
VIRGINIA TECH ON-FARM WHEAT TEST PLOTS Eastern Virginia August 2008

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



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**FINANCIAL ASSISTANCE PROVIDED BY:
VIRGINIA SMALL GRAINS BOARD**

INTRODUCTION

The demonstration and research plot results discussed in this publication are a cooperative effort by seven Virginia Cooperative Extension agents, several extension specialists from Virginia Tech, area producers, and agribusinesses. We are proud to present this year's on-farm wheat plot work to you. Following extremely dry conditions during the first part of October, timely rains restored topsoil moisture later in the month, and for the most part, very good to excellent stands of wheat were obtained. Although the winter was relatively dry, tiller development was good heading into growth stage 30. May was relatively wet and some foliar disease was noted. However, cool temperatures in May allowed for a long grain filling period, and many growers reported excellent wheat yields. Our plots also yielded well. Wheat prices remain very good for 2009, but increasing costs of production will reduce the profit potential.

The field work and printing of this publication are supported by the Virginia Small Grains Check-Off Funds. The cooperators greatly 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.

DISCLAIMER:

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TABLE OF CONTENTS

	Page
General Summary	4
Wheat Variety Plots	5-11
Soil Fertility Plots	12-26
Foliar Fungicide Plots	27-29

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 between varieties. Four varieties averaged over 100 bushels per acre across the New Kent, Lancaster, and Middle Peninsula locations: USG 3665 at 106.1 bushels per acre, Southern States 8309 at 101.3 bushels per acre, Sisson at 100.4 bushels per acre, and Vigoro 9510 at 100.2 bushels per acre. The best source of information available for selecting small grain varieties is Virginia Cooperative Extension publication “Small Grains for 2008.”
- B. SEEDING RATE DEMONSTRATION:** In a non-replicated demonstration plot evaluating seeding rates of 24, 27, 29, and 33 seeds per row foot, there was no difference in yield with yields around 95 bushels per acre. To maximize profits producers need to continue to plant based on seeds per row foot rather pounds per acre. We hope to do more seeding rate studies during the 2008-09 season.
- C. SOIL FERTILITY PLOTS:** Continuous no-tillage production systems are increasing soil organic matter which is allowing producers to reduce nitrogen fertilizer rates on wheat. See the results of the two plots from New Kent and Charles City for details. Total spring nitrogen fertilizer applications of 0 to 90 pounds per acre are producing some very good yields in some situations. In a plot evaluating Nutrisphere applied at growth stage 30, there was no difference in yield between the treated and untreated plots. In a plot evaluating the addition of sulfur to the spring nitrogen application, the addition of sulfur did not increase yields. In a plot evaluating the 3 rates of foliar magnesium (Epsom salts) in late March, there was no statistical difference in yields in any of the treatments compared to the untreated check.
- D. CROP PROTECTION PLOTS:** An at-heading application of 12 ounces of Quilt per acre on Pioneer 26R24 wheat decreased scab incidence from 38% in the untreated check to 27% in the treated plots. Yields were also increased by just over 14 bushels per acre. In a plot evaluating 6 ounces per acre of Headline applied to SS 520 wheat during the boot stage, yield was increased by 2.5 bushels per acre with fungicide application. In a plot evaluating several fungicides at flag leaf emergence and heading, both applications increased yields, but in general the application at heading increased yields more.

Middle Peninsula No-Till Wheat Variety Comparison

Cooperators: Producer: Jason Benton
 Extension: David Moore, VCE-Middlesex
 Keith Balderson, VCE – Essex
 Industry: Participating Companies

Previous Crop: Corn
Soil Type: Suffolk Fine Sandy Loam
Plant Date: November 2, 2007
Planting Rate: 24-26 seeds/row foot
Fertilization: 27-70-90 at planting
 15-0-0 December with 2 ounces Warrior
 45-0-0-5 February
 60-0-0-8 March

Crop Protection: Glyphosate Burndown, .35 ounces Finesse
 6 ounces Headline- May (at heading)

Check Variety: USG 3665

Harvest Date: June 27, 2008

Variety	Treatment	M%	TW	Yield @ 13.5%
USG 3342	DV2/Awaken	12.1	59.5	85.9
Check	DV2/Awaken	12.3	60	106.5
Renwood 3260	DV2	12.4	61	90.5
Check		12.2	60	101.1
Renwood 3706	DV2	12.2	60	88.9
Check		12.3	60	108.4
Pioneer 26R24	Raxil-Thiram	12.2	59.5	99.3
Check		12.2	60	110.6
Pioneer 26R31	Raxil-Thiram	12.2	60	95.6
Check		12.5	60	107.9
Featherstone 176	Raxil-Thiram	12.4	60	98.1
Check		12.5	60	101.4
Vigoro 9510	DV2	12.6	60	97.7
Check		12.6	60	106.0
Dominion	DV2	12.9	61	92.7
Check		12.6	60	100.7
MPV-57	Raxil-Thiram	13.2	58	94.1
Check		12.6	60	104.8
SS 8309	Raxil-Thiram	12.5	60	110.8
Check		12.8	60	102.2
Harvard	DV XL RTA	12.9	61	88.0 (Hard Winter)
Check		12.8	60	108.9
Jamestown		12.6	62	88.9

