Virginia Cooperative Extension
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2015 VIRGINIA ON-FARM WHEAT TEST PLOTS

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, extension specialists from Virginia Tech, and an associate professor at the Virginia State University School of Agriculture. We are proud to present this year's on-farm small grain plot work to you. We hope the information in this publication will help farmers produce a profitable crop in 2016.

The field work and printing of this publication are supported by the Virginia Small Grains Check-Off Funds. The cooperators gratefully acknowledge this support. Any small grain producer or agribusiness personnel who would like to receive 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 twenty-second year of this multi-year 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 and to Taylor Sabo, 2015 Essex and Middlesex County VCE intern for his assistance with data compilation.

DISCLAIMER:

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GENERAL SUMMARY

A. VARIETY SELECTION: Variety selection remains one of the most important components of wheat production. Five wheat variety plots were planted in eastern Virginia. Three plots were located in the central and upper coastal plain at Virginia State University and Westmoreland and Middlesex Counties. Fifteen wheat varieties were replicated across those three locations, and the average yield per variety across locations ranged from 80.5 to 70.3 bushels per acre. Wheat variety plots were also planted in Chesapeake and Virginia Beach with seventeen varieties replicated across the two locations. Averaged across both locations, yields ranged 83.5 to 67.5 bushels per acre.

In addition to yield, producers should also consider test weight, disease resistance, standability, and the presence of "beards" if deer pressure is a concern. The best resource for wheat variety selection is the Virginia Cooperative Extension publication, **Small Grains for 2015**, which is posted on the Virginia Cooperative Extension website at www.ext.vt.edu.

B. SEED TREATMENT PLOT: There was one seed treatment plot that was conducted in Westmoreland County this year looking at Gaucho 600 and BIOSTART RhizoBoost. Gaucho 600 is an insecticide seed treatment for the control of aphids and barley yellow dwarf. BIOSTART RhizoBoost belongs to a category of bacteria called spore formers which have the ability to create endospores. Endospores are bacterial seeds; they are in a dormant state and generated when the bacteria is stressed or placed in harsh conditions such as extreme heat, desiccation or drastic pH change. The endospores contain all of the necessary genetic information required to produce a new active bacterial cell once conditions are favorable. Spores have recoverable activity after environmental or chemical shifts. In the one plot evaluated the Gaucho 600/BIOSTART RhizoBoost plot yielded 2 bushels better than the check plots.

C. FUSARIUM HEAD BLIGHT FUNGICIDE & GROWTH REGULATOR PLOTS: Fusarium Head Blight (head scab) pressure under favorable weather conditions can dramatically reduce yield and test weight. As concerns over head scab and vomitoxin continue to increase, more farmers are treating small grains with fungicides to prevent scab infection. Both ground and aerial application are being used. In one plot evaluating Prosaro Fungicide applied at flowering, the Prosaro treated plot yielded almost 6 bushels per acre better than the untreated check plots, but the yield difference was not statistically significant. In two plots evaluating aerial versus ground applications of Prosaro, the aerial application yielded 2 bushels per acre better than the ground application in one plot, while yields were the same for each treatment in the other plot. Aerial applications can be very beneficial in fields without tramlines and in situations where no tracks are already in the field. One plot evaluated the use of the growth regulator Palisade. Increased rates of nitrogen applications to increase yield may lead to decreased straw strength and lodging later in the growing season which is unfavorable. In this plot, there was little difference in yield and test weight between the treated and untreated plots, making the application unprofitable.

D. TISSUE TESTING: Tissue testing may be conducted to solve fertility issues or inquire about the fertility levels in the crop including macro and micronutrients. During the 2014-2015 small grains growing season, 13 small grain tissue samples were submitted for analysis. Boron was low in nine samples and deficient in 1 sample. Complete results of the tissue analysis results year by year can be found under the section in this publication labeled 2007-2015 Small Grain Tissue Sample Summary.

2014/15 Virginia State University Small Grain Variety Comparison

Cooperators: Producer: Glenn F. Chappell, III
Glenn F. Chappell, II – Virginia State University
Scott Reiter – Virginia Cooperative Extension – Prince George
Previous Crop: Corn
Soil Type: Slagle sandy loam
Tillage: No-Till
Test/Plot Size: 650 ft. x 15 ft. per variety
Planting Equipment: John Deere 1590 NT Drill
Planting Date: October 19, 2014
Row Spacing: 7.5 inches
Variety: Various
Seeding Rate: 20 seed/row ft.
Crop Protection: Herbicides: 2pt./A Gramoxone 2.0 SL - October 6, 2014;
0.5 oz./A of Harmony Extra SG – February 15, 2015
Fungicides: 6.0 oz./A of Headline SC – May 6, 2015
Insecticides: 1.0 oz./A of Karate Z – May 6, 2015
Fertilizer: 30 lbs./A of N – October 6, 2014; 30 lbs./A of N February 15, 2015; 60 lbs./A of N March 25, 2015
Harvest Date: June 25, 2015
Harvest Equipment: John Deere 6620

