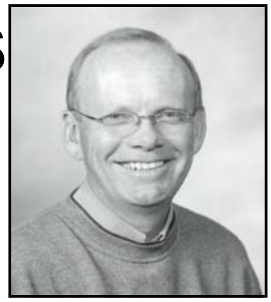
AGRONOMY NEWS

Grasslands For Tomorrow

Volume 6, Issue 1 **March 2006**



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2005 Dickey County Winter Wheat Management Study

Blake Vander Vorst

Cooperators
Larry Anderson and Marty Visto

Seven cultivars of winter wheat were planted 7.5 miles east of Ellendale, ND on the Larry and Jane Anderson farm on September 14, 2004 with the assistance of Eugene Elhard and Larry Anderson. All varieties were seeded at 1.2 million PLS/A at a depth of 1.5 inches and the seed treated with Raxil MD. Starter fertilizer was applied at 15 GPA of 10-34-0 and 3 pints/A of TJ Wheat Micromix 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 with a 7.5 foot Horsch Anderson air plot drill with a 15-inch shank spacing. September through December 2004 rainfall totaled 8.15 inches.

Urea Ammonium Nitrate (UAN or 28-0-0) (54 GPA or 160 lbs/A actual) was applied with stream bars provided by Amity Technology for an 85-bushel yield goal using 2.25 lbs of nitrogen per bushel. Larry Anderson applied Roundup Ultra Max at 22 oz/A + AMS on September 13, 2004 as a preplant burn down. Marty Visto applied the nitrogen and fungicide treatments. He also applied Buccaneer Plus at 32 oz/A + BB5 on July 15, 2005 as a pre-harvest burn down. Dr. Marcia McMullen, NDSU, took the field disease notes.

Soil Test Information

Nitrogen 0-6" = 13 lbs 6-24' = 6 lbs	Phosphorus 6 ppm	pH 7.3
O.M. 3.9%	Copper 0.58 ppm	Sulfur 0-6" = 44 lbs 6-24" = 360 lbs
Zinc 0.86 ppm	Potassium 448 ppm	Boron 0.7 ppm

2005 Nitrogen Treatments

N-Check = No nitrogen other than starter
N-Early = 54 GPA UAN on April 1
N-Late = 54 GPA UAN on May 3
N-Split = 27 + 27 GPA UAN on April 1 and May 3
Rainfall after application:
April 11 = 0.70"
May 7 = 0.25"; 8 = 0.25"; 9 = 1.65"; 13 = 0.60

Winter Cereal Sponsors
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North Dakota Natural Resources Trust

South Dakota Game, Fish and Parks

North Dakota Game & Fish Department

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

North Dakota Dept. of Health 319 Program

NDSU and SDSU Cooperative Extension Service

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Fungicide Treatment

Quilt (7 oz/A) fungicide was applied at 10 GPA with Discover NG + DSV + WideMatch herbicides on May 19, 2005 at Feekes 6 growth stage (6 leaf). Folicur (4 oz./A) + BB5 NIS was applied in 25 GPA of water carrier with LurMark twin nozzles on June 15, 2005 to winter wheat at Feekes 10.51 growth stage (early flower). The cultivars Expedition and Wesley were further advanced in their maturity.

Table 1. Response of cultivars to fungicide treatment to % severity on the flag leaf for Septoria and leaf rust and the fusarium head blight index.

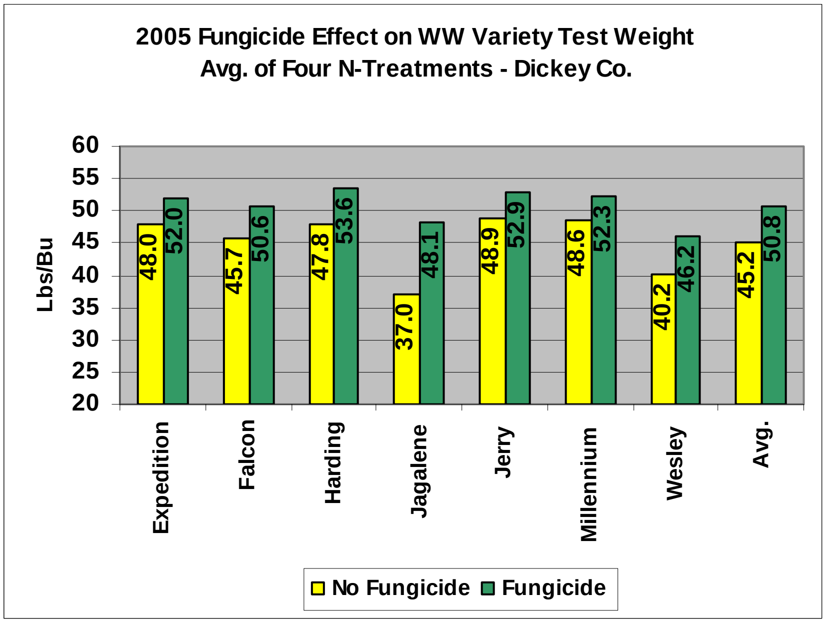
	Leaf spot			FHB Field Severity		
Variety	**Untreated**	**Treated**	**% Leaf Spot Reduction**	**Untreated**	**Treated**	**% FHB Reduction**
Millennium	45.8	6.8	85.2	45	12.2	72.9
Wesley	70.3	6.6	90.6	69.4	39.2	43.5
Expedition	77.6	4.9	93	45.9	17.1	62.7
Falcon	78.3	6.2	92.1	65.8	28.2	57.1
Harding	48.9	5.5	88.8	31.7	7.5	76.1
Jagalene	80.7	5.3	93.4	94	53.7	42.8
Jerry	53.9	5.1	90.5	35.4	11.7	66.9

