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2021 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 collaboration between county agents, producers, crop specialists, and agribusinesses 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 many producers and agribusiness for their cooperation in obtaining the data in this publication. Without their support, this information would not be available, and the resulting publication would not be possible. This publication is made available at numerous small grain conferences held annually, at the VCE resources website (<https://resources.ext.vt.edu>), and is also available from any local county agricultural Extension agent, who can request copies from Robbie Longest in the Essex County VCE Office at (804) 443-3551 or robbiel7@vt.edu.

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This is the twenty-eighth year of this multi-year project. Further work is planned for the upcoming growing season. The demonstration and research plot results discussed in this publication are a cooperative effort by six Virginia Cooperative Extension ANR agents, one retired agent, an Extension specialist 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 2022.

If you are a producer interested in participating in on-farm plot work, or have research ideas that you would like to see evaluated through this project, please contact your local Extension office.

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: Essex County On-Farm Wheat Variety Plot exhibiting different varieties. These plots allow producer-cooperators to visually assess the different wheat varieties for growth and performance from planting to harvest. (photo by Robbie Longest)



Figure 2: Producer-cooperator Jacob Bostic harvesting the 2021 Goochland County On-Farm Wheat Variety Plot. (photo by Robbie Longest)

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Soft red winter wheat at maturity (photo by Robbie Longest)

GENERAL SUMMARY

- A. THE SEASON:** Most of the test locations experienced a wet fall in 2020, resulting in several challenges including delayed planting, slower growth and tillering, and some nutrient loss in sandier soil types. One major difference from the 2019-2020 growing season was that there was not a substantial late freeze event around flowering like experienced in May 2020. Recommendations to delay planting (about 7 days) later into the fall than historical plant dates are being advised due to increasing accumulations of fall growing degree days (GDD). This practice will hopefully help to avoid spring freeze damage, by positioning the crop to have adequate, but not excessive, fall growth resulting in slightly later flowering dates in the spring. April-May was relatively dry for most locations, resulting in minimal disease pressure and Fusarium Head Blight (FHB) incidence.
- B. VARIETY SELECTION:** Variety selection has been and continues to be a very important foundation of producing high-yielding, good quality small grain. With so many options being commercially available, replicated yield data such as that presented in this publication is of great value to producers in helping make this important decision. Many agronomic factors should be considered when selecting a variety such as yield, grain quality, disease resistance package, lodging susceptibility, response to fertility, heading date, etc. Virginia Cooperative Extension, along with six producer-cooperators, planted six variety plots throughout eastern and central Virginia in 2020-21. A total of thirteen varieties of soft red winter wheat (SRWW) and two varieties of hard red winter wheat (HRWW) were donated and tested across the counties of Culpeper, Essex, Goochland, New Kent, Northumberland, and Westmoreland. It should be noted that the New Kent plot only consisted of 12 varieties and did not include Berkeley and the 2 HRWW varieties. Variety yield and test weight summaries for all locations can be found on pages 12 and 13 respectively, summarizing results for comparative purposes. An agronomic traits table found on page 14 reports maturity, plant height, and several disease resistance ratings for all of the tested varieties. Wheat seed size varies, resulting in differences in planting rates and pounds of seed per acre sowed. Included on page 15 is a planting chart for different sized wheat seed as a reference to insure accurate planting populations.

It is advisable to be cautious when choosing a variety from any publication that reports yield data, particularly single-year single-location data. Simply choosing the top yielding variety found in this publication may or may not be the best choice for your style of production and farm. Please consider the production practices listed for each location versus yours when selecting a variety and anticipating its performance.