2008 New Kent Wheat Variety Trial

Producer: Boogie Davis, Davis Farm, New Kent, VA
Extension: Paul Davis, New Kent & Charles City; Mike Likins, Chesterfield VCE;
 Wade Thomason, VA Tech Grain Specialist;
 William Townsend, New Kent Summer Intern
Contributors: Jim Wallace, Colonial SWCD
Soil Type: Altavista/Dogue
Planted: 11/1/2007, No-Till into corn stalks
Population: 28 seeds/ft.
Equipment: 10 ft. Great Plains No-Till
Crop Protection: Herbicides:
 1/17/08 Osprey 4.75 oz. + Harmony GT .33 oz.
 1/17/08 Osprey 4.75 oz. + Harmony GT .33 oz. + Karate 1.56 oz.
 2/17/08 GS .25 – 45# N
 3/20/08 GS .30 – 55# N
Insecticides:
 1/17/08 Karate 1.46 oz.
Fertilizers: Preplant: 10/20/07 30-40-60
 February: 2/17/08 45# 28% N +5% S
 March: 3/20/08 55# 30% N

Variety	Yield (Bu/Ac)	Test Weight	% Moisture	Powdery Mildew ^a (0-9)	Lodging ^b (0-5)	Deer Damage ^c (0-9)
USG 3665	108	58	12	2	3	0
Vigoro 9510	103	57	10.9	3	1	0
SS 8302	102	58	11.9	7	1	0
AgriPro Branson	101	58	11.2	2	0	0
Pioneer 26R24	101	60	15	1	1	0
AgriPro Panola	100	57	11.6	1	1	0
Pioneer 26R15	97	58	13.4	1	0	0
Sisson	97	59	13	2	0	0
USG 3342	96	58	11.3	0	0	0
Jamestown	95	61	12	1	0	0
SS 8309	95	57	14	4	1	0
Pioneer 26R31	94	59	14.5	3	0	0
McCormick	94	60	13.2	0	1	0
AgriPro W1377	91	59	11.8	6	0	0
AgriPro Coker 9511	88	61	11.2	4	3	0
Tribute	86	62	11.7	0	1	5
Renwood 3260	86	59	11.7	0	0	0

Featherstone 176	85	58	10.8	1	1	4
AgriPro Coker 9553	84	58	12.2	0	0	0
Renwood 3706	79	58	11.9	1	0	3
SS MPV57	68	59	14	2	1	1

	Yield	Test	%
	(Bu/Ac)	Weight	Moisture
AVERAGES	93	59	12

^a The 0-9 ratings indicated a genotype's response to disease, where 0=highly resistant and 9=highly susceptible.

^b The Lodging rating from 0-5 where 0=5 where 0=wheat standing upright, and 5=wheat totally flat.

^c Deer damage rating from 0-9 where 0=no deer damage from head feeding and 9=where all heads have been eaten by deer.

Lancaster / Northumberland Wheat Variety Trial

Cooperators: **Producer:** Lowell Starr
Extension: Matt Lewis
Agribusiness: Various Seed Company Representatives

Soil Type: Sassafras fine sandy loam
Planted: October 23, 2007 – no-till into corn stalks
Fertilizer/Chemicals: Preplant: 40-45-70
Dec 20, 2007: 30-0-0
Jan 25, 2008: 30-0-0-3.75S + Harmony
Mar 13, 2008: 30-0-0 + Warrior & Tilt

Harvest: June 18, 2008

<u>Variety</u>	<u>Moisture %</u>	<u>Yield @ 13.5%</u>
Hubner H57	13.1	93
Hubner H37	13.3	91
Renwood 3260	13.8	94
Renwood 3706	13.9	92
USG 3665	14.1	105
USG 3342	13.6	91
Southern States MPV-57	13.4	97
Southern States 8309	14.3	98
Dominion	13.9	94
Vigoro 9510	13.6	100
Sisson	13.5	102
Jamestown	11.5	91
McCormick	13.3	98
Featherstone 176	13.4	96
Coker Panola	12.0	99
Coker 9553	13.6	91

Discussion:

The wheat growing season of 2007/2008 was excellent, as indicated by the fact this plot averaged 96 bu/acre. Please use this and other published variety tests when selecting wheat varieties for the 2008/09 season.

2008 CHESAPEAKE WHEAT VARIETY COMPARISON

Cooperator: **Producer:** Marvel Nicholas and G. C. Nicholas, Jr.
Extension: Watson Lawrence - VCE - Chesapeake
Date Planted: November 7, 2007
Previous Crop: Corn
Tillage: Disk + Disk & Culti-packer
Soil Type: Chesapeake fine sandy loam
Fertilization: October, (400) lbs. 5-15-20 pre-plant
 March 14, (100) lbs. Nitrogen (30%)
Crop Protection: December 10, (4.75 oz. Osprey + 2-qts./100 gal. nonionic surfactant +
 2 qts. 30% N) per Acre
 March 14, 1/2 oz. Harmony Extra with liquid Nitrogen
Date Harvested: June 10, 2008