Brand	Variety	H_2O (%)	Test wt.	Yield Bu/A	% of Check**
USG	3404*	13.2	54.1	55.7	------
AgriMaxx	446	12.9	54.4	58.1	106.8
Featherstone	73	12.9	53.4	51.0	93.7
Southern S.	8416	13.0	53.5	57.7	106.0
AgriMaxx	434	13.0	54.6	56.5	103.9
Great Heart	933	12.9	52.1	58.9	108.2
Pioneer	26R10	12.8	55.1	61.9	113.8
USG	3251	12.8	54.5	55.2	101.4
Dyna-Gro	9223	12.9	53.8	63.4	116.4
Southern S.	8360	12.9	54.0	58.8	108.2
Dyna-Gro	9552	12.8	55.3	61.6	113.1
Southern H.	4300	12.4	53.3	63.0	115.7
Pioneer	26R20	12.4	54.8	52.8	97.0
Southern H.	3200	12.4	52.7	50.5	92.8
Great Heart	940	12.5	56.6	66.7	122.5
USG	3404*	12.8	54.3	55.2	-----

*Check Variety

**% of Check is calculated by dividing the individual variety yield by the mean of the two checks located on either side of the variety plot.

Discussion: Compare these results with regional data to choose varieties that match your production conditions. Test weights were low probably due to the moderate late season scab pressure and ryegrass contamination. The GS 25 nitrogen application was based on tiller counts and the GS 30 nitrogen application was based on tissue testing.

2015 Westmoreland County Wheat Variety Plot

Cooperators: Producer: F.F. Chandler, Jr.
Extension: Stephanie Romelczyk, VCE – Westmoreland
Keith Balderson, VCE – Essex
Trent Jones, VCE – Northumberland/Lancaster
Agribusiness: Participating Companies; Curtis Packett and Rusty Green, CPS
Previous Crop: Corn
Soil Type: Kempsville loam
Tillage: No-till
Planting Date: October 28, 2014
Fertilizer: 40-50-80 + 5 lbs/A S in fall
50 lbs N + 20 lbs S + ½ gal. Black Label Zn in February
50 lbs N + 20 lbs S + ½ gal. Black Label Zn in March
Crop Protection: Burndown: 2 pts/A Gramoxone & 0.4 oz/A Finesse Cereal and Fallow
3 oz/A Quadris in March w/N application
7 oz/A Prosaro & 2 oz/A Tombstone in May
Harvest Date: July 15, 2015

Variety	Test Weight (Lbs./Bu.)	Moisture (%)	Yield Bu./A @13.5%
Agri-Maxx 446	53	13.2	85.67
Pioneer 26R10	53	13.0	82.04
Southern States 8360	54	13.5	81.40
USG 3251	53	13.3	80.31
Southern Harvest 4300	55	13.7	77.41
Agri-Maxx 434	52	13.2	76.95
Dyna-Gro 9552	50	13.0	76.75
Southern States 8415	53	12.6	76.60
Dyna-Gro 9223	53	13.5	76.47
Featherstone 73	53	12.6	75.66
Southern Harvest 3200	54	14.1	75.01
Pioneer 26R20	53	13.5	74.70
Great Heart 933	53	13.4	74.27
USG 3404	53	14.5	74.24
Great Heart 940	53	12.9	68.84

Discussion: Good yields overall. Harvest was extremely delayed due to rain in June and early July – as a result, low test weights were recorded.

2015 Middlesex County Wheat Variety Plot

Cooperators:
Producer: Jason Benton
Extension: David Moore, VCE-Middlesex
Taylor Sabo, VCE-Summer Intern

Previous Crop: Corn
Soil Type: Suffolk Fine Sandy Loam
Tillage No Till into shredded stalks
Planting Date: 10/24/14
Fertilization: 10-60-120 Broadcast
20-0-0 December
50-0-0 March
70-0-0 April
Crop Protection: Glyphosate Burndown
Finesse + Lambda-Cy-December
Palisade-April; Prosaro-May
Harvest Date: June 19, 2015

Variety	Test Weight (lbs./bu.)	Moisture (%)	Yield (bu/A @13.5)
GHT 940	62	14.3	104.3*
Check (Shirley)	61	15.2	101.1
GHT 933	61	14.8	92.5
Check	61	15.0	104.6*
Dyna-Gro 9552	62	15.0	92.8
Check	60	14.9	105.6
Dyna-Gro 9223	59	14.9	97.4
Check	60	15.0	102.3
USG 3251	61	14.5	96.5**
Check	61	14.8	102.7
USG 3404	61	14.2	96.7
Check	60	14.0	101.3
Pioneer P26R10	60	13.9	97.5**
Check	60	13.7	100.9
Pioneer P26R20	61	14.1	90.6
Check	60	14.1	101.8
Agri-Maxx 434	61	14.4	92.7*
Check	60	14.3	97.7
Agri-Maxx 446	61	13.9	91.5
Check	60	14.1	103.2
Southern States 8360	61	14.2	100.7*
Check	62	13.7	87.2
Southern States 8415	62	13.2	85.0
Check	60	13.1	103.4
Southern Harvest 3200	62	13.2	91.5*
Check	60	13.2	103.1*

Southern Harvest 4300	60	12.7	98.4
Check	60	13.0	103.6
Featherstone 73	60	13.7	91.4*

*75 lbs. added to the yield weight to compensate for one tire track in the plot.
**150 lbs. added to the yield weight to compensate for two tire tracks in the plot
Estimated total yield damage from tire tracks in 6.8 acre plot is 58 bushels.

