Virginia Cooperative Extension
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Small Grains In 2013

2013 Virginia Polytechnic Institute and State University CSES-62NP

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Recommended Small Grain Varieties

The following are the small grain variety recommendations for Virginia in 2013. The recommendations are based on the agronomic performance in wheat and barley variety tests conducted by the Research and Extension Divisions of Virginia Tech in the various agricultural regions of the state.

Recommended Wheat Varieties Arranged in Order of Maturity

All varieties have been extensively tested and proven to be adapted statewide.

Agronomic Characteristics

Cultivar	Head Date 3yr Mean	Grain Yield	Test Weight	Milling Quality	SRW Baking Quality
Early Heading Varieties (116-118 d, Julian)					
USG 3120	116	3	4	Very Good	Very Good
Jamestown	116	2	4	Moderate	Moderate
SS 520*	117	3	1	Good	Good
USG 3555	118	3	2	Poor	Moderate
Mid-Season Heading Varieties (119-120 d, Julian)					
12V251	119	3	1	Moderate	Moderate
Dyna-Gro 9171	119	4	1	Very Good	Excellent
Yorktown	119	3	4	Fair	Poor
Progeny 870	119	3	1	Very Good	Excellent
SS 5205	119	3	3	Very Good	Excellent
Merl	119	2	4	Good	Moderate
USG 3438	119	4	1	Very Good	Very Good
SS 8412	120	3	4	Moderate	Good
USG 3201	120	4	4	Good	Good
Full-Season Heading Varieties (121-122 d, Julian)					
SS 8340	121	4	4	Good	Very Good
Featherstone VA-258	121	3	2	Fair	Poor
Shirley	121	4	1	Very Good	Excellent
Pioneer 26R10	121	4	2	Good	Very Good
Pioneer 26R20	122	3	4	Fair	Fair
Pioneer 25R32	122	2	4	Good	Poor
Progeny 357	122	4	1	Fair	Good
USG 3251	122	4	3	Good	Very Good

* This line is not daylength sensitive and should not be planted early in order to avoid potential freeze damage.

4 - Significantly higher than average		2 - Average or lower than average
3 - Average or higher than average		1 - Significantly lower than average

Disease Resistance

Cultivar	FHB† resistance	Powdery Mildew Resistance	Leaf Rust Resistance	Barley Yellow Dwarf Virus Tolerance
Early Heading Varieties (116-118 d, Julian)				
USG 3120	Moderate	Very Good	Very Good	Very Good
Jamestown	Excellent	Very Good	Moderate	Very Good
SS 520*	Good	Very Good	Very Good	Weak
USG 3555	Moderate	Very Good	Weak	Very Good
Mid-Season Heading Varieties (119-120 d, Julian)				
12V251	Good	Very Good	Excellent	Very Good
Dyna-Gro 9171	Moderate	Weak	Moderate	Weak
Yorktown	Very Good	Excellent	Excellent	Very Good
Progeny 870	Good	Weak	Moderate	Weak
SS 5205	Moderate	Very Good	Very Good	Very Good
Merl	Moderate	Excellent	Weak	Moderate
USG 3438	Good	Weak	Moderate	Weak
SS 8412	Moderate	Very Good	Very Good	Moderate
USG 3201	Excellent	Weak	Moderate	Very Good
Full-Season Heading Varieties (121-122 d, Julian)				
SS 8340	Very Good	Weak	Moderate	Moderate
Featherstone VA-258	Weak	Moderate	Moderate	Very Good
Shirley	Weak	Excellent	Excellent	Moderate
Pioneer 26R10	Very Good	Weak	Weak	Weak
Pioneer 26R20	Weak	Very Good	Moderate	Moderate
Pioneer 25R32	Excellent	Very Good	Weak	Moderate
Progeny 357	Moderate	Very Weak	Weak	Moderate
USG 3251	Good	Moderate	Weak	Moderate

* This line is not daylength sensitive and should not be planted early in order to avoid potential freeze damage.

† FHB - Fusarium head blight

Recommended Barley Varieties

	Hulled Barley					Hulless Barley		
	Nomini*	Callao	Price	Thoroughbred	Atlantic	Doyce	Eve	Dan
Adapted Regions								
Coastal Plain		X	X	X	X	X	X	X
Piedmont, South of James River		X	X	X	X	X	X	X
Piedmont, North of James River		X	X	X	X	X	X	X
West of Blue Ridge	X	X	X	X	X	X	X	X
Agronomic Characteristics								
Yield	3	3	2	4	3	2	3	2
Test Weight	1	3	3	3	3	2	3	4
Lodging Tolerance	3	1	2	3	2	2	2	3
Relative Height	3	2	2	3	2	2	2	2
Relative Heading	Avg	Early	Avg	Late	Avg	Avg	Early	Avg

4 - Significantly higher than average
3 - Average or higher than average
2 - Average or lower than average
1 - Significantly lower than average

*Nomini barley has low test weight. It is not recommended in eastern Virginia because low test weight grain is unsuitable for export or domestic non-ruminant feed markets.

Barley and Wheat Entries

Commercial Barley Entries

Virginia Tech and Virginia Crop Improvement Association, 9142 Atlee Station Road, Mechanicsville, VA 23116 – Atlantic, Barsoy, Callao, Dan, Doyce, Eve, Nomini, Price, Thoroughbred, and Wysor.

Idaho Foundation Seed, 3806 North 3600 East, Kimberly, ID 83341 – Endeavor.

Commercial and Experimental Wheat Entries

AgriMAXX Wheat Company, 7167 Highbanks Road, Mascoutah, IL 62258 – AgriMAXX 413, AgriMAXX 415, AgriMAXX 427, AgriMAXX 434, AgriMAXX 438, and AgriMAXX Exp 1340.
Crop Production Services, 1140 Sweet Road, East Aurora, NY 14052 – Dyna-Gro 9042, Dyna-Gro 9171, Dyna-Gro 9223, Dyna-Gro 9343, Yorktown, and Shirley.
Dupont Pioneer, 59 Greif Parkway Suite 200, Delaware, OH 43015 – Pioneer 25R32, Pioneer 25R40, Pioneer 26R10, Pioneer 26R12, Pioneer 26R20, Pioneer 26R22, Pioneer 26R41, Pioneer 26R53, and Pioneer XW11G.
Eddie Mercer Agri-Services, Inc, 6900 Linganore Road, Frederick, MD 21702 – Mercer Brand 12-W-270, Mercer Brand 12-W-296, Mercer Brand 12-V-251, and Mercer Brand 11-V-258.
Featherstone Seed Company, 13941 Genito Road, Amelia, VA 23002 - Featherstone VA 258.
University of Georgia, 1109 Experiment Street, Griffin, GA 30223 – GA-04570-10E46, GA-031257-10LE34, and GA-031086-10E29.
University of Maryland, 27664 Nanticoke Rd, Salisbury, MD 21801 – MD04W249-11-7.
NC State University, 840 Method Road Unit 3, Raleigh, NC 27695 – NC-Cape Fear, NC-Yadkin, NC08-140, NC08-21273, and NC09-22402.
Progeny Ag Products, 1529 Hwy 193, Wynne, AR 72396 – Progeny 117, Progeny 125, Progeny 185, Progeny 308, Progeny 357, Progeny 870, and Progeny PGX 12-10.
Southern States Cooperative, 6606 West Broad Street, Richmond, VA 23230 - SS 520, SS 5205, SS 8302, SS 8340, SS 8350, SS 8404, SS 8500, SS 8700, and SS EXP 412.
Steyer Seeds, 6154 N. Co. Road 33, Tiffin, OH 44883 – Steyer Pierson, Steyer Hunker, and Steyer Heilman.
Syngenta Seeds, Inc., 806 N. 2nd St, Berthoud, CO 80513 –Oakes, SY Harrison, SY 483, and and MH07-7474.
UniSouth Genetics, 3205-C HWY 46S, Dickson, TN 37055 – USG 3013, USG 3120, USG 3201, USG 3251, USG 3404, USG 3438, USG 3523, USG 3555, USG 3612, and USG 3993.
USDA-ARS, NCSU, Box 7616 Raleigh, NC 27695-7616 ARS08-0047.
Virginia Tech and Virginia Crop Improvement Association, 9142 Atlee Station Road, Mechanicsville, VA 23111 –Jamestown, Massey, Merl, and all lines prefixed by VA.

Appreciation is expressed to the Virginia Small Grains Check-Off Board, AgriMAXX, Crop Production Services, Dupont Pioneer, Eddie Mercer Agri-Services, Inc., Featherstone Seed, Inc., Progeny Ag Products, Southern States Cooperative, Steyer Seeds, Syngenta Seeds, Inc., UniSouth Genetics, Inc., and the Virginia Crop Improvement Association for their financial support of the Small Grains Variety Testing Program at Virginia Tech.
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Introduction

The following tables present results from barley and wheat varietal tests conducted in Virginia in 2011-2013. Small-grain cultivar performance tests are conducted each year in Virginia by the Virginia Tech Department of Crop and Soil Environmental Sciences and the Virginia Agricultural Experiment Station. The tests provide information to assist Virginia Cooperative Extension Service agents in formulating cultivar recommendations for small grain producers and to companies developing cultivars and/or marketing seed within the state. Yield data are given for individual locations and across locations and years; yield and other performance characteristics are averaged over the number of locations indicated in parenthesis near the column heading. Performance of a given variety often varies widely over locations and years which makes multiple location-year averages a more reliable indication of expected performance than data from a single year or location. Details about management practices for barley and wheat are listed for each experimental location.

