with the drill at seeding in September. Factors such as soil type, organic matter and water table distance from the soil surface, are important to consider when determining when and by what method to apply your nitrogen to winter wheat. However, it is encouraging to have yields from the nitrogen applied in a band with the drill at seeding to equal the spring nitrogen treatment yields.

Extra: Figure 7 has absolutely nothing to do with statistics or planned comparisons, but I found the yields interesting and indicative of the fungicide and nitrogen interactions that we have witnessed at the Ellendale location. The data is taken from the nitrogen at seeding trial from 2005 with CDC Falcon and Wesley cultivars. The N-Check columns only received the starter fertilizer and the N-Fall received all the nitrogen and starter in the fall at seeding. Each nitrogen treatment then had a fungicide treated and untreated treatment.

Agromony News
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Figure 7. Nitrogen and fungicide effect on winter wheat yield.



Note the following yield differences:

Adding nitrogen without fungicide increased yield 4.8 bushels (37.1 – 32.3)

Adding fungicide without nitrogen increased yield 6.7 bushels (39.0 – 32.3)

Adding nitrogen and fungicide increased yield 20.2 bushels (52.5 – 32.3)

Fusarium head blight (scab) was the most limiting yield factor in 2005 at this location as exhibited in Figure 7. Normally, nitrogen would be expected to provide the greater yield increase when soil nitrogen is limiting. The take home point is this: “To get the most from your fungicide applications, you need adequate fertilization to realize the potential yield increases the environment may offer in any given year and vice versa.”

Acknowledgements

This research was supported in part by grants from BASF Corporation, Bayer Crop Science, Syngenta Crop Protection, Ducks Unlimited, ND Natural Resources Trust, ND Game and Fish Department, SD Game, Fish & Parks. Others providing material support were the Bristol and Oakes Wheat Growers, Agrilience of Ellendale, NDSU Foundation Seed, SD Foundation Seed, Horsch Anderson, AgriPro Seeds, UAP Northern Plains, David Kinzler, Dakota Crop Services, K&S Soil Analysis, Dickey Co. CIA, NDSU and SDSU Extension Service, Conservation Districts and NRCS.

2006 Research/Demo Sites

The following are the winter wheat research locations and subject matter areas being studied by Ducks Unlimited, SDSU, NDSU and the Conservation Cropping Systems Project.

Andover, SD – 2.5 miles east on the south side of Highway 12 on the Kevin Anderson farm. Dr. Martin Draper, SDSU, is conducting a fungicide study with eight timing treatments across four winter wheat varieties. BASF, Bayer CropScience and Syngenta Crop Protection are providing support. This location also hosts a winter wheat seed inoculant trial supported by TJ Technologies and Philom Bios. The third study compares the five times of nitrogen application across five varieties. There is also a winter wheat variety demonstration containing new materials from SDSU, AgriPro, and the breeding programs in the provinces of Alberta and Saskatchewan, Canada. One of the new SDSU varieties is a white wheat and a variety from Canada is rated resistant to wheat streak mosaic.

Forman, ND – 1 mile south on Highway 32 on the Arlen Hanson farm. The study consists of 10 no-till crop rotations on a heavy silty-clay soil in a higher rainfall environment. Crops include corn, soybean, winter wheat, spring wheat, flax, and alfalfa.

Lisbon, ND – 7.5 miles south on Highway 32 at the Randy Mairs farm. Dr. Joel Ransom, Dr. Marcia McMullen and Scott Meyer are comparing foliar fungicide treated to untreated winter wheat and spring wheat varieties. BASF and Bayer Crop-Science are providing support for this site. Pea varieties have also been planted at this site.

Ellendale, ND – 7 miles east on Highway 11 at the Larry Anderson farm. There are seven winter wheat varieties with five times of nitrogen application treatments with fungicide treated and untreated plots. Syngenta Crop Protection is providing support. There a winter wheat variety demonstration containing the same materials as listed above for the Andover, SD location. This location and the Andover, SD location also have demo strips with combination treatments of Dividend Extreme and Cruiser seed treatments.

Reminder

All “Agronomy News” issues can be found at the Ducks Unlimited [website](#) in color:

http://prairie.ducks.org/Agronomy_News

Also, email Janell at jrath@ducks.org and let her know if you would like to receive it by email. Agronomy News will arrive 7-10 days sooner if you choose to receive it by email.

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Ibrahim Recognized at Annual Wheat Quality Council Meeting



Dr. Amir Ibrahim, winter wheat breeder at SDSU, received recognition for his breeding accomplishments at the Wheat Quality Council annual meeting in 2005. The annual meeting provided an opportunity for the millers and bakers to present their findings on their evaluations of thirty two submitted lines plus nine checks. In the hard white/red winter wheat class, Ibrahim submitted two lines for testing. The experimental line SD97W609 was named "Best in Show" by the millers. This line is a hard white winter wheat and will likely be released in 2006 as the second white wheat variety released by SDSU.

CONGRATULATIONS TO DR. IBRAHIM AND STAFF!

NASS Winter Wheat Seedings Report

NASS released their winter wheat seedings report in January indicating a 2 percent increase in U.S. acreage over all classes. Hard Red Winter wheat seeded area is about 29.9 million acres, down 1 percent from 2005. Soft Red Winter seeded area is about 7.3 million acres, up 19 percent from last year. White Winter wheat seeded area is about 4.2 million acres, down 1 percent from 2005. The following table shows the winter wheat acreage estimates for the Northern Plains states for 2004 to 2006.

	<u>2004</u>	<u>2005</u>	<u>2006</u>
Minnesota	27,000	20,000	30,000
Montana	1,900,000	2,150,000	2,000,000
North Dakota	245,000	310,000	180,000
South Dakota	1,650,000	1,550,000	1,350,000

A number of growers have commented in the last few weeks that they wished they had seeded some or more winter wheat last fall with KCBT future prices higher than the MGE spring wheat prices .