Testing done by Mennel Milling:

Protein=Higher the better for baking/milling
SDS=Baking /milling quality; Higher the number the better.
Vomitoxin= Level of toxins (DON levels) found in wheat; for human consumption should not be over 1.5 ppm. (Vomitoxin is directly associated with Head Scab levels)

Variety	Protein Levels	SDS	Vomitoxin (ppm)
GHT 940	10.8	61.2	.21
Check 1-Shirley	9.7	46.5	.37
GHT 933	9.5	45.5	.29
Dyna-Gro 9552	10.3	47.6	.59
Dyna-Gro 9223	9.6	43.7	.25
USG 3251	10.2	45.8	.24
USG 3404	9.9	42.9	.20
Pioneer 26R10	10.3	49.2	.30
Pioneer 26R20	9.8	38.9	.23
Agri-Maxx 434	9.8	44.9	.03
Agri-Maxx 446	10.4	45.0	.25
Southern States 8360	10.2	43.4	.21
Southern States 8415	10.4	52.4	.84
Southern Harvest 3200	10.1	53.5	.46
Southern Harvest 4300	9.2	35.1	.00
Check 2-Shirley	9.9	45.2	.20
Featherstone 73	9.6	46.5	.00

Discussion: This has been a trying year for wheat. Many thanks to Jason and to Mennel for their association with this plot and the results. The plot was treated with Prosaro fungicide with hopes of reducing scab/toxin levels. As you see, the levels were very acceptable. Protein and SDS levels were also decent for the most part.

Use this and other Virginia Tech on-farm research results when making planting decisions for 2016 crop.

2015 Chesapeake Wheat Variety Plot

Cooperators: Producer: Marvel Nicholas
Extension: Watson Lawrence-Chesapeake
Previous Crop: Corn
Soil Type: Chesapeake Fine Sandy Loam
Tillage: Disk followed by disk with culti-packer
Planting Date: October 29, 2014
Fertilizer: October 27: 1 ½ tons Lime/A
October 27: 342 lbs. 14-10-26 + 5.7 lbs. Sulfur/A
April 2: 100 lbs.N/A (32% Liquid Nitrogen)
Crop Protection: April 2: Herbicides (Finesse .2 oz./A + Harmony SG ½ oz./A)

Harvest Date: June 22, 2015

Variety	Test Weight (Lbs./Bu.)	Moisture (%)	Yield Bu./A @13.5%)
Southern States 8340	57.0	11.9	80.59
Dyna Gro 9223	53.3	12.0	80.13
Pioneer 26R10	55.3	12.0	79.73
Great Heart 955	53.2	11.3	79.07
Great Heart 940	56.9	11.4	76.83
Oakes	57.9	12.8	74.94
Shirley	53.2	11.1	74.81
Dyna Gro 9552	55.8	11.8	73.78
Southern States 8870	56.4	12.1	73.58
Harrison	53.1	12.0	72.49
Pioneer 26R41	55.3	12.1	72.45
USG 3251	56.6	12.4	72.30
Great Heart 933	54.4	11.1	70.80
Southern States 8404	55.4	10.9	68.55
Pioneer 26R20	54.8	11.3	67.81
USG 3555	54.7	11.8	65.99
USG 3120	54.7	11.5	63.66
Average	**55.2**	**11.7**	**73.38**

Discussion: Wheat heads showed evidence of Fusarium Head Blight. The incidence of fusarium head blight is strongly associated with moisture at the time of flowering, and the timing of rainfall, rather than the amount, is the most critical factor. Some varieties were impacted more than others, reflecting variation of flowering dates and variety resistance. Varieties with low test weights often evidence of Fusarium Head Blight. Specific recommended fungicides for head diseases are most effective after head emergence and can provide some late-season foliar disease protection.

