ON-FARM WHEAT TEST

# Virginia Tech On-farm Wheat Test Plots

## Eastern Virginia

July 2007

*A Summary of Replicated Research and Demonstration Plots Conducted by Virginia Cooperative Extension in Cooperation with Local Producers and Agribusinesses*


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Virginia Cooperative Extension

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# Introduction

The demonstration and research plot results discussed in this publication are a cooperative effort by eight Virginia Cooperative Extension agents, several Extension specialists from Virginia Tech, area producers, and agribusinesses. We are extremely proud to present this year's on-farm wheat plot work to you. 2006-2007 brought several challenges to small-grain producers in eastern Virginia. Heavy rains in the fall and early winter caused drowned-out spots in many fields. A late spring freeze from April 6 through 9 caused winter kill in many fields, and dry weather in May reduced yields on some sandy-textured fields. Yields varied considerably across the area, but dry harvest weather allowed for a timely harvested, high-quality small-grain crop. With wheat prices around $5.00 per bushel for 2008 and 2009, farmers are optimistic about producing the crop.

The field work and printing of this publication are supported by the Virginia Small Grains Check-Off Funds. The cooperators graciously acknowledge this support. Any small-grain producer who would like a copy of this report should contact his/her local Extension agent, who can request a copy from Keith Balderson in Essex County at 804/443-3551 or *thbalder@vt.edu*.

This is the fifteenth year of this multi-county project. Further work is planned for the upcoming growing season.

The authors wish to thank the many producers who participated in this project. Appreciation is extended to the seed, chemical, and fertilizer representatives who donated products and/or assisted with the field work.

## General Summary

**A. VARIETY SELECTION:** Variety selection remains one of the most important components of wheat production. In our variety plots, yields and test weight values varied considerably among varieties. The best source of information available for selecting small-grain varieties is *Small Grains in 2007*, Virginia Cooperative Extension publication 424-001.

**B. STALK MANAGEMENT:** As fuel prices remain high, producers are interested in reducing the number of trips across the field. Some producers are planting no-till wheat into "standing" stalks following corn harvest, while others are chopping stalks or running reduced-tillage equipment, such as the "Turbo-Till," prior to planting. In a plot evaluating stalk shredding, there was no difference in yield between the shredded and unshredded plots with yields around 80 bushels per acre.

**C. CROP PROTECTION PLOTS:** In a plot evaluating insecticide and seed treatments for barley yellow dwarf virus control, the seed treatments (Gaucho, Cruiser, and an experimental treatment) and the fall insecticide treatment all decreased the number of virus hits compared to the check. In a plot evaluating an application of Osprey herbicide to control annual bluegrass, the Osprey provided good control and increased yield by about 19 bushels per acre (49 bushels vs. 68 bushels). In two plots evaluating foliar fungicide applications, the fungicides increased yields only slightly in a relatively dry year with relatively little disease pressure.

**D. FERTILITY PLOTS:** Proper timing and rates of nitrogen fertilizer are critical to producing high wheat yields and protecting water quality. There is some indication that nitrogen rates may be able to be reduced in long-term continuous no-tillage systems. Tests conducted on two plots provided some insight into this theory. See the individual plot results for more information. Sulfur deficiency was evident on sandy-textured soils where no sulfur was applied in the topdress nitrogen, and magnesium deficiency was also found in sandy-textured fields with a long history of lime-stabilized bio-solids use. See the article on plant tissue testing for more specific information.

**E. PLANTING DEPTH:** Proper planting depth remains an issue in no-tillage wheat, especially in fields with heavy corn residue. Observations were made in several fields to help illustrate this point. See the article on planting depth for more insight into this production challenge.

# Wheat Variety Plots

## Westmoreland Wheat Variety Trial

**Cooperators:** Producer: F.F. Chandler Jr.
Extension: Sam Johnson, Westmoreland, Caroline Salisbury, Summer Intern
Industry: Curtis Packett and Rusty Green, Crop Production Services
**Soil Type:** Suffolk, sandy loam
**Planting Date:** November 2, 2006
**Land Preparation/Planting:** IH No-till drill into corn stubble, 7.5-inch rows, 34 seeds/row foot
**Fertilization/Protection:** At planting: 30-60-80
February 1: 40 lbs nitrogen plus Harmony
Extra, April 5: 60 lbs nitrogen plus Warrior
**Harvest Date:** July 3, 2007, JD 9500

| Variety | Seed Treatment | % Moisture | Test Weight (lb) | Yield |
|---|---|---|---|---|
| Coker 9553 | Dividend Extreme | 12.5 | 57.7 | 60.20 |
| 3706 | Raxil/Apron | 11.6 | 56.8 | 79.30 |
| SS 8302 | Raxil/Thiram | 12.3 | 56.6 | 67.04 |
| Dominion | Raxil/Thiram | 12.1 | 56.9 | 74.83 |
| Pioneer 26R87 | Dividend Extreme | 12.2 | 58.9 | 62.59 |
| Coker 9511 | Dividend Extreme | 12.4 | 58.6 | 63.82 |
| Vigoro 9510 | Dividend Extreme | 10.7 | 55.3 | 61.41 |
| Sisson | Dividend Extreme | 11.7 | 56.4 | 68.48 |
| Pioneer 26R31 | Untreated | 12.6 | 57 | 71.71 |
| USG 3665 | Dividend Extreme | 11.9 | 55.1 | 69.51 |
| SS 8309 | Raxil/Thiram | 12.5 | 54.7 | 63.70 |
| Renwood 3260 | Dividend Extreme | 12.5 | 58.1 | 63.32 |
| Featherstone 176 | Raxil/Thiram | 12.1 | 55.3 | 63.45 |
| USG 3209 | Dividend Extreme | 12.8 | 57 | 60.24 |

**Discussion:** Renwood 3706 had the highest yield, but also had 10 percent to 15 percent lodging. These are strip plots. Therefore, growers should compare these numbers with other tests across the area before making variety decisions.

