

ON-FARM WHEAT TEST



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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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

¹Means 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

¹Means 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

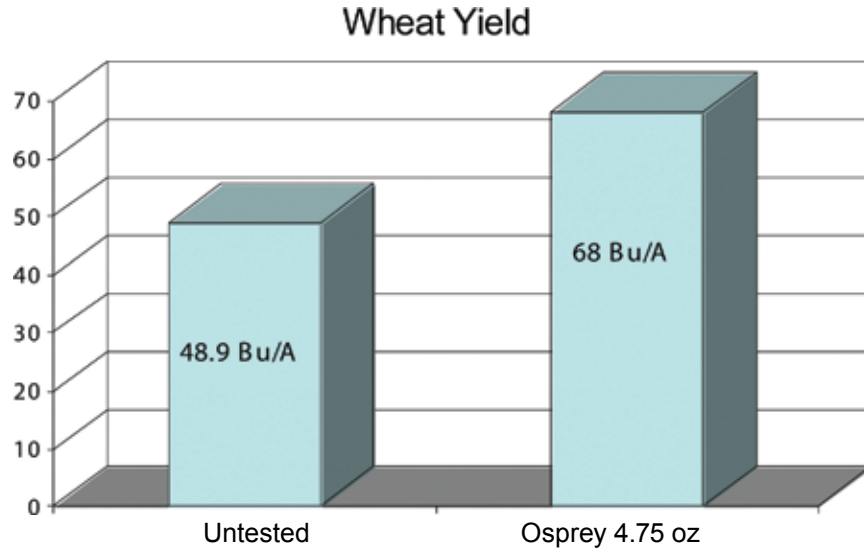
Soil Name: Emporia, fine sandy loam
Planted: December 5, 2006
Variety: USG 3209
Seeding Rate: 2.5 bu/ac
Herbicides: 4.75 oz Osprey, 1.33 pt methylated seed oil, 20 gal water
Plot Size: 60 feet x 450 feet (average)
Replications: Four
Harvested: June 21, 2007

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, Greenville/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 @ 13.5 %)
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

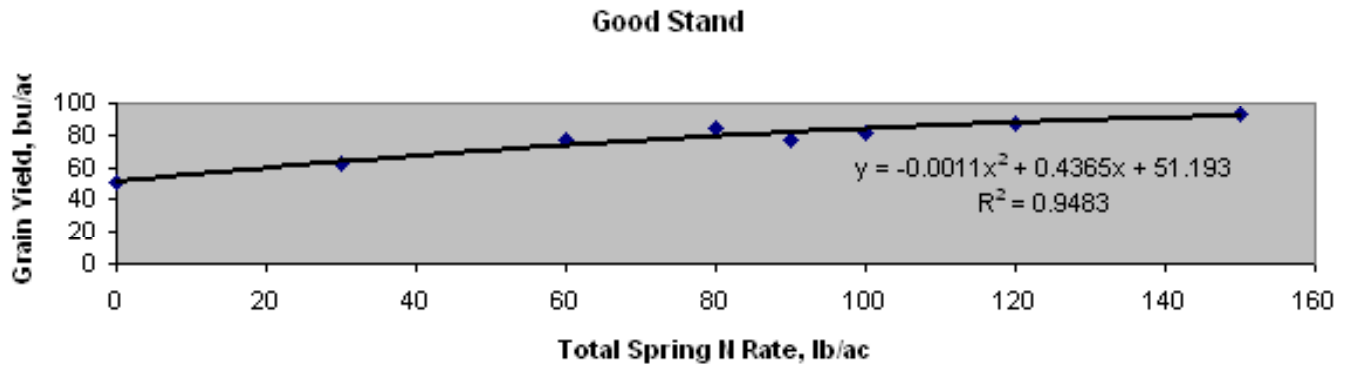
Discussion: Current practices of splitting spring nitrogen applications to wheat are aimed at ensuring nitrogen availability at plant growth stages when it is needed since nitrogen is lost to leaching, especially in sandy soils characteristic of southeast Virginia. Nutrisphere N, a product whose mode 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

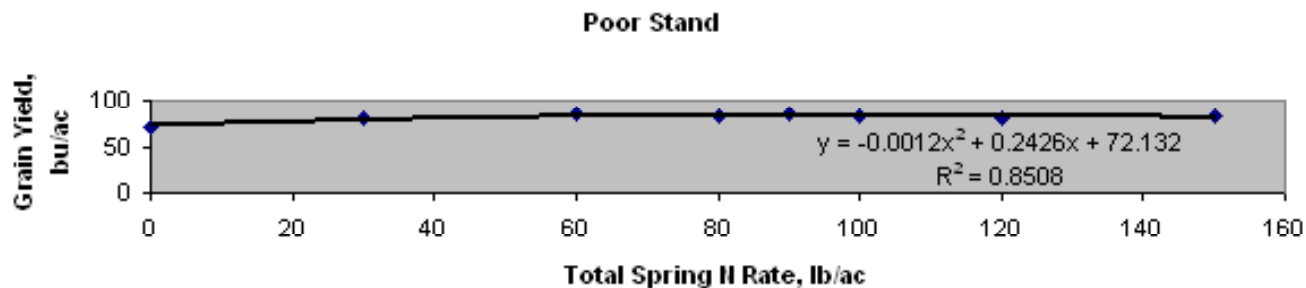
January: 4.75 oz Osprey + .5 oz Harmony +

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 right 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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