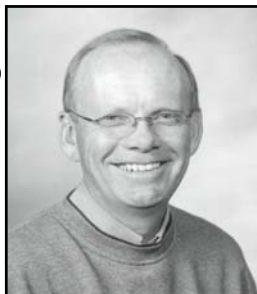


AGRONOMY NEWS

 **Grasslands for Tomorrow**

Volume 7, Issue 1

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2007 Fall Seeding – Are You Ready?

Have you decided where you are going to plant your winter wheat in September of 2007? That decision is one to two months away, depending where you live. Somebody is probably saying, “What are you talking about?” Well, the crop you plant the winter wheat into this fall will be planted sometime in late March to mid-May. That prior crop can have a big impact on the winter wheat that will follow it.

One of my assigned topics at the Best of the Best wheat meetings sponsored by the MAWG, NDGGA and the Extension Service was to discuss seeding winter wheat following soybeans. **Winterkill risk increases because of later seeding and less snow catch following soybeans.**

Survival data (Figure 1) for eight winter wheat varieties at Prosper/Casselton, ND in 2003-04 showed a substantial difference in survival when seeded into soybean stubble. The four varieties with greater winter hardiness had survival ratings two to three times greater than the less winter hardy varieties. However, when seeded into spring wheat, the survival ratings were only 10 to 20% less and were at acceptable levels to attain good yields.

Figure 1.

Effect of crop residue on winter survival, 2003/04, ND.

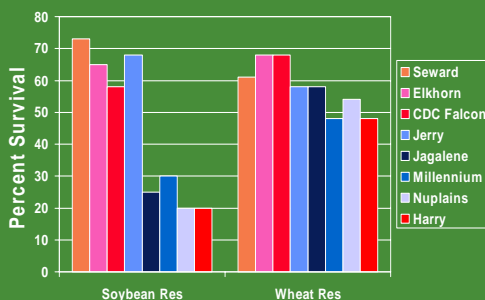


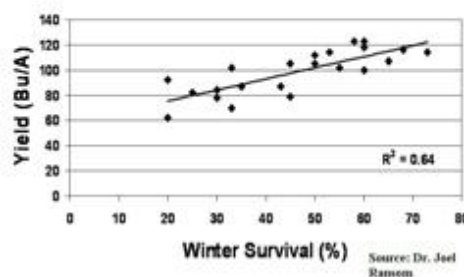
Figure 2 shows the relationship between winter survival and yield for the same trial. The yield trend line corresponds well with increases in winter survival. Once you reach the 50% survival level, yields do seem to cluster in the 100 to 120 bushel grouping. Uniform winter wheat stands of 50% or greater can have very good yield potential due to winter wheat’s ability to tiller and compensate for stand loss.

The take home message is **plant a winter hardy variety** if you are seeding winter wheat into a prior crop with minimal standing residue.

Continued on page 6...

Figure 2.

Relationship between winter survival and yield, Casselton, 2004



Reminder

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2004 - 2006 Winter Wheat Nitrogen at Seeding Management Study
Blake Vander Vorst

Three winter wheat cultivars were planted east of Ellendale, ND (Dickey Co.) and Andover, SD (Day Co.) on the farms of **Larry and Jane Anderson** and **Kevin and Donna Anderson**, respectively. **Dr. Joel Ransom and Scott Meyer, NDSU**, and **Dr. Martin Draper and Kay Ruden, SDSU**, were research cooperators at their respective state's sites. All cultivars were seeded at a depth of 1.5 inches and the seed treated with Raxil MD in 2004 and 2005. The seed treatment for 2006 was Dividend Extreme + Cruiser. The PLS seeding rates and cultivars by location are in Table 1.