The Season

Most small grain was seeded timely in fall 2012 due to cooperative weather. By mid-October, 22% of wheat and 72% of barley was planted, which was ahead of the five-year average for both crops. Early November brought hurricane Sandy and the associated rains which left some flooded areas and killed wheat and barley in low spots in fields in some areas. These rains slowed the final wheat acres, but by November 25, 77% of the crop was seeded, which was still 8% ahead of the long term average. In most of the Commonwealth the month of December was relatively mild and dry until rains at the very end of the month. January was mostly dry but cold in most areas, which delayed small grain tillering in many areas. On January 30, 66% of the small grain crop was rated good, 22% fair, and only 8% excellent. A good portion of February and March was unseasonably cold but the wheat crop was still rated 65% good at the end of March. By April 15, warm weather, 14 degrees above normal for some areas, had arrived along with some rains that helped the small grain crop develop rapidly. Cooler temperatures returned quickly, though and the month as a whole was significantly cooler than the long term average. By April 30, only 23% of the wheat crop had headed, compared with 85% the previous year. Continued rainy weather during wheat and barley flowering created conditions that were conducive to development of fusarium head blight, or head scab, in many areas of eastern Virginia. Growers also reported significant infestations of Stagonospora leaf and glume blotch. In early estimates, NASS estimates that Virginia's winter wheat crop for 2013 is expected to total 18.6 million bushels, up 19 percent from last year’s crop of 15.6 million bushels. Producers in the Commonwealth are expected to harvest 290,000 acres of wheat that will yield an average of 64 bushels per acre.

Figure 1. 2012-13 and 30-yr mean cumulative monthly growing season precipitation for Virginia.

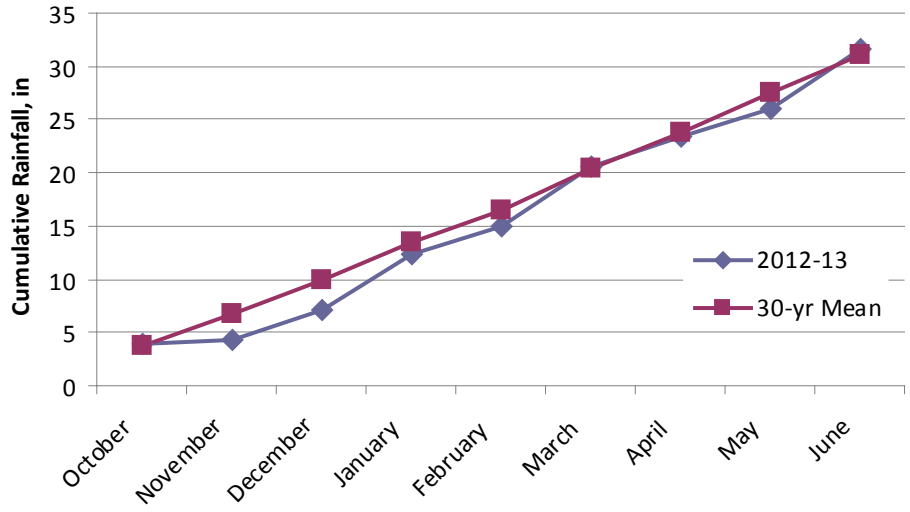
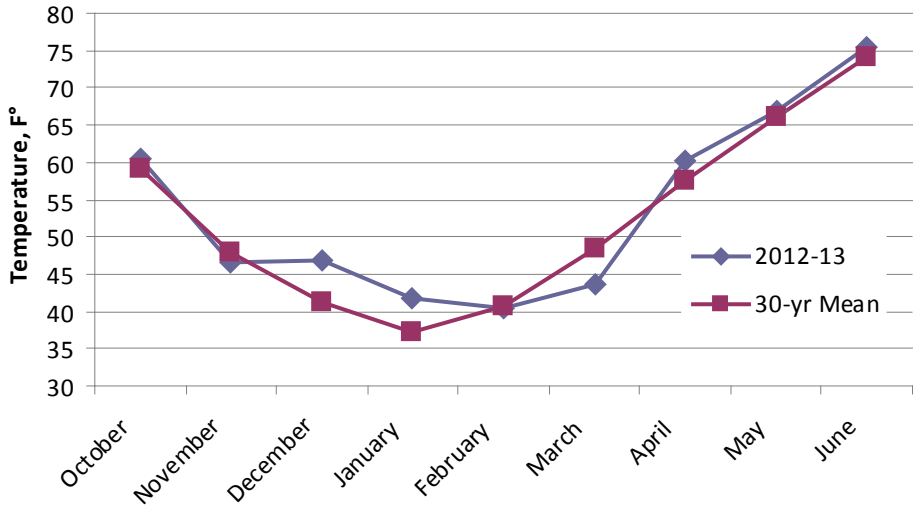


Figure 2. Growing season daily average temperature, 2012-13 and 30-yr mean.



Section 1: Barley Varieties

The Virginia Tech Barley breeding program will continue to develop and improve yield potential and end use quality of new barley lines derived from crosses made between superior barley breeding lines and cultivars, such as Atlantic and Thoroughbred, with outstanding lines from the program. This season (2011-2012), approximately, 80 advance barley lines were evaluated in replicated yield tests at locations in Maryland, Virginia, North Carolina, Kentucky, Pennsylvania and Delaware. Virginia Tech barley breeding program is currently involved in a collaborative winter malt barley breeding research effort targeted at local brewing industries in the mid Atlantic and south Eastern regions. Owing to the rising cost of feed ingredients, animal producers are considering alternative options; therefore barley specifically aimed at the feed market could provide that low cost option for producers. The Virginia Tech breeding program will continue to work with interested parties in evaluating the potential of barley for these and other diverse purposes. Through these efforts, the quality and value of winter barley has increased greatly during the past two years.

Virginia grown barley typically yields in excess of 100 bushels per acre and fits well in many crop rotation systems. However, profitable barley production on over 50,000 acres in Virginia will require revival of international market opportunities and/or improve domestic value added opportunities.

Hulless Barley

Hulless barley tests were planted in seven-inch rows at Blackstone, Orange, Holland, and Painter. They were planted in six-inch rows at Warsaw and Blacksburg. They were planted in seven and one-half-inch rows at the Warsaw No-Till location. The no-till tests at Holland and Warsaw were planted at 28 seeds per row foot. All other locations were planted at 32 seeds per row foot.

Three year average (2011, 2012 and 2013) grain yield for Doyce hulless barley in Virginia was 82 bushels per acre with test weight of 53.3 pounds per bushel. Grain yield of Eve and Dan each averaged 84 bushels per acre. However, Dan had the highest average test weight (58.7 pounds/bushel) that was 1.4 pounds per bushel higher than Eve and 5.4 pounds per bushel higher than Doyce (53.3 pounds/bushel). Meanwhile, elite hulless experimental line VA07H-31WS had the highest three year average grain yield (91 bushels per acre) that were 7 bushels per acre higher than that of Eve (84 bushels/acre), 7 bushels per acre higher than Dan, 9 bushels per acre higher than Doyce, and 7 bushels per acre more than test average.

Hulled Barley

Hulled barley tests were planted in seven-inch rows at Blackstone, Orange, Holland, and Painter. They were planted in six-inch rows at Warsaw and Blacksburg. They were planted in seven and one-half-inch rows at the Warsaw No-Till location. The no-till tests at Holland and Warsaw were planted at 28 seeds per row foot. All other locations were planted at 24 seeds per row foot.

Three year average (2011, 2012 and 2013)

grain yields of Thoroughbred hulled barley were 108 bushels per acre with average test weight of 45.5 pounds per bushel compared to the mean yield of 106 bushel per acre and test weight of 45.7 pounds per bushel for the mean of all cultivars tested. Three year average grain yield of Atlantic (108 bushels per acre) was similar to Thoroughbred, 2 bushels per acre higher than Nomini (106 bushels per acre), 6 bushels per acre higher than Callao and Price (102 bushels per acre). Hulled experimental line VA08B-85 had the highest three year average grain yield (117 bushels per acre) that was 9 bushel per acre higher than Thoroughbred and Atlantic (108 bushels per acre), 11 bushels per acre higher than Nomini , and significantly higher than Callao and Price (102 bushels per acre). However, our current focus is on a better understanding of the genetic basis of yield potential of barley and thereby continue to improve yield and value added traits of winter barley lines for specific end uses.

Summary of barley management practices for the 2013 harvest season (All rates are given on a per acre basis.)

Blacksburg - Planted September 25-26, 2012. Preplant fertilizer was 30-60-80 September 21, 2012. Site was sprayed with .75 oz Harmony Extra SG® on November 30, 2012. Site was fertilized with 45 lb N plus 0.6 oz Harmony Extra SG® on February 21, 2013 and with 60 lb N on March 22, 2013. Harvest occurred June 16, 2013.

Blackstone - Planted October 19, 2012. Preplant fertilizer was 300 lb 10-10-10 on October 17, 2012. Site was top-dressed with 60 lb N using 14-0-14 on February 6, 2013 and again on March 22, 2013. Site was sprayed with 4 oz Harmony Extra SG® on February 6, 2013. Harvest occurred June 15, 2013.

Painter - Planted October 23, 2012. Preplant fertilizer was 30 lb N using 30% UAN on October 22, 2012. Site was fertilized with 60 lb N using 30%UAN and 0.75 oz Harmony Extra SG® March 5, 2013. Site was fertilized with 60 lb N using 30% UAN March 30, 2013. Harvest occurred June 22, 2013.

Warsaw - Planted October 16, 2012. Preplant fertilizer was 30-60-80-5 applied October 11, 2012. One ton lime was applied October 1, 2012. Site was fertilized using 12-0-0-1.5 at 25 lb on December 14, 2012 and again on March 10, 2013 at 50 lb using 24-0-0-3. Site was treated with 6.5 oz Starane® and .75 oz Harmony Extra SG® on December 17, 2012. Harvest occurred June 5, 2013.

Holland - Planted no-till October 22, 2012. Preplant fertilizer was 1.5 ton lime on October 12, 2012 and 300 lb 6-16-36 on October 17, 2012. Site was fertilized with 60 lb N and 1.5 lb Mn plus 0.6 oz Harmony Extra SG® on February 21, 2013. Site was fertilized with 60 lb N on March 15, 2013 using 24-0-0-3 and 1 lb of Mn. Site was treated with 2 oz Baythroid® on May 4, 2013. Harvest occurred June 5-6, 2013.