## Middlesex Wheat Variety Plot 2006-2007

**Cooperators:** Producer: Jason Benton
Extension: David Moore, Middlesex, Keith Balderson, Essex
**Previous Crop:** Corn
**Planting Date** November 1, 2006
**Soil Type:** Suffolk, fine sandy loam
**Planting Info:** No-till 7.5-inch rows, 26 seeds/row foot
**Check:** Southern States 520
**Crop Protection:** Glyphosate Burndown; Warrior-December;
Harmony GT with 1st Shot N
**Fertilization:** 28-70-120 fall; 40/60 lbs nitrogen split
**Harvest Date:** June 21, 2007

| Variety | Treatment Code | Seed/lb | Test Weight (lb) | % Moisture | Yield @ 13.5% |
|---|---|---|---|---|---|
| Coker 9511 | Dx2 | 12300 | 63 | 14.8 | 77.9 |
| Check | RT | 12800 | 61 | 14.8 | 85.3 |
| Coker 9553 | Dx2 | 11050 | 62 | 14.7 | 79.9 |
| Check | | | 60 | 14.8 | 84.3 |
| SS 8302 | RT | 10860 | 62 | 14.7 | 87.0 |
| Check | | | 60 | 14.5 | 86.9 |
| SS 8309 | RT | 12680 | 57 | 14.4 | 87.9 |
| Check | | | 61 | 14.4 | 80.4 |
| Vigoro 9510 | DX | 12500 | 62 | 14.1 | 80.2 |
| Check | | | 60 | 14.2 | 85.9 |
| Dominion | DX | 11000 | 62 | 13.9 | 86.2 |
| Check | | | 61 | 14.3 | 85.5 |
| Pioneer 26R31 | U | 11500 | 61 | 14.1 | 82.9 |
| Check | | | 61 | 14.2 | 84.6 |
| Pioneer 26R87 | DX | 11000 | 64 | 14.0 | 73.8 |
| Check | | | 60 | 14.1 | 87.6 |
| Sisson | DX | 12140 | 63 | 14.0 | 83.5 |
| Check | | | 61 | 14.0 | 77.7 |
| Featherstone 176 | RT | 11222 | 62 | 13.8 | 78.8 |
| Check | | | 61 | 13.9 | 82.1 |
| USG 3209 | DX | 10400 | 60 | 13.7 | 84.1 |
| Check | | | 61 | 14.0 | 81.2 |
| Renwood 3706 | RA | 12553 | 61 | 13.5 | 80.4 |
| Check | | | XXXX not a complete check | | |
| Renwood 3260 | DX | 12180 | 62 | 13.5 | 77.7 |
| Check | | | XXXX not a complete check | | |
| USG 3665 | DX | 14000 | 61 | 13.5 | 90.9 |
| Check | | | | | |
| Average Non Check | | | 61.5 | | 82.2 |

**Treatment Code:**

Dx2 Dividend Extreme (4oz)
DX Dividend Extreme (2oz)
RT Raxil Thiram
U Untreated
RA Raxil Apron

## Wheat Variety Heading Dates

| | |
|---|---|
| Pioneer 26R87 | April 24 |
| SS 520 | April 25 |
| Pioneer 26R31 | April 27 |
| Coker 9553 | April 27 |
| Coker 9511 | April 27 |
| Featherstone 176 | April 30 |
| Dominion | April 30 |
| Renwood 3260 | April 30 |
| Renwood 3706 | April 30 |
| USG 3209 | April 30 |
| Sisson | May 1 |
| USG 3665 | May 2 |
| Vigoro 9510 | May 2 |
| SS 8309 | May 3 |
| SS 8302 | May 4 |

**Discussion:** It's always fun to do this plot. We even offered a prize to those attending the educational "walk-through" for picking the highest producing variety. Congratulations to Chuck Hunt for picking USG 3665 as the winner with a suspected yield of 90.5 bushels. As you can see, USG 3665 did top the plot at 90.7 bushels. Great guess, Chuck!

The varieties were very close in yields. Test weights were good and most varieties yielded good-looking, clean wheat. There were some scabby heads that did not harvest well and partial heads ended up in the samples. Two varieties showing this in particular were USG 3209 and SS8309. Scab and barley yellow dwarf virus were evident prior to dry down and at harvest. Pinkish spikelets and glumes, signifying scab, were present in several varieties at harvest. Try to make planting decisions based on scab resistance and test weight, as well as yield.

Use this and other Virginia Tech variety information when making planting decisions for 2007-2008.

## 2007 Chesapeake Wheat Variety Comparisons

**Cooperator:** Producer: G. C. Nicholas Jr.
Extension: Watson Lawrence, Chesapeake
**Date Planted:** November 1, 2006
**Previous Crop:** Corn
**Tillage:** Disk + Disk & Culti-packer
**Soil Type:** Chesapeake, fine sandy loam
**Fertilization:** October: 400 lbs 5-15-20 preplant
March 13: 90 lbs nitrogen (30%)
**Crop Protection:** March, 0.5 oz Harmony Extra with liquid nitrogen
**Date Harvested:** June 23, 2007

| Variety | Seed Treatment* | (%) Moisture | Test Weight (lbs) | Yield (bu/ac) |
|---|---|---|---|---|
| McCormick | U | 14.4 | 62 | 89.5 |
| Vigoro 9510 | DX | 13.8 | 60 | 86.8 |
| Southern States 560 | RT | 13.6 | 56 | 72.8 |
| Dominion | RT | 13.9 | 57 | 72.3 |
| Vigoro McIntosh | DX | 14.0 | 61 | 71.3 |
| So. States MPV57 | RT | 13.8 | 57 | 69.8 |
| Vigoro 9412 | DX | 14.1 | 58 | 69.2 |
| Pioneer 26R31 | U | 13.9 | 58 | 66.7 |
| Pioneer 26R15 | DX | 13.8 | 58 | 65.2 |
| Tribute | DX + R | 14.4 | 62 | 60.0 |

***Seed Treatment Code:**
DX: Dividend Extreme
R: Reldan
RT: Raxil Thiram
U: Untreated

**Discussion:** 2007 was a good year for wheat production. Test weights were good. Number 2 Soft Red Winter Wheat standards are 58 pounds. Wheat must be 56 pounds for sale at a discounted price. There were few pest problems. Cereal leaf beetles were not a significant pest this year. There were few problems with diseases, partly because it remained so dry in the spring. There was a spring infestation of barley yellow dwarf virus (BYDV) that had less impact than a fall infestation. This disease is spread by aphids, if the virus is present in the aphid population that year. There is no preplant measure of risk for BYDV. The Tribute variety also was impacted by a small patch of soil-borne wheat mosaic virus (SWMV). This virus is soil-borne, which may explain why it affected only a small area of the field on the end where the Tribute was. Typically, Tribute has been a top yielder for our area and this disease definitely affected its yield. McCormick had some lodging but still yielded well.