VARIETY	*SEED TREATMENT	(%) MOISTURE	(lbs.) TEST WT.	(bu./A) YIELD
Sisson	RT	12.1	56	94.0
SS MPV57	RTS	11.9	59	93.6
Tribute	U	12.6	58	91.2
Featherstone 176	RT	11.9	62	84.7
Progency 185	U	12.0	61	84.2
Dominion	DX	11.8	61	84.0
SS 560	RTS	11.8	58	82.9
McCormick	U	12.3	62	80.7
Vigero 9412	DX	12.0	57	80.2
Jamestown	RTS	12.0	65	79.2
Vigoro 9713	DX	12.8	60	78.6

***Seed Treatment Code:**

DX: Dividend Extreme

RT: Raxil/Thiram

U: Untreated

RTS: Raxil/Thiram + Storcide II

Discussion: 2008 was a good year for wheat production. Yields and test weights were good. #2 Soft Red Winter Wheat standards are 58 lbs. or more for no discount. There were few insect pest problems. Cereal leaf beetles were not a significant pest this year. There were heavy aphid populations this spring and fortunately, little Barley Yellow Dwarf Virus (BYDV) present in those populations. This disease, when present, is spread by aphids. There was some powdery mildew observed in March on susceptible varieties, as well as some head scab. This year there were relatively few other disease problems. Standability was excellent.

Wheat Population Evaluation

Cooperators: Producer: Bill Gresham
Extension: David Moore, VCE-Middlesex

Soil Type: Kempsville Sandy Loam
Previous Crop: Corn
Planting Date: November 9, 2007, No-Till in 7.5 inch rows
Field Prep: Bush Hog, Home-Made "Turbo-Till"
Wheat Variety: Pioneer 26R24 (13,800 seeds/#)
Fertilization: 30-50-90 at planting
15-0-0 January
50-0-0 February
40-0-0 March

Crop Protection: Glyphosate Burndown, Harmony Extra
Harvest Date: June 25, 2008

<u>Population</u>	<u>Moisture%</u>	<u>TW</u>	<u>Yield @ 13.5%</u>
29 seeds/row ft. 162#/A = 2,235,600 seeds	14.1	60	96.6
27 seeds/row ft. 146 #/A = 2,017,332 seeds	14.1	60	95.1
24 seeds/row ft. 130 #/A = 1,793,184 seeds	14.2	60	96.5
33 seeds/row ft. 179 #/A = 2,465,628 seeds	14.2	60	95.0

Discussion: (This trial was not replicated)

More seeds does not always equate to more bushels. Many producers are planting 150# per acre. With this variety, at 150 # per acre, Bill was planting a little over 27 seeds per row foot. 29 seeds per row foot looks good, but is no better in this test than 24 seeds per row foot. With the high cost (and getting higher) of wheat seed, producers should be paying attention to the number of seeds that they are planting rather than just dumping 3 bags to the acre. As you know, seeds per pound can vary from 10,000 to almost 15,000 seeds between varieties. Make sure that you know the seed size of the variety that you plant.

In this test, planting 24 seeds rather than 29 would save almost 350,000 seeds per acre or just over a bag every 2 acres! Use this and other Virginia Tech on-farm test results when making planting decisions for 2008-09.

2008 New Kent Nitrogen Rate Trial

Producer: Boogie Davis, Davis Farm, New Kent, VA
Extension: Paul Davis, New Kent & Charles City
 Wade Thomason, Grain Specialist, VA Tech
Contributors: Jim Wallace, Colonial SWCD
Soil Type: Altavista/Dogue, fine sandy loam
Planted: 11/1/2007, No-Till corn stalks
Population: 28 seeds/ft.
Equipment: 10 ft. Great Plains No-Till
Crop Protection: Herbicides:
 10/20/07 Glyphosate 2 qt @ burndown
 1/17/08 Osprey 4.75 oz. + Harmony GT .33 oz.
 1/17/08 Osprey 4.75 oz. + Harmony GT .33 oz. + Karate 1.56 oz.
 2/17/08 GS .25 – 45# N
 3/20/08 GS .30 – 55# N
Insecticides:
 10/20/07 Baythroid 1.25 oz. with burndown
 1/17/08 Karate 1.46 oz.
Fertilizers: Preplant: 10/20/07 30-40-60
 February: 2/17/08 45# 28% N + 5% S
 March: 3/20/08 55# 30% N

Nitrogen (lbs./A)		Rep				*Lodging	
GS 25	GS 30	Rep 1	Rep 2	Rep 3	Rep 4	Avg	Avg
0	0	error	67.4	78.5	69.9	71.9	0.00
0	30	58.9	86.0	84.5	73.9	75.8	0.00
0	60	58.0	83.2	81.6	91.2	78.5	0.00
0	90	66.4	92.4	80.5	86.9	81.6	0.50
30	0	59.3	82.1	81.1	66.4	72.2	0.00
30	30	75.9	78.9	78.5	83.6	79.2	0.75
30	60	84.0	81.1	87.2	79.5	83.0	0.50
30	90	85.3	78.9	71.4	83.8	79.9	2.25
60	0	89.1	93.3	84.7	84.5	87.9	0.25
60	30	90.4	82.6	86.6	89.9	87.2	1.75
60	60	87.3	83.4	80.7	79.8	82.8	1.75
60	90	85.3	58.4	52.2	63.4	64.8	3.50
90	0	92.6	89.8	89.8	98.9	92.8	1.00
90	30	77.6	58.3	70.8	82.0	72.1	3.75
90	60	75.3	60.7	71.2	78.9	71.4	4.25
90	90	79.0	50.2	61.7	43.7	58.4	5.00

*Lodging Rating: 0 = all wheat standing upright, 5 = all wheat flat on the ground.