2015 Virginia Beach Wheat Variety Plot

Cooperators: Producer: Russell H. Malbone
Extension: Roy D. Flanagan III
Previous Crop: No till Field Corn
Soil Type: Predominantly Nimmo Loam and Dragston Fine Sandy Loam
Tillage: Conventional Tillage, Disked 2X, Field Cultivator 2X
Planting Date: November 21, 2013
Fertilizer: Topdressed with 250lbs of 46-0-0
Crop Protection: Harmony Extra SG @ .5oz. per acre
Tilt @ 4 oz. per acre
No insecticide used
Harvest Date: June 30, 2015

Variety	Test Weight (Lbs./Bu.)	Moisture (%)	Yield Bu./A @13.5%)
—Check	**58**	**13.2**	**74.85**
SS 8870	60	12.9	89.51
Oakes	62	13.7	87.97
Pioneer 26R20	61	14.2	86.42
SS 8340	62	13.0	86.42
Dyna Gro 9223	61	13.5	81.79
Pioneer 26R10	60	13.7	80.25
Harrison	62	13.6	80.25
Great Heart 940	62	13.2	77.16
Great Heart 955	60	13.3	77.16
USG 3120	61	13.3	77.16
USG 3251	60	13.1	74.08
Shirley	62	13.5	74.08
Progeny P870	61	12.8	72.53
USG 3555	61	13.3	70.99
Great Heart 933	61	13.4	69.45
SS 8404	62	12.7	66.36
Dyna Gro 9552	62	12.9	64.82
Pioneer 26R41	Data withheld	water hurt	
Average	**61**	**13.29**	**77.29**

2015 "Bearded" Wheat Variety Trial

Cooperators: Producer: Robert Bland IV
Extension: David Moore, VCE-Middlesex
Taylor Sabo, VCE Intern

Previous Crop: Bermudagrass Hay
Soil Type: Emporia Sandy Loam
Tillage: Ripped, Disked and Field Cultivator
Planting Date: November 14, 2014
Fertilizer: 1.5 Ton Chicken Litter (Broadcast)
80-0-0-15s April
Crop Protection: Burndown prior to Chicken Litter-Glyphosate + 2,4-D
Harmony Extra applied in March
Palisade and Smart Trio (April)
Warrior and Prosaro (May)
Harvest Date: June 24, 2015

Variety	Test Weight	% Moisture	Yield A @13.5%
Check-(USG 3120)	59	14.7	77.5
Pioneer 26R10	56	14.8	94.5
Check	58	16.0	76.8
Agri-Maxx 434	57	15.9	82.7
Check	59	15.6	77.2
Southern Harvest 4300	58	15.4	90.3

Discussion:
This was a plot to compare several "bearded" wheat varieties to the check that the producer was using. (A good way for all to learn is to do some small plots on your farm) This has been a very trying wheat crop to get harvested. We even got "stuck" trying to get this one harvested.

A lot of variation in this plot, but overall, a very good plot and some good yields. Please use other Virginia Tech variety information when making planting decisions for the 2016 wheat crop.

2015 Virginia Cooperative Extension On-Farm Wheat Variety Plot Yield Summary for Central and Upper Coastal Plain (bushels/acre)

Variety	Virginia State	Westmoreland	Middlesex	Average	Rank
Great Heart 933	58.9	74.3	92.5	**75.2**	11
Great Heart 940	66.7	68.8	104.3	**79.9**	3
Dyna-Gro 9223	63.4	76.5	97.4	**79.1**	5
Dyna-Gro 9552	61.6	76.8	92.8	**77.1**	8
USG 3251	55.2	80.3	96.5	**77.3**	7
USG 3404	55.7	74.2	96.7	**75.5**	9
Pioneer P26R10	61.9	82.0	97.5	**80.5**	1
Pioneer P26R20	52.8	74.7	90.6	**72.7**	T13
Agri-Maxx 434	56.5	77.0	92.7	**75.4**	10
Agri-Maxx 446	58.1	85.7	91.5	**78.4**	6
Southern States 8360	58.8	81.4	100.7	**80.3**	2
Southern States 8415	57.7	76.6	85.0	**73.1**	12
Southern Harvest 3200	50.5	75.0	91.5	**72.3**	14
Southern Harvest 4300	63.0	77.4	98.4	**79.6**	4
Featherstone 73	51.0	75.7	91.4	**72.7**	T13
Average	**58.1**	**77.1**	**94.6**		

2015 Virginia Cooperative Extension On-Farm Wheat Variety Plot Yield Summary for Central and Upper Coastal Plain (lbs./bu)

Variety	Virginia State	Westmoreland	Middlesex	Average	Rank
Great Heart 933	52.1	53	61	**55.37**	12
Great Heart 940	56.6	53	62	**57.20**	1
Dyna-Gro 9223	53.8	53	59	**55.27**	13
Dyna-Gro 9552	55.3	50	62	**55.77**	10
USG 3251	54.5	53	61	**56.17**	T5
USG 3404	54.1	53	61	**56.03**	T8
Pioneer P26R10	55.1	53	60	**56.03**	T8
Pioneer P26R20	54.8	53	61	**56.27**	3
Agri-Maxx 434	54.6	52	61	**55.87**	9
Agri-Maxx 446	54.4	53	61	**56.13**	6
Southern States 8360	54	54	61	**56.33**	2
Southern States 8416	53.5	53	62	**56.17**	T5
Southern Harvest 3200	52.7	54	62	**56.23**	4
Southern Harvest 4300	53.3	55	60	**56.10**	7
Featherstone 73	53.4	53	60	**55.47**	11
Average	**54.1**	**53**	**60.9**		