Above data based on 3 reps of Early Nitrogen treatment + 3 reps of Split Nitrogen treatment. All differences between untreated and treated were significant.

Table 1 indicates that Expedition, Falcon, Jagalene and Wesley had the most leaf spot. Leaf rust ranged from almost none on Harding to 25%+ on Wesley and Jagalene. Fungicides reduced leaf rust levels to zero and were very effective in reducing leaf spot.

Jagalene had the greatest FHB field severity rating at 94% followed by Wesley and Falcon. The untreated FHB ratings seemed to be more severe for the shorter stature cultivars (Falcon, Jagalene and Wesley) whose heads are closer to the leaf canopy, medium for the medium height cultivars (Expedition and Millennium) and the least for the taller cultivars (Harding and Jerry). Fungicide treatment appeared to be more effective in reducing FHB when applied to the medium and taller cultivars. This may be partially due to the fact that Wesley and Expedition flower first, followed closely by Jagalene and Falcon and then the remaining cultivars. Fungicide treatment application timing may have been more timely for the later flowering cultivars. It should also be noted that Jagalene has an extended flowering period, which can range from 1 to 3 weeks depending on the environmental conditions based on observation by Dr. Martin Draper, SDSU.

Figure 1. Individual winter wheat cultivars test weight response to fungicide treatment. Average of check, 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 for each cultivar and when averaged over all cultivars (5.6 lbs/bu). Severe FHB disease resulted in large test weight increases from fungicide application. The untreated test weight is probably a good indication of a cultivars susceptibility to FHB.

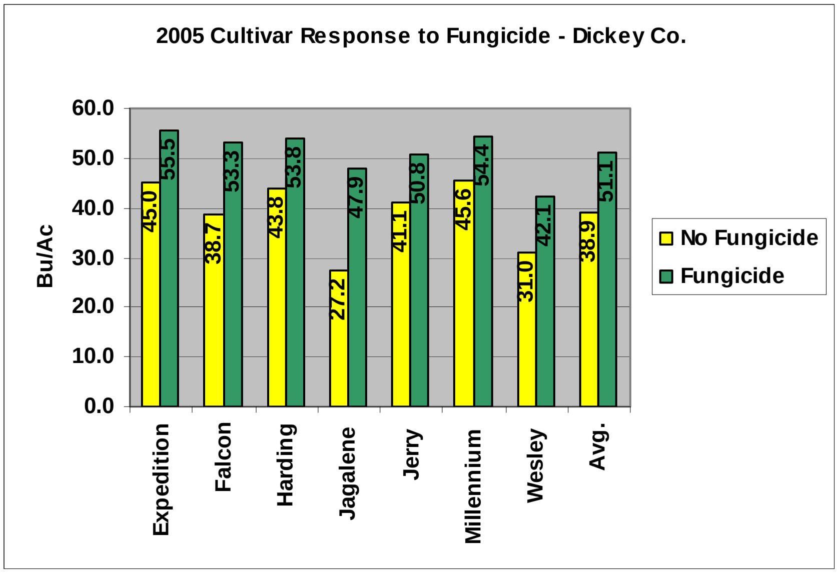


Figure 2. Individual winter wheat cultivars yield response to fungicide treatment. Average of check, early, late and split nitrogen applications.