Culpeper County Wheat Variety Plot

Cooperators: **Producer:** Rosenberger Farms - Nathan Rosenberger, Natalie Upshaw
Extension: Carl Stafford, ANR – Culpeper
 Greg Lillard

Previous Crop: Soybean
Soil Type: Glenelg Silt Loam, 27B/27C
Tillage: No-till
Planter/Row Width: 15’drill/ 7.5 inches
Planting Date: December 12, 2020
Planting Population: 3 bu./A
Fertilizer: 70# N (split 35# each),100# P, 200# K
 1gal./A Ferterain
Crop Protection: Fungicide: Aproach Prima / Insecticide: Lamcap II
Harvest Date: June 30, 2021

Variety	Test Weight (Lbs./Bu.)	Moisture (%)	Yield (Bu./A @13.5%)
Progeny Berkeley	59.8	12.7	77.0
VIPG 41T (HRWW)	58.6	11.9	73.7
Southern Harvest 9520	59.2	13.7	79.9
Eddie Mercer MBX 223	57.1	13.1	79.4
Pioneer 26R59	53.8	16.3	77.2
Croplan CP8550	57.5	14.0	74.5
USG 3472	N/A ^a (Wet)	N/A	N/A
Check (Pioneer 26R59)	53.2	17.9	81.0
Progeny PGX19-17	53.3	18.9	84.2
Croplan CP9606	55.3	15.4	84.8
Pioneer 26R45	57.4	13.0	86.0
Southern Harvest 7200	59.6	13.8	78.6
Eddie Mercer MBX 127	57.1	18.6	76.3
Liberty 5658	56.3	18.6	74.6
VIPG 2519T (HRWW)	59.0	13.4	73.1
USG 3562	60.4	13.0	84.4
Check (Pioneer 26R59)	54.8	15.7	83.3
AVERAGE	57.0	15.0	79.3
AVERAGE CHECK	54.0	16.8	82.2

^a N/A = readings not available

Discussion: Pounds grain adjusted to zero moisture = dry mater (DM). DM / standard dry matter content (1-.135=.865) = adjusted pounds / 60 pounds per bushel at 13.5% = bushels / area = bushels per acre.

Essex County Wheat Variety Plot

Cooperators: **Producer:** Dunbrooke Farms- Lane and Patrick Brooks
Extension: Robbie Longest, ANR – Essex
 Mike Broaddus, Former ANR – Caroline/King George

Previous Crop: Corn
Soil Type: Kempsville sandy loam
Tillage: No-till (behind vertical tillage)
Planter/Row Width: John Deere 1990 Airdrill/ 7.5 inches
Planting Date: November 6, 2020
Planting Population: ~3 bu./A (36 seeds / row foot)
Fertilizer: **Pre-plant:** 20-50-120-12 S (lbs./A) broadcast
In-Season: Dec. 40# N / Mar. & Apr. 60# N (28-0-0-5)
Crop Protection: **Burndown:** Devour (2 pt./A), Sharpen (1oz./A), MSO
In-Season: Dec. Zidua (2.5 oz./A), T-Square,
 Priaxor + Ravage (2 oz./A)
Mar. & Apr. Vigil (4oz./A) / Apr. Insect. + micros
Early May Caramba
Harvest Date: June 21, 2021

Variety	Test Weight (Lbs./Bu.)	Moisture (%)	Yield (Bu./A @13.5%)
Check (USG 3329)	56.0	12.2	79.1
VIPG 2519T (HRWW)	57.5	11.2	87.4
VIPG 41T (HRWW)	55.6	10.6	81.6
Progeny PGX19-17	55.4	12.7	98.1
Progeny Berkeley	57.3	11.0	87.7
Liberty 5658	60.0	11.9	91.0
USG 3472	58.3	11.9	91.4
USG 3562	58.8	11.6	88.6
Croplan CP8550	58.2	12.1	91.2
Croplan CP9606	57.0	12.1	95.8
Southern Harvest 7200	59.7	12.0	90.9
Southern Harvest 9520	57.9	11.4	91.2
Pioneer 26R59	52.2	11.7	98.8
Eddie Mercer MBX 127	58.4	11.9	87.0
Pioneer 26R45	57.2	11.9	90.0
Eddie Mercer MBX 223	55.9	12.0	87.7
Check (USG 3329)	56.9	12.1	76.5
AVERAGE	57.2	11.8	89.0
AVERAGE CHECK	56.5	12.2	77.8

Discussion: Great yields despite a challenging growing season, and was a great example of intensive winter wheat management. USG 3329 was used as the producer check.