## 2007 Charles City Wheat Variety Strip Trial

| | | |
|---|---|---|
| **Cooperators:** | Producers: | George and David Black |
| | Extension: | Paul Davis, New Kent/Charles City |
| | Agribusiness: | Brian Noyes and Jim Wallace, CSWCD and various seed representatives |
| **Previous Crop:** | No-till corn | |
| **Planted:** | October 24, 2006 | |
| **Variety:** | see below | |
| **Soil type:** | Pamunkey, fine sandy loam | |
| **Tillage:** | No-till into corn stalks | |
| **Fertilizers:** | Preplant: 40-40-80 | |
| | Winter: 45 lbs 24-0-0-3 | |
| | Spring: 50 lbs 24-0-0-3 | |
| **Herbicides:** | Preplant: 26 oz Roundup + 1 pt. 2,4-D | |
| | January: 4.75 oz Osprey + .5 oz. Harmony + 2 oz. Warrior | |
| **Fungicides:** | May: Headline + 2 oz. Warrior | |
| **Insecticides:** | see above | |
| **Growth Regulator:** | May: 8 oz. Cerone | |
| **Harvested:** | June 21, 2007 | |

| | Cultivar | Yield (bu/ac) | % Moisture |
|---|---|---|---|
| 1 | Featherstone 176 | equip. malfunction | |
| 2 | SS MPV57 | 81.2 | 13.2 |
| 3 | SS 8309 | 60.3 | 11.4 |
| 4 | SS 8302 | 72.7 | 14.4 |
| 5 | Renwood 3260 | 75.7 | 13.4 |
| 6 | Renwood 3706 | 82.3 | 13.1 |
| 7 | USG 3209 | 80.4 | 14.2 |
| 8 | USG 3665 | 85.2 | 13.3 |
| 9 | USG 3342 | 80.1 | 13.1 |
| 10 | Sisson | 89.0 | 13.2 |
| 11 | Pioneer 26R31 | 88.4 | 13.3 |
| 12 | Pioneer 26R15 | 104.2 | 13.3 |
| 13 | Pioneer 26R87 | 74.1 | 10.7 |
| 14 | Coker 9184 | 76.8 | 14.1 |
| 15 | Corker 9553 | 77.2 | 13.6 |
| 16 | Coker 9511 | 82.7 | 13.3 |
| 17 | Tribute | 69.4 | 14.4 |
| 18 | Vigoro 9510 | 86.6 | 13.5 |
| 19 | Dominion | 85.3 | 13.0 |
| | **Averages** | 80.6 | 13.3 |

**Discussion:** Yields were good and seed quality excellent in this yield strip trial. Pioneer 26R15, Sisson, Pioneer 26R31, Vigoro 9510, USG 3665, and Dominion varieties were all well above the plot average of 80.6 bushels per acre.

## Prince George/Dinwiddie Wheat Variety Trial

**Cooperators:** Producer: Glenn F. Chappell
Extension: Glenn F. Chappell II, Prince George
Mike Parrish, Dinweiddie
**Date Planted:** November 29, 2006
**Soil Type:** Emporia, sandy loam
**Previous Crop:** Corn
**Tillage/equipment:** JD 1590 No-till drill
**Fertilization:** Pre-plant: 50-50-50
February 28: 70-0-0
March 30: 50-0-0
**Crop Protection:** March 30: 2.0 oz Warrior
6.0 oz Headline
0.5 oz Harmony Extra
**Date Harvested:** June 27, 2007, JD 6620

| Treatment | Vigor (0-5)** | % Moisture | Test Weight (lb) | Yield (bu/ac @ 13.5%) | % of Plot Avg |
|---|---|---|---|---|---|
| Sisson | 2 | 11.4 | 57 | 59.4 | 94.52 |
| USG 3342 | 3 | 10.7 | 58 | 70.1 | 111.52 |
| USG 3209 | 4 | 11.9 | 58 | 68.9 | 109.63 |
| USG 3665 | 3 | 10.7 | 55 | 69.1 | 109.96 |
| Coker 9553 | 3 | 10.8 | 59 | 68.3 | 108.67 |
| Coker 9511 | 3 | 11.8 | 60.5 | 67.8 | 107.82 |
| Coker 9184 | 3 | 11.8 | 60 | 66.6 | 105.89 |
| Featherstone 176 | 3 | 11.1 | 57 | 74.7 | 118.74 |
| Pioneer 26R31 | 4 | 10.0 | 57.5 | 60.5 | 96.18 |
| Pioneer 26R15 | 1 | 11.0 | 55 | 50.6 | 80.43 |
| Pioneer 26R87 | 3 | 9.8 | 61.5 | 63.0 | 100.24 |
| Renwood 3260 | 4 | 11.9 | 60 | 59.8 | 95.06 |
| VCIA 3706 | 3 | 10.5 | 57 | 56.3 | 89.51 |
| FFR 8302 | 3 | 10.5 | 57.5 | 59.8 | 95.08 |
| FFR 8309 | 2 | 10.3 | 56.5 | 52.9 | 84.08 |
| FFR MPV 57 | 3 | 11.5 | 57 | 55.1 | 87.70 |
| Dominion | 3 | 9.4 | 59 | 66.3 | 105.44 |
| Tribute | 3 | 9.9 | 61 | 62.5 | 99.45 |
| Vigoro 9510 | 3 | * | * | * | * |
| **Plot Average:** | | | | **62.9** | |

*= missing data
**Vigor – 0 = Poor and 5 = Good. Ratings were taken March 12, 2007, and are relative to the other varieties in the study. A vigor rating of 3 represents the overall average of the varieties in the plot.

**Discussion:** Grain planting was delayed because of wet conditions. Following the early moisture, the remaining season was dry through harvest. Lodging, disease, and insects were not noteworthy factors.

## 2007 On-Farm Wheat Variety Plot Yield Summary

| Variety | Westmoreland | Charles City | Middlesex | Chesapeake | P.G./ Dinwiddie | Avg | Ranking |
|---|---|---|---|---|---|---|---|
| Coker 9553 | 60.2 | 77.2 | 79.9 | | 68.3 | 71.4 | 12 |
| 3706 | 79.3 | 82.3 | 80.4 | | 56.3 | 74.5 | 5 |
| Dominion | 74.8 | 85.3 | 86.2 | 72.3 | 66.3 | 76.9 | 3 |
| Pioneer 26R87 | 62.5 | 74.1 | 73.8 | | 63.0 | 68.3 | 15 |
| Coker 9511 | 63.8 | 82.7 | 77.9 | | 67.8 | 73.0 | 9 |
| Vigoro 9510 | 61.4 | 86.6 | 80.2 | 86.8 | | 78.7 | 1 |
| Sisson | 68.4 | 89.0 | 83.5 | | 59.4 | 75.1 | 4 |
| Pioneer 26R31 | 71.7 | 88.4 | 82.9 | 66.7 | 60.5 | 74.0 | 6 |
| SS 8309 | 63.7 | 60.3 | 87.9 | | 52.9 | 66.2 | 16 |
| Renwood 3260 | 63.3 | 75.7 | 77.7 | | 59.8 | 69.1 | 13 |
| Featherstone 176 | 63.4 | | 78.8 | | 74.7 | 72.3 | 10 |
| USG 3209 | 60.2 | 80.4 | 84.1 | | 68.9 | 73.41 | 7 |
| SS MPV57 | | 81.2 | | 69.8 | 55.1 | 68.7 | 14 |
| SS 8302 | 67.0 | 72.7 | 87.0 | | 59.8 | 71.6 | 11 |
| USG 3665 | 69.5 | 85.2 | 90.9 | | 69.1 | 78.6 | 2 |
| USG 3342 | | 80.1 | | | 70.1 | | |
| Pioneer 26R15 | | 104.2 | | 65.2 | 50.6 | 73.3 | 8 |
| Coker 9184 | | 76.8 | | | 66.6 | | |
| Tribute | | 69.4 | | 60.0 | 62.5 | 63.9 | 17 |
| McCormick | | | | 89.5 | | | |
| SS 560 | | | | 72.8 | | | |
| McIntosh | | | | 71.3 | | | |
| Vigoro 9412 | | | | 69.2 | | | |
| **Location Average** | **66.4** | **80.6** | **82.2** | **72.3** | **62.8** | | |