Figure 2 shows that fungicide treatment significantly increased yield of all winter wheat cultivars. There was a 12.2 bu/A yield increase for fungicide treatment when averaged over the seven cultivars. The increase in yield for individual cultivars ranged from 8.8 bushels for Millennium to 20.2 bushels for Jagalene. However, fungicide treatment was not able to recapture the entire lost yield to FHB, in particular for the two most susceptible cultivars, Jagalene and Wesley, in comparison to the less FHB susceptible cultivars. Freezing temperatures in May of 2005 when the winter wheat was in the 5 to 6 leaf stage, FHB, bacterial leaf blight, barley yellow dwarf, septoria, and warmer temperatures during flowering all contributed to lower yields in 2005.

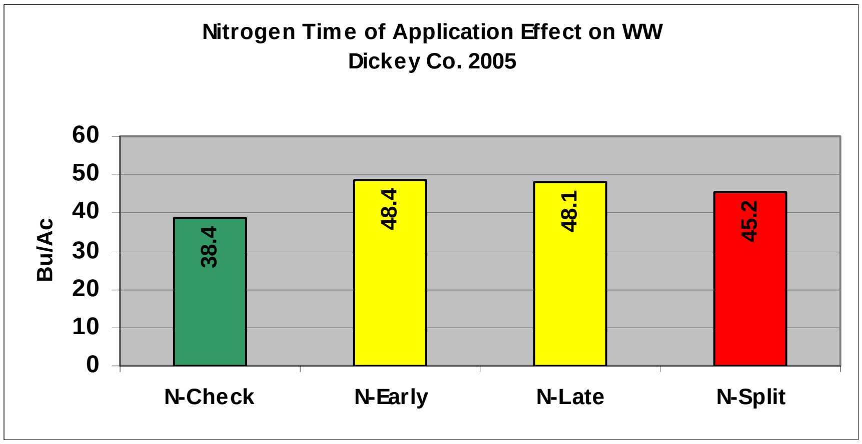


Figure 3. Effect of nitrogen time of application on yield. Average of seven winter wheat cultivars and fungicide treated and untreated plots in 2005.

Figure 4. Effect of nitrogen time of application on yield. Average of six winter wheat cultivars and fungicide treated and untreated plots in 2004.

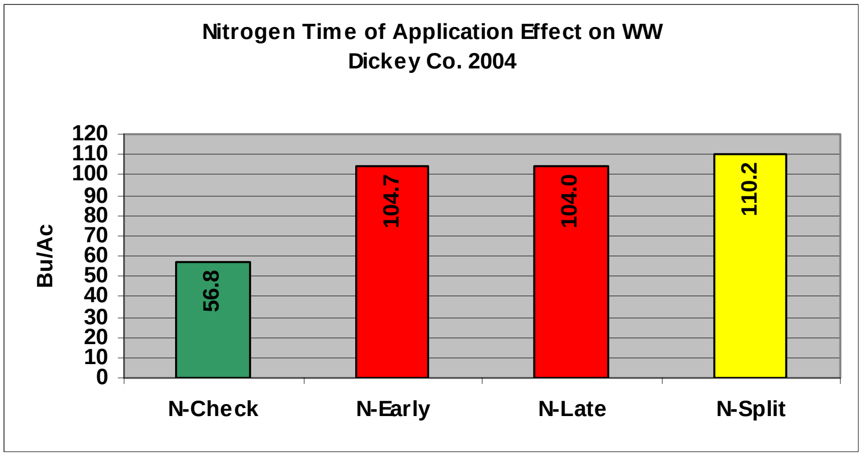
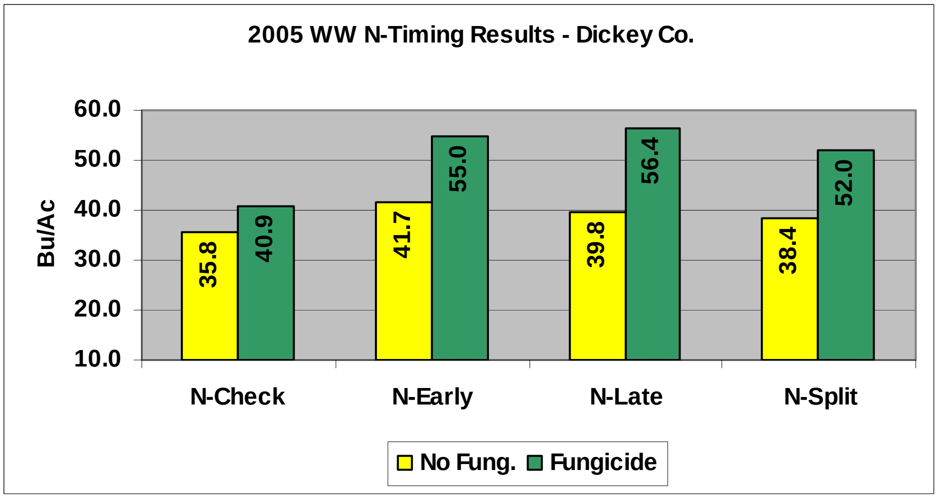