Orange - Planted October 11, 2012. Preplant fertilizer was 30-60-40 September 26, 2012. Sixty lb N and 4 oz Harmony Extra SG® were applied March 15, 2013. Hulless barley harvest occurred June 17, 2013 and the hulled barley harvest occurred June 21, 2013.

Table 1. Summary of performance of hulless entries in the Virginia Tech Barley Test, 2013 harvest.

Hulless Lines	Yield (Bu/a @ 48 lb/bu) (5)		Test Weight (Lb/bu) (5)		Date Headed (Julian) (2)		Height (In) (3)		Lodging (0-9) (5)		Leaf Rust (0-9) (3)		Powdery Mildew (0-9) (3)		Net Blotch (0-9) (2)		Early Lodging (0-9) (1)		Winter Survival (%) (1)	
VA08B-85	106	+	44.6	-	111	-	31	-	5	+	1	-	1	-	2		7	+	100	+
Thoroughbred	94	+	43.4	-	116	+	33	-	4		6	+	7	+	2	-	1		86	
Atlantic	94	+	43.0	-	109	-	30	-	7	+	4		1	-	3		6	+	100	+
VA07H-31WS	88	+	56.6	+	115		36	+	4		4		5	+	1	-	1		90	
VA11H-97 WS	87		56.7	+	111	-	35		4		2	-	1	-	2	-	0		97	+
VA10H-34	87		56.2	+	114		34		4		3	-	3		5	+	2		90	
VA08H-65	84		57.4	+	114		33	-	5		4		0	-	1	-	1		91	
VA07H-35WS	84		56.5	+	116	+	35	+	4		4		5	+	1	-	2		86	
VA11H-89 WS	83		56.3	+	111	-	34		4		2	-	1	-	2	-	2		91	
VA06H-25	82		56.3	+	116	+	35		4		4		5	+	2	-	3		88	
VA06H-79	82		56.1	+	115	+	34		4		8	+	1	-	1	-	2		90	
VA11H-83	82		55.0		120	+	33	-	5		5	+	3		1	-	3		92	
VA10H-64	82		55.8	+	112	-	30	-	3	-	4		1	-	2		0		85	
VA09H-110(2R)	82		55.7	+	116	+	36	+	5		5	+	1	-	3		2		81	-
VA08H-5BS	81		57.3	+	115		36	+	3	-	4		4	+	1	-	0		90	
VA10H-79WS (2R)	81		56.9	+	119	+	37	+	3	-	5		2		6	+	3		94	
VA11H-63	80		57.4	+	114		35		4		2	-	1	-	1	-	0		86	
VA10H-57	79		56.7	+	115		34		4	-	3	-	1	-	6	+	1		81	-
Dan	79		58.7	+	115		33	-	3	-	4		1	-	1	-	0		95	
VA10H-29	79		56.6	+	113	-	34		4		2	-	2		5	+	1		85	
VA08H-72	79		56.8	+	115	+	35		4	-	6	+	1	-	3		1		100	+
VA10H-55	78		56.2	+	113	-	36	+	5		2	-	1	-	8	+	1		81	-
VA09H-112(2R)	78		57.6	+	116	+	36	+	3	-	5		1	-	4	+	3		92	
Eve	75	-	56.1	+	109	-	31	-	5	+	4		1	-	6	+	3		97	+
Doyce	75	-	52.4	-	113	-	32	-	6	+	6	+	2		5	+	4		90	
VA08H-79WS	68	-	54.5		120	+	34		5	+	7	+	8	+	0	-	1		95	
Average	83		54.9		114		34		4		4		2		3		2		90	
LSD (0.05)	5		0.5		1		1		1		1		1		1		2		6	
C.V.	9		1.5		1		4		24		22		46		37		79		5	

Released cultivars are shown in bold print. The number in parentheses below column headings indicates the number of locations on which data are based. Varieties are ordered by descending yield averages. A + or - indicates a performance significantly above or below the test average.

The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

WS indicates white seed and (2R) indicates a 2-row type.

Table 2. Two year average summary of performance of hulless entries in the Virginia Tech Barley Tests, 2012 and 2013 harvests.

Hulless Lines	Yield (Bu/a @ 48 lb/bu) (11)		Test Weight (Lb/bu) (11)		Date Headed (Julian) (5)		Height (In) (6)		Lodging (0-9) (11)		Leaf Rust (0-9) (6)		Powdery Mildew (0-9) (5)		Net Blotch (0-9) (4)	
VA08H-65	90	+	57.2	+	103	-	34		4		3	-	0	-	3	
VA07H-31WS	88		56.1		106		36	+	4		4		4	+	3	
VA10H-64	87		55.2	-	102	-	31	-	3		3	-	1	-	4	
VA06H-25	87		56.0		106		35		4		4		4	+	2	
Dan	86		58.3	+	106		33	-	3		3	-	1		3	
VA07H-35WS	85		56.1		107	+	36	+	4		4	-	4	+	2	
VA06H-79	84		55.5		107	+	35		3		8	+	1	-	1	-
Doyce	84		53.3	-	103	-	33	-	5	+	6	+	2		6	+
VA08H-5BS	83		57.1	+	106		37	+	2	-	3	-	3		2	
VA09H-110(2R)	82		55.8		107	+	35		3		4		1	-	4	
Eve	82		56.6		101	-	33	-	4		4		1	-	5	+
VA08H-72	82		56.0		107	+	35		3		6	+	0	-	4	
VA09H-112(2R)	77	-	57.1	+	107	+	35		3	-	4		1	-	5	+
VA08H-79WS	73	-	54.6	-	112	+	35		4		7	+	7	+	2	-
Average	84		56.1		106		35		4		4		2		3	
LSD (0.05)	5		0.6		1		1		1		1		1		1	
C.V.	10		2.0		1		4		32		27		72		39	

Released cultivars are shown in bold print. The number in parentheses below column headings indicates the number of locations on which data are based. Varieties are ordered by descending yield averages. A + or - indicates a performance significantly above or below the test average.

The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

WS indicates white seed and (2R) indicates a 2-row type.

Table 3. Three year average summary of performance of hulless entries in the Virginia Tech Barley Tests, 2011, 2012, and 2013 harvests.

Hulless Lines	Yield (Bu/a @ 48 lb/bu) (18)		Test Weight (Lb/bu) (18)		Date Headed (Julian) (7)		Height (In) (9)		Lodging (0-9) (16)		Leaf Rust (0-9) (7)		Powdery Mildew (0-9) (8)		Net Blotch (0-9) (7)	
VA07H-31WS	91	+	56.7		108		37	+	4		4	-	5	+	2	-
VA06H-25	88	+	56.5	-	109		36		4	+	4	-	5	+	2	-
VA07H-35WS	88	+	56.7		109	+	37		4	+	4	-	4	+	2	-
VA06H-79	87	+	56.1	-	109	+	36		3		8	+	1	-	1	-
VA08H-5BS	85		57.6	+	108		38	+	3	-	3	-	4	+	3	-
Eve	84		57.3	+	103	-	34	-	4		4	-	1	-	6	+
Dan	84		58.7	+	108		34	-	4		3	-	2	-	4	
VA09H-110(2R)	84		56.5	-	109	+	37		3		4	-	1	-	5	+
VA09H-112(2R)	82		57.8	+	109		37	+	2	-	4	-	1	-	5	+
Doyce	82		53.3	-	105	-	34	-	5	+	6	+	2		6	+
VA08H-72	81		56.5	-	109	+	36		3		6	+	1	-	5	+
VA08H-79WS	72	-	55.4	-	113	+	36		3		7	+	8	+	2	-
Average	84		56.6		108		36		4		5		3		3	
LSD (0.05)	3		0.4		1		1		0		1		1		1	
C.V.	11		1.9		1		4		38		23		49		38	

Released cultivars are shown in bold print. The number in parentheses below column headings indicates the number of locations on which data are based. Varieties are ordered by descending yield averages. A + or - indicates a performance significantly above or below the test average.

The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

WS indicates white seed and (2R) indicates a 2-row type.

Table 4. Summary of performance of hulless entries in the Virginia Tech Barley Test, Southern Piedmont AREC, Blackstone, VA, 2013 harvest.

Hulless Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Lodging (0-9)		Powdery Mildew (0-9)		Net Blotch (0-9)	
VA11H-97 WS	85		56.2	+	5		2		1	
Atlantic	85	+	44.1	-	8	+	1		2	
Thoroughbred	81	+	41.0	-	8		8	+	3	
Eve	78		54.9	+	8	+	1		3	
VA08B-85	78		45.5	-	6		0	-	1	
VA10H-64	77		54.7		5		1		3	
VA08H-72	77		56.1	+	5		1	-	2	
VA08H-65	72		55.7	+	7		0	-	1	
Dan	72		58.2	+	5		2		1	
VA07H-31WS	71		55.1	+	5		5	+	1	
VA10H-57	70		56.2	+	5		1		3	
VA10H-79WS (2R)	67		54.6		6		2		6	+
VA11H-83	67		52.9		8		4		1	-
VA09H-110(2R)	65		51.3	-	7		1		2	
Doyce	65		50.3	-	8	+	3		6	+
VA09H-112(2R)	63		55.3	+	5		1		5	+
VA11H-89 WS	62		55.5	+	6		1		1	
VA06H-79	59		55.8	+	4		1	-	1	-
VA10H-55	58		55.0	+	7		1	-	7	+
VA06H-25	57		55.0	+	5		5	+	1	
VA07H-35WS	56		54.4		5		4	+	1	
VA10H-34	55		55.1	+	6		2		5	+
VA10H-29	55		54.6		6		1		4	+
VA08H-5BS	54		56.1	+	4	-	3		1	
VA11H-63	49	-	56.8	+	6		0	-	1	-
VA08H-79WS	48	-	52.2	-	7		9	+	1	-
Average	66		53.6		6		2		2	
LSD (0.05)	14		1.2		2		2		1	
C.V.	13		1.4		24		52		42	

Released cultivars are shown in bold print. Varieties are ordered by descending yield averages.