Table 1. Seeding Rates in PLS/A and cultivars.

| Location | 2004 | 2005 | 2006 |
|---------------|----------|-----------------|---------------------|
| Ellendale, ND | 900,000 | 1.2 mil. | 1.2 mil. |
| Andover, SD | 1.5 mil. | 1.2 mil. | 1.2 mil |
| Ellendale, ND | Wesley | Falcon & Wesley | Falcon & Wesley |
| Andover, SD | Wesley | Wesley | Falcon & Millennium |

Table 2. Fertilizer Rates and Nitrogen Time of Application.

| | | | | 28-0-0 GPA | | | | | | | | |
|-------------|------|------|------|------------|-------|------|------|-------|------|------|-------|------|
| 10-34-0 GPA | | | | 2004 | | | 2005 | | | 2006 | | |
| Treatment | 2004 | 2005 | 2006 | Seed | Early | Late | Seed | Early | Late | Seed | Early | Late |
| N-Check | 15 | 15 | 10 | | | | | | | | | |
| N-Seeding | 15 | 15 | 10 | 45 | | | 54 | | | 43 | | |
| N-Early | 15 | 15 | 10 | | 45 | | | 54 | | | 43 | |
| N-Split | 15 | 13.5 | 10 | | 20 | 25 | | 27 | 27 | | 21.5 | 21.5 |
| N-Late | 15 | 15 | 10 | | | 45 | | | 54 | | | 43 |

Table 2 provides the starter fertilizer and nitrogen application rate information. The 2005 and 2006 winter wheat trials had 3 pints/A of TJ Wheat Micromix added to the 10-34-0 starter. The starter was applied in a deep band below and between the seed spread 5 to 6 inches with Anderson triple shoot openers. The winter wheat was seeded in spring wheat stubble except at Ellendale in 2004, when barley was the preceding crop. The winter wheat was seeded with a 7.5 foot Horsch Anderson air plot drill with a 15-inch shank spacing.

Table 2 also provides the amounts and time of Urea Ammonium Nitrate (UAN) (45 GPA = 135 lbs/A, 54 GPA = 160 lbs/A, 43 GPA = 130 lbs/A of actual nitrogen) application with the drill or post applied with stream bars provided by **Amity Technology**. Yield goals were set at 80 bu/A for 2004 and 85 bu/A for 2005 and 2006 using 2.3 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, SDSU, and Wheat Growers from Bristol, SD applied the nitrogen and fungicide treatments at Andover. A pre-harvest burn down was used each year at the Ellendale site and in 2006 at Andover.

Table 3. Dates of the Early and Late nitrogen applications are as follows:

| <u>Location</u> | <u>Early</u> | <u>Late</u> |
|-----------------|--------------|-------------|
| Ellendale, ND | 4-3-04 | 5-2-04 |
| | 4-1-05 | 5-3-05 |
| | 4-12-06 | 4-28-06 |
| Andover, SD | 3-29-04 | 4-27-04 |
| | 4-1-05 | 5-3-05 |
| | 4-12-06 | 4-28-06 |

Soil Test Information: Nitrogen amounts in the top two feet were approximately 25 pounds at both sites for 2004 and 2005 and 60 pounds in 2006. A complete soil analysis is available.

Fungicide Treatment: In 2004 and 2005, the Andover, SD site had seven different fungicide treatments and a fungicide check. Headline, Tilt and Folicur were used separately and in combination in these treatments. In 2006, all plots were treated with Stratego with the herbicide and Folicur at early flower. Each year one-half of the Ellendale plots received fungicide treatment and the other one-half of the plots were untreated. Stratego and Folicur treatments were applied in 2004 and Quilt and Folicur in 2005, and Quilt and Tilt in 2006 with the herbicide and at early flower, respectively.

Nitrogen Treatments: All nitrogen-timing treatments yielded more than the nitrogen check at Ellendale and Andover in 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 yield for the early nitrogen treatment is trending lower in comparison to the N at seeding, late and split applied treatments at Ellendale in 2004.

The early treatment at Andover, SD in 2004 was significantly lower in yield than the N at seeding, early and late nitrogen treatments (Figure 2). This may have been caused by the lack of significant precipitation following the early nitrogen application at both Ellendale and Andover.

At Ellendale in 2005, the N at seeding, early, and late nitrogen treatments had similar yields (Figure 3). The split nitrogen treatment yielded less than the N at seeding and early nitrogen treatments. The late nitrogen treatment yielded significantly more than the other nitrogen treatments at Andover in 2005 (Figure 4). Night time temperatures on several days in May of 2005 caused freeze injury to the winter wheat. There appeared to be visual differences in freeze injury between the nitrogen timing treatments.

There were no differences in yield for nitrogen treatments in 2006 at Ellendale. Additional nitrogen was likely released from the good organic matter-silt loam soil with the warmer temperatures and good early season soil moisture. Yields were limited by hot temperatures and moisture stress three weeks prior to maturity.