Figure 3 compares yield response for time of nitrogen application averaged over fungicide treated and untreated plots and the seven cultivars. The early and late nitrogen treatments yielded significantly more than the split and check treatments in 2005, while the split nitrogen treatment yielded more than the check. The split nitrogen application in 2004 yielded significantly more than the early and late nitrogen applications when averaged over varieties and fungicide treated and untreated plots. (Figure 4).

Figure 5. Effect of nitrogen time of application and fungicide treatment on yield. Average of seven winter wheat cultivars in 2005.



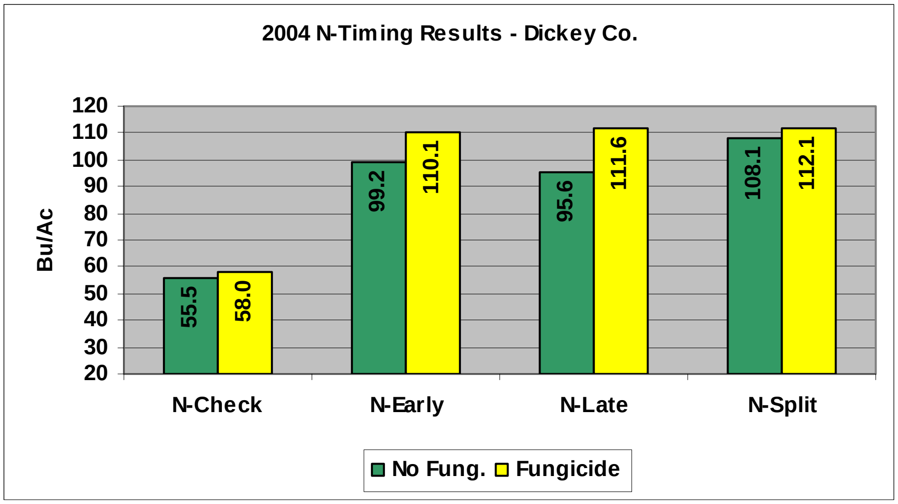


Figure 6. Effect of nitrogen time of application and fungicide treatment on yield. Average of six winter wheat cultivars in 2004.

Figure 5 compares the 2005 winter wheat yields for the time of nitrogen application treatments for fungicide treated and untreated plots averaged over the seven cultivars. All nitrogen times of application recorded a significant increase in winter wheat yield when comparing fungicide treated and untreated plots.

In 2004 (Figure 6), only the Early and Late nitrogen treatments indicated a significant yield increase from fungicide application. The 2004 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. The time of nitrogen application did not make a difference in yield when fungicide was applied (Early 110.1, Late 111.6, and Split 112.1 bu/A).

Averaging the no fungicide and fungicide columns in Figures 5 and 6 would give you the same yield numbers as in Figures 3 and 4, respectively. Note how the fungicide treated yield bars have less variation than the untreated in Figure 6 indicating that fungicide was able to overcome the yield differences between the nitrogen treatments when they did not receive a fungicide treatment.

Reminder

All "Agronomy News" issues can be found at Ducks Unlimited website:

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.

Figure 7. 2004 and 2005 winter wheat yield increase as affected by fungicide treatment on nitrogen time of application. Average of winter wheat cultivars.