A plus or minus sign indicates a performance significantly above or below the test average.

The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

WS indicates white seed and (2R) indicates a 2-row type.

Table 5. Summary of performance of hulless entries in the Virginia Tech Barley Test, Tidewater AREC, Holland, VA, 2013 harvest.

Hulless Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Lodging (0-9)	
Thoroughbred	90	+	46.2	-	2	
VA10H-79WS (2R)	77		57.4		2	
VA07H-35WS	76		57.6		4	
VA08B-85	76		46.4	-	4	+
Atlantic	76		46.7	-	2	
VA10H-57	74		58.7	+	2	
VA06H-25	73		58.0		4	
VA07H-31WS	73		57.4		3	
Doyce	72		55.6		3	
VA11H-83	72		56.5		1	-
VA08H-79WS	72		55.0	-	2	
VA10H-55	70		59.0	+	3	
VA06H-79	70		57.4		2	
VA09H-110(2R)	68		59.5	+	3	
VA09H-112(2R)	68		60.6	+	1	
VA08H-72	66		58.1		2	
VA08H-5BS	66		58.7	+	1	-
VA10H-29	65		59.1	+	3	
Dan	64		60.1	+	2	
VA11H-63	60		58.7	+	4	+
Eve	59		60.1	+	4	
VA10H-34	58	-	58.3	+	2	
VA11H-97 WS	58	-	58.7	+	4	
VA08H-65	56	-	59.0	+	2	
VA11H-89 WS	55	-	59.0	+	4	
VA10H-64	49	-	58.3		2	
Average	68		56.9		3	
LSD (0.05)	9		1.4		1	
C.V.	9		1.6		32	

Released cultivars are shown in bold print. Varieties are ordered by descending yield averages.
A plus or minus sign indicates a performance significantly above or below the test average.
The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.
WS indicates white seed and (2R) indicates a 2-row type.

Table 6. Summary of performance of hulless entries in the Virginia Tech Barley Test, Eastern Virginia AREC, Warsaw, VA, 2013 harvest.

Hulless Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)		Net Blotch (0-9)	
VA08B-85	135	+	42.8	-	107	-	31	-	6		1	-	1		3	
Thoroughbred	117	+	43.4	-	110	+	33		4	-	5	+	7	+	1	-
VA07H-35WS	110	+	56.4	+	111	+	37	+	6		2	-	6	+	1	-
Atlantic	107	+	39.5	-	106	-	31	-	8	+	3		1	-	4	
VA06H-25	104	+	56.0	+	111	+	35		6		2		5	+	2	
VA07H-31WS	103	+	56.4	+	110		36	+	6		3		6	+	2	-
VA06H-79	101		55.5		110		34		6		7	+	0	-	1	-
VA10H-29	99		57.2	+	107	-	35		6		2		4	+	5	+
VA11H-89 WS	99		56.2	+	107	-	35		6		2	-	2		2	
VA08H-5BS	96		57.8	+	109		37	+	6		3		4	+	1	-
VA11H-63	95		57.0	+	108	-	35		7		2	-	3		1	-
VA11H-97 WS	95		56.7	+	107	-	36	+	6		2		1		2	
VA10H-34	94		55.0		108	-	35		7		2		3		6	+
VA09H-112(2R)	93		58.3	+	110	+	36	+	5	-	3		1	-	3	
VA09H-110(2R)	91		56.5	+	110	+	36		7		4		1	-	3	
VA11H-83	90		55.9	+	116	+	32	-	5		4		2		1	-
VA10H-79WS (2R)	89		56.3	+	114	+	36	+	2	-	2	-	0	-	7	+
VA08H-65	88		56.8	+	108	-	35		7		3		0	-	2	-
VA10H-64	88		55.4		107	-	30	-	6		3		1		2	
VA10H-55	78	-	55.1		107	-	35		7	+	2		0	-	9	+
Dan	75	-	59.4	+	109		33	-	6		4		1	-	2	-
VA08H-79WS	74	-	54.3		117	+	36	+	7	+	5	+	8	+	0	-
VA08H-72	74	-	57.0	+	111	+	35		6		5	+	0	-	4	
VA10H-57	69	-	54.6		109		33	-	7		2		0	-	9	+
Doyce	69	-	51.6	-	107	-	32	-	7	+	5	+	3		5	
Eve	68	-	55.4		105	-	32	-	6		3		0	-	9	+
Average	93		54.5		109		34		6		3		2		3	
LSD (0.05)	10		1.1		1		2		1		1		1		2	
C.V.	7		1.5		1		3		12		33		48		34	

Released cultivars are shown in bold print. The number in parentheses below column headings indicates the number of locations on which data are based. Varieties are ordered by descending yield averages. A + or - indicates a performance significantly above or below the test average.

The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

WS indicates white seed and (2R) indicates a 2-row type.

Table 7. Summary of performance of hulless entries in the Virginia Tech Barley Test, Eastern Shore AREC, Painter, VA, 2013 harvest.

Hulless Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Lodging (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)	
Atlantic	98	+	43.5	-	5		3		1	-
VA08B-85	93	+	45.2	-	4		1	-	1	-
VA10H-34	82		56.3	+	3		4		3	
Thoroughbred	81		44.1	-	3		6	+	7	+
VA11H-89 WS	80		56.7	+	5	+	2	-	1	-
Dan	80		58.9	+	4		3		1	
VA10H-79WS (2R)	79		57.9	+	3		6	+	3	
VA07H-31WS	77		56.4	+	4		4		5	+
VA09H-110(2R)	77		57.0	+	4		5		1	-
VA10H-57	77		57.2	+	3		3		1	-
VA07H-35WS	77		56.4	+	4		5		4	+
Doyce	75		51.5	-	5	+	6	+	2	
VA11H-83	75		55.3		5	+	4		3	
VA06H-25	75		56.7	+	3		5		5	+
VA08H-65	74		58.2	+	5		4		1	-
VA11H-63	73		58.0	+	4		2	-	1	
VA11H-97 WS	73		56.6	+	4		2	-	1	-
VA08H-5BS	72		57.9	+	2	-	3		5	+
VA10H-64	70		55.1		4		4		2	
VA08H-72	67		56.8	+	2	-	5		1	-
VA09H-112(2R)	66		57.8	+	2	-	5		1	
VA10H-55	64		57.4	+	5		2	-	1	-
VA06H-79	63		56.8	+	3		7	+	2	
VA10H-29	62		57.6	+	5		3		2	
Eve	60	-	57.1	+	4		4		2	
VA08H-79WS	56	-	54.8		4		7	+	8	+
Average	74		55.3		4		4		2	
LSD (0.05)	13		0.9		1		1		1	
C.V.	11		1.1		21		24		38	

Released cultivars are shown in bold print. Varieties are ordered by descending yield averages.
A plus or minus sign indicates a performance significantly above or below the test average.
The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.
WS indicates white seed and (2R) indicates a 2-row type.

Table 8. Summary of performance of hulless entries in the Virginia Tech Barley Test, Northern Piedmont Center, Orange, VA, 2013 harvest.

Hulless Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Height (In)		Lodging (0-9)	
VA11H-83	92	+	56.3		31.750		0.000	
VA08B-85	88	+	46.9	-	31.500		2.250	+
VA08H-72	88	+	58.3	+	34.000		0.000	
VA10H-34	86	+	57.3		33.000		0.000	
VA08H-65	85	+	58.9	+	31.250		0.000	
VA11H-63	84		58.6	+	34.750	+	0.000	
Thoroughbred	82		46.0	-	29.750	-	0.000	
Dan	80		58.8	+	33.750		0.000	
VA10H-57	79		58.3	+	32.500		0.500	
Doyce	79		56.0		31.250		1.250	
VA11H-97 WS	76		57.6	+	32.500		1.000	
VA10H-55	75		57.1		35.000	+	0.000	
VA07H-31WS	75		58.2	+	34.500	+	0.000	
Eve	74		58.0	+	30.500	-	0.000	
VA08H-79WS	72		56.7		32.000		0.750	
VA10H-79WS (2R)	72		58.7	+	35.750	+	0.000	
VA09H-110(2R)	72		55.5		32.750		0.000	
VA09H-112(2R)	69		58.3	+	31.750		0.000	
VA06H-25	68		57.7	+	32.500		0.000	
Atlantic	67		46.7	-	28.750	-	4.250	+
VA10H-64	67		57.6	+	29.000	-	0.000	
VA11H-89 WS	66		58.0	+	31.750		0.500	
VA06H-79	66		55.7		32.000		0.000	
VA08H-5BS	65	-	57.1		34.250		0.000	
VA10H-29	65	-	56.1		32.250		0.000	
VA07H-35WS	62	-	58.2	+	34.250		0.000	
Average	75		56.2		32.423		0.404	
LSD (0.05)	10		1.1		1.858		1.220	
C.V.	8		1.3		4.067		214.480	

Released cultivars are shown in bold print. Varieties are ordered by descending yield averages.
A plus or minus sign indicates a performance significantly above or below the test average.
The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.
WS indicates white seed and (2R) indicates a 2-row type.

Table 9. Summary of performance of hulless entries in the Virginia Tech Barley Test, Kentland Farm, Blacksburg, VA, 2013 harvest.