A variety must be entered in at least three locations for an average to be reported. See the individual plot results in this publication for additional information. Some of the plots used check varieties. Yields of the checks are not reported here.

# Stalk Management Plot

## Standing vs. Shredded Stalks

**Cooperators:** Producer: Jason Benton
Extension: David Moore, Middlesex
**Previous Crop:** Corn
**Soil Type:** Suffolk, fine sandy loam
**Plant Date:** November 2, 2006
**Fertilization:** 28-70-120 in fall, 40/60 split nitrogen application
**Crop Protection:** Glyphosate Burndown, 0.5 oz Harmony GT
May 1: 6 oz Headline
**Variety:** Southern States 520
**Harvest Date:** June 16, 2007

| Application | % Moisture | Test Weight | Yield @ 13.5% |
|---|---|---|---|
| Standing Stalks | 15.6 | 60 | 77.1 |
| Shredded Stalks | 15.4 | 60 | 74.6 |
| Standing Stalks | 15.6 | 60 | 81.3 |
| Shredded Stalks | 15.5 | 60 | 82.5 |
| Standing Stalks | 15.5 | 60 | 80.3 |
| Shredded Stalks | 15.4 | 60 | 85.2 |
| Average Standing | | | 79.6 |
| Average Shredded | | | 80.8 |

**Discussion:** The objective of this test was to see if there are any significant differences in yield, TW, etc. of wheat planted into standing stalks versus shredded stalks. From this test, I would say that statistically, there were none.

Several producers have switched to this practice and are very satisfied with no yield "drag" while saving a trip across the field. There are, however, concerns with planting (good seed-to-soil contact) into these stalks and also a concern about the aesthetic appearance of the field when leaving the stalks standing. Planting on an angle will help decrease "stalk clogging" while planting into standing stalks.

Use this and other Virginia Tech replicated plot information when making planting decisions for 2007-2008.

# Wheat Seed Treatment Plots

## 2007 New Kent Wheat Seed Treatments to Control Barley Yellow Dwarf Virus

**Cooperators:** Producers: Davis Produce
Extension: Paul Davis, New Kent/Charles City
**Previous Crop:** No-till corn
**Planted:** October 26-27, 2006
**Variety:** Pioneer 26R15
**Soil type:** Altavista, fine sandy loam
**Tillage:** No-till
**Fertilizers:** October 5: 30-40-80
December 14: 25 lbs nitrogen
February 11: 30 lbs nitrogen
March 26: 55 lbs nitrogen
**Herbicides:** October 5: 1 qt of Roundup Max
February 11: 0.403 oz/ac of Harmony Extra
**Insecticides:** December 14: 1.56 oz/ac of Karate
**Harvested:** June 23, 2007

| # | Material | Rate/ac | Total Hits[1] | Total Area Infected (sq ft) | Test Weight (lb) | % Moisture | Bu/ac |
|---|---|---|---|---|---|---|---|
| **1** | Untreated | — | 36.75 a | 11.340 a | 59.3 | 11.0 | 69.62 |
| **2** | Untreated + Warrior | 2.56 oz/ acre | 5.50 cb | 0.170 d | 59.8 | 10.7 | 66.79 |
| **3** | Gaucho 600 FS | 0.79 oz/ cwt | 21.00 b | 0.927 cd | 59.3 | 11.1 | 64.32 |
| **4** | Cruiser 5FS | 0.74 oz/ cwt | 13.75 bc | 0.825 cd | 59.5 | 11.7 | 71.03 |
| **#** | **Material** | **Rate/ac** | **Total Hits[1]** | **Total Area Infected (sq ft)** | **Test Weight (lb)** | **% Moisture** | **Bu/ac** |
| **5** | V10170 | 10 g ai/hkg | 25.75 ab | 1.695 b | 59.3 | 11.2 | 67.00 |
| **6** | V10170 | 30 g ai/hkg | 15.00 bc | 0.946 bc | 60.0 | 11.2 | 66.47 |
| **7** | V10170 | 50 g ai/hkg | 6.50 c | 0.345 cd | 60.7 | 11.3 | 68.56 |

[1]*Means within a column followed by the same letter(s) are not significantly different.*

**Discussion**: Due to low BYDV pressure there were no significant yield differences in treatments. Even with low aphid pressure, the untreated seed had significantly more area infected with BYDV than all the seed treatments.

## 2007 Charles City Wheat Seed Treatment
## To Control Barley Yellow Dwarf Virus

**Cooperators:** Producers: David and George Black
Extension: Paul Davis, New Kent/Charles City
**Previous Crop:** No-till corn
**Planted:** October 25, 2006
**Variety:** McCormick
**Soil type:** Pamunkey, fine sandy loam
**Tillage:** No-till in corn stalks
**Fertilizers:** Preplant: 40-40-80
Winter: 45 lbs 24-0-03
Spring: 50 lbs 24-0-03
**Herbicides:** Preplant: 26 oz Roundup + 1 pt 2,4-D
January: 4.75 oz Osprey + 0.5 oz Harmony
**Insecticides:** January: 2 oz Warrior
**Harvested:** June 20, 2007

| # | Material | Rate/ac | Total Hits[1] | Total Area Infected (sq ft) | Test Weight (lb) | Bu/ac |
|---|---|---|---|---|---|---|
| **1** | Untreated | — | 0.75 a | 0.0164 a | 58.63 c | 106.01 ab |
| **2** | Gaucho 600 FS | 0.79 oz/cwt | 0.75 a | 0.0164 a | 59.83 a | 106.50 ab |
| **3** | Untreated + Warrior | 2.56 oz/ A | 0.00 a | 0.0000 a | 59.40 ab | 101.00 b |
| **9** | Cruiser 5FS | 0.74 oz/cwt | 0.25 a | 0.0055 a | 59.75 ab | 101.53 b |
| **#** | **Material** | **Rate/ac** | **Total Hits[1]** | **Total Area Infected (sq ft)** | **Test Weight (lb)** | **Bu/ac** |
| **4** | V10170 | 10 g ai/hkg | 1.00 a | 0.0286 a | 59.83 a | 108.95 ab |
| **5** | V10170 | 30 g ai/hkg | 0.50 a | 0.0109 a | 59.03 bc | 102.50 ab |
| **6** | V10170 | 50 g ai/hkg | 1.25 a | 0.0341 a | 59.63 ab | 110.15 a |

[1]*Means within a column followed by the same letter(s) are not significantly different*

**Discussion:** This plot was accidentally treated with 2 ounces of Warrior in January, which gave great control of the aphids that transmit BYDV. The new numbered insecticide does show promise, in that it produced yields not significantly different from Gaucho and Cruiser.

