

# 2019 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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## INTRODUCTION

The On-Farm Variety and Research Publications are a result of collaboration between county agents, producers, crop specialists, and agribusiness to provide research-based information on not only variety selection, but other management practices such as new cultivation, fertilization, planting, and harvesting practices of small grain. It is the intent of all the cooperators involved to provide an unbiased publication that is beneficial in variety selection as well as other current small grain issues.

The authors of this publication wish to thank the cooperators and agribusiness for their cooperation in for the data in this publication, and we are grateful for this cooperation. Without their support, this information would not be available, and the resulting informative data would not be necessary. This publication is made available at the many small grain conferences held annually, at the VCE website (<http://pubs.ext.vt.edu>) and is also available from any local county agricultural extension agent, who can request it from Mike Broaddus in Caroline County (804) 633-6550, or by emailing [broadus@vt.edu](mailto:broadus@vt.edu).

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This is the twenty-sixth year of this multi-year project. Further work is planned for the upcoming growing seasons. The demonstration and research plot results discussed in this publication are a cooperative effort by six Virginia Cooperative Extension agents, extension specialists from Virginia Tech, and a VCE summer intern. 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 2020.

### DISCLAIMER:

Trade and brand names used in this publication are for educational and comparative purposes only, and Virginia Cooperative Extension does not guarantee or warrant the standards of the products, nor does Virginia Cooperative Extension imply approval of the product to the exclusion of others that may be suitable.





**Figure 1.** This picture vividly depicts the timing and pattern of a prior material left in boom lines on a 120 foot boom width sprayer. After spraying end rows with Prosaro herbicide and running the tank empty, the sprayer was filled with a spray solution of Miravis Ace herbicide and proceeded spraying. We can easily see how the Miravis Ace started coming out first in the center, closest to the pump, and slowly pushed the Prosaro out to the boom end nozzles as it went along. (Photo courtesy of David Hula)

## TABLE OF CONTENTS

	Page
General Summary .....	5
Westmoreland County Variety Plot.....	6
Essex County Variety Plot.....	8
Virginia Beach Variety Plot .....	9
Test Weight Summary Chart .....	10
Yield Summary Chart.....	11
2019 Variety Disease Resistant Chart .....	12
2019 Prince George County Wheat Fungicide Plot Results.....	13
2019 Essex County Wheat Fungicide Plot Results .....	14
2019 Wheat On-Farm Fungicide Test Summary.....	16
2019 Wheat On-Farm Graphical Summary.....	17
2019 Wheat On-Farm Turbo-till Wheat Plot.....	18
References .....	20

## GENERAL SUMMARY

- A. THE SEASON:** 2018-19 was not a model year for wheat. The fall of 2018 was wetter than average, and thus prevented 34% of wheat acres from being seeded by November 11, so a significant amount was planted late. With a seasonable December and January, stands looked well, but significant statewide rainfall during February appears to have taken a toll on the tillering process and the result was not a well tillered, thick stand. In addition, a very hot spell during the end of June led to a condition across Eastern Virginia that led to a great amount of seed shattering. This fierce and sudden hot spell caused the formation of a very thin and weak abscission layer between the seed kernels and the flower that produced them, thus a great amount of shattering ensued for many varieties.
- B. VARIETY SELECTION:** There are many factors that can be altered in wheat production such as soil fertility, and the decision to apply/not apply pest and disease control options. However, variety selection still remains an extremely important component of wheat production. Virginia Cooperative Extension, along with cooperating producers, planted three variety plots throughout central Virginia in 2018-19. A total of eleven soft red winter wheats were donated and tested across Westmoreland County, Essex County, and Virginia Beach, and the yields and test weights for all eleven are compared on pages 8 and 9. Essex utilized a variety supplied by the farmer for two check strips, to determine variance across the field. Virginia Beach also tested five additional wheat varieties bred for southern climates. For comparative purposes, there is a table in this publication that summarizes all three plots for comparative yield and test weight. This year, the average yield per variety across all three locations ranged from 61.9 bushels per acre to 75.8 bushels per acre, and the average yields for all varieties at the three locations ranged from 58.1 bushels per acre in Essex to 79.1 bushels per acre in Virginia Beach. The average tests weights across varieties were also very similar in readings of the test weights, ranging from 56.3 pounds per bushel to 58.3 pounds per bushel. However, unlike the small variance in test weights between the varieties, the variance in test weights between the locations was not so small, ranging from an average of 53.3 pounds per bushel in Essex, to 60.9 pounds per bushel in Virginia Beach. We can speculate in saying this can be due to very spotty and irregular weather patterns from late winter of 2018 to harvest in 2019.
- It is advisable to be cautious when choosing a variety from any publication that reports yield data. Simply choosing the top yielding variety may or may not be the best yielding variety for your style of production. One would be advised to consider many factors when choosing the best variety for their operation. Different soils, different fertilization practices, different pesticide practices, and different timing of planting and harvesting can severely alter variety performance and yield results. These practices are listed on each plot reporting sheet in this publication and are there for your use. Please consider these practices versus yours when choosing a variety.
- C. DISEASE:** Fusarium Head Blight (Scab) is a large concern for wheat farmers in the region, and results in less profit per acre. In addition to our normal wheat variety testing plots you will also notice a section where agents worked with producers on a new fungicide from Syngenta named Miravis Ace, which has a new MOA that prevents Fusarium fungi from being detrimental to growing crops. In addition to the fungicide treatment plots, there is also a test plot done on no-tilling versus vertical tillage, replicating research done in 2014 by Keith Balderson on the results on reduction of inoculant in wheat fields at planting.