Discussion:

The highest three yielding treatments had 60# of N or more at GS 25, which helped increase tillering during the winter and four of the six top yielding treatments used a total of 90# N per acre. Every treatment with > 90# N had a problem with lodging. Lodging ratings of 2.0 and higher were difficult to harvest. This field has been in continuous no-till production for 8 years along with winter annual cover crops after double crop soybeans prior to planting the last two corn crops. Soil quality is improving greatly along with wheat yields. Compare this trial with the 2008 Henrico Wheat Nitrogen Trial.

2008 Henrico Wheat Nitrogen Rate Study

Cooperators: **Producers:** Randolph Aigner
Extension: Paul Davis, New Kent/Charles City VCE
Wade Thomason, Grain Specialist, VA Tech

Previous Crop: No-till corn
Planted: 11/1/2007
Variety: Vigoro 9510
Soil Type: Pamunkey, fine sandy loam
Tillage: No-till into corn stalks
Fertilizers: preplant: 30-90-120
winter:
spring:
Herbicides: preplant: Glyphosate 1 qt @ burndown
January: Harmony .50oz+Osprey 4.75
Fungicides: Headline 6oz @ heading
Insecticides: none
Growth Regulator: Cerone 8oz @ boot stage
Harvested: 7/1/08

Nitrogen Rate (lbs./Acre)		Rep				Rep	*Lodging
GS25	GS30	Rep 1	Rep 2	Rep 3	Rep 4	Avg	Avg
0	0	76.8	81.3	88.5	97.0	85.9	0.0
0	30	89.0	89.6	88.3	91.8	89.7	0.5
0	45	93.9	83.3	85.8	84.3	86.8	0.5
0	60	93.0	93.0	74.5	95.1	89.1	0.5
30	0	82.1	93.6	92.2	90.7	89.6	0.5
30	30	82.1	107.6	90.4	88.5	92.2	0.0
30	45	67.8	70.2	83.0	71.7	73.2	2.5
30	60	79.9	70.1	80.3	73.0	75.7	2.5
45	0	74.4	86.1	87.4	66.6	78.6	2.3
45	30	67.8	84.1	90.2	87.4	82.4	1.0
45	45	75.4	77.5	56.7	77.6	71.8	2.8
45	60	87.4	90.3	81.8	73.3	83.2	1.3
60	0	70.1	91.8	80.5	87.2	82.4	1.8
60	30	87.8	102.3	83.1	83.4	89.2	1.3
60	45	90.2	87.9	81.5	82.4	85.5	1.8
60	60	84.2	75.1	86.2	63.8	77.3	1.8

*Lodging: 0= All wheat standing up right, and 5=All wheat flat on the ground

Discussion: Mr. Aigner continues to show us how increased soil organic matter over 15 years of continuous no-till production can make excellent wheat yields with low rates of nitrogen fertilizer. Six

of the top seven yields needed only 60 lbs nitrogen or less total winter/spring nitrogen to make 86-92 bu/ac yields. No nitrogen at either GS 25 or GS 30 yielded 85.9 bu/ac (amazing), while the highest yield of 92.0 bu/ac was made with only 30# N at GS 25 + 30# N at GS 30. The soil organic matter has gone from 1.5% to over 3% in the top 2 inches during the past 15 years and Mr. Aigner has cut his wheat nitrogen rates by 40-50 lbs/ac, while maintaining outstanding yields in his intensive managed wheat crops.

2008 WHEAT SPRING NITROGEN APPLICATION TEST

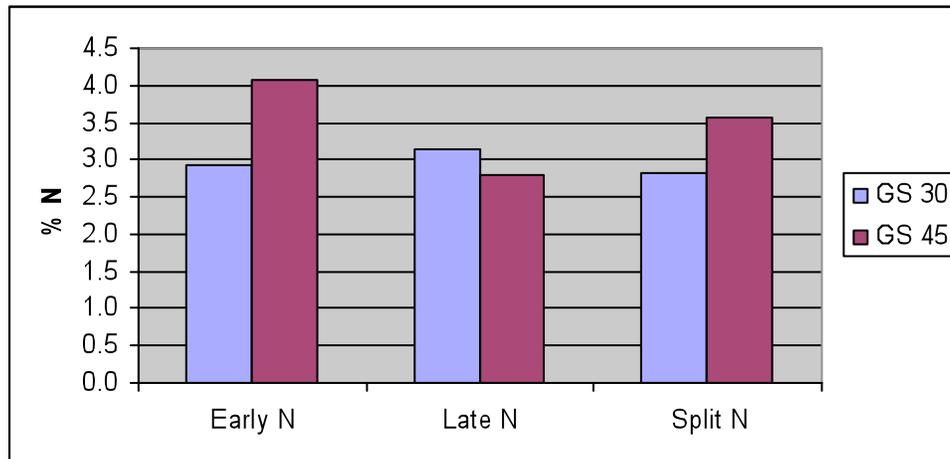
Cooperators: Producer: Rodger Drake
Extension: Cyndi Estienne, Greensville/Emporia VCE
Wes Alexander, Southampton VCE
Wade Thomason, Grains specialist, VT