Goochland County Wheat Variety Plot

Cooperators: **Producer:** Jacob Bostic
Extension: Nicole Shuman, ANR – Goochland
 Robbie Longest, ANR – Essex

Previous Crop: Corn
Soil Type: Madison fine sandy loam, Cecil fine sandy loam
Tillage: No-till
Planter/Row Width: 7.5 inches
Planting Date: December 12, 2020
Planting Population: 3 bu./A
Fertilizer: **Pre-plant:** 60-46-90-24 S (lbs./A)
 In-season: 120-46-90-42 S (lbs./A)
Crop Protection: **Burndown:** glyphosate, Volta (0.5 oz./A)
Harvest Date: July 6, 2021

Variety	Test Weight (Lbs./Bu.)	Moisture (%)	Yield (Bu./A @13.5%)
USG 3472	57.7	12.2	38.6
USG 3562	56.9	12.3	35.2
Progeny Berkeley	55.7	11.5	39.8
Progeny PGX19-17	57.1	12.8	34.7
Croplan CP 9606	56.6	12.2	40.0
Croplan CP 8550	58.3	11.9	45.7
VIPG 41T (HRWW)	59.4	10.8	51.2
VIPG 2519T (HRWW)	58.0	10.3	52.3
Pioneer 26R59	54.5	11.7	45.9
Pioneer 26R45	57.6	11.6	27.8
Liberty 5658	57.3	10.9	46.3
Southern Harvest 7200	58.0	11.1	41.5
Southern Harvest 9520	59.4	11.5	38.3
Eddie Mercer MBX 127	56.8	11.4	38.1
Eddie Mercer MBX 223	55.6	11.5	38.4
AVERAGE	57.2	11.6	40.9

Discussion: Due to wet weather in the fall of 2020, this plot was planted much later than desired. February was unusually wet and this may have contributed to nutrient loss in the field. Harvest was fairly but not perfectly timely. There appeared to have been deer activity in the Pioneer 26R45 plot, above and beyond what was seen in other plots, and this is thought to have contributed to that plot’s well below average yield.

New Kent County Wheat Variety Plot

Cooperators: **Producer:** Davis Farms
 Extension: Paul Davis, Retired ANR – New Kent

Previous Crop: Corn
Soil Type: Tetotum
Tillage: No-till (behind vertical tillage)
Planter/Row Width: John Deere 1590NT drill / 7.5 inches
Planting Date: November 18, 2020
Planting Population: 28 seeds / row foot
Fertilizer: **At Planting:** Oct. 24 30-60-80 (lbs./A)
 In-Season: Jan. 8 25# N/ Feb. 25 60# N
 Mar. 30 50# N
Crop Protection: **Burndown:** Oct. 21 paraquat (1.5 pt./A)
 In-Season: Jan. 8 Metribuzin (2 oz./A) + Powerflex (2 oz./A)
 May 6 Miravis Ace (13.7 oz./A)
Harvest Date: June 21, 2021

Variety	Test Weight (Lbs./Bu.)	Moisture (%)	Yield (Bu./A @13.5%)
Pioneer 26R45	N/A	10.8	72.3
Pioneer 26R59	N/A	11.7	79.8
Eddie Mercer MBX 127	N/A	12.3	76.6
Eddie Mercer MBX 223	N/A	12.3	71.5
Croplan CP 8550	N/A	11.9	77.2
Croplan CP 9606	N/A	12.6	80.5
Southern Harvest 7200	N/A	12.8	71.5
Southern Harvest 9520	N/A	12.5	77.6
Progeny PGX19-17	N/A	12.4	72.9
USG 3472	N/A	12.6	77.1
USG 3562	N/A	12.1	68.4
Liberty 5658	N/A	13.4	54.7
AVERAGE	N/A	12.3	73.3

Note: Test weight data was not available for this site location.