2015 Virginia Cooperative Extension On-Farm Wheat Variety Plot Yield Summary for Chesapeake and Virginia Beach (bushels/acre)

Variety	Chesapeake	Virginia Beach	Average	Rank
Great Heart 933	70.8	69.5	**70.13**	13
Great Heart 940	76.8	77.2	**76.98**	8
Great Heart 955	79.0	77.2	**78.08**	6
Dyna-Gro 9223	80.1	81.8	**80.95**	4
Dyna-Gro 9552	73.8	64.8	**69.31**	14
USG 3120	63.7	77.2	**70.43**	12
USG 3251	72.3	74.1	**73.19**	11
USG 3555	66.0	71.0	**68.50**	15
Pioneer P26R10	79.7	80.3	**79.98**	5
Pioneer P26R20	67.8	86.4	**77.11**	7
Pioneer P26R41	72.5	Data withheld	water hurt	-
Southern States 8340	80.6	86.4	**83.51**	1
Southern States 8404	68.6	66.4	**67.48**	16
Southern States 8870	73.6	89.5	**81.56**	2
Harrison	72.5	80.3	**76.38**	9
Oakes	74.9	88.0	**81.44**	3
Shirley	74.8	74.1	**74.44**	10
Average	**73.38**	**77.74**		

2015 Virginia Cooperative Extension On-Farm Wheat Variety Plot Yield Summary for Chesapeake and Virginia Beach (lbs./bu)

Variety	Chesapeake	Virginia Beach	Average	Rank
Great Heart 933	54.4	61.0	**57.70**	10
Great Heart 940	56.9	62.0	**59.45**	3
Great Heart 955	53.2	60.0	**56.60**	15
Dyna-Gro 9223	53.3	61.0	**57.15**	14
Dyna-Gro 9552	55.8	62.0	**58.90**	4
USG 3120	54.7	61.0	**57.85**	T9
USG 3251	56.6	60.0	**58.30**	6
USG 3555	54.7	61.0	**57.85**	T9
Pioneer P26R10	55.3	60.0	**57.65**	11
Pioneer P26R20	54.8	61.0	**57.90**	8
Pioneer P26R41	55.3	Data withheld	Water hurt	-
Southern States 8340	57	62.0	**59.50**	2
Southern States 8404	55.4	62.0	**58.70**	5
Southern States 8870	56.4	60.0	**58.20**	7
Harrison	53.1	62.0	**57.55**	13
Oakes	57.9	62.0	**59.95**	1
Shirley	53.2	62.0	**57.60**	12
Average	**55.18**	**61.2**		

2015 Evaluation of Gaucho 600/BioStart Rhizoboost

Cooperators: Producer: Keith Balderson
Extension: Keith Balderson, VCE-Essex and Stephanie Romelczyk, VCE-Westmoreland and Taylor Sabo, VCE Intern
Agribusiness: Jim Riddell, Agronomist, Southern States Cooperative

Previous Crop: Corn

Variety: SS 5205 treated with EverGol Energy vs. EverGol Energy/Gaucho 600/ BioStart Rhizoboost

Soil Type: Kempsville Sandy Loam

Tillage: No-Till, stalks bush hogged

Planting Date: October 18, 2014

Fertilizer: Fall: 30-90-90 per acre
Spring Topdress: 110-0-0-18 split applied in early February and early April

Crop Protection: Burndown Herbicide: Gramoxone
Pre-emergence Herbicide: Finesse

Harvest Date: June 20, 2015

Treatment	Test Weight	% Moisture	Yield A @13.5%
Check-Rep 1	56.6	12.8	76.8
Gaucho 600/BioStart Rhizoboost-Rep 1	56.5	12.5	78.5
Check-Rep 2	56.6	12.8	76.5
Gaucho 600/BioStart Rhizoboost-Rep 2	56.5	12.5	78.6
Check-Ave.	56.6	12.8	76.65
Gaucho 600/BioStart Rhizoboost-Ave	56.5	12.5	78.55
LSD (0.10)	ns	ns	1.3

Discussion:
This plot compared EverGol Energy Seed Treatment to EverGol Energy/Gaucho 600/BioStart Rhizoboost on SS 5205 wheat. Gaucho 600 is an insecticide seed treatment for the control of aphids and barley yellow dwarf. BIOSTART RhizoBoost belongs to a category of bacteria called spore formers which have the ability to create endospores. Endospores are bacterial seeds; they are in a dormant state and generated when the bacteria is stressed or placed in harsh conditions such as extreme heat, desiccation or drastic pH change. The endospores contain all of the necessary genetic information required to produce a new active bacterial cell once conditions are favorable. Spores have recoverable activity after environmental or chemical shifts. In this plot, the Gaucho 600/BioStart Rhizoboost treatment tended to yield more than the check plots. Visibly there did not appear to be significant barley yellow dwarf present in the check plots, and we don't know if the yield increase is due to the Gaucho 600 or BioStart Rhizoboost.