# Crop Protection Plots

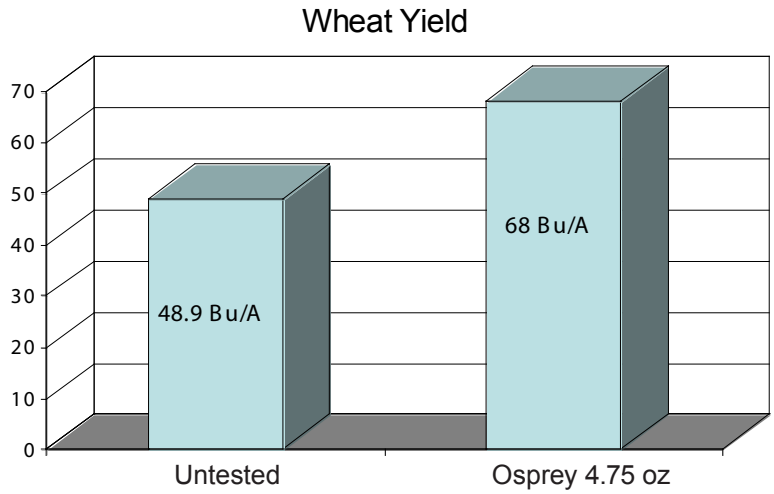
## Evaluating Osprey on Winter Wheat

| | | |
|---|---|---|
| **Cooperators:** | Producers: | Lewis Everett |
| | | M.L. Everett |
| | Extension: | Wes Alexander, Southampton County |
| | | Cyndi Estienne, Greensville County |
| | | Wade Thomason, Virginia Tech |
| | Agribusiness: | Franklin Dowless, Bayer CropScience |
| | | Coastal AgroBusiness |
| **Soil Name:** | Emporia, fine sandy loam | |
| **Planted:** | December 5, 2006 | |
| **Variety:** | USG 3209 | |
| **Seeding Rate:** | 2.5 bu/ac | |
| **Herbicides:** | 4.75 oz Osprey, 1.33 pt methylated seed oil, 20 gal water | |
| **Plot Size:** | 60 feet x 450 feet (average) | |
| **Replications:** | Four | |
| **Harvested:** | June 21, 2007 | |

| Plot Number | Harvest Weight | Test Weight | % Moisture | 13.5% Moisture (bu/ac) |
|---|---|---|---|---|
| 101 | 542 | 59.0 | 15.1 | 53.0 |
| 102 | 756 | 60.0 | 14.9 | 71.11 |
| 201 | 418 | 60.0 | 14.8 | 39.27 |
| 202 | 760 | 60.5 | 14.7 | 65.88 |
| 301 | 642 | 60.5 | 14.6 | 53.03 |
| 302 | 812 | 60.5 | 14.7 | 66.27 |
| 401 | 618 | 61.0 | 14.7 | 50.22 |
| 402 | 858 | 60.5 | 14.5 | 68.55 |

| Treatment | Av. Yield |
|---|---|
| 1 - No herbicide | 48.9 |
| 2 - 4.75 oz Osprey | 68.0 |
| LSD 0.05 | 8.8 |
| Pr>F | 0.006 |

Treatment 1 = Untreated check
Treatment 2 = 4.75 oz Osprey, 1.33 pt. methylated seed oil, 20 gal. water




Alexander, W.C.; Estienne, C.K.; Thomason, W.

**Discussion:** Many acres of wheat in Southampton County are planted no-till following cotton without an herbicide burn down. An increasing problem is the prolificacy of annual bluegrass (*Poa annua*). Few herbicides are labeled to control annual bluegrass post emergence in winter wheat. Osprey was applied 23 days after wheat was planted. A considerable coverage of annual bluegrass was present. No additional herbicides were applied. Wheat tillered better after the Osprey treatment and there was significantly less broadleaf-weed competition observed in the treated plots compared to the untreated plots. Wheat was harvested on June 21, 2007, and weighed using a calibrated weigh wagon. The treated plots had a nearly 20 bushel increase. Moisture was determined using a Farmex multi-grain moisture tester and test weight was determined using a Berckes portable grain scale.

## Wheat Fungicide Study

**Cooperators:** Producer: Jason Benton
Extension: David Moore, Middlesex
Industry: Southern States, Gloucester
**Previous Crop:** Corn
**Soil Type:** Suffolk, fine sandy loam
**Plant Date:** November 2, 2006
**Fertilization:** 28-70-120, 40/60 Split N Application
**Crop Protection:** Glyphosate burn down, 0.5 oz Harmony GT
May 1: 6 oz Headline/acre on treated replications
**Harvest Date:** June 16, 2007

| Treatment | % Moisture | Test Weight (lb) | Yield @ 13.5% |
|---|---|---|---|
| Fungicide | 16.9 | 58 | 71.7 |
| No Treatment | 16.9 | 59 | 70.4 |
| Fungicide | 17.0 | 59 | 72.2 |
| No Treatment | 16.6 | 60 | 73.9 |
| Fungicide | 16.4 | 60 | 77.3 |
| No Treatment | 15.6 | 59 | 70.8 |
| **Average Fungicide** | | | **73.7** |
| **Average No Treatment** | | | **71.7** |

**Discussion:** Lots of plot work has been done with fungicides on wheat in order to see if applications of fungicides increase yields. There was no visible difference in this plot until plants were drying down, and then the fungicide treated areas appeared cleaner and brighter.

Fungicide treated areas averaged 2 bushels better than the untreated. At $4.00 wheat, it will be trading dollars, at best, to make this application with no disease present in order to get a yield boost. Southern States 520 was relatively clean and disease-free this spring. Applications to other wheat varieties may have made a more significant difference in yield.

Use this and other Virginia Tech variety and production plot work information when making planting decisions for 2007-2008.