Discussion: This location experienced excessive precipitation from fall 2020 through March 2021. From Oct. 2020 through March 2021, this site received just shy of 34 inches of rainfall; the historical annual rainfall for this farm averages around 45 inches.

Northumberland County Wheat Variety Plot

Cooperators: **Producer:** Alan and Justin Welch
Extension: Trent Jones, ANR – Lancaster/Northumberland
 Stephanie Romelczyk – ANR Westmoreland

Previous Crop: Corn
Soil Type: Suffolk fine sandy loam, Sassafras fine sandy loam
Tillage: No-till
Planter/Row Width: 15 ft John Deere Drill/ 7.5 inches
Planting Date: November 24, 2020
Planting Population: 200 lbs. seed / A
Fertilizer: **At Planting:** 340 lb. (25-60-100-14S)
 Feb. 5 Broadcast 60# N (28-0-0-5)
 Mar. 25 Broadcast 64# N (28-0-0-5) + MaxxGro Wheat
Crop Protection: Mar. 14 Axial XL (16.4 oz.) + Priaxor (2 oz.)
 May 3 Sultrus (2 oz.), Miravis Ace (13.7 oz.), 1 gal. CORON
Harvest Date: June 30, 2021

Variety	Test Weight (Lbs./Bu.)	Moisture (%)	Yield (Bu./A @13.5%)
VIPG 2519T (HRWW)	59.9	11.1	77.6
VIPG 41T (HRWW)	58.2	11.3	79.3
Eddie Mercer MBX 223	57.6	12.2	86.9
Progeny Berkeley	58.3	11.5	88.5
Eddie Mercer MBX 127	60.4	10.9	102.2
Southern Harvest 9520	59.5	11.9	92.9
Southern Harvest 7200	61.8	11.5	95.3
Progeny PGX19-17	55.9	12.0	96.8
Pioneer 26R45 ^a	EE	EE	EE
Pioneer 26R59	57.2	12.2	92.5
USG 3562	57.6	11.4	86.1
Croplan 8550	57.6	11.6	87.3
Croplan 9606	58.3	12.4	94.3
Libery 5658	58.9	11.6	82.1
USG 3472	56.9	11.9	87.9
Check (DynaGro Laverne)	57.6	12.7	94.7
AVERAGE	58.4	11.7	89.6

^aPioneer 26R45 was planted at this location, but an equipment error occurred at harvest and no data could be collected for this variety.

Discussion: Great yields at this location. DynaGro Laverne was used as a check (94.7 Bu./A). Use this data and other replicated test plot results when making variety selections in 2021.

Westmoreland County Wheat Variety Plot

Cooperators: **Producer:** F.F. Chandler, Jr. and Louis Chandler
Extension: Stephanie Romelczyk, ANR – Westmoreland
 Trent Jones, ANR – Northumberland/Lancaster
 Clare Tallamy, VCE Intern

Previous Crop: Corn
Soil Type: Savannah Loam; Kempsville Loam*
Tillage: No-till
Planter/Row Width: 7.5 inches
Planting Date: November 19, 2020
Planting Population: 40 seeds / row foot
Fertilizer: **Pre-plant:** Oct. 35-80-80-5 S (lb./A)
 In-Season: Late Jan. 40-0-0-5 S (lb./A)
 Late Mar. 70-0-0-9 S (lb./A) + Black Label Zn(1gal/A)
 May Maximum N-Pact K (1gal./A)

Crop Protection: **Pre-plant:** Oct. Gramoxone (2pt./A), Liberate (¾ pt./A), Finesse
 In-Season: Jan. Anthem Flex (3oz/A), Radiate (2oz/A), Tombstone
 Late Mar. Satori (6 oz./A)
 May Tombstone (1.5 oz./A), Miravis Ace (13.7 oz./A)