At Andover in 2006 (Figure 6), the early nitrogen treatment yielded more than the check, N at seeding and split treatments, but similar to the late treatment. The early treatment probably enhanced tillering that compensated for stand loss due to the winter injury experienced at the Andover site. Yields from an early N treatment at Ellendale in 2003 also had a higher yield than later applied N when there was winter injury.

Figures 7 and 8 show there is no major difference in yield between the nitrogen treatments when averaged over the 3 years at both sites. However, each year can be different depending on winter injury to the winter wheat and the timing of precipitation.

Protein: Figures 9 and 10 compare the protein levels for each nitrogen treatment for Ellendale and Andover, respectively. The last set of bars in each figure is an average of available data. The protein trends are in line with expectations in that the later you apply the nitrogen the higher your protein will be. The protein levels for the N at seeding appear to be trending slightly lower than the spring treatments.

Summary and Conclusions

The best time to apply nitrogen can vary by year and location. The variation can be caused by rainfall amount and timing following application and by the extent of winter injury to the winter wheat.

Applying some nitrogen early is highly recommended to increase tillering to compensate for loss of stand, tillers and vigor when winter injury is obvious. This also applies to fields that have had their nitrogen banded at seeding. If winter injury is severe, the roots will have to redevelop from the winter wheat crown which will likely be a distance for the nitrogen band of the drill.

It is encouraging that the deep banded nitrogen application with the drill at seeding is yielding the same as the three stream bar-post applied spring nitrogen treatments. However, there is a trend toward lower protein content in the winter wheat from the nitrogen at seeding treatment.

The slightly lower yields from the early nitrogen treatment in 2004 demonstrate how important rainfall timing, temperature, residue levels and surface moisture are in determining the success of surface applied nitrogen. Most University soils specialists

Figure 1.

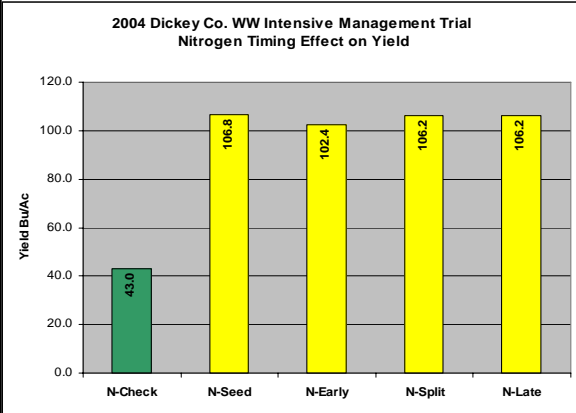


Figure 2.

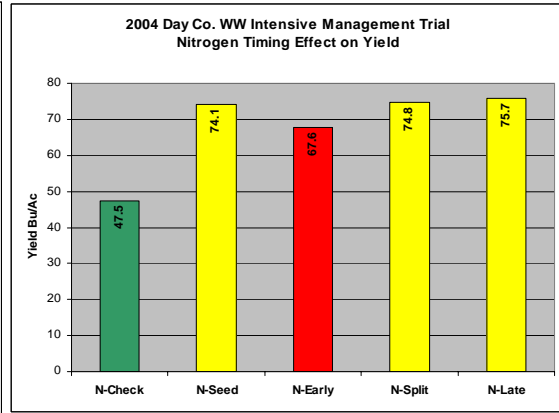


Figure 3.

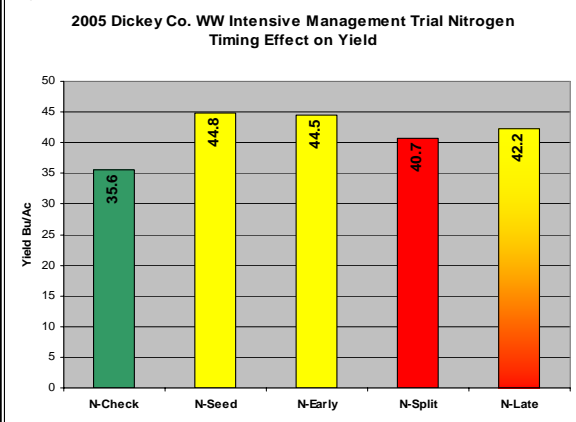


Figure 4.