Hulless Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Leaf Rust (0-9)		Early Lodging (0-9)		Winter Survival (%)	
VA08B-85	126	+	44.1	-	115	-	31	-	8	+	1	-	7	+	100	+
Thoroughbred	114	+	41.9	-	122	+	36		7		8	+	1		86	
VA08H-5BS	112		57.7	+	120		38	+	4		5		0		90	
VA07H-31WS	112		56.5	+	120		36		6		5		1		90	
VA11H-89 WS	110		54.6		115	-	35		5		2	-	2		91	
Atlantic	109		41.4	-	112	-	31	-	9	+	6		6	+	100	+
VA10H-55	108		56.6	+	119		38	+	5		2	-	1		81	-
VA10H-34	108		57.3	+	120		34		5		2	-	2		90	
VA06H-79	107		56.3	+	121		36		6		9	+	2		90	
VA11H-97 WS	106		56.6	+	114	-	36		5		3	-	0		97	+
VA10H-29	105		57.7	+	119		35		5		2	-	1		85	
VA06H-25	103		56.0		122	+	36		7		6		3		88	
VA11H-63	102		57.1	+	119		35		4		2	-	0		86	
VA10H-64	102		55.6		118	-	31	-	2	-	5		0		85	
VA09H-110(2R)	100		57.3	+	122	+	39	+	5		6		2		81	-
VA08H-65	99		57.4	+	120		34		5		5		1		91	
VA07H-35WS	99		56.4	+	121		35		7	+	6		2		86	
VA10H-57	99		57.0	+	121		37		3	-	3	-	1		81	-
VA09H-112(2R)	96		58.2	+	122	+	39	+	5		6		3		92	
VA10H-79WS (2R)	95		57.3	+	123	+	38	+	6		7	+	3		94	
Dan	93		57.8	+	121		32	-	3	-	4		0		95	
Eve	91		54.7		113	-	32	-	8	+	7	+	3		97	+
Doyce	86	-	52.9	-	119		34		7		7	+	4		90	
VA08H-72	84	-	56.0		120		36		5		8	+	1		100	+
VA11H-83	83	-	53.8		125	+	34		6		6	+	3		92	
VA08H-79WS	76	-	53.4		124	+	36		8	+	9	+	1		95	
Average	101		54.7		119		35		5		5		2		90	
LSD (0.05)	12		1.5		1		2		2		1		2		6	
C.V.	8		1.9		1		4		22		14		79		5	

Released cultivars are shown in bold print. The number in parentheses below column headings indicates the number of locations on which data are based. Varieties are ordered by descending yield averages. A + or - indicates a performance significantly above or below the test average.

The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

WS indicates white seed and (2R) indicates a 2-row type.

Table 10. Summary of performance of barley entries in the Virginia Tech Barley Test, 2013 harvest.

Barley Lines	Yield (Bu/a @ 48 lb/bu) (5)		Test Weight (Lb/bu) (5)		Date Headed (Julian) (2)		Height (In) (3)		Lodging (0-9) (5)		Leaf Rust (0-9) (3)		Net Blotch (0-9) (2)		Powdery Mildew (0-9) (3)		Early Lodging (0-9) (1)		Winter Survival (%) (1)		Awns[1]
VA11B-143	119	+	45.6	+	114		34	+	3	-	1	-	1	-	2		5		90		LA
VA11B-140	115	+	46.4	+	113	-	37	+	3	-	2	-	1		2	+	3		86	-	LA
VA11B-141	115	+	46.0	+	116	+	36	+	3	-	2	-	1	-	1		0	-	92		LA
VA08B-85	115	+	46.3	+	112	-	31	-	4		1	-	2		1	-	8	+	100	+	SA
VA08B-108	114	+	45.0		112	-	30	-	4		2	-	3		1	-	7		97		SA
VA10B-43	114	+	45.1		117	+	33		3	-	1	-	1	-	1		5		90		SA
VA11B-102	113	+	43.8	-	116	+	35	+	4		2		1		1		6		99	+	LA
VA09B-35	113	+	45.8	+	112	-	32		4		4	+	0	-	2		2	-	96		LA
VA12B-7	111	+	46.2	+	116	+	33		2	-	7	+	2		2	+	2	-	91		LA
VA11B-134	110	+	44.2		113	-	34	+	4		1	-	3		1		4		89		LA
VA11B-130	110	+	46.5	+	113	-	35	+	4		2	-	2		1	-	7		92		LA
VA11B-10	110	+	44.7		116	+	31		4		2	-	0	-	1	-	6		89		SA
VA11B-126	110	+	45.1		113	-	32		4		1	-	2		1	-	4		99	+	LA
VA10B-3	110	+	45.3	+	117	+	29	-	5	+	1	-	4	+	1		7		90		SA
VA11B-56	110	+	44.5		117	+	33		3	-	2		3	+	1		1	-	91		LA
VA11B-4	110	+	45.4	+	115	+	30	-	4		2		1		1		7		88		SA
VA11B-55	108		45.3	+	117	+	32		2	-	2	-	4	+	2	+	0	-	91		LA
VA11B-87	108		42.4	-	114		31	-	3		1	-	1	-	1	-	7		89		SA
VA11B-15	107		45.1		111	-	31		4		2		1	-	1		8	+	95		SA
VA10B-20	107		45.1		111	-	31		4		1	-	3	+	1	-	6		94		SA
Thoroughbred	106		44.2		118	+	33		3	-	6	+	2		6	+	3		94		LA
VA11B-71	106		44.6		113	-	31		3		1	-	3		3	+	7		90		SA
VA08B-109	106		44.7		113	-	30	-	4		1	-	1	-	1	-	7	+	91		SA
VA11B-30	106		45.0		113	-	30	-	3	-	1	-	2		1	-	4		92		SA
VA11B-133	106		45.8	+	114		37	+	3	-	2		1	-	1		2	-	86	-	LA
VA11B-29	105		43.9	-	113	-	29	-	3		1	-	2		0	-	5		92		SA
VA11B-165	105		43.6	-	116	+	33		3	-	2	-	3		5	+	0	-	92		LA
VA06B-48	105		45.0		111	-	29	-	5	+	4	+	1		1		7		92		SA
VA11B-131	105		43.9	-	113		33		4		1	-	4	+	2		2	-	85	-	LA
VA09B-34	104		46.4	+	112	-	32		4		1	-	3		1		3		94		LA
VA11B-43	104		43.2	-	118	+	34	+	4		1	-	1	-	1		5		100	+	SA
VA10B-11	104		45.0		115		30	-	5	+	1	-	1	-	1	-	7		89		SA
VA08B-84	103		46.2	+	111	-	30	-	5	+	1	-	3		0	-	8	+	97	+	SA

Table 10. Summary of performance of barley entries in the Virginia Tech Barley Test, 2013 harvest, cont'd.

Barley Lines	Yield (Bu/a @ 48 lb/bu) (5)		Test Weight (Lb/bu) (5)		Date Headed (Julian) (2)		Height (In) (3)		Lodging (0-9) (5)		Leaf Rust (0-9) (3)		Net Blotch (0-9) (2)		Powdery Mildew (0-9) (3)		Early Lodging (0-9) (1)		Winter Survival (%) (1)		Awns[1]
VA10B-6	103		44.3		115		31	-	5	+	1	-	1	-	1	-	7	+	92		SA
MD08-09BF6-7-7	103		42.5	-	117	+	35	+	3	-	2		6	+	3	+	6		56	-	LA
VA10B-9	101		47.2	+	112	-	31	-	4		1	-	1		1		7		90		SA
VA11B-37	101		44.0	-	114		29	-	3	-	1	-	1	-	0	-	4		92		SA
Atlantic	100		44.3		110	-	29	-	5	+	3	+	3		1	-	7		99	+	SA
VA08B-89	100		46.0	+	112	-	31	-	5	+	1	-	2		1		7		91		SA
VA11B-127	100		45.9	+	113	-	34	+	4	+	1	-	5	+	1		2	-	90		LA
VA11B-108	100		44.9		112	-	30	-	5	+	3	+	1	-	2		7	+	95		SA
Callao	99		43.8	-	110	-	28	-	6	+	3	+	1		1	-	8	+	95		SA
VA11B-26	98	-	44.1		113	-	28	-	5	+	2		1		1		6		90		SA
VA10B-36	98	-	43.5	-	113	-	31	-	5	+	1	-	0	-	0	-	6		98	+	SA
VA11B-125	98	-	45.0		116	+	34	+	4		1	-	4	+	1		1	-	95		LA
VA08B-95	97	-	44.1		111	-	31		5	+	2		0	-	8	+	8	+	95		SA
Wysor	97	-	41.9	-	113	-	36	+	4		6	+	3	+	1	-	6		96		AL
Price	96	-	45.1		113	-	30	-	4		4	+	6	+	1		3		97		SA
Endeavor	91	-	43.0	-	118	+	32		3	-	5	+	1	-	2	+	6		83	-	LA
Novosadski 183	91	-	46.3	+	116	+	30	-	2	-	5	+	3	+	1	-	3		83	-	LA
Barsoy	89	-	43.5	-	113	-	35	+	4		6	+	2		1		7		99	+	LA
Nomini	89	-	43.0	-	112	-	38	+	3	-	4	+	1	-	1	-	2	-	94		AL
VA92-42-46	84	-	43.3	-	114		38	+	4		1	-	6	+	0	-	2	-	92		AL
STARS 1014B	81	-	38.6	-	128	+	36	+	4		4	+	4	+	2		6		92		LA
Average	104		44.6		114		32		4		2		2		1		5		92		
LSD (0.05)	5		0.6		1		1		1		1		1		1		2		5		
C.V.	8		2.1		1		5		27		32		50		52		35		4		

Released cultivars are shown in bold print. The number in parentheses below column headings indicates the number of locations on which data are based. Varieties are ordered by descending yield averages. A plus or minus sign indicates a performance significantly above or below the test average.

The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

The Holland location was not included in this data because of the variability of the data.

[1] LA=long awned, SA=short awned, AL=awnletted or awnless

Table 11. Two year average summary of performance of hulled entries in the Virginia Tech Barley Tests, 2012 and 2013 harvests.