## 2019 Westmoreland County Wheat Variety Plot

**Cooperators:** Producer: F.F. Chandler, Jr.  
 Louis Chandler  
 Extension: Stephanie Romelczyk, VCE – Westmoreland  
 Trent Jones, VCE – Northumberland/Lancaster  
 Mike Broaddus, VCE – King George/Caroline  
 Ahmerah Thompson, VCE Intern

**Previous Crop:** Corn

**Soil Type:** Suffolk sandy loam

**Tillage:** No-till

**Planting Date:** November 20, 2018

**Fertilizer:** 30-80-90-5S in fall  
 40-0-0-15S in January  
 70-0-0-8S + 1gal Black Label Zn in March

**Crop Protection:** Pre-plant: Gramoxone 2.5 pts/A + Scanner  $\frac{3}{4}$  pt/A + Finesse 0.4 oz/A +  
 Sharpen 1 oz/A  
 Quelex 0.75oz/A + Scanner  $\frac{3}{4}$  pt/A + Quadris 3oz/A in March  
 Miravis Ace 13.7 oz/A + LI 700  $\frac{1}{2}$  pt/100 gal + Tombstone 2 oz/A in May

**Harvest Date:** June 25, 2019

Variety	Test Weight (Lbs/Bu.)	Moisture (%)	Yield Bu./A @13.5%
Croplan 8550	56.5	15.2	69.3
Croplan 8800	56.0	14.6	84.4
Hilliard	56.5	15.2	73.5
Progeny Berkley	56.5	13.9	67.2
Pioneer 26R10	57.5	15.2	70.6
Hubner H400	56.5	14.4	64.6
Pioneer 26R59	57.5	14.9	71.0
Progeny Bullet	58.0	15.0	69.0
Southern Harvest 7200	57.5	15.0	68.8
Southern Harvest 7510	57.0	14.1	72.8
Hubner H350	58.0	14.7	69.9

**Discussion:** Wet weather in the fall and winter during planting and tillering may have impacted yields, which tended to be lower than usual. Test weights were normal despite recent rain events.



**Figure 2.** Taken June 25, 2019, F.F. Chandler, Jr. of the Northern Neck harvests wheat variety plots for the 2019 On-Farm Wheat Variety Plot Publication. (Photo courtesy of Stephanie Romelczyk)

## 2019 Essex County Wheat Variety Plot

**Cooperators:** Producer: Calvin Haile; Haile Farms  
 Extension: Robbie Longest; VCE - Essex

**Previous Crop:** Corn

**Soil Type:** Tetotum loam

**Tillage:** No-till

**Planter/Row Width:** John Deere 1890CCS 36ft. grain drill, 7.5 inch spacing

**Planting Date:** October 25, 2018

**Planting Population:** 32 seeds per row foot

**Fertilizer:** Variable rate averaging 50# AMS, 80# MAP, and 129# Potash per acre

**Crop Protection:** Burndown: Gramoxone and 2,4-D  
 March 27, 2019: Osprey @ 4.75 oz/A and Quelex @ 0.75 oz/A  
 May 6, 2019: Prosaro @ 7.0 oz/A