2015 Middlesex Prosaro Fungicide Test

Cooperators: **Producer:** Jason Benton
Extension: David Moore, VCE-Middlesex
Taylor Sabo, VCE Summer Intern

Previous Crop: Corn
Soil Type: Suffolk Fine Sandy Loam
Tillage No-Till into Shredded Corn Stalks
Planting Date: October 24, 2014
Fertilizer: 10-60-120 Broadcast
20-0-0 December
50-0-0 March
70-0-0 April
Crop Protection: Glyphosate Burndown
Finesse + Lambda-Cy-December
Palisade-April; Prosaro-May
Treatment: Alternating strips with and without Prosaro
Variety: Shirley
Harvest Date: June 18, 2015

Treatment	*Test Weight lbs./bu.	*Moisture %	Yield @13.5%
With Prosaro 1	59.7	14.5	87.3
Without Prosaro1	58.6	13.9	75.8
With Prosaro 2	59.1	14.3	82.3
Without Prosaro2	59.0	13.8	80.6
With Prosaro 3	59.2	14.2	86.3
Without Prosaro3	58.5	13.8	81.8
Avg. With Prosaro	**59.3**	**14.3**	**85.3**
Avg. Without Prosaro	**58.7**	**13.8**	**79.4**
LSD (0.10)	ns	.2	ns

*Mennel Milling Numbers

Discussion:
Each year, depending on rain and wind events at flowering and variety resistance, results from treating for FHB (head scab) can be varied. This year yield results were more varied showing yield advantages from 1.7 to over 11 bushels from applying Prosaro at flowering. Statistically, the yield differences were not significant. Mennel Milling ran test weight, vomitoxin and SDS numbers for the samples of the two treatments.

Other Samples run by Mennel Milling:

Protein: The higher the number the better
SDS = Milling/Baking quality (the higher the better). Indicates protein and gluten strength.
Vomitoxin – Levels of toxins in the sample. It is directly related to the amount of Head Scab present in sample. (For human consumption, levels should be below 1.5 ppm)

Treatment	Protein	SDS	Vomitoxin
With Prosaro 1	10.4	52.5	0.00
Without Prosaro 1	10.8	53.8	0.00
With Prosaro 2	10.5	50.0	0.00
Without Prosaro 2	10.8	51.9	0.09
With Prosaro 3	10.4	49.4	0.00
Without Prosaro 3	10.7	51.2	0.00

Discussion: There is a pretty significant yield bump from using Prosaro in this test, but there is nothing significant about the amount of Vomitoxin present in the samples whether using Prosaro or not. The easiest way to explain that and not get too technical is to say, some DON toxins are more harmful than others.

We do see differences in moisture and test weight when using a Scab fungicide. Generally, there is an increase in moisture and test weight when the fungicide is used and this was again the case in this plot.

Use this and other Virginia Tech on-farm research results when making production decisions for 2016 wheat crop.

2015 Comparison of Aerial vs. Ground Application of Prosaro Fungicide

Cooperators: Producer: Cloverfield Enterprise
Extension: Keith Balderson, VCE-Essex
Taylor Sabo, VCE Intern
Agribusiness: Matt Crabbe, Crabbe Aviations

Previous Crop: Corn
Variety: Yorktown
Soil Type: Tetotum loam and Munden fine sandy loam
Planting Date: October 26, 2014
Fertilizer: Pre-Plant—193 lbs. per acre MAP; 129 lbs. per acre Potash (60% Product)
Burndown—30-0-0-4 per acre
Topdress—100-0-0-12.5 per acre in mid March
Harvest Date: June 26, 2015

Treatment	Replication	% Moisture	Yield A @13.5%
Aerial Application	1	12.9	80
Ground Application	1	13.1	79
Ground Application	2	12.6	74
Aerial Application	2	12.7	76
Aerial Application	3	12.8	85
Ground Application	3	12.5	82
Ground Application-Average		12.7	78.3
Aerial Application-Average		12.9	80.3
LSD (0.10)		ns	1.7

Discussion:
As concerns over Fusarium Head Blight and vomitoxin continue to increase, more farmers are treating small grains with fungicides to prevent scab infection. Both ground and aerial application are being used. Aerial applications can be very beneficial in fields without tramlines and in situations where no tracks are already in the field. Ground and aerial applications of fungicide and insecticide were made at the same time in this plot. This field had tramlines and yields were taken out of the tramlines so the tracks from the ground application would have had little to no effect on yields. Scab pressure in the field was relatively low, and the aerial application tended to be better than the ground application. With wheat at $5.50 per bushel, the aerial application would need to yield about 1 bushel per acre more than the ground application to cover the difference between the costs of the two types of application.