Previous Crop(s): Cotton 2005, Wheat/Soybean-2006; Corn 2007
Soil Type: Altavista fine sandy loam
Fertility: 75 lb K₂O; 25 lb nitrogen (N) per acre at planting
Tillage: Shred cornstalks; Paratil 7 shanks 30" on center; disc 1X; No-till drill
Test/Plot Size: 10' by 25'
Harvested Area: 6.5' by 20'
Planting Equipment: 15' John Deere drill, 7.5 inch rows on center
Variety: Pioneer 26R24
Planting Date: November 12, 2007
Row Spacing: 7.5 inch
Seeding Rate: unknown
Crop Protection: Harmony Extra .75 oz/A on 2/20; Potassium thiosulfate on 3/12 and 14 oz/A;
Quilt on 4/9
Harvest Date: June 13, 2008
Harvest Equipment: Massey Ferguson 8XP small plot combine, 6.5' head
Experimental Design: Randomized complete block; four replications
Treatments: *Early N:* 120 units N applied at GS25
Split N: 60 units N applied at GS25; 60 units N applied at GS30
Late N: 120 units N applied at GS30

Wheat Yield Data

Treatment	% Moisture	Test Weight lb/bu	Lodging Score 0-9	Yield bu/A (DM)
Early N	11.8	68.7	3.0	85.9
Split N	11.0	65.2	5.0	82.1
Late N	11.2	66.4	5.3	82.4
MEAN	11.3	66.8	4.4	83.4
LSD (.05)	.5	ns	ns	ns

Tissue Nitrogen Concentration



Mean at GS 30 = 2.97

Mean at GS 45 = 3.48; LSD (.05)= .44

Plant tissue was collected at GS 30 and GS 45 for analysis of plant N content. Samples were analyzed by A and L Eastern Laboratories (Richmond, VA)

Discussion: Recommendations for spring N application in intensively managed wheat call for a split application at Zadoks GS 25 and GS 30. Splitting nitrogen provides available N at the growth stages when uptake is highest. The total spring N application should not exceed 120 units. In this study, there were three treatments. The 120 lb N/ac applied all at GS 25; 120 lb N/ac applied all at GS 30, or spring N was split with 60 lbs of N applied at GS 25 and 60 lbs N applied at GS 30. There was no difference between treatments in yield, test weight, lodging or % tissue N at GS 25.

There was significantly less tissue N at GS 45 in plots that received the entire 120 lbs N at GS 30 ($P < .05$) than the other two treatments. There may not have been sufficient time for N absorption by the plant between the application at GS 30 and tissue sampling at GS 45.

Above average rainfall occurred at this location. There was no difference in yield between, early N, late nitrogen, and split N application. This field was not responsive to split N application this year.

Evaluation of Nutrisphere on Wheat at Growth Stage 30

Cooperator: Producer: Jason Benton
Extension: David Moore, VCE-Middlesex

Previous Crop: Corn
Date Planted: November 3, 2007
Soil Type: Suffolk Fine Sandy Loam
Variety: Southern States MVP 57
Fertilization: 30-60-90 at planting
15-0-0 December
40-0-0-6 February
60-0-0-10 March

Crop Protection: Glyphosate Burndown
Harmony Extra February
Quilt (12 ounces) in May

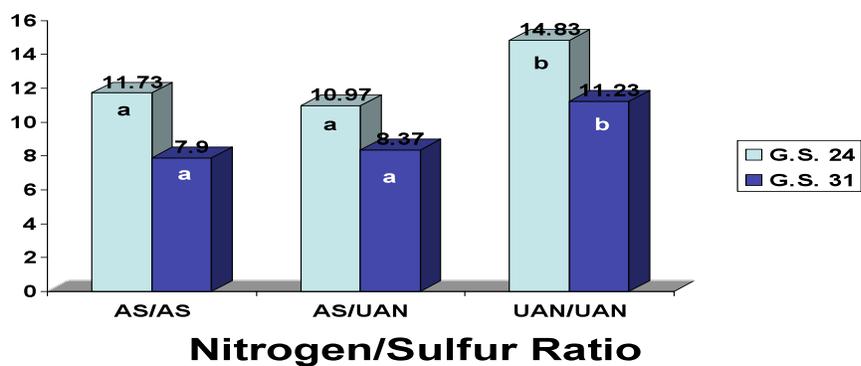
Application Date: March 25, 2008 (0.5% mixture)
Harvest Date: June 24, 2008