**Harvest Date:** June 26, 2019

Variety	Test Weight (Lbs./Bu.)	Moisture (%)	Yield Bu./A @13.5%
Check (Cropland 8340)	55.4	14.0	60.9
Hubner H350	54.8	12.9	53.9*
Progeny "Berkeley"	53.5	11.8	64.6
Cropland CP 8800	52.9	12.0	56.8
VCIA "Hilliard"	53.1	11.9	64.5
Southern Harvest SH7510	53.8	12.7	59.2
Pioneer 26R59	53.6	11.8	58.1*
Progeny "Bullet"	51.3	11.7	59.0
Hubner H400	52.9	11.9	50.4*
Southern Harvest SH7200	54.3	12.4	62.4
Pioneer 26R10	54.8	11.9	56.8
Cropland CP 8550	51.5	11.5	53.2
Check (Cropland 8340)	54.9	13.0	60.6
<b>Average</b>	<b>53.6</b>	<b>12.3</b>	<b>58.5</b>

**Discussion:** The 2018-2019 growing season was not the most optimal situation for wheat producers. Frequent rainfall throughout the fall and early winter of 2018 created planting and fertility challenges. Tiller development seemed to be affected by many of these challenges, and probably corresponded to lower yields than normal in some situations. Several of the varieties in this plot (denoted by a \*) had visibly more deer feeding damage, which was evident in the yield values. Please compare this variety plot data with data from other variety plots from your region and use it to make seed selection choices for 2019 that match your production conditions.



## 2019 Virginia Beach Wheat Variety Plot

**Cooperators:** Producer: Jason Dawley  
 Extension: Roy Flanagan & Watson Lawrence  
  
**Previous Crop:** Corn  
**Soil Type:** Tetotum Loam and State Loam  
**Tillage:** Conventional Till  
**Row Width:** 7-inch drill rows  
**Planting Date:** November 14, 2018  
**Fertilizer:** 350 lbs. 11-15-26 + 6% S pre-plant; plus 28 gal. 32% liquid N (100 lbs.)  
**Crop Protection:** Quelex .75 oz./acre + Osprey 4.75 oz./acre  
**Harvest Date:** June 17, 2019

Variety	Test Weight (Lbs./Bu.)	Moisture (%)	Yield Bu./A @13.5%
Syngenta 547	61	12.8	95.9
VACP Hillard	62	13.5	94.0
Pioneer 26R59	59	13.0	92.7
Progeny Berkley	61	12.9	91.3
USG 3458	61	13.3	88.4
Cropland 8800	60	13.3	86.2
Pioneer 26R10	59	13.0	85.6
Hubner 350	61	12.7	83.8
Lima Grain 3204	62	13.1	81.3
Progeny Bullet	61	13.0	79.2
Hubner 400	61	13.2	76.2
Syngenta Viper	62	13.2	74.6
USG 3536	62	13.4	73.2
Southern Harvest 7200	63	13.8	71.1
Cropland 8550	62	13.4	63.2
Southern Harvest 7510	61	13.5	46.6
<b>Average</b>	<b>61</b>	<b>13.2</b>	<b>80.2</b>

**Discussion:** Frequent rain during flowering and grain fill stages prevented fungicide application by ground in 2019. In the Virginia Beach Variety Test, test weights were ½ lb./bu. higher in 2019 vs. 2018. Average yield was 6 bushels/acre higher in 2019.

## 2019 Virginia Cooperative Extension On-Farm Wheat Variety Plot

### Test Weight Summary (pounds/bushel)

<b>Variety</b>	<b>Westmoreland</b>	<b>Essex</b>	<b>Va. Beach</b>	<b><u>AVERAGE</u></b>
Croplan 8550	56.5	51.5	62.0	<b>56.7</b>
Croplan 8800	56.0	52.9	60.0	<b>56.3</b>
Hilliard	56.5	53.1	62.0	<b>57.2</b>
Progeny Berkley	56.5	53.5	61.0	<b>57.0</b>
Progeny Bullet	58.0	51.3	61.0	<b>56.8</b>
Hubner H400	56.5	52.9	61.0	<b>56.8</b>
Pioneer 26R59	57.5	53.6	59.0	<b>56.7</b>
Pioneer 26R10	57.5	54.8	59.0	<b>57.1</b>
Southern Harvest 7200	57.5	54.3	63.0	<b>58.3</b>
Southern Harvest 7510	57.0	53.8	61.0	<b>57.3</b>
Hubner H350	58.0	54.8	61.0	<b>57.9</b>
<b><u>AVERAGE</u></b>	<b>57.0</b>	<b>53.3</b>	<b>60.9</b>	<b>57.1</b>