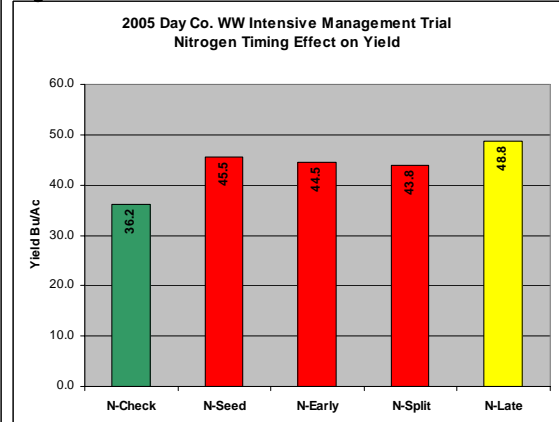


Figure 5.

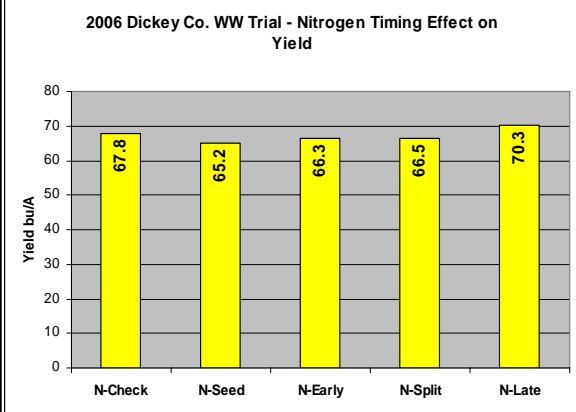
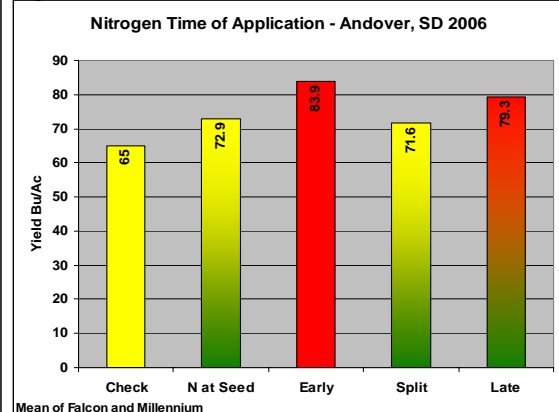


Figure 6.



do not recommend surface applied nitrogen in no-till fields with heavy surface residue. 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 nitrogen applied at seeding. Important factors such as soil type, organic matter, flooding or ponding of water, and water table distance from the soil surface, are items 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 in these silt loam soils with organic matter levels between 3% and 4%. This study may suggest that a producer with a silt loam soil may be able to apply most of the nitrogen in a band at seeding and then use a late application to capture very high yield potential and increase protein.

Figure 7.

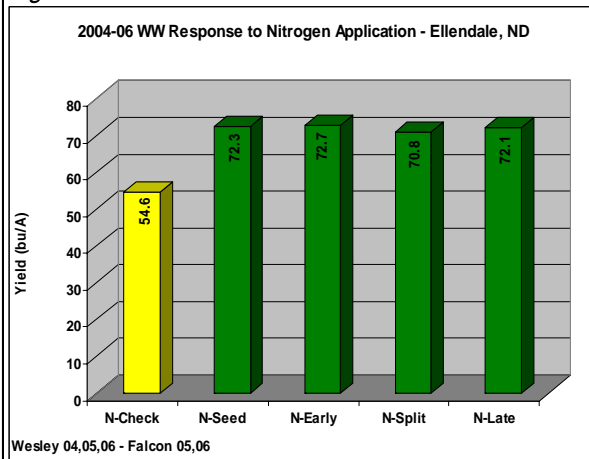


Figure 8.

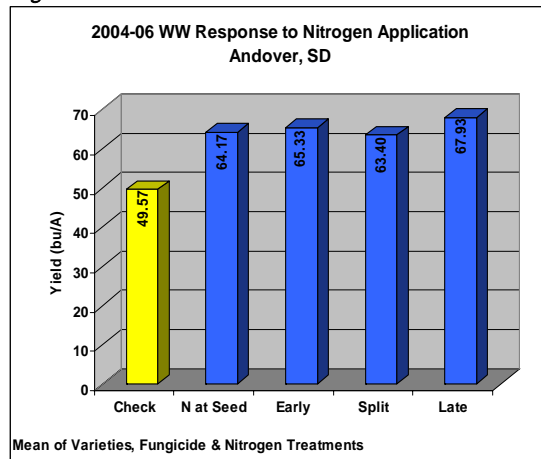


Figure 9.