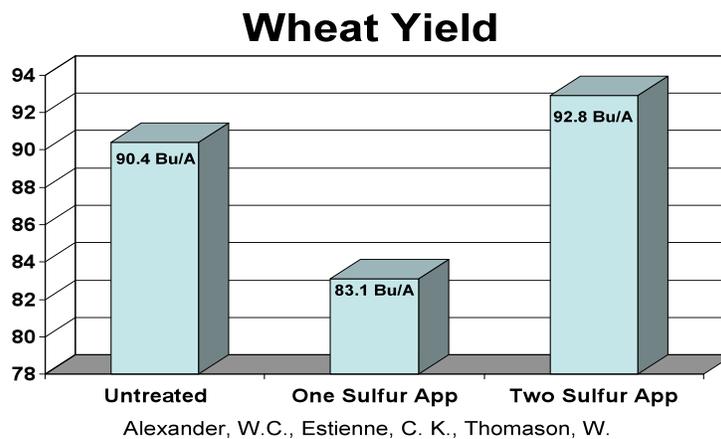
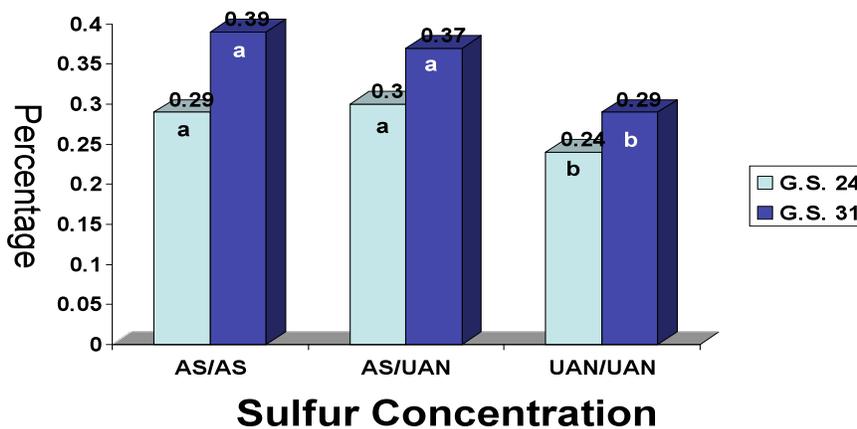
Treatment	Rep	M%	TW	Yield bu.A @13.5%
Untreated	1	13.4	58	99.6
Treated	1	13.4	58.5	99.1
Untreated	2	13.2	59	100.0
Treated	2	13.1	58.5	99.9
Untreated	3	13.2	59	101.1
Treated	3	13.1	59	99.5
Averages:				
Untreated		13.3	58.7	100.2
Treated		13.2	58.7	99.5

Discussion:

Nutrisphere is a polymer that protects nitrogen fertilizers by slowing the conversion process, thus allowing more N to be available longer for the plant to take up. These were some great yields, but all in all, there were no significant differences in the treated and untreated plots. Use this and other Virginia information when making wheat production decisions for 2009

Plot Number	Harvest Weight (Lb)	Test Weight	Moisture (%)	13.5% Moisture (Bu/Ac)
101	91.3	63.0	11.3	83.4
102	107.0	61.5	11.1	97.9
103	78.8	61.0	11.6	71.7
201	101.9	61.0	11.2	93.2
202	102.8	56.0	11.2	94.0
203	103.8	62.0	11.3	94.8
301	103.4	62.0	11.2	94.5
302	94.9	62.0	11.3	86.7
303	82.5	61.0	11.1	82.9
Treatment		Averages		
1 = Untreated Check		62.0	11.2	90.4
2 = Two Sulfur Application		59.8	11.2	92.8
3 = One Sulfur Application		61.3	11.3	83.1
LSD 0.05		ns (4.5)	ns (0.4)	ns (18.4)
CV		3.3	1.6	9.1





Discussion: Sulfur deficiencies have been observed in many wheat fields in Southampton County, especially on deep sandy soils with no recent history of peanuts planted. Peanut production requires the application of calcium sulfate, thus supplying ample sulfur for future crops. This research project was designed to measure yield differences in soft red winter wheat receiving applied sulfur compared to the untreated control. Wheat was harvested and weighed using a small plot combine. Moisture was determined using a Farmex multi-grain moisture tester and test weight was determined using a Seedburo portable grain scale. No significant difference was measured between treatments. The field selected had less depth of sand than assumed and a clay layer at twelve inches from the surface. Tissue samples analyzed an adequate percentage of sulfur and less than a 15 nitrogen/sulfur ratio in all treatments. Soil

sampled from the clay soil profile indicated adequate sulfur was available to the plant. This research supports the recommendation to analyze soil from the clay level for sulfur, magnesium, and potassium; in addition to the top six inches.