Harvest Date: June 29, 2021

Variety	Test Weight (Lbs./Bu.)	Moisture (%)	Yield (Bu./A @13.5%)
Pioneer 26R59	57.5	12.5	96.7
Southern Harvest 7200	60.1	11.7	89.0
Southern Harvest 9520	58.9	12.2	94.6
Croplan 9606	58.2	12.5	88.2
Croplan 8550	59.0	12.0	84.0
Progeny Berkeley	58.6	11.3	79.2
VIPG 41T (HRWW)	59.2	10.8	85.8
VIPG 2519T (HRWW)	60.7	11.1	85.8
Pioneer 26R45*	54.1	12.9	94.6
Eddie Mercer MBX 127*	57.5	12.9	97.0
Liberty 5658*	59.3	13.2	92.0
USG 3562*	56.2	13.1	87.1
USG 3472*	56.9	13.3	102.7
Eddie Mercer MBX 223*	57.5	13.8	92.7
Progeny PGX19-17*	54.0	13.6	98.3
AVERAGE	57.8	12.5	91.2

Discussion: These trials were split up between two different fields. The starred (*) varieties were located in the second field- soil type is also starred. Management information is the same for both fields. Excellent yields with several varieties yielding over 90 Bu./A.

2021 Virginia Cooperative Extension On-Farm Wheat Variety Plots

Yield Summary (bushels/acre @ 13.5%)

(NP=Not Planted) (EE=Equipment Error) (N/A = Not Available)

Variety	Culpeper	Essex	Goochland	New Kent	Northumberland	Westmoreland	AVERAGE
VIPG 2519T (HRWW)	73.1	87.4	52.3	-NP-	77.6	85.8	75.2
VIPG 41T (HRWW)	73.7	81.6	51.2	-NP-	79.3	85.8	74.3
Progeny PGX 19-17	84.2	98.1	34.7	72.9	96.8	98.3	80.8
Progeny Berkeley	77.0	87.7	39.8	-NP-	88.5	79.2	74.4
Liberty 5658	74.6	91.0	46.3	54.7	82.1	92.0	73.5
USG 3472	-EE-	91.4	38.6	77.1	87.9	102.7	79.5
USG 3562	84.4	88.6	35.2	68.4	86.1	87.1	75.0
Croplan CP 8550	74.5	91.2	45.7	77.2	87.3	84.0	76.5
Croplan CP 9606	84.8	95.8	40.0	80.5	94.3	88.2	80.6
Southern Harvest 7200	78.6	90.9	41.5	71.5	95.3	89.0	77.8
Southern Harvest 9520	79.9	91.2	38.3	77.6	92.9	94.6	79.1
Pioneer 26R59	77.2	98.8	45.9	79.8	92.5	96.7	81.8
Pioneer 26R45	85.9	87.0	27.8	72.3	-EE-	94.6	73.5
Eddie Mercer MBX 127	76.3	90.0	38.1	76.6	102.2	97.0	80.0
Eddie Mercer MBX 223	79.4	87.7	38.4	71.5	86.9	92.7	76.1
Location AVERAGE	78.8	90.6	40.9	73.3	89.3	91.2	

2021 Virginia Cooperative Extension On-Farm Wheat Variety Plots

Test Weight Summary (pounds/bushel)

(NP=Not Planted) (EE=Equipment Error) (N/A = Not Available)