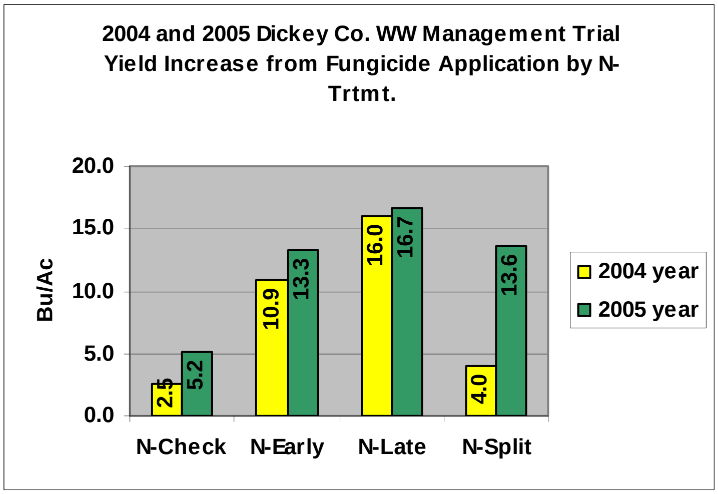
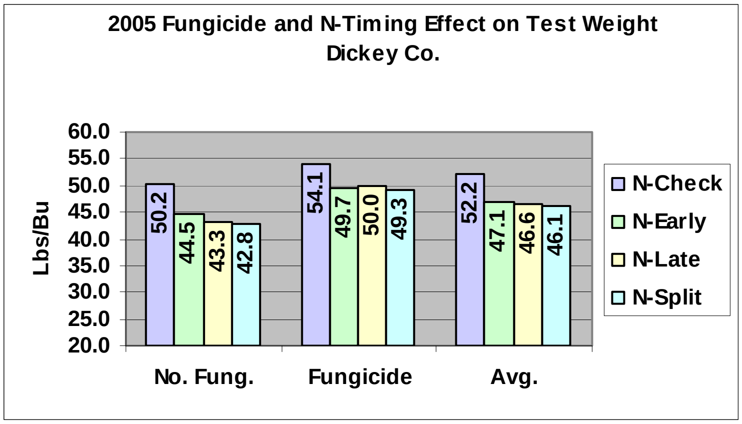


Figure 7 is an alternative view of Figures 5 and 6 and shows the amount of yield increase for each nitrogen treatment due to fungicide application. The yield response to fungicide treatment is greatest when the nitrogen is applied Late (5 to 6 leaf) in both years (16.0 and 16.7 bushel). It does not appear that the winter wheat yield of the Late nitrogen treatment is higher than the Early or Split treatments when fungicide is applied. However, there is some indication that the yield is lower in the Late nitrogen treatment in the untreated fungicide plots allowing for the larger yield increase when fungicide is applied.

The question arises as to why does the late nitrogen treatment have a greater response to fungicide treatment? One suggestion has been that the plant may be under some level of nitrogen stress prior to the nitrogen application and as a result more susceptible to disease infection. The fungicide treatment may be compensating for disease or plant stress.

The encouraging part of the first two years of data is that it appears nitrogen applications can be made to winter wheat breaking dormancy to the 5 to 6 leaf stage and still maintain yield when fungicide application is part of the management plan. Conversely, if your winter wheat is visibly short of nitrogen and disease is present and the nitrogen application is being applied at later growth stages, tank mixing a fungicide with the herbicide may be necessary to compensate for a less healthy plant. The prior crops in these studies have been spring wheat and barley. Winter wheat seeded into flax, canola or peas may react differently.

Figure 8. Effect of nitrogen time of application and fungicide treatment on test weight. Average of seven winter wheat cultivars.



The nitrogen Check had significantly higher test weight than the Early, Late and Split nitrogen treatments. The nitrogen Check received only the starter application (10-34-0) and micronutrient mix and no additional nitrogen. There was much less foliage and fewer heads in the nitrogen check plots. With a less dense canopy, leaf and head wetness may have dissipated earlier in the day causing less FHB infection. The test weights were significantly higher for the nitrogen treatments treated with fungicide verses no fungicide.

Acknowledgements:

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CSP Signup – February 13 to March 31, 2006

USDA – NRCS State Conservationist's Janet Oertly and J.R. Flores, South Dakota and North Dakota respectively, announced the 2006 Conservation Security Program (CSP) sign-up is being held from Feb. 13 to March 31, 2006 in the Mud watershed in South Dakota and the Upper Sheyenne watershed in North Dakota. This is the third CSP sign-up. (See maps)

To be eligible for CSP, most of a producer's agricultural operation must fall within the boundaries of the selected watershed. Applications that meet CSP's minimum requirements as set forth in the amendment to the Interim Final Rule published in the Federal Register March 25, 2005, will be placed in enrollment categories. Categories will be funded in alphabetical order until funds are exhausted.

The CSP amendment to the Interim Final Rule is available for viewing at: http://www.nrcs.usda.gov/programs/csp/.

Winter cereal crops are included as a CSP enhancement activity. The winter cereal payment rate is $10 per acre in both states for the 2006 CSP watersheds. Producers should check with their local NRCS staff for more details on CSP and the winter cereals enhancement practice if your farm is in one of the designated watersheds.

The NRCS CSP Winter Cereal Enhancement Job Sheets can be found at the following websites:

North Dakota: http://www.nd.nrcs.usda.gov/programs/CSP/Upper_Sheyenne_River.asp

South Dakota: http://www.sd.nrcs.usda.gov/programs/2006_CSP.html