Magnesium Applications on Winter Wheat

Cooperators: Growers: Rodger Drake
Extension: Wes Alexander, Southampton County
Cyndi Estienne, Greenville County
Wade Thomason, Virginia Tech
Mark Alley, Virginia Tech
Agribusiness: Dean Collamer, Honeywell

Previous Crops: Cotton-2005, Wheat/Soybean-2006, Corn-2007
Soil Name: Altavista fine sandy loam
Fertility: 75 lb K₂O; 25 lb N per acre at planting
Tillage: Shred corn stalks; Paratil 7 shanks 30" on center;
Disc 1X; No-Till drill
Planting Date: November 12, 2007
Planting Equipment: 15' John Deere drill, 7.5 inch rows on center
Variety: Pioneer 26R24
Seeding Rate: Not Available
Crop Protection: November 30, Harmony Extra (old formula) ½ oz/A
April 17, Quilt 10 oz/A
April 17, Karate 1.6 oz/A

Harvest Date: June 13, 2008
Harvest Equipment: Massey Ferguson 8xP small plot combine
Plot Size: 9.3 feet x 25 feet
Harvested area = 6.5 feet x 25 feet plot center
Experimental Design: Randomized Complete Block
Replications: Three
Treatment Info: 1. Untreated check; Foliar Mg Treatments applied on 3/28/2008
2. 5 lb Epsom Salt/Acre (9.6% Mg)
3. 10 lb Epsom Salt/Acre (9.6% Mg)
4. 15 lb Epsom Salt/Acre (9.6% Mg)

Soil Samples Analyzed for Magnesium

Plot Number	0-6" Depth	12" Depth (Clay Layer)
102	M-	H
202	M-	H
302	M	H

Tissue Samples Analyzed for Magnesium (%)

Treatment	G.S.24 on Mar. 6	G.S.31 on Mar. 20	Flag Leaf, Full Head Apr. 24
Control-No Magnesium	0.1	0.1	0.19
0.48lb Magnesium/Acre	0.1	0.1	0.21
0.96lb Magnesium/Acre	0.1	0.1	0.19
1.44lb Magnesium/Acre	0.1	0.1	0.19

Harvest Data

Plot Number	Harvest Weight (Lb)	Moisture (%)	Yield Bu/a @ 13.5% Moisture
102-0	12.8	9.5	69.2
102-5	15.2	9.3	82.3
102-10	13.5	10.0	72.5
102-15	14.3	10.5	76.4
202-0	18.3	10.8	97.5
202-5	17.5	10.5	93.5
202-10	16.2	10.4	86.7
202-15	15.3	10.3	81.9
302-0	13.1	10.0	70.4
302-5	15.2	10.1	81.6
302-10	15.0	10.3	80.3
302-15	13.6	10.4	72.8

Treatment	Averages	
1 = Untreated Check	10.1	79.0
2 = 5 lb Epsom Salt/A	10.0	85.8
3 = 10lb Epsom Salt/A	10.2	79.8
4 = 15lb Epsom Salt/A	10.4	77.0
LSD 0.05	ns (0.7)	ns (11.6)
CV	3.6	7.2

Discussion: Southampton County wheat growers typically take soil samples from the top six inches of the soil profile and send to Virginia Tech Soil Testing Lab for an available plant nutrient analysis. Growers also make use of local consultants who in turn take tissue samples and send them to an analytical laboratory for plant analysis. Minerals such as magnesium, sulfur, and potassium often leach through the sandy surface soil horizons, but bond to the clay particles which increase at a deeper depth.

Early growth stage plant tissue samples often indicate a deficiency in magnesium and sulfur before the plant's roots have reached these nutrients held in the higher clay content subsoil. Therefore a recommendation is made for foliar application of magnesium in the form of Epsom Salt or another source of magnesium, increasing the expense of wheat production. This research project was designed to measure yield differences in soft red winter wheat receiving various amounts of applied magnesium compared to the untreated control. A field was selected that had a low level of magnesium and low action exchange capacity (CEC) in the soil analysis. The clay layer was within twelve inches of the surface and tested high for magnesium. Four treatments of supplemental magnesium in the form of Epsom Salt ($\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$) were applied in a randomized complete block design with three replications. Tissue samples taken at growth stage 24 and 31 indicated deficiency in magnesium across all four treatments and all three replications. Wheat was harvested and weighed using a small plot combine. Moisture was determined using a Farmex multi-grain moisture tester. No significant yield or moisture difference was measured between treatments. Tissue samples analyzed at the flag leaf and full head emerged growth stage indicated sufficient levels of magnesium at 0.19 – 0.21 percent. Soil sampled from the clay soil profile indicated adequate magnesium was available to the plant. This research supports the recommendation to analyze soil from the subsoil clay level for magnesium in addition to the surface soil from the top six inches. These subsoil samples should also be analyzed for sulfur and potassium as these elements may also leach from the surface and be held in the subsoil clay layer. As long as plants roots explore the subsoil clay layer, we can expect the plants to take up nutrients from this layer.

2008 New Kent Wheat Foliar Fungicide Trial

Cooperators: **Producers:** Boogie Davis, Davis Farm, New Kent, VA
Extension: Paul Davis, New Kent & Charles City;
 Wade Thomason, VA Tech Grain Specialist

Previous Crop: No-till corn
Planted: 10/31/2007
Variety: Vigoro 9510
Soil Type: Altavista, Sandy loam
Tillage: No-till into corn stalks
Fertilizers: preplant: 10/20/2007 40-40-80
 winter: 2/15/2008 50#N(28-0-0-5)
 spring: 3/22/2008 Avg. 63#N (30% UAN) with GreenSeeker
Herbicides: preplant 10/29/2007 1.5 pts. Roundup
 12/28/2007 4.75 oz. Osprey + .5 oz. Harmony XT .33 oz.
Fungicides: see below
Insecticides: 10/29/07 1.3 oz. Baythroid
 12/28/07 Karate 1.5 oz.
Harvested: 6/26/08

