

# AGRONOMY NEWS

Grasslands For Tomorrow



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## 100 Bushel "Reality"

I have confirmation that two South Dakota (SD) growers, one in east central and one in north-central areas of the state, exceeded 100 bushel per acre average winter wheat yields. A person can get pretty excited about raising winter wheat with these yields. Weather in 2000 was great for wheat production and may have been even more favorable for spring wheat than winter wheat with the sparse April moisture.

The grower in north-central SD averaged **105.6** bushels per acre on 240 acres. The grower in east-central SD averaged **128** bushels per acre on 500 acres according to Alan Hojer, Syngenta Crop Protection Representative. The growers both planted the variety Wesley. One planted in spring wheat stubble and the latter in soybean stubble. DU was particularly pleased to have the opportunity to provide technical assistance over the last three years to the north-central SD grower.

I have received a number of reports of average yields from 80 to 110 bushel per acre. Yields in the DU project area tended to be in the 60 to 90 bushel per acre range, a very good year. The following article shows the results of the DU demonstration plot in Dickey County at the Larry Anderson farm. It confirms the high yields attained in the area and reveals some interesting results for different management applications.

### Winter Cereal Sponsors

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*North Dakota Dept. of Health 319 Program*

*NDSU and SDSU Cooperative Extension Service*



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## *2003 Dickey County Winter Wheat Management Study*

*by: Blake Vander Vorst,  
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Dr. Duane Pool, Statistician*

### **Plot Management**

Ten varieties of winter wheat were planted nine miles east of Ellendale next to Highway 11 on the Larry and Jane Anderson farm on September 13, 2002. All varieties were seeded at 100 lbs/A at a depth of 1.5 inches and 10-34-0 starter fertilizer was applied at 5 GPA. The plots were seeded in spring wheat stubble with a 7.5' Horsch Anderson air plot drill with 15-inch shank spacing. Shanks were equipped with Anderson triple shoot openers. The seed spread was 5 to 6 inches and the fertilizer placed between and below the seed.

Forty-five pounds per acre of actual nitrogen was applied. The soil test indicated 138 pounds of nitrogen with 60 pounds in the 0-6 inch soil depth and 78 pounds in the 6-24 inch depth. Puma + Bronate Advanced + Tilt was applied at 8 + 12 + 1 ounces, respectively. The June 18 Tilt was applied at 3 ounces per acre with a non-ionic surfactant at early flower or Feekes stage 10.51. The stream bar nitrogen was applied to the wheat at the 4-leaf stage.

*(continued on page 2)*

### January Issue

- ◆ Winter Wheat Micro Nutrient Trail Results from Kevin Anderson's Farm
- ◆ 2004 Winter Wheat Trails

### Agronomy News

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**2003 Dickey County Winter Wheat Management Study** - (continued from page 1)

**Table 1. Treatments**

Treatment (Application Date)	4-Leaf N	Early N	4-Leaf N & Fung	Early N & Fung
100 lbs/A Urea (4-1-03)		X		X
Puma + Bronate (5-1-03)	X	X		
Puma + Bronate + Tilt (5-1-03)			X	X
15 GPA 28-0-0 w/Stream Bar (5-2-03)	X		X	
Tilt + Surfactant (6-18-03)			X	X

**Discussion and Results**

Winter wheat plant populations were less than expected. There was no snow cover in February and March because of below average snowfall. Temperatures were also below normal during this period. There were 10 to 14 plants per square foot or 450,000 to 620,000 plants per acre based on spring survival counts. Seeds planted ranged from 1.3 to 1.7 million per acre based on varietal seed size. Plants entered dormancy with 3.5 to 4 leaves and 0 to 3 tillers.

**Table 2. Disease Ratings**

Variety	% Septoria		% Leaf Rust	
	Untreated	Treated	Untreated	Treated
Wesley	9 b	2.5 b	5 c	2 b
Millennium	9 b	4 ab	0 c	0 b
Jagalene	7 b	3.5 b	0 c	0 b
CDC Falcon	32.5 a	5 ab	0 c	0 b
Arapahoe	12.5 b	5 ab	2 c	0 b
Wahoo	7.5 b	3 b	5 c	0 b
Nekota	17.5 b	4 ab	30 a	15 a
Harding	6.5 b	2.5 b	0 c	0 b
Jerry	25 ab	3.5 b	5 c	0 b
Expedition	11.5 b	6.5 a	20 b	5 b
Average	16.6 a	4.7 b	6.7 a	0.6 b

\*Disease values followed by a different letter within a column are significantly different at the 90% confidence level.