## 2007 Late Season Wheat

## Foliar Fungicide Plot Study

| | | |
|---|---|---|
| **Cooperators:** | Producers: | George and David Black |
| | Extension: | Paul Davis, New Kent/Charles City |
| | Agribusiness: | Brian Noyes and Jim Wallace, CSWCD and various seed representatives |
| **Previous Crop:** | No-till corn | |
| **Planted:** | October 24, 2006 | |
| **Variety:** | See below | |
| **Soil type:** | Pamunkey, fine sandy loam | |
| **Tillage:** | No-till into corn stalks | |
| **Fertilizers:** | Preplant: | 40-40-80 |
| | Winter: | 45 lbs 24-0-0-3 |
| | Spring: | 50 lbs 24-0-0-3 |
| **Herbicides:** | Preplant: | 26 oz Roundup + 1 pt 2,4-D |
| | January: | 4.75 oz Osprey + 0.5 oz Harmony |
| **Insecticides:** | January | 2 oz Warrior with herbicides |
| **Growth Regulator:** | May | 8 oz Cerone |
| **Harvested:** | June 21, 2007 | |

| Treatment | Rate | Avg Test Weight | Avg bu/ac | Avg % Moisture |
|---|---|---|---|---|
| Untreated | — | 60.0 | 80.0 | 13.2 |
| Tilt | 4 oz flagleaf | 60.4 | 85.2 | 12.5 |
| Stratego | 10 oz flagleaf | 60.9 | 82.1 | 13.3 |
| Quilt | 10 oz flagleaf | 59.7 | 80.0 | 13.7 |
| Headline | 6 oz flagleaf | 61.2 | 81.7 | 12.9 |
| Tilt | 4 oz heading | 60.9 | 77.6 | 12.9 |
| Stratego | 10 oz heading | 60.8 | 83.5 | 12.9 |
| Headline | 6 oz heading | 60.8 | 84.2 | 13.1 |
| Headline | 3 oz flagleaf + 3 oz heading | 60.8 | 84.3 | 12.9 |
| Quilt | 7 oz flagleaf + 10 oz heading | 61.2 | 80.9 | 13.6 |

* Flagleaf application: 4/18/07
* Heading application: 5/4/07

**Discussion:** This year, the disease pressure was low due to dry conditions (February through May). The Tilt at flag leaf emergence and Stratego and Headline at heading increased yields by over 3.5 bushels per acre compared to the untreated check. Overall yields were not statistically different. Scouting fields and using economic thresholds to make treatment decisions is still a wise investment of time.

# Soil Fertility Plots and Tissue Sample Results

## Effect of Adding Nutrisphere Nitrogen to Wheat Response to Spring Nitrogen Application 2007

**Cooperators:** Producer: Jimmy Ferguson
Extension: Cyndi Estienne, Greensville/Emporia
Wes Alexander, Southampton
Wade Thomason, Virginia Tech
Agribusiness: Southern States Cooperative, Emporia
**Variety:** Southern States 560
**Row Width:** 7.5 inches
**Soil Type:** Dothan, loamy sand
**Date Planted:** November 28, 2006
**Spray Equipment:** Terragator Air Max (8006 AI nozzles)
**Nitrogen Source:** 30% Urea Ammonium Nitrogen
**Nutrisphere N Rate:** 0.5 gal/100 gal UAN
**Herbicide:** Harmony 0.5 oz/acre at first spring nitrogen application
**Initial N application:** 40 lbs/acre post planting
**First Spring N Application:** February 28, 2007
**Second Spring N Application:** April 9, 2007
**Plot Size:** 60 feet x 500 feet (average length)
**Replications:** Four
**Date Harvested:** June 18, 2007

| Treatment | Test Weight (lb) | % Moisture | Yield (bu/ac @ 1 3.5 %) |
|---|---|---|---|
| 80 units of Nitrogen applied at first spring application | 60.6 | 11.3 | 68.92 |
| 80 units of Nitrogen + Nutrisphere N applied at first spring application | 60.5 | 11.5 | 66.88 |
| 50 units of Nitrogen applied at first and second spring application | 61.3 | 11.3 | 68.50 |

LSD = 0.05

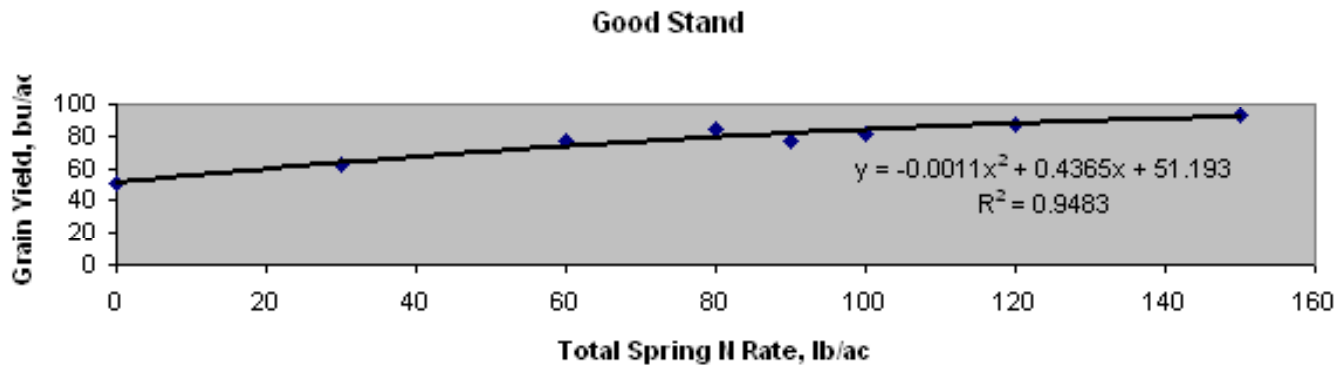
**Discussion:** Current practices of splitting spring nitrogen applications to wheat are aimed at ensuring nitrogen availability at plant growth stages when it is needed since nitrogen is lost to leaching, especially in sandy soils characteristic of southeast Virginia. Nutrisphere N, a product whose mode of action is to bind nickel ions necessary for the enzyme reactions converting $NH_4$ to $NH_3$ and $NO_2$, is said to slow nitrate leaching, denitrification, and volatilization. In order to determine if the addition of Nutrisphere N to the first spring nitrogen application could eliminate the need for the second spring nitrogen application, this experiment was conducted. There was no significant difference in yield, test weight, or moisture of harvested wheat in any of the three treatments.

Neither split application of nitrogen nor addition of Nutrisphere nitrogen improved yields when compared to a single spring nitrogen application in this trial utilizing less than intensive wheat management.