## 2019 Virginia Cooperative Extension On-Farm Wheat Variety Plot

### Yield Summary (bushels/acre @ 13.5%)

<b>Variety</b>	<b>Westmoreland</b>	<b>Essex</b>	<b>Va. Beach</b>	<b><u>AVERAGE</u></b>
Croplan 8550	69.25	53.2	63.24	<b>61.9</b>
Croplan 8800	84.43	56.8	86.18	<b>75.8</b>
Hilliard	73.49	64.5	93.98	<b>77.3</b>
Progeny Berkley	67.20	64.6	91.31	<b>74.4</b>
Progeny Bullet	70.58	59.0	79.17	<b>69.6</b>
Hubner H400	64.59	50.4	76.15	<b>63.7</b>
Pioneer 26R59	71.00	58.1	92.65	<b>73.9</b>
Pioneer 26R10	69.04	56.8	85.59	<b>70.5</b>
Southern Harvest 7200	68.77	62.4	71.14	<b>67.4</b>
Southern Harvest 7510	72.79	59.2	46.60	<b>59.5</b>
Hubner H350	69.92	53.9	83.81	<b>69.2</b>
<b><u>AVERAGE</u></b>	<b>71.0</b>	<b>58.1</b>	<b>79.1</b>	<b>69.4</b>

## 2019 Variety Disease Resistance Traits

Information courtesy Small Grains in Virginia, 2019, Virginia Tech Wheat Test, 2017, 2018, and 2019 harvest data (Thomason, et al)

Cultivar	Mat. date	FHB index*	Powd. Mild.*	Stripe rust*	Leaf Rust *	BYD *
CROPLAN 8550	121	2	1	0	1	1
CROPLAN 8800 <sup>(2)</sup>	121	3	1	n/a	1	2
Hilliard	119	2	1	0	2	1
Progeny Berkley	118	3	1	0	2	1
Progeny Bullet	121	2	1	0	1	1
Hubner H400 <sup>(3)</sup>	120	1	3	6	1	3
Pioneer 26R59	119	3	1	0	4	2
Pioneer 26R10	121	2	3	0	5	2
Southern Harvest SH7200	118	5	2	2	1	2
Southern Harvest SH7510	121	2	2	0	1	1
Hubner H350 <sup>(3)</sup>	120	3	4	1	2	2

\* = The 0-9 ratings indicate a varieties response to disease or lodging where 0 = highly resistant and 9 = no resistance

<sup>(2)</sup> = taken from summary of 2019 harvest data, Small Grains in Virginia, 2019

<sup>(3)</sup> = taken from Humber Seed Product website



## 2019 Prince George County Wheat Fungicide Trial

**Cooperators:** Producer: George Reiter  
Extension: Scott Reiter, Prince George

**Previous Crop:** Soybeans

**Soil Type:** Emporia sandy loam

**Tillage:** No-till

**Planter/Row Width:** John Deere 1590 drill, 7.5 inch rows

**Planting Date:** November 3, 2018

**Planting Population:** 25 seed per foot - USG 3536

**Fertilizer:** Pre: 20-40-120-12S  
Feb 10: 40-0-0-5S  
Mar 23: 65-0-0

**Crop Protection:** Burndown: 1 qt/A Roundup Powermax  
Mar 23: 0.8 oz/A Harmony Extra SG  
April 30: Miravis Ace 13.7 oz/A + Factor 80 non-ionic surfactant (1 pt/100 gal) or untreated

**Harvest Date:** June 16, 2019

Treatment	Replication	Test Weight (Lbs./Bu.)	Moisture (%)	Yield Bu./A @13.5%
Miravis Ace	1	57.1	14.0	66.7
Untreated	1	55.1	12.9	68.5
Miravis Ace	2	57.0	14.2	66.6
Untreated	2	54.4	12.7	61.9
Miravis Ace	3	57.4	13.9	60.9
Untreated	3	54.7	12.9	62.4
<b>AVERAGE</b>				
Miravis Ace		57.2 a	14.0 a	64.8
Untreated		54.7 b	12.8 b	64.3
<i>Letters following numbers indicate a statistical difference at the 95% confidence level. (P=0.05)</i>				

**Discussion:** This test evaluated the potential of Miravis Ace fungicide to improvement wheat yield and quality. Yield was positively improved by ½ bushel per acre, which is not statistically different. Test weight was positively influenced by fungicide application with a 2.5 lb/bu increase. Moisture of the treated plots was 1.2% higher than the untreated. This is attributed to the longer stay green period of the treated wheat. The treated plots had visibly brighter straw and heads than the untreated plots. A comparison of discounts for moisture and test weight shows that the Miravis Ace treatment had a \$0.015 per bushel advantage (untreated = \$0.13 bu; treated = \$0.115 bu). At these yield levels, that is approximately \$1 per acre difference in revenue.