Barley Lines	Yield (Bu/a @ 48 lb/bu) (11)		Test Weight (Lb/bu) (11)		Date Headed (Julian) (5)		Height (In) (6)		Lodging (0-9) (11)		Leaf Rust (0-9) (6)		Net Blotch (0-9) (4)		Powdery Mildew (0-9) (4)	
VA08B-85	118	+	46.1		101		32	-	4		0	-	2	-	1	-
VA08B-108	114	+	45.7		101		32	-	4		1	-	3		1	-
VA06B-48	113	+	45.9		100	-	31	-	4		4	+	2	-	1	-
Atlantic	111	+	45.7		99	-	31	-	5	+	3		3		0	-
VA09B-35	111	+	46.4	+	101		33		3	-	4	+	1	-	1	
VA08B-84	110	+	47.1	+	100	-	32	-	5	+	1	-	3		0	-
VA08B-109	109	+	45.4		101		31	-	4		1	-	2	-	0	-
Thoroughbred	109		45.1		107	+	35	+	3		6	+	3		6	+
VA08B-89	105		46.7	+	101	-	32	-	5	+	1	-	2	-	1	-
VA09B-34	103		46.9	+	101	-	33		3	-	1	-	2	-	1	
Price	103		45.7		101		32	-	4		4	+	6	+	1	
Callao	103		44.7		99	-	30	-	6	+	3	+	3		1	-
Nomini	102		43.8	-	100	-	39	+	2	-	4	+	1	-	1	-
VA08B-95	102		44.9		100	-	33		5	+	2	-	2	-	7	+
Wysor	98	-	42.9	-	102	+	37	+	4		5	+	4	+	0	-
VA92-42-46	93	-	44.1	-	102	+	39	+	3	-	1	-	7	+	0	-
Barsoy	88	-	43.8	-	101	-	35	+	4		6	+	3		1	
Novosadski 183	83	-	46.2		104	+	31	-	3	-	4	+	5	+	1	-
Average	104		45.4		101		33		4		3		3		1	
LSD (O.05)	5		0.9		0		1		1		0		1		0	
C.V.	11		4.5		1		4		35		29		31		49	

Released cultivars are shown in bold print. The number in parentheses below column headings indicates the number of location-years on which data are based. Varieties are ordered by descending yield averages. A plus or minus sign indicates a performance significantly above or below the test average.

The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

Table 12. Three year average summary of performance of hulled entries in the Virginia Tech Barley Tests, 2011, 2012, and 2013 harvests.

Barley Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Leaf Rust (0-9)		Net Blotch (0-9)		Powdery Mildew (0-9)	
	(17)		(17)		(7)		(9)		(17)		(7)		(7)		(6)	
VA08B-85	117	+	46.8	+	104		33	-	4		1	-	2	-	0	-
VA08B-108	114	+	45.9		104		33	-	4		2	-	3		0	-
VA06B-48	112	+	45.8		103	-	32	-	4		4	+	2	-	1	-
VA08B-84	111	+	47.3	+	103	-	33	-	5	+	1	-	3		0	-
VA08B-109	110		46.0		104	+	32	-	4		1	-	2	-	0	-
Thoroughbred	108		45.5		109	+	36	+	4		6	+	2	-	6	+
Atlantic	108		45.9		102	-	32	-	5	+	3	+	3		0	-
VA08B-89	108		47.1	+	103		33	-	5	+	1	-	3		1	-
Nomini	106		44.4	-	103	-	40	+	2	-	4	+	1	-	0	-
VA09B-34	105		47.4	+	103		35		4	-	1	-	3		1	-
Callao	102		45.2		102	-	31	-	6	+	4	+	3	-	0	-
Price	102		45.8		104	+	32	-	4		4	+	6	+	1	-
VA08B-95	102	-	44.9	-	103		34		5	+	2	-	2	-	7	+
Wysor	99	-	43.4	-	104	+	38	+	4		6	+	4	+	0	-
VA92-42-46	96	-	44.5	-	104	+	40	+	3	-	1	-	7	+	0	-
Barsoy	93	-	44.7	-	103	-	36	+	4		6	+	3		1	
Average	106		45.7		104		34		4		3		3		1	
LSD (O.05)	4		0.6		0		1		1		0		0		0	
C.V.	11		4.0		1		4		36		27		30		51	

Released cultivars are shown in bold print. The number in parentheses below column headings indicates the number of location-years on which data are based. Varieties are ordered by descending yield averages. A plus or minus sign indicates a performance significantly above or below the test average.

The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

Table 13. Summary of performance of barley entries in the Virginia Tech Barley Test, Southern Piedmont AREC, Blackstone, VA, 2013 harvest.

Barley Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Lodging (0-9)		Powdery Mildew (0-9)		Net Blotch (0-9)	
VA12B-7	100	+	44.9	+	3	-	1		2	
VA11B-130	98	+	44.8	+	5		0		2	
VA08B-85	97		45.9	+	5		0		2	
VA11B-140	96		45.1	+	5		0		2	
VA11B-131	95		42.1	-	7	+	1		3	+
Callao	95		43.9		8	+	0		1	
VA10B-9	95		46.8	+	5		0		1	
VA08B-108	95		44.5	+	4		0		1	
VA11B-55	94		42.3		4		1		4	+
VA11B-10	94		44.0		5		0		1	
VA10B-43	92		44.5		4		0		1	
VA11B-141	92		44.5	+	3	-	0		1	
Thoroughbred	92		42.6		5		5	+	2	
VA11B-15	92		44.8	+	5		0		1	
VA09B-35	92		44.8	+	5		0		1	
VA11B-134	91		42.7		6		0		2	
VA11B-126	91		43.6		5		0		1	
VA11B-102	91		40.9	-	6		0		2	
VA11B-71	91		44.1		4		2	+	3	+
VA11B-29	90		42.2		5		0		1	
VA11B-87	90		41.2	-	4		0		1	
VA11B-133	89		44.6	+	5		1		1	
VA11B-143	89		43.3		4		1		1	
VA08B-89	88		45.8	+	5		0		2	
VA08B-95	87		43.3		6		8	+	0	
VA10B-3	86		43.1		7	+	1		4	+
VA10B-20	85		44.5	+	5		0		1	
VA11B-127	85		44.8	+	7	+	1		3	+
VA06B-48	85		44.3		6		0		1	
VA11B-56	83		40.7	-	6		0		3	+
VA11B-108	83		45.0	+	6		0		1	
STARS 1014B	82		37.6	-	5		0		0	
VA11B-43	82		41.4	-	5		1		1	
VA08B-109	82		43.9		5		0		1	
VA11B-125	82		43.0		6		0		3	
VA09B-34	81		45.1	+	5		0		0	
Price	81		44.6	+	5		0		3	+
VA92-42-46	81		43.3		5		0		5	+
VA11B-4	80		43.8		5		0		1	
VA11B-30	80		44.1		4		0		1	
MD08-09BF6-7-7	80		40.1	-	4		3	+	5	+
Atlantic	79		44.1		6		0		1	
VA11B-26	79		43.5		6		0		1	
VA10B-6	78		42.9		5		0		1	

Table 13. Summary of performance of barley entries in the Virginia Tech Barley Test, Southern Piedmont AREC, Blackstone, VA, 2013 harvest, cont'd.

Barley Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Lodging (0-9)		Powdery Mildew (0-9)		Net Blotch (0-9)	
VA11B-37	77		43.1		5		0		1	
Barsoy	75		41.7	-	5		0		2	
Novosadski 183	75		44.2		4		0		4	+
Wysor	75		41.9	-	5		0		2	
Endeavor	74		37.3	-	3	-	1		1	
VA08B-84	74		45.9	+	6		0		2	
VA10B-36	72	-	41.7	-	7	+	0		0	
VA11B-165	69	-	41.4	-	5		5	+	3	+
VA10B-11	66	-	44.5	+	5		0		1	
Nomini	65	-	41.9	-	4		0		0	
Average	85		43.3		5		1		2	
LSD (0.05)	12		1.1		2		1		1	
C.V.	10		1.7		22		127		61	

Released cultivars are shown in bold print.
Varieties are ordered by descending yield averages.
A plus or minus sign indicates a performance significantly above or below the test average.
The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

Table 14. Summary of performance of barley entries in the Virginia Tech Barley Test, planted no-till at the Tidewater AREC, Holland, VA, 2013 harvest.

Barley Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Lodging (0-9)	
VA11B-56	97	+	46.2		3	
VA08B-108	95	+	46.2		2	
STARS 1014B	95	+	46.0		2	-
VA11B-71	91		47.1		3	
VA08B-85	90		47.7		4	+
Thoroughbred	88		47.3		2	-
VA10B-11	88		47.1		5	+
VA10B-43	87		47.1		2	-
VA11B-4	87		48.6		2	
VA11B-143	86		46.9		2	
Endeavor	86		48.5		2	-
VA11B-134	86		46.5		5	+
MD08-09BF6-7-7	86		44.6	-	2	-
VA11B-15	85		46.8		4	+
VA11B-55	85		46.9	-	2	-
Atlantic	84		47.3		4	
VA10B-20	83		47.3		2	
VA06B-48	83		46.7		3	
VA10B-9	83		49.8	+	2	
VA11B-130	82		49.9	+	3	
VA12B-7	82		48.0		2	-
VA11B-102	81		46.0		3	
VA11B-30	81		46.7		2	
Price	81		47.3		3	
VA08B-109	80		47.4		5	+
VA11B-29	80		47.7		3	
VA11B-43	80		45.1	-	2	
VA09B-34	80		48.2		4	
VA11B-133	80		49.3	+	4	
VA10B-3	80		48.5		2	
VA11B-141	79		47.9		3	
VA11B-125	79		47.7		4	
VA11B-126	77		49.1		3	
VA11B-37	77		44.7	-	2	
VA09B-35	77		47.2		4	
VA11B-87	77		43.6	-	2	
VA10B-6	76		48.5		4	
VA11B-165	76		44.9	-	4	
VA11B-127	76		49.0		4	
Novosadski 183	76		49.2		3	
VA11B-131	76		45.7		4	
VA08B-84	75		48.9		5	+

Table 14. Summary of performance of barley entries in the Virginia Tech Barley Test, planted no-till at the Tidewater AREC, Holland, VA, 2013 harvest, cont'd.

Barley Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Lodging (0-9)	
VA11B-10	74		47.5		3	
VA11B-140	72		48.5		3	
Barsoy	72		46.7		4	
VA11B-108	71		47.5		5	+
VA08B-95	70		46.3		4	
VA08B-89	70		47.3		3	
VA10B-36	67	-	48.6		3	
VA11B-26	65	-	46.6		3	
Callao	62	-	47.4		4	+
Wysor	N/A		N/A		1	-
Nomini	N/A		N/A		2	-
VA92-42-46	N/A		N/A		1	-
Average	80		47.3		3	
LSD (0.05)	13		2.0		1	
C.V.	10		2.7		28	

Released cultivars are shown in bold print.