Treatment	Rate/Timing	Yield	Yield	Yield	Yield
		Bu/Ac	Bu/Ac	Bu/Ac	Bu/Ac
		Rep 1	Rep 2	Rep 3	Rep Avg
Control		85.9	89.8	78.7	84.8
Tilt	2.5 oz/GS 30	92.7	76.7	93.8	87.7
Tilt	4 oz/GS 30	88.3	92.2	82.7	87.7
Tilt	2.5 oz/GS 30 & 4 oz/Heading	93.7	98.1	100.2	97.3
Headline	6 oz/Flag leaf	Harvest error	86.8	83.6	85.2
Headline	6 oz/Heading	96.0	83.1	93.1	90.7
Quilt	10 oz/Flag leaf	89.3	103.3	90.3	94.4
Quilt	10 oz/Heading	87.3	94.1	94.2	91.9
Stratego	10 oz/Flag leaf	86.8	89.3	79.7	85.3
Stratego	10 oz/Heading	88.8	84.8	96.6	90.1
Avg		86.8	89.8	89.3	89.5

GS30: 3/27/08

Flagleaf application: 4/23/08

Heading application: 5/5/08

Discussion: Vigoro 9510 was the variety used in this test and already has good disease resistance. The addition of a fungicide significantly increased yields especially if applied at heading, except for Quilt. The flag leaf application of Quilt yielded better than the heading application, but the difference was not statistically significant. The heading application averaged 4.5 bu/ac better than flag leaf application which was 7.7 bushels per acre better than the untreated.

Headline Fungicide at GS 49 (Late Boot-Early Heading)

Cooperators: Producer: Jason Benton
Extension: David Moore, VCE-Middlesex

Previous Crop: Corn
Soil Type: Suffolk Fine Sandy Loam
Plant Date: October 20, 2007
Variety: SS 520
Fertilization: 27-69-90 at planting
15-0-0 December
45-0-0 February
60-0-0 March
Crop Protection: Glyphosate Burndown
Harmony Extra – February
6 ounces of Headline –April
Harvest Date: June 11, 2008

<u>Treatment</u>	<u>M%</u>	<u>TW</u>	<u>Yield @ 13.5%</u>
Treated 1 (6 oz Headline)	14.0	63	82.6
Untreated 1	13.2	61	80.5
Treated 2	13.5	62	85.5
Untreated 2	13.2	61	83.8
Treated 3	13.6	62	88.6
Untreated 3	13.5	60	85.1
Averages:			
Treated	13.7	62.3	85.6
Untreated	13.3	60.6	83.1

Discussion:

How about this wheat year? It's been fun to watch harvest but we certainly worried and fretted over it enough during the growing season. One question that a lot of producers have is the benefits of fungicides. In this test, the 6 ounce rate of Headline was applied just prior to heading due to some scattered patches of powdery mildew and tan spot found in the field. Costs to apply this fungicide were roughly \$15-18 per acre. The average increase in yield was 2.5 bushels. At \$6.50 wheat, that is a \$16.25 increase in income making this a breakeven situation in this test. Use this and other Virginia Tech on-farm plot information when making production decisions for 2008-09.

Wheat Fungicide Treatment—At Heading

Cooperators: Producer: Jason Benton
Extension: David Moore, VCE-Middlesex

Previous Crop: Corn

Soil Type: Suffolk Fine Sandy Loam

Plant Date: October 18, 2007

Variety: Pioneer 26R24

Fertility: 30-60-90 at planting
15-0-0 December
40-0-0-6 February
60-0-0-8 March

Crop Protection: Glyphosate Burndown
2 oz. Warrior in December
Harmony Extra in February
12 ounces Quilt in May

Harvest Date: June 24, 2008

<u>Treatment</u>	<u>Rep</u>	<u>M%</u>	<u>TW</u>	<u>Yield @ 13.5%</u>	<u>%Scab Incidence</u>
Treated	1	12.4	59	96.9	26
Untreated	1	11.9	56	80.3	36
Treated	2	12.2	57.5	90.4	28
Untreated	2	11.9	55	79.6	41
Treated	3	12.2	57.5	93.3	27
Untreated	3	11.9	56	77.8	36
Averages:					
Treated		12.3	58	93.5	27
Untreated		11.9	55.7	79.2	38

Discussion:

Very interesting! First of all, Pioneer 26R24 has a fairly high rating for scab incidence. In lower Middlesex, where this plot was, several heavy rains fell at the beginning of and during flowering. That is a recipe for problems. Yields here were good, but scab was a significant problem. Quilt, a product that contains a strobilurin and a triazole gave some protection and some yield advantage. The timing of application was perfect. In a situation like this, a strobilurin alone, cannot help and actually, research says, makes the toxin levels in “scabby” wheat increase. To protect against scab, plant varieties with resistance, protect wheat in the late heading stage with a curative product recommended for protection against scab such as Folicur, Tilt, or Proline. Use this and other Virginia Tech information when making production decisions for 2009.