## 2019 Essex County Wheat Fungicide Trial

**Cooperators:** Producer: Calvin Haile; Haile Farms  
Extension: Robbie Longest; VCE - Essex

**Previous Crop:** Corn

**Soil Type:** Rumford loamy sand, Kempsville sandy loam, Slagle fine sandy loam

**Tillage:** No-till

**Planter/Row Width:** John Deere 1890CCS 36ft. grain drill, 7.5 inch spacing

**Planting Date:** October 8, 2018

**Variety:** Steyer 5210 Hard Red Winter wheat

**Planting Population:** 32 seeds per row foot

**Fertilizer:** Variable rate averaging 50# AMS, 80# MAP, and 129# Potash per acre

**Crop Protection:** Burndown: Gramoxone and 2,4-D  
March 18, 2019: Osprey @ 4.75 oz/A and Quelex @ 0.75 oz/A  
April 17, 2019: Palisade @ 10.5 oz/A and Grizzly Too @ 2.0 oz/A  
May 3, 2019: Miravis Ace @ 13.7 oz/A on test plots  
Prosaro @ 8.2 oz/A on test plots

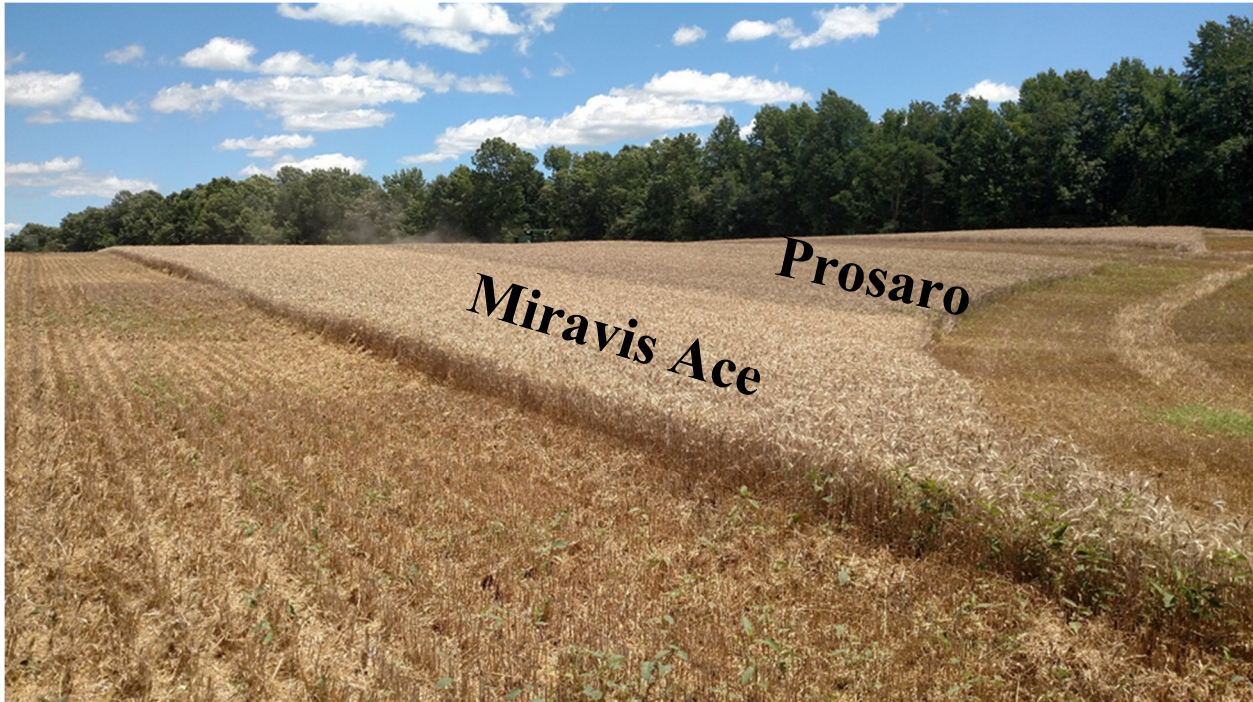
**Treatment:** Strips of Miravis Ace fungicide and Prosaro fungicide

**Harvest Date:** June 14, 2019

Treatment	Replication	DON (ppm)	Test Weight (Lbs./Bu.)	Moisture (%)	Yield Bu./A
Check (Prosaro)	1				71.4
MiravisAce	1				76.3
Check	2				74.5
MiravisAce	2				74.7
Check	3				72.9
MiravisAce	3				69.9
<b>AVERAGE</b>					
<b>Check (Prosaro)</b>		<b>0.11</b>	<b>56.0</b>	<b>15.1</b>	<b>73.0</b>
<b>MiravisAce</b>		<b>0.25</b>	<b>57.7</b>	<b>18.0</b>	<b>73.6</b>