Dr. Marcia McMullen, NDSU Extension Plant Pathologist, completed leaf disease ratings (Table 2) on July 1, 2003 at the late milk to early dough stage. The disease means are across both nitrogen treatments. Tilt fungicide significantly reduced Septoria and leaf rust levels when averaged over varieties. Nekota and Expedition exhibited higher levels of leaf rust. CDC Falcon had more Septoria. Dr. McMullen estimated the UAN stream bar applied plots had approximately 50% less disease, but that they were less mature at the time of disease rating.

As varieties reached maturity, general observations by Blake Vander Vorst indicated that Millennium, Harding and Jagalene appeared to maintain the best leaf health. Leaf rust was not detected on CDC Falcon and Millennium.

**Table 3. Variety Results**

The variety results (Table 3) are averaged over nitrogen and fungicide treatments. CDC Falcon, Wahoo and Jerry had lower test weights. Wesley and Harding had the highest protein content. Lodging notes from 7-10-03 indicate that Wesley, Jagalene and CDC Falcon did not exhibit any lodging. Millennium had very little lodging and Nekota and Jerry had slightly more lodging. Harding exhibited the most lodging.

Variety	Yield bu/A	Test Wt.lbs	Protein %
Wesley	92.3	61.65	13.56
Millennium	86.8	61.53	12.50
Jagalene	86.4	61.15	12.90
CDC Falcon	85.0	59.41	12.49
Arapahoe	81.7	61.24	13.08
Wahoo	81.3	59.36	12.58
Nekota	80.9	61.59	12.36
Harding	80.8	61.39	13.43
Jerry	79.5	59.51	13.03
Expedition	77.0	61.13	12.24
Average	83.2	60.80	12.82

LSD .05                      6.2 bu.                      0.72 lbs.                      0.22%

**Table 4. Treatment Results (bushels/acre)**

LSD .05    Variety by Treatment = 15.8 bu.

Urea applied early with fungicide had the highest yield (92.6 bu.) when averaged over varieties as indicated by Table 4. UAN (28-0-0) applied at the 4-leaf stage with fungicide averaged 86.5 bushels and was better than urea applied early without fungicide at 79.6 bushels. The 4-leaf UAN nitrogen without fungicide had the lowest yield at 74 bushels.

LSD .05    Treatment Average = 4.44 bu.

Variety	4-Leaf N	Early N	4-Leaf N & Fung	Early N & Fung
Wesley	79.6	92.1	86.7	110.9
Millennium	80.7	83.7	88.9	94.1
Jagalene	76.0	80.5	89.4	99.7
CDC Falcon	77.5	79.5	87.6	95.6
Arapahoe	77.7	79.7	84.2	85.4
Wahoo	70.3	79.8	86.3	88.8
Nekota	66.5	75.8	84.2	97.1
Harding	73.4	81.4	83.6	84.6
Jerry	74.3	76.5	86.9	80.4
Expedition	64.0	66.9	87.4	89.9
Trtmt. Ave.	74.0a	79.6b	86.5c	92.6d

**Table 5. Nitrogen Timing and Fungicide Results (bushels /acre)**

LSD .05 Variety by Treatment = 9.9 bu.

Variety	Early N*	4-Leaf N*	No Fungicide**	Fungicide**
Wesley	101.5	83.1	85.8	98.8
Millennium	88.8	84.8	82.2	91.5
Jagalene	90.1	82.7	78.2	94.5
CDC Falcon	87.5	82.6	78.5	91.6
Arapahoe	82.6	80.9	78.7	84.8
Wahoo	84.3	78.3	75.0	87.5
Nekota	86.4	75.3	71.1	90.6
Harding	83.0	78.5	77.4	84.1
Jerry	78.4	80.6	75.4	83.6
Expedition	78.4	75.7	65.4	88.6
Trtmt. Ave.	86.1a	80.2 b	76.8 b	89.6 a

LSD .05 Treatment Average = 2.8 bu.

\* Early N and 4 Leaf N yields are an average over Fungicide and No Fungicide treatments.

\*\* No Fungicide and Fungicide yields are an average over Early N and 4-Leaf N treatments.

Urea applied early (86.1 bu.) yielded more than UAN applied at the 4-leaf stage (80.2 bu.) when averaged over varieties as indicated in Table 5. Wesley and Nekota yielded more with urea applied early than with UAN applied at the 4-leaf stage. Although tiller counts were not taken, visual observation indicated that the early nitrogen application was more effective in stimulating tillering that resulted in increased head numbers. This was important because of the low plant populations as a result of winterkill.

The winter wheat trial was planted in spring wheat residue and fungicide was important in attaining top yields in the 2003 environment as indicated by the 12.8-bushel average increase (76.8 vs. 89.6) to Tilt fungicide applications. Tilt fungicide application appeared to have its' greatest impact on those varieties with high yield potential and better straw strength as indicated in Table 5. Those varieties include Wesley, Millennium, Jagalene, CDC Falcon, Expedition, Nekota and Wahoo. The Expedition and Nekota yields increased 23.2 and 19.5 bushels, respectively, with fungicide application verses no fungicide. They are the same varieties that had significantly higher levels of leaf rust as indicated in Table 2.