Varieties are ordered by descending yield averages.

A plus or minus sign indicates a performance significantly above or below the test average.

The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

N/A - DATA NOT REPORTED DUE TO DEER FEEDING DAMAGE

Table 15. Summary of performance of barley entries in the Virginia Tech Barley Test, Eastern Virginia AREC, Warsaw, VA, 2013 harvest.

Barley Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)		Net Blotch (0-9)	
VA11B-10	165	+	47.3		112	+	34		1		2		0		0	-
VA11B-130	162	+	48.6	+	108	-	40	+	4		1		0		2	
VA11B-4	157	+	47.7	+	110		33		2		1		0		2	
VA08B-109	157	+	47.2		109		33		4		1		0		1	-
VA11B-15	157	+	47.3	+	108	-	33		1		2		0		0	-
VA10B-11	156	+	46.4		110		33		4		1		0		0	-
VA10B-6	155	+	46.4		109		33		5		1		0		1	-
VA08B-85	155	+	47.7	+	108	-	32		3		1	-	0		2	
VA11B-143	151		48.0	+	109		35		1	-	1		0		1	-
VA11B-165	150		46.7		110	+	34		2		1		2	+	2	
VA11B-102	150		46.1		112	+	38	+	1		2		0		1	-
VA11B-134	150		46.6		108	-	35		3		0	-	0		3	
VA11B-71	150		46.9		110		33		3		1		0		2	
VA11B-108	147		46.6		108	-	32	-	4		3		1		1	-
VA09B-34	147		47.9	+	107	-	35		4		1		0		5	+
VA10B-43	146		46.9		112	+	34		0	-	1		0		1	-
VA12B-7	145		49.2	+	111	+	35		0	-	6	+	0		2	
VA08B-108	145		46.4		108	-	32		4		2		0		4	
VA08B-84	145		47.4	+	107	-	32		6	+	1		0		4	
VA11B-87	145		43.7	-	110		32		2		1		0		0	-
VA11B-141	144		47.6	+	111	+	37	+	3		1	-	0		1	-
VA11B-140	144		48.3	+	107	-	39	+	1		1		0		1	
VA09B-35	143		46.5		108	-	33		4		4	+	0		0	-
VA11B-131	143		46.1		108	-	36	+	4		1	-	0		4	+
VA10B-36	142		46.3		109		31	-	4		1		0		1	-
VA11B-37	141		45.7	-	109		30	-	1	-	1		0		1	-
Callao	141		46.1		107	-	29	-	7	+	3		0		2	
VA10B-3	140		46.8		113	+	29	-	5		1		0		3	
VA11B-43	140		45.2	-	115	+	35		2		1		1		2	
VA06B-48	140		46.7		108	-	31	-	5	+	3		0		1	
VA10B-20	139		46.7		107	-	33		5		1		0		6	+
VA11B-127	139		48.1	+	108	-	35		6	+	1		0		7	+
VA11B-56	139		47.0		112	+	34		1	-	1		0		4	
Thoroughbred	138		46.7		114	+	34		0	-	5	+	6	+	3	
VA11B-126	138		47.5	+	108	-	33		4		1		0		3	
VA08B-89	137		46.7		108	-	32		5	+	0	-	0		3	
Barsoy	136		47.0		107	-	36	+	5		5	+	0		3	
VA11B-133	136		47.8	+	110		38	+	1	-	2		0		2	
VA10B-9	136		48.4	+	107	-	31	-	5		1		0		2	
VA11B-55	136		47.5	+	112	+	32		2		1		0		5	+
VA11B-26	135		46.2		109		29	-	3		1		0		1	
MD08-09BF6-7-7	134		43.4	-	109		37	+	1		1		0		7	+
VA11B-29	132		45.9		109		30	-	2		2		0		2	

Table 15. Summary of performance of barley entries in the Virginia Tech Barley Test, Eastern Virginia AREC, Warsaw, VA, 2013 harvest, cont'd.

Barley Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)		Net Blotch (0-9)	
Atlantic	131		45.7	-	107	-	31	-	5		3	+	0		5	+
Wysor	131		43.9	-	108	-	39	+	3		6	+	0		5	+
VA11B-30	130		46.8		108	-	30	-	1	-	1		0		2	
VA11B-125	130		47.2		111	+	35		3		1		0		6	+
VA08B-95	130		44.5	-	107	-	34		6	+	1	-	8	+	0	-
Endeavor	129	-	46.4		113	+	32		1		3	+	1		1	-
Nomini	127	-	44.6	-	106	-	40	+	2		4	+	0		1	-
Novosadski 183	126	-	50.2	+	110		30	-	0	-	4	+	0		3	
VA92-42-46	111	-	43.2	-	108	-	40	+	6	+	1		0		8	+
Price	110	-	45.1	-	108	-	32	-	5		3	+	0		8	+
STARS 1014B	91	-	38.8	-	124	+	36	+	6	+	2		0		8	+
Average	140		46.5		109		34		3		2		0		3	
LSD (0.05)	11		0.8		1		2		2		1		0		2	
C.V.	6		1.2		1		4		45		41		96		44	

Released cultivars are shown in bold print.
Varieties are ordered by descending yield averages.
A plus or minus sign indicates a performance significantly above or below the test average.
The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

Table 16. Summary of performance of barley entries in the Virginia Tech Barley Test, Eastern Shore AREC, Painter, VA, 2013 harvest.

Barley Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Lodging (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)	
VA11B-134	96	+	44.7		4		2		4	
VA12B-7	94	+	46.6	+	3		5	+	5	+
VA11B-15	91	+	44.5		4		2		3	
VA11B-141	91	+	45.9		3		3		3	
VA06B-48	89		44.2		3		3		3	
VA08B-108	88		45.3		3		1		2	
VA11B-10	87		44.5		4		1		2	-
VA08B-85	86		45.9		3		1	-	2	
VA11B-4	85		45.6		4		2		2	
Endeavor	85		43.9		3		5	+	5	+
VA11B-126	84		45.0		4		1		2	-
VA10B-11	84		45.0		4		1	-	2	-
VA11B-143	84		45.4		3		2		5	+
Atlantic	84		44.3		5		2		2	-
VA11B-102	84		43.5		4		1	-	2	
VA10B-20	83		43.0	-	4		1	-	2	
VA11B-30	83		45.6		3		1		2	-
VA11B-87	81		42.9	-	3		1	-	2	-
VA08B-84	81		46.8	+	4		1	-	1	-
VA10B-6	80		45.1		4		1	-	2	-
VA10B-36	80		45.1		4		1	-	1	-
VA11B-108	80		45.3		4		3		5	+
VA10B-3	79		45.7		3		2		3	
VA11B-29	79		44.6		2	-	1	-	1	-
Thoroughbred	78		44.6		3		5	+	8	+
VA09B-35	78		45.8		4		4	+	5	+
MD08-09BF6-7-7	77		43.4		4		4	+	6	+
Price	77		45.0		3		3	+	4	
VA11B-165	77		43.0	-	5		3		8	+
STARS 1014B	75		41.5	-	3		3		6	+
VA10B-43	75		44.7		4		1		3	
VA11B-133	75		45.2		4		2		2	
VA11B-55	74		45.0		2	-	2		5	+
VA09B-34	74		45.6		4		2		4	
VA11B-56	74		44.4		3		1		3	
VA11B-130	73		46.6	+	3		2		2	
VA11B-140	73		45.9		4		3		6	+
Callao	72		43.8		5		2		2	
VA08B-109	72		44.4		4		1		2	-
Novosadski 183	71		45.4		3		6	+	2	
VA11B-26	71		44.5		4		1		3	
Nomini	71		43.5		4		3		2	
VA08B-95	70		43.6		5	+	4	+	9	+

Table 16. Summary of performance of barley entries in the Virginia Tech Barley Test, Eastern Shore AREC, Painter, VA, 2013 harvest, cont'd.

Barley Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Lodging (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)	
VA11B-125	69		44.9		5		1		3	
VA11B-37	69		44.7		2	-	1	-	1	-
VA11B-71	69		44.3		2	-	1	-	6	+
Wysor	69		43.3	-	4		5	+	2	-
VA11B-43	69		43.4		3		1	-	3	
VA11B-131	65		42.8	-	4		2		5	+
VA10B-9	64		47.7	+	3		1	-	4	
VA08B-89	62		46.3	+	3		1	-	3	
Barsoy	61	-	44.3		4		5	+	3	
VA11B-127	49	-	46.1		3		2		2	
VA92-42-46	36	-	43.4		3		1	-	1	-
Average	76		44.7		3		2		3	
LSD (0.05)	14		1.4		1		1		1	
C.V.	11		2.0		24		32		29	

Released cultivars are shown in bold print.

Varieties are ordered by descending yield averages.

A plus or minus sign indicates a performance significantly above or below the test average.

The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

Table 17. Summary of performance of barley entries in the Virginia Tech Barley Test, Northern Piedmont Center, Orange, VA, 2013 harvest.