**Discussion:** This wheat fungicide trial evaluated Miravis Ace compared to a grower check fungicide (Prosaro) to assess the control of wheat fungal diseases, primarily Fusarium Head Blight. Fungicides were applied at flowering on the same day in alternating strips within the field. A composite sample across replications was taken for each treatment. There was a visual color difference at harvest as shown in the two photos below (Figure 1 and Figure 2). The Miravis Ace plots were visibly lighter in color than the Prosaro treatment. Grain samples submitted to a local grain elevator were tested for DON content, with the Prosaro sample having a lower DON (ppm) value. The moisture was 2.9% higher at harvest in the Miravis Ace treatment. The Miravis Ace treatment average had a 0.6 bushel per acre yield advantage over the Prosaro treatment.





**Figure 1:** The Miravis Ace treatment replications (left) were visibly lighter in color than the Prosaro treatment replications (right) at harvest (photo courtesy of Robbie Longest).



**Figure 2:** Another photo of the comparison in straw and glume color between the Miravis Ace fungicide treatment (left), and the Prosaro fungicide treatment (right) (photo courtesy of Robbie Longest).

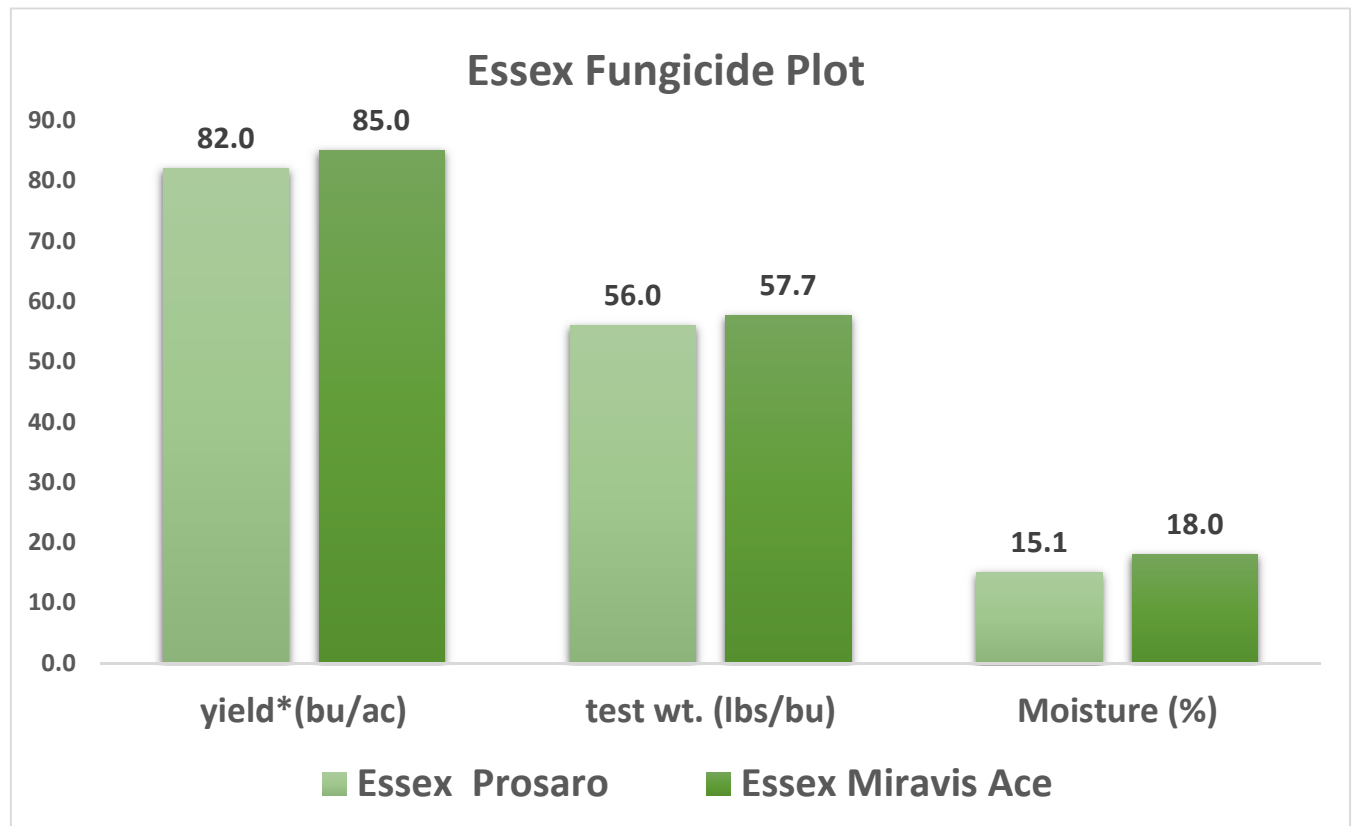
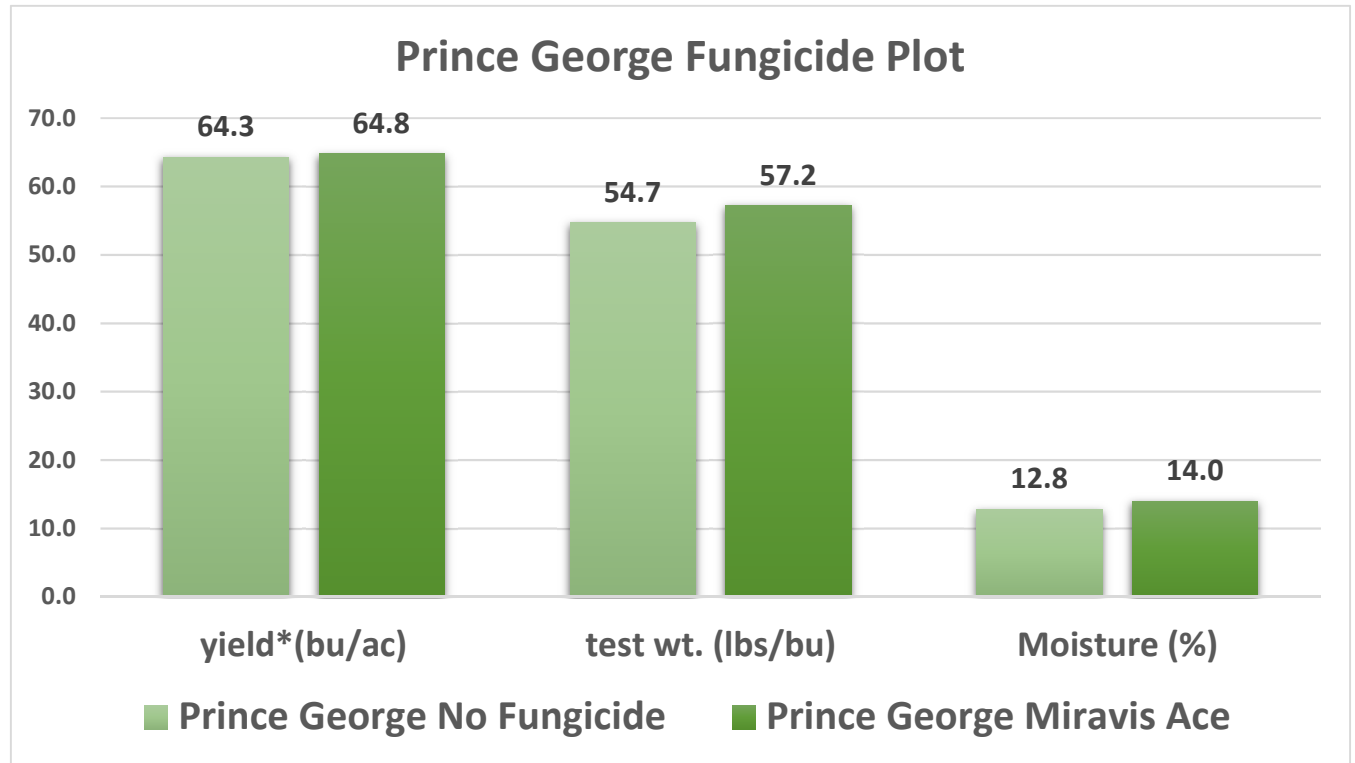
## 2019 Wheat On-Farm Fungicide Test Summary

	<u>Essex</u>		<u>Prince George</u>	
	Prosaro	Miravis Ace	Untreated	Miravis Ace
Yield*(bu/ac)	82	85	64.3	64.8
Test wt. (lbs/bu)	56	57.7	54.7	57.2
Moisture (%)	15.1	18.0	12.8	14.0
VOM/DON	0.11	0.25	0.1	0.04
Scab dockage	0.4	0.4	0.3	0.2
Falling number	312	373	77	120
Damage	0.5	0.4	13.6	7.5