**Table 6. Test Weight and % Protein**

Treatment	Test Wt. Lbs./bu.	Protein %
Early N	61.02 b	12.79 a
4-Leaf N	60.57 a	12.84 a
No Fungicide	59.97 a	12.61 a
Fungicide	61.62 a	13.02 b
4-Leaf N	59.49 a	12.70 b
Early N	60.45 b	12.52 b
4-Leaf N & Fung.	61.66 c	12.98 c
Early N & Fung.	61.59 c	13.07 c

\* Values followed by a different letter are significantly different at the 95% confidence level.

Urea applied early increased test weight but did not have a significant impact on protein as indicated in Table 6.

Fungicide application increased test weight 1.65 pounds per bushel averaged over varieties and nitrogen treatments. Percent protein also showed a significant increase with fungicide application.

### Conclusions

- ◆ Urea applied April 1 had significantly higher grain yield than UAN applied with stream bars May 2 at the 4-leaf stage based on the conditions present at this site in 2003.
- ◆ Fungicide application had a significant impact on winter wheat yields, test weight and % protein when planted in spring wheat residue in this high yield environment.
- ◆ Expedition and Nekota displayed the greatest sensitivity to leaf rust and the greatest yield response to fungicide application suggesting that leaf rust also contributed significant yield loss in addition to Septoria.

The good Lord blessed us with great weather, but management decisions including choosing the correct variety, fungicide application, and nitrogen timing can make a significant difference.

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RETURN SERVICE REQUESTED

*The Money Farm by Mike Krueger*  
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It's always interesting to start looking at potential supply and demand estimates for the next marketing year even though we're only half way through the current marketing year. In the case of wheat, the overall tone of the market continues to be bearish – although that tone is showing signs of change – even though ending supplies this year are forecast to be the smallest ever. We've covered the ramifications of small world supplies coupled with increased supplies among the five major exporters on numerous occasions. Wheat prices for the balance of the 2003-04 marketing year will depend on the final level of US wheat exports and that will depend on the EU and China's level of imports. Some analysts are already bearish wheat prices for the 2004-05 marketing year based on strong odds for a significant recovery in world wheat production from the last two years. We will undoubtedly see estimates of world wheat production exceeding 600 MMT's in the coming year. After all, that's where most analysts started the process in each of the last three years. The table below gives you a picture of where we've been in terms of production, consumption and ending supplies. The 2004-05 column is WPI's current forecast. We apologize for the size of the table, but it goes back to the 1997-98 marketing year that established a record for world wheat production that set the stage for huge world ending supplies of wheat in the next few years. It also gives you a recent historical perspective of production in the major countries.

WORLD WHEAT PRODUCTION (MMT'S, Source: USDA & WPI*)								
	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05*
US	67.5	69.3	62.6	60.8	53.3	44	63.6	60
Argentina	15.7	13.3	16.4	16.2	15.5	12.3	13.5	13
Australia	19.2	21.5	24.8	22.1	24.9	9.4	24	23
Canada	24.3	24.1	26.9	26.5	20.6	15.7	22	23
China	123.3	109.7	113.9	99.6	93.9	90.3	87	90
EU	94.2	103.1	96.4	104.7	91.2	103.3	92	105
FSU	80.6	57.6	66.1	64.8	93	99.2	61.9	78
India	69.4	66.4	70.8	76.4	69.7	71.8	67	68
Others	115.9	124.8	107.6	110.4	119.2	119.5	118.6	120
TOTAL	610.1	589.7	585.3	581.5	581.1	565.5	549.5	581
USE	584.1	579.1	584.7	583.8	584.4	597.8	584.4	584
<b>END STOCKS</b>	<b>171.8</b>	<b>206.1</b>	<b>203</b>	<b>200.7</b>	<b>197.4</b>	<b>165</b>	<b>130.2</b>	<b>127.2</b>

There are a number of factors we want to bring to your attention:

1. Even with a substantial recovery in world production, ending supplies of wheat will probably decline again in the 2004-05 marketing year.
2. The two critical regions to watch are the EU and the FSU. We are projecting a record EU wheat crop based on ideas of a 5% top 6% increase in planted acres and much better weather than last year's drought. We are also projecting a substantial recovery in the FSU. A five to ten MMT reduction in these areas from today's WPI estimate would be very significant.
3. Also note that we are guessing Canada and Australia will have excellent wheat crops in 2004-05 and we are many months away from those crops being planted.