2015 Comparison of Aerial vs. Ground Application of Prosaro Fungicide

Cooperators:	Producer:	Cloverfield Enterprise
	Extension:	Keith Balderson, VCE-Essex
		Taylor Sabo, VCE Intern
	Agribusiness:	Matt Crabbe, Crabbe Aviation
Previous Crop:	Corn	
Variety:	Dyna-Gro 9343	
Soil Type:	Wickham fine sandy loam and Altavista fine sandy loam	
Planting Date:	October 28, 2014	
Fertilizer:	Pre-Plant—190 lbs. per acre Potash (60% product); 190 lbs per acre MAP	
	Burndown—3-0-0-4 per acre	
	Topdress—100-0-0-12.5 per acre	
Harvest Date:	June 29, 2015	

Treatment	Replication	% Moisture	Yield A @13.5%
Aerial Application	1	13.0	84
Ground Application	1	13.4	83
Aerial Application	2	13.0	87
Ground Application	2	13.1	86
Aerial Application	3	12.9	86
Ground Application	3	13.1	87
Aerial Application-Average		13.0	85.7
Ground Application-Average		13.2	85.3
LSD (0.10)		ns	ns

Discussion:
As concerns over Fusarium Head Blight and vomitoxin continue to increase, more farmers are treating small grains with fungicides to prevent scab infection. Both ground and aerial application are being used. Aerial applications can be very beneficial in fields without tramlines and in situations where no tracks are already in the field. Ground and aerial applications of fungicide and insecticide were made at the same time in this plot. This field had tramlines and yields were taken out of the tramlines so the tracks from the ground application would have had little to no effect on yields. Scab pressure in the field was relatively low, and there was virtually no difference in yield between the aerial and ground application. With wheat at $5.50 per bushel, the aerial application would need to yield about 1 bushel per acre more than the ground application to cover the difference between the costs of the two types of application.

2015 Middlesex Palisade Growth Regulator Test

Cooperators: **Producer:** Jason Benton
Extension: David Moore, VCE-Middlesex
Taylor Sabo, VCE Summer Intern

Previous Crop: Corn
Soil Type: Suffolk Fine Sandy Loam
Tillage: No-Till into Shredded Corn Stalks
Planting Date: October 26, 2014
Fertilizer: 10-60-120 Broadcast
20-0-0 December
50-0-0 March
70-0-0 April
Crop Protection: Glyphosate Burndown
Finesse + Lambda-Cy-December
Palisade-April; Prosaro-May
Treatment: Alternating strips with and without Palisade
Variety: Pioneer 26R10
Harvest Date: June 22, 2015

Treatment	Test Weight lbs./bu.	Moisture %	Yield @13.5%
With Palisade 1	60	11.4	81.8
Without Palisade 1	59	11.4	86.0
With Palisade 2	60	11.5	77.5
Without Palisade 2	59.5	11.4	77.9
With Palisade 3	60	11.4	77.5
Without Palisade3	60	11.7	77.3
Avg. With Palisade	**60**	**11.4**	**78.9**
Avg. Without Palisade	**59.5**	**11.5**	**80.4**
LSD (0.10)	ns	ns	ns

Discussion: Palisade is a growth regulator and is suggested to be used if you suspect that wheat will lodge due to weather or increased nitrogen use. It is not meant to increase yields without the increased use of nitrogen. In previous years, it may have increased yields, but did not do more than cover the cost of application. It was a trade of dollars. In this particular test, it did not do that.

Application of Palisade can be made between GS 30 (begin jointing) and GS 37 (just prior to flag leaf). Use this and other Virginia Tech replicated on-farm plot results when making production decisions for 2016 wheat crop.

2007 – 2015 Small Grain Tissue Sample Summary

Totals-2007	N	S	P	K	Mg	Ca	Na	B	Zn	Mn	Fe	Cu	Al
Very High	0	0	0	2	0	0	0	0	0	1	5	0	0
High	0	0	3	2	0	0	0	0	0	1	5	0	2
Sufficient	0	10	7	6	1	7	10	8	4	7	0	6	8
Low	8	0	0	0	9	2	0	2	2	1	0	4	0
Deficient	2	0	0	0	0	1	0	0	4	0	0	0	0
Total	10	10	10	10	10	10	10	10	10	10	10	10	10

Totals-2008	N	S	P	K	Mg	Ca	Na	B	Zn	Mn	Fe	Cu	Al
Very High	4	12	3	36	0	2	0	0	0	23	59	32	0
High	4	32	20	29	0	20	1	1	8	50	41	28	3
Sufficient	24	46	77	35	22	53	100	38	64	15	1	34	98
Low	71	4	1	1	71	26	0	56	26	5	0	7	0
Deficient	8	7	0	0	8	0	0	6	3	8	0	0	0
Total	111	101	101	101	101	101	101	101	101	101	101	101	101

Totals-2009	N	S	P	K	Mg	Ca	Na	B	Zn	Mn	Fe	Cu	Al
Very High	0	0	0	7	0	0	0	0	0	1	13	0	0
High	4	7	3	7	0	3	0	0	5	9	6	7	0
Sufficient	8	11	15	5	14	15	19	10	12	7	0	6	19
Low	7	1	1	0	5	1	0	9	2	0	0	6	0
Deficient	0	0	0	0	0	0	0	0	0	2	0	0	0
Total	19	19	19	19	19	19	19	19	19	19	19	19	19