### Summary Discussion:

This test was to determine the effectiveness of the new Fusarium head blight fungicide Miravis Ace against other methods and fungicides currently being used. Although four (4) tests were planned, only two produced data that could be utilized to report. The data from these two tests do indicate that the new Miravis Ace fungicide does increase yield, but from this data, only very little. There are many things to note in the results of this test, seemingly due in large to the timing of rainfall events prior to flowering. Grain elevators have noted in 2019 that Fusarium head blight, or scab, was not as prevalent in 2019 as was witnessed in prior years, therefore, yield, test weight, scab dockage and other tests performed this year may have been more pronounced in more scab prevalent years. One large note was made in the test weight; on both the tests where Miravis Ace was compared to Prosaro and no treatment, the test weights were notably higher. This in itself can highly affect yield. Moisture was identical when compared to Prosaro, but against the untreated plots in Prince George was much higher. This higher moisture, when also considering the higher falling number, leads us to believe that the Miravis Ace fungicide seems to slow the ripening process for wheat by keeping scab fungi at bay, therefore keeping the wheat living longer. The amount of damage as seen in the Prince George tests also support this theory in that ripe seed, versus greener seed, will suffer more combine damage. Also, in both locations, the wheat treated with Miravis Ace had a very appealing golden color, whereby the other compared plots appeared grayish in color, which may have been the presence of decomposing fungi. In conclusion, more work is needed to thoroughly determine the effectiveness of this new fungicide and more test plots should be performed in years more prevalent in scab.



**2019 On-Farm Fungicide Test Graphical Summary:**

## 2019 Turbo Till Wheat Plot

**Cooperators:** Producer: Calvin Haile; Haile Farms  
Extension: Robbie Longest, VCE - Essex

**Previous Crop:** Corn

**Soil Type:** Suffolk and Kempsville sandy loam, Atlee silt loam, Slagle fine sandy loam

**Tillage:** No-till except for vertical tillage in Turbo Till treatment plots

**Planter/Row Width:** John Deere 1890CCS 36ft. grain drill, 7.5 inch spacing

**Planting Date:** October 10, 2018

**Variety:** Vizion 45 Hard Red Winter Wheat

**Planting Population:** 32 seeds per row foot

**Fertilizer:** Variable rate averaging 50# AMS, 80# MAP, and 129# Potash per acre

**Crop Protection:** Burndown: Gramoxone and 2,4-D  
March 19, 2019: Osprey @ 4.75 oz/A and Quelex @ 0.75 oz/A  
April 12, 2019: Palisade @ 10.5 oz/A and Grizzly Too @ 2.0 oz/A  
May 2, 2019: Prosaro @ 7.0 oz/A

**Treatment:** Strips of Turbo Till vs. stalk chopping header

**Harvest Date:** June 15, 2019

Treatment	Replication	*Tillers/ft. <sup>2</sup>	Yield Bu./A
Check (Stalk Chopping Header)	1	32.3	69.4
Turbo Till	1	44.0	61.8
Check	2	32.3	57.7
Turbo Till	2	38.4	63.2
Check	3	23.5	61.6
Turbo Till	3	17.6	59.6
<b>Average Check (2019)</b>		<b>29.4</b>	<b>62.9</b>
<b>Average Turbo Till (2019)</b>		<b>33.3</b>	<b>61.5</b>
<b>Average Check (2014)</b>		<b>76.7</b>	<b>91.0</b>
<b>Average Turbo Till (2014)</b>		<b>85.3</b>	<b>92.6</b>

\*Tiller counts were taken on March 15, 2019 and the reported tillers/ft<sup>2</sup> is the average of two counts taken from each plot from average areas of the plot.

**Discussion:** This work was a continuation of a similar study that was assessed in 2014. Residue management continues to be a concern in small grains in relation to seeding and germination, as well as a source of disease inoculum. These studies looked at vertical tillage using a Turbo Till, and its effects on tillering and grain yield. Tiller counts were low in this plot at the time of sampling in 2019, but this may be explained by excessive fall and winter precipitation which may have leached nutrients and altered application timing. In both years of this study, vertical tillage prior to planting did not significantly increase yields, and in fact resulted in a 1.35 bushel per acre average decrease in 2019. Average tiller counts were greater in the Turbo Till treatment in both 2014 and 2019. Yield was determined using a yield monitor on the combine.



**Figure 3:** This photo was taken on March 15, 2019 when tiller counts were taken. There was not much visual difference in the stalk chopping header (check) treatment on the left of the orange flag, and the Turbo Till treatment on the right (photo courtesy of Robbie Longest).

## **References**

- NOAA, 2019 National Climatic Data Center
- USDA, 2019 National Agricultural Statistics Service (NASS)
- Small Grains in VA, 2019. <https://www.pubs.ext.vt.edu/SPES/SPES-153/SPES-153.html>