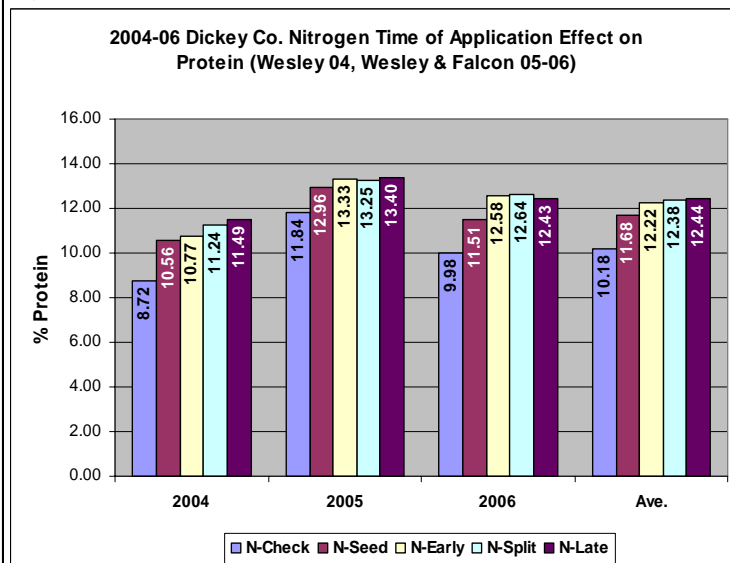
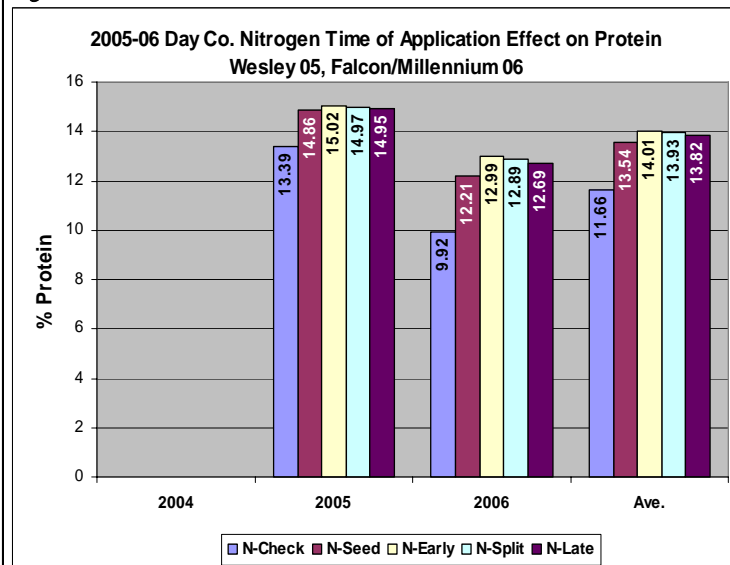


Figure 10.



Acknowledgements

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To increase your chance of a successful winter wheat crop planted into soybean stubble, consider these management items:

- ... Plant an early maturing soybean variety to allow an earlier winter wheat seeding date
- ... Plant your soybeans early
- ... Consider using a soybean harvest aid to enhance soybean dry down
- ... Consider the pod height of soybean varieties to allow taller standing stubble
- ... Consider solid seeding verses 30" rows
- ... Uniformly spread the soybean residue over the soil surface
- ... Also seed the soybeans no-till to increase surface residues

The crown is the over-wintering mechanism for winter wheat. Seeding date and depth have a huge impact on crown size.

Other prior crop options are canola, flax, mustard, crambe, peas, oat, barley, and spring wheat. Each has their own niche and management scenario as a prior crop to winter wheat.

Agronomy News

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Prairie Grains Magazine

DU now has the privilege to write a column on winter wheat for each of the regular issues of the **Prairie Grains** magazine. It is one of the most informative magazines in circulation and a great resource for wheat growers. Tracy Sayler does a great job of putting together meaningful information.

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