# 2007 Nitrogen Rate Study on Good Wheat Stand under Long-term Continuous No-till Production Systems

| | | |
|---|---|---|
| **Cooperators:** | Producers: | George and David Black |
| | Extension: | Paul Davis, New Kent/Charles City |
| | Agribusiness: | Brian Noyes and Jim Wallace, CSWCD and various seed representatives |
| **Previous Crop:** | No-till corn | |
| **Planted:** | October 24, 2006 | |
| **Variety:** | Maxine (Hard Red Winter Wheat) | |
| **Soil Type:** | Pamunkey, fine sandy loam | |
| **Tillage:** | No-till into corn stalks | |
| **Fertilizers:** | Preplant: | 40-40-80 |
| | Winter: | See below |
| | Spring: | See below |
| **Herbicides:** | Preplant: | 26 oz Roundup + 1 pt 2,4-D |
| | January: | 4.75 oz Osprey + 0.5 oz Harmony + |
| **Insecticides:** | 2 oz Warrior with herbicides in January | |
| **Growth Regulator:** | None | |
| **Harvested:** | June 21, 2007 | |

| GS 25 N Rate | GS 30 N Rate | Avg % Moisture | Avg Test Weight | Avg Yield (bu/ac) |
|---|---|---|---|---|
| 0 | 0 | 13.5 | 59.0 | 50.8 |
| 0 | 30 | 13.4 | 59.6 | 68.0 |
| 0 | 60 | 13.3 | 59.4 | 74.2 |
| 0 | 90 | 13.5 | 59.4 | 75.4 |
| 30 | 0 | 13.1 | 59.5 | 54.0 |
| 30 | 30 | 13.4 | 59.2 | 78.4 |
| 30 | 60 | 13.3 | 60.2 | 76.1 |
| 30 | 90 | 13.2 | 59.7 | 91.4 |
| 60 | 0 | 12.9 | 59.7 | 76.0 |
| 60 | 30 | 13.2 | 59.5 | 84.4 |
| 60 | 60 | 13.0 | 58.7 | 79.8 |
| 60 | 90 | 13.2 | 59.6 | 92.7 |
| 90 | 0 | 13.3 | 59.7 | 76.7 |
| 90 | 30 | 13.5 | 59.5 | 86.7 |
| 30 + Eco-min | 60 | 13.3 | 59.6 | 72.3 |
| 60 + Eco-min | 60 | 13.6 | 59.6 | 91.8 |
| 40 | 60 | 13.5 | 59.5 | 81.7 |
| 40 + Eco-min | 60 | 13.6 | 60.3 | 79.9 |
| 20 | 60 | 13.4 | 59.2 | 84.2 |
| 20 + Eco-min | 60 | 13.5 | 59.7 | 83.3 |

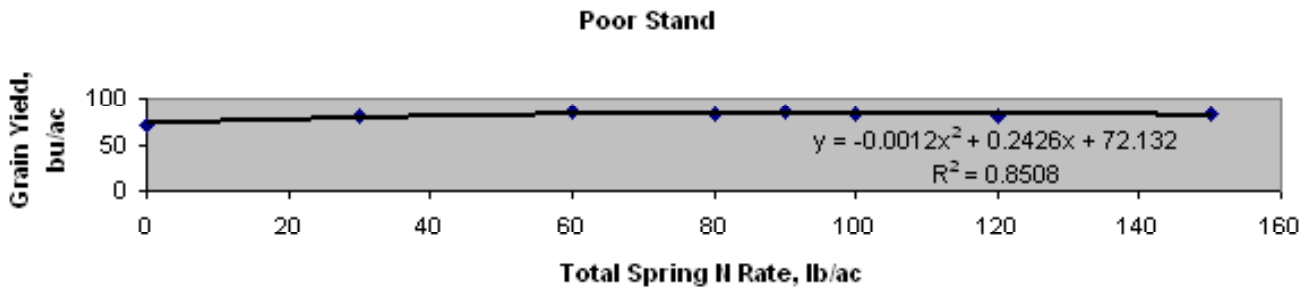



**Discussion:** The addition of Eco-min did not give a yield response at the 200 pounds per acre rate. The max nitrogen rate of 150 pounds gave the highest yield at 92.7 bu/ac but this was not significantly different from the 120- and 100-pound rates, even though they were 12 bushels per acre less. The 0-nitrogen rate yielded 50 bushels per acre, which shows that in a corn, wheat, and soybean rotation without tillage there is nitrogen becoming available for the wheat in the spring.

## 2007 Nitrogen Rate Study on a Poor Wheat Stand under Long-term Continuous No-till Production Systems

**Cooperators:** Producers: George and David Black
Extension: Paul Davis, New Kent/Charles City
Agribusiness: Brian Noyes & Jim Wallace, CSWCD and various seed representatives
**Previous Crop:** No-till corn
**Planted:** October 24, 2006
**Variety:** McCormick
**Soil Type:** Pamunkey, fine sandy loam
**Tillage:** No-till into corn stalks
**Fertilizers:** Preplant: 40-40-80
Winter: See below
Spring: See below
**Herbicides:** Preplant: 26 oz Roundup + 1 pt. 2,4-D
January: 4.75 oz Osprey + .5 oz Harmony +
**Insecticides:** 2 oz Warrior with herbicides in January
**Growth Regulator:** None
**Harvested:** June 21, 2007

| GS 25 N Rate | GS 30 N Rate | Avg % Moisture | Avg Test Weight | Avg Yield (bu/ac) |
|---|---|---|---|---|
| 0 | 0 | 12.7 | 60.8 | 70.6 |
| 0 | 30 | 13.2 | 60.9 | 80.8 |
| 0 | 60 | 12.1 | 59.8 | 83.2 |
| 0 | 90 | 11.8 | 60.1 | 77.4 |
| 30 | 0 | 12.8 | 60.7 | 79.9 |
| 30 | 30 | 12.7 | 60.8 | 82.5 |
| 30 | 60 | 11.5 | 59.3 | 82.7 |
| 30 | 90 | 11.9 | 59.0 | 82.0 |
| 60 | 0 | 12.2 | 59.3 | 86.7 |
| 60 | 30 | 12.5 | 58.8 | 84.2 |
| 60 | 60 | 12.2 | 59.3 | 83.8 |
| 60 | 90 | 11.7 | 58.7 | 82.5 |
| 90 | 0 | 12.0 | 59.5 | 93.9 |
| 90 | 30 | 11.9 | 58.7 | 77.0 |
| 30 + Eco-min | 60 | 12.2 | 59.4 | 82.9 |
| 60 + Eco-min | 60 | 11.5 | 58.8 | 82.1 |
| 40 | 60 | 11.6 | 59.3 | 92.5 |
| 40 + Eco-min | 60 | 11.5 | 59.4 | 74.9 |
| 20 | 60 | 11.9 | 59.1 | 81.9 |
| 20 + Eco-min | 60 | 11.6 | 58.9 | 82.4 |




**Discussion:** There was no response to the addition of 200-pound rate of Eco-min at this location. The addition of only 30 lbs. of nitrogen gave equal yields to higher nitrogen rates. Significant lodging occurred to all nitrogen rates above 60 pounds. These are excellent yields from a beginning stand that was estimated at only 70 percent.