Variety	Culpeper	Essex	Goochland	New Kent	Northumberland	Westmoreland	AVERAGE
VIPG 2519T (HRWW)	59.0	57.5	58.0	-NP-	59.9	60.7	59.0
VIPG 41T (HRWW)	58.6	55.6	59.4	-NP-	58.2	59.2	58.2
Progeny PGX 19-17	53.3	55.4	57.1	-N/A-	55.9	54.0	55.1
Progeny Berkeley	59.8	57.3	55.7	-NP-	58.3	58.6	57.9
Liberty 5658	56.3	60.0	57.3	-N/A-	58.9	59.3	58.4
USG 3472	-EE-	58.3	57.7	-N/A-	56.9	56.9	57.5
USG 3562	60.4	58.8	56.9	-N/A-	57.6	56.2	58.0
Croplan CP 8550	57.5	58.2	58.3	-N/A-	57.6	59.0	58.1
Croplan CP 9606	55.3	57.0	56.6	-N/A-	58.3	58.2	57.1
Southern Harvest 7200	59.6	59.7	58.0	-N/A-	61.8	60.1	59.8
Southern Harvest 9520	59.2	57.9	59.4	-N/A-	59.5	58.9	59.0
Pioneer 26R59	53.8	52.2	54.5	-N/A-	57.2	57.5	55.0
Pioneer 26R45	57.4	57.2	57.6	-N/A-	-EE-	54.1	56.6
Eddie Mercer MBX 127	57.1	58.4	56.8	-N/A-	60.4	57.5	58.0
Eddie Mercer MBX 223	57.1	55.9	55.6	-N/A-	57.6	57.5	56.7
Location AVERAGE	57.5	57.3	57.2	-N/A-	58.4	57.8	

2021 Variety Disease Resistance Traits

Information courtesy of manufacturer's breeding data and Small Grains in 2021 (Thomason, et. al)

Variety	Heading Date (Julian)	Height (in.)	FHB Index ¹	Powdery Mildew*	Leaf Rust*	Barley Yellow Dwarf Virus*	Septoria*
VIPG 2519T (HRWW) ^b	124	36	3.5	0.3	0.0	1.3	N/A
VIPG 41T (HRWW) ^b	126	35	1.5	0.0	0.0	1.3	N/A
Progeny PGX19-17 (#CHAD) ^c	120	33	2.7	0.0	0.1	0.7	3.7
Progeny Berkeley ^d	118	33.9	2.8	0.14	0.81	1.5	4.3
Liberty 5658 ^d	119	35.7	1.5	0.41	0.73	0.5	5.3
USG 3472 ^b	125	34	1.0	0.0	2.5	0.0	N/A
USG 3562 ^b	125	34	2.0	0.0	1.5	1.3	N/A
Croplan CP 8550 ^a	122	34	0.7	0.0	1.75	3.3	N/A
Croplan CP 9606 ^a	118	38	2.9	1.8	1.7	N/A	3.7
Southern Harvest 7200 ^d	118	35.9	4.2	0.36	0.31	3.5	2.3
Southern Harvest 9520 ^b	128	33	3.5	0.0	1.5	2.7	-
Pioneer 26R59 ^d	120	31.5	4.6	0.41	2.92	2.7	2.3
Pioneer 26R45 ^d	121	35.6	2.4	0.55	1.15	2.5	2.4
Eddie Mercer MBX 127 ^c	123	37	1.0	0.8	1.7	1.3	2.0
Eddie Mercer MBX 223 ^c	121	36	1.6	0.2	2.8	3.3	3.7

^a Single year data (2019) / ^b (2021)

^c Two-year average (2020 and 2021)

^d Three-year average (2019, 2020, 2021)

¹ FHB (fusarium head blight) Index; 0 = highly resistant and 100 = highly susceptible.

* The 0-9 ratings indicate a varieties response to disease where 0 = highly resistant and 9 = highly susceptible.

Wheat Seed Size Planting Conversion Table

	SEEDS PER ROW FOOT (7.5" row spacing)					
	19	22	25	28	31	34
	SEEDS PER SQUARE FOOT					
	30	35	40	45	50	55
SEEDS/POUND	POUNDS OF SEED/ACRE (divided by 60 equals bushels/acre)					
10,000 (large seed)	131	152	174	196	218	240
11,000	119	139	158	178	198	217
12,000	109	127	145	163	182	200
13,000	101	117	134	151	168	184
14,000	93	109	124	140	156	171
15,000	87	102	116	131	145	159
16,000	82	95	109	123	136	150
17,000	77	90	102	115	128	141
18,000	73	85	97	109	121	133
19,000	69	80	92	103	115	126
20,000 (small seed)	65	76	87	98	109	120

References

Thomason, W. et al. 2021. "Small Grains in 2021"
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