Totals-2010	N	S	P	K	Mg	Ca	Na	B	Zn	Mn	Fe	Cu	Al
Very High	20	0	13	19	1	1	0	0	0	2	23	4	0
High	2	9	6	3	0	1	0	1	7	4	7	9	0
Sufficient	5	11	11	8	22	21	22	8	13	13	0	14	29
Low	3	2	0	0	6	7	8	13	8	3	0	3	1
Deficient	0	8	0	0	1	0	0	8	2	8	0	0	0
Total	30	30	30	30	30	30	30	30	30	30	30	30	30

Totals-2011	N	S	P	K	Mg	Ca	Na	B	Zn	Mn	Fe	Cu	Al
Barley													
Very High	0	0	0	4	0	0	0	0	0	0	3	0	0
High	2	2	3	0	0	4	0	0	1	2	0	0	0
Sufficient	2	3	2	1	5	1	5	1	3	2	2	3	5
Low	2	0	0	0	0	0	0	2	1	0	0	1	0
Deficient	0	0	0	0	0	0	0	2	0	1	0	1	0
Total	6	5	5	5	5	5	5	5	5	5	5	5	5
Wheat													
Very High	0	0	0	0	0	0	0	0	0	0	3	0	0
High	12	0	10	1	0	0	0	0	0	0	0	0	2
Sufficient	22	13	9	18	17	18	19	4	18	17	16	14	17
Low	0	6	0	0	2	1	0	13	1	1	0	5	0
Deficient	0	0	0	0	0	0	0	2	0	1	0	0	0
Total	34	19	19	19	19	19	19	19	19	19	19	19	19

Totals-2012	N	S	P	K	Mg	Ca	Na	B	Zn	Mn	Fe	Cu	Al
Barley													
Very High	0	0	0	0	0	0	0	0	0	0	0	0	0
High	2	0	0	0	0	3	0	0	0	1	0	0	0
Sufficient	1	3	5	5	4	1	4	5	5	4	5	5	4
Low	0	1	0	0	1	1	1	0	0	0	0	0	0
Deficient	2	1	0	0	0	0	0	0	0	0	0	0	1
Total	5	5	5	5	5	5	5	5	5	5	5	5	5
Wheat													
Very High	1	0	0	0	0	0	1	1	0	0	1	0	0
High	5	0	6	3	0	6	0	0	0	0	0	1	0
Sufficient	14	17	15	21	21	18	23	9	23	22	23	23	18
Low	2	6	3	0	3	0	0	14	1	1	0	0	6
Deficient	2	1	0	0	0	0	0	0	0	1	0	0	0
Total	24	24	24	24	24	24	24	24	24	24	24	24	24

Totals-2013	N	S	P	K	Mg	Ca	Na	B	Zn	Mn	Fe	Cu	Al
Barley and Wheat													
Very High	2	0	0	0	0	0	0	0	0	2	0	0	0
High	3	1	3	0	0	3	0	0	0	0	5	0	0
Sufficient	51	46	60	65	53	58	67	28	55	60	62	65	67
Low	1	4	1	1	8	4	0	38	3	0	0	1	0
Deficient	10	16	3	1	6	2	0	1	9	5	0	1	0
Total	67	67	67	67	67	67	67	67	67	67	67	67	67

Totals-2014	N	S	P	K	Mg	Ca	Na	B	Zn	Mn	Fe	Cu	Al
Barley and Wheat													
Very High	4	0	0	0	0	0	0	0	0	0	6	0	1
High	18	1	8	6	0	9	0	2	0	0	5	0	3
Sufficient	13	29	27	29	32	26	35	26	35	33	24	35	31
Low	0	1	0	0	0	0	0	5	0	0	0	0	0
Deficient	0	4	0	0	3	0	0	2	0	2	0	0	0
Total	35	35	35	35	35	35	35	35	35	35	35	35	35

Totals-2015	N	S	P	K	Mg	Ca	Na	B	Zn	Mn	Fe	Cu	Al
Barley and Wheat													
Very High	1	0	0	4	0	0	0	0	0	0	3	0	0
High	7	12	11	7	0	11	0	1	10	8	10	1	1
Sufficient	5	1	2	2	12	2	13	2	3	5	0	12	12
Low	0	0	0	0	1	0	0	9	0	0	0	0	0
Deficient	0	0	0	0	0	0	0	1	0	0	0	0	0
Total	13	13	13	13	13	13	13	13	13	13	13	13	13

Total Tissue Samples	N	S	P	K	Mg	Ca	Na	B	Zn	Mn	Fe	Cu	Al
(2007-2015)													
Very High	33	12	16	68	1	3	1	1	0	29	113	36	1
High	60	62	76	61	0	59	1	5	30	72	79	47	11
Sufficient	158	201	238	210	215	239	331	142	250	202	149	232	317
Low	95	33	14	7	112	42	12	178	49	16	5	31	17
Deficient	24	38	3	1	19	4	1	20	18	28	0	1	0
Total	370	346	347	347	347	347	346	346	347	347	346	347	346