# Small Grain 2006-07 Tissue-sampling Project

*Keith Balderson, Extension Agent, Agriculture and Natural Resources*

Plant tissue testing, in conjunction with soil testing, is an excellent method for monitoring plant nutrition to solve problems and to determine if the fertilization program is providing optimum nutrition. During the 2006-2007 small grain production season, Extension agents from eastern Virginia submitted 37 plant tissue samples for testing at a local laboratory. Many of the samples were submitted for troubleshooting a crop problem. A complete analysis was run on 27 samples, while nitrogen (N) only was run on 10 samples in an effort to monitor nitrogen levels in the plant and help farmers make economically and environmentally sound nitrogen fertilizer applications.

The most prevalent deficiency found this year was sulfur (S). Faced with high nitrogen fertilizer prices, many farmers eliminated spring sulfur applications on small grains. In southeastern Virginia, eliminating peanuts from the rotation has resulted in a decreased use of land plaster (calcium sulfate), which supplies large quantities of plant-available S. Of the 27 samples we submitted, eight indicated S deficiency. The deficiencies were mild to severe, and they generally did not show up until growth stage 25-30. Deficiencies were found on sandy-textured surface soils that contained very little clay in the subsoil. This would be expected as S in the sulfate (plant available) form leaches much in the same manner as N in the nitrate form. When interpreting plant tissue test results for sulfur deficiency, one should pay particular attention to the nitrogen to sulfur ratio. A N:S ratio greater than 15 indicates sulfur is probably limiting, especially if adequate N has been applied. In our samples with S deficiency, the N:S ratio ranged from 18 to 30.

Plants suffering from S deficiency were stunted, with yellowing appearing first on the young upper leaves. In contrast, nitrogen deficiency symptoms appear first on the older leaves, and in wheat, plants may have a reddish tinge during the winter when N is limiting. In general, S applications of 12 to 20 pounds per acre corrected the deficiencies. However, yield potential was probably lost because applications should have been made earlier in the growing season.

Soil type differences within this field were readily apparent from the sulfur deficiency pattern. The soil type in the pale areas had a much higher sand content down to 3 feet than the soil type in the dark green areas.

The pictures below were taken of a field that had been ripped prior to cotton planting in the spring of 2006. Notice the strips of S deficiency, which is an indication that the wheat roots were able to go deeper in the ripped areas and pick up sulfur that had accumulated deeper in the soil profile. These pictures are "before and after" shots where 16 pounds of sulfur per acre were applied on April 19. This field is an example of a soil that had adequate clay in the subsoil which held S, but with a compacted layer between the surface soil and the subsoil, deep tillage prior to wheat planting may be useful. However, as we need to limit tillage passes after ripping, the use of a no-till ripper prior to wheat planting may be beneficial on these soils.

**March 30, 2007**

**April 25, 2007, 6 days after application**

Tissue sample results this year also indicated magnesium deficiencies on relatively sandy fields with a long history of lime-stabilized bio-solids application. The lime used in the stabilization process is very high in calcium and low in magnesium, and barley appears to be more sensitive to this deficiency than wheat.

Potassium, calcium, and magnesium are all cations (have a positive charge) in the soil solution. They need to be somewhat balanced in the soil solution or one of them might become deficient to the plant. When the soil solution has one cation available to it in much higher concentrations than the other two, that cation will dominate the soil solution, thus leaving the other two out and possibly causing deficiencies. This can occur even when soil test levels indicate that adequate amounts of the nutrient are in the soil.

When soil testing, we would like to see the magnesium base saturation at 12 percent to 15 percent with a minimum of 10 percent. On some fields with a long history of lime-stabilized bio-solids application, we are seeing readings below 5 percent.

Dolomitic limestone is the least expensive method of applying magnesium to soils. We **strongly recommend** that on fields with a potential for magnesium deficiencies that the producer apply dolomitic limestone rather than lime-stabilized bio-solids when the soil pH indicates a lime application is needed.

Bio-solids are a valuable soil amendment that supplies lime (in many cases), nitrogen, phosphorous, organic matter, and micronutrients. Farmers who utilize this product in crop production should use an intensive soil and plant tissue-testing program to help them monitor crop nutrition.

The following picture is from a barley field suffering from magnesium deficiency. Some spots in the field actually died from the deficiency. Magnesium deficiency looks very similar to manganese deficiency. Plant tissue testing should be used to verify the deficiency so that growers can make the proper fertilizer application.

These are excellent examples of how tissue testing can be utilized to help develop an efficient fertility program for small grains and troubleshoot problems. As fertilizer prices continue to increase, utilizing this tool will become more important for maintaining profitability.

# Planting Depth Observations

## No-tillage Wheat Production and Planting Depth: Observations from the Field

*Keith Balderson, Extension Agent, Agriculture and Natural Resources*

Proper seed placement remains a major challenge in no-till small-grain production, especially in high levels of corn residue. Residue management, planting speed, soil moisture, soil density, and drill weight are all factors in seed placement. Placing the seed at the proper depth (1 to 1.5 inches) below the soil surface of the **soil, not the residue**, is critical to achieving good seed-to-soil contact and proper tiller development. Shallow planting can also lead to increased winter kill.

The following picture shows how plant emergence and tiller development can be affected by planting depth. These plants were located in the same field within a few feet of each other. The plant on the left was planted at about 0.75 of an inch **in the soil**, and the plant on the left was planted in the corn residue. This picture was taken in early March when we would expect three tillers per plant on timely planted wheat. The plant on the left has tillered properly, while the plant on the right has not.

***Shallow planting can lead to tiller death as shown in this picture taken in early March.***

Consistent stands of well-tillered wheat are very important in producing high yields. It is estimated that as much as 60 percent of the yield potential of a field of wheat is determined when planting is completed. Some of the yield potential in this field was lost at planting due to poor seed placement, which resulted in a less than optimum stand. This picture was taken in eastern Virginia in mid March.

Planting into heavy corn residue can be a challenge. The job can be made easier by following the following recommendations.

1. Aim to plant 1 to 1.5 inches into the soil.
2. Distribute the residue as evenly as possible.
3. Allow the residue to dry off before planting to minimize hairpinning.
4. Replace worn coulters and double disc openers when necessary.
5. Don’t plant too fast. Four miles per hour is fast enough.
6. Check the depth from time to time. Changes in soil type and soil moisture can affect planting depth.

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