Barley Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Height (In)		Lodging (0-9)			
VA11B-30	103	+	45.0		27		0			
Thoroughbred	103	+	45.0		29		0			
VA11B-56	99	+	45.2		29		0			
VA10B-43	97	+	45.2		31		0			
VA11B-141	92		45.3		32	+	0			
VA08B-108	92		44.5		29		1			
VA11B-55	92		45.5		30		0			
VA11B-140	92		46.6	+	33	+	0			
VA10B-3	91		45.1		27	-	0			
VA11B-143	89		46.1		31		0			
VA11B-4	87		44.7		26	-	0			
VA10B-20	87		45.4		28		0			
MD08-09BF6-7-7	87		44.7		32	+	0			
VA11B-87	86		43.0	-	27		0			
VA11B-127	86		45.9		31		1			
VA11B-102	85		44.2		31		1			
VA11B-133	85		45.6		34	+	0			
VA11B-165	85		43.3	-	30		0			
VA09B-35	83		45.4		29		1			
Callao	83		44.7		25	-	3	+		
VA08B-85	83		46.5	+	28		1			
VA10B-6	83		43.5		27		1			
VA11B-26	82		45.0		25	-	3	+		
VA10B-9	81		46.0		27		0			
VA11B-130	81		46.4	+	31		0			
STARS 1014B	81		42.4	-	35	+	0			
VA11B-125	80		45.5		31		0			
VA12B-7	80		45.0		29		0			
VA11B-37	79		43.2	-	26	-	0			
VA11B-43	79		43.0	-	30		0			
VA10B-36	79		43.4		28		0			
VA09B-34	79		45.8		27		1			
VA11B-126	77		45.4		30		0			
VA08B-89	77		45.5		28		3	+		
VA11B-134	77		45.7		30		1			
VA11B-29	77		43.8		25	-	0			
Price	76		45.5		27		0			
VA11B-71	76		44.4		29		0			
Endeavor	74		43.9		30		0			
VA08B-109	74		44.0		26	-	0			
VA11B-131	73		45.2		28		0			
Nomini	73		41.5	-	33	+	0			

Table 17. Summary of performance of barley entries in the Virginia Tech Barley Test, Northern Piedmont Center, Orange, VA, 2013 harvest, cont'd.

Barley Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Height (In)		Lodging (0-9)	
Atlantic	73		45.9		25	-	1	
VA08B-84	72		45.9		28		2	+
VA11B-15	72		45.6		28		1	
VA10B-11	71		43.3	-	26	-	1	
Novosadski 183	71		44.3		27		0	
VA11B-108	71		44.8		27	-	2	
VA06B-48	69		46.1		26	-	0	
Barsoy	67	-	43.4		31		0	
VA08B-95	65	-	44.8		29		2	+
VA11B-10	63	-	43.2	-	27		0	
Wysor	N/A		N/A		34	+	0	
VA92-42-46	N/A		N/A		35	+	0	
Average	81		44.8		29		0	
LSD (0.05)	13		1.4		2		1	
C.V.	11		2.0		6		240	

Released cultivars are shown in bold print.
Varieties are ordered by descending yield averages.
A plus or minus sign indicates a performance significantly above or below the test average.
The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.
N/A - DATA NOT REPORTED DUE TO DEER FEEDING DAMAGE

Table 18. Summary of performance of barley entries in the Virginia Tech Barley Test, Kentland Farm, Blacksburg,VA, 2013 harvest.

Barley Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Leaf Rust (0-9)		Early Lodging (0-9)		Winter Survival (%)	
VA10B-43	144	+	44.4		122	+	36		8		1	-	5		90	
VA11B-55	144	+	46.3	+	122	+	35		1	-	2		0	-	91	
VA11B-71	144	+	43.4		116	-	32		8		1	-	7		90	
VA09B-35	143	+	46.2	+	117	-	34		5	-	5	+	2	-	96	
VA11B-56	143	+	45.7	+	122	+	35		5	-	4	+	1	-	91	
VA11B-141	141	+	46.2	+	121	+	38	+	5	-	2	-	0	-	92	
VA11B-143	141	+	44.9		120	+	37	+	7		1	-	5		90	
VA11B-29	138	+	42.7		118	-	31	-	8		2	-	5		92	
VA11B-165	138	+	43.4		121	+	35		4	-	1	-	0	-	92	
VA11B-133	138		45.5	+	119		40	+	6		1	-	2	-	86	
VA11B-140	137		45.2		119		41	+	6	-	1	-	3		86	
VA11B-43	137		42.9		121	+	37	+	8		1	-	5		100	+
VA11B-87	137		41.3	-	119		33		8		2	-	7		89	
VA11B-131	136		43.4		119		35		6		1	-	2	-	85	-
VA09B-34	136		47.4	+	117	-	35		5	-	1	-	3		94	
Price	135		45.5	+	118	-	33		7		6	+	3		97	+
VA11B-134	135		41.4	-	119		36		8		1	-	4		89	
VA11B-126	134		43.5		118		34		7		1	-	4		99	+
VA11B-130	134		45.8	+	117	-	36		8		2	-	7		92	
VA11B-127	133		44.4		119		36		6		1	-	2	-	90	
VA08B-85	133		45.1		116	-	32		8		0	-	8	+	100	+
VA10B-11	131		45.3	+	120		33		9	+	1	-	7		89	
VA08B-108	131		44.3		117	-	31	-	8		2	-	7		97	+
VA11B-37	131		43.4		118		32		8		1	-	4		92	
VA08B-84	130		44.9		114	-	31	-	9	+	0	-	8	+	97	+
VA10B-9	129		47.2	+	116	-	33		8		2	-	7		90	
VA12B-7	129		45.2		121	+	36		6	-	9	+	2	-	91	
VA11B-125	128		44.5		121	+	37	+	6		2	-	1	-	95	
VA08B-109	128		44.1		117	-	30	-	9	+	1	-	7	+	91	
VA10B-3	128		45.4	+	120	+	33		9	+	1	-	7		90	
VA11B-102	127		43.7		120	+	37	+	8		3		6		99	+
VA11B-10	127		44.1		120		34		8		2	-	6		89	
VA10B-20	127		44.7		115	-	32		8		2	-	6		94	
VA11B-30	126		43.7		118		33		7		1	-	4		92	
VA11B-4	126		45.0		120	+	33		8		4		7		88	
VA08B-89	126		45.9	+	116	-	33		9	+	1	-	7		91	
VA08B-95	124		44.5		115	-	32	-	9	+	1	-	8	+	95	
VA06B-48	121		43.4		115	-	31	-	9	+	6	+	7		92	
VA11B-26	121		41.7	-	117	-	30	-	9	+	3		6		90	
Thoroughbred	121		42.3		123	+	36		8		8	+	3		94	
Atlantic	120		42.4		113	-	30	-	9	+	5	+	7		99	+
MD08-09BF6-7-7	117		40.5	-	124	+	37	+	5	-	2		6		56	-
VA10B-36	116		41.2	-	118		33		9	+	2		6		98	+

Table 18. Summary of performance of barley entries in the Virginia Tech Barley Test, Kentland Farm, Blacksburg,VA, 2013 harvest, cont'd.

Barley Lines	Yield (Bu/a @ 48 lb/bu)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Leaf Rust (0-9)		Early Lodging (0-9)		Winter Survival (%)	
VA11B-15	111	-	43.3		115	-	32	-	9	+	4	+	8	+	95	
VA11B-108	109	-	42.7		116	-	31	-	9	+	5	+	7	+	95	
VA10B-6	106	-	43.6		120	+	33		9	+	2	-	7	+	92	
VA92-42-46	104	-	43.3		120		39	+	5	-	1	-	2	-	92	
Barsoy	103	-	40.6	-	119		37	+	8		9	+	7		99	+
Novosadski 183	100	-	46.6	+	122	+	34		5	-	7	+	3		83	-
Wysor	100	-	39.2	-	118		36		8		8	+	6		96	
Nomini	96	-	43.2		117	-	40	+	5	-	6	+	2	-	94	
Callao	92	-	40.8	-	113	-	31	-	9	+	5	+	8	+	95	
Endeavor	89	-	42.2	-	124	+	35		8		7	+	6		61	-
STARS 1014B	73	-	34.2	-	131	+	36		8		6	+	6		92	
Average	125		43.7		119		34		7		3		5		91	
LSD (0.05)	13		1.5		1		2		1		1		2		5	
C.V.	7		2.5		1		5		12		26		34		4	

Released cultivars are shown in bold print.

Varieties are ordered by descending yield averages.

A plus or minus sign indicates a performance significantly above or below the test average.

The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

Section 2: Barley Scab Research

One of the primary research objectives of the Virginia Tech barley breeding program is to identify and develop cultivars possessing resistance to Fusarium Head Blight (FHB) or scab. Each year all barley and hulless barley entries in Virginia's Official State Variety Trials are evaluated for FHB resistance in an inoculated, irrigated nursery at a Mount Holly test site, except in 2011 when the trials were planted at the Blacksburg test site. Data from this test for the current crop year and two and three year averages for FHB incidence, FHB severity, FHB Index (incidence x severity / 100), and deoxynivalenol (DON) content from 2012 are included in this bulletin (Tables 19 - 24) to aid producers in selection of cultivars on the basis of FHB resistance. Cultivars possessing complete resistance or immunity to FHB have not been identified and resistance levels in currently available cultivars vary from moderately resistant to highly susceptible.

A major goal of the breeding program is to identify and incorporate unique and complementary types of FHB resistance into cultivars to enhance the overall level of resistance. Incorporating multiple resistance genes having additive effects on FHB resistance into cultivars will enhance the overall level of resistance. Because the individual resistance genes are located on different barley chromosomes and each gene confers only partial resistance to FHB, identifying lines having multiple resistance genes is difficult using traditional breeding techniques. To overcome this limitation, our program will incorporate the available markers to help select FHB resistant cultivars.

Entries were inoculated by spreading scabby corn seeds in plots at the booting stage. A high level of FHB infection was obtained in 2013. Among 26 hulless lines and varieties tested in 2013, the FHB index ranged from 1 to 55 with FHB incidence ranging from 33% to 100% and FHB severity from 2% to 55% (Table 19). 'Eve' had the least FHB index. Fifteen lines and two varieties had FHB index values lower that than the test mean (20). Based on two year mean data for 2012 and 2013 (Table 20), three lines and one variety had FHB index values lower than the test mean (<18) and DON content values lower than the test mean(17.12 ppm) in 2012. Three hulless barley lines (VA09H-112, VA09H-110, and VA08H-5BS) and one variety (Eve) tested across three years (2011-2013) had average FHB index values lower than the test mean of 14 and DON content lesser than susceptible variety 'Doyce' in 2012 (Table 21).

A moderate FHB infection level was obtained for hulled barley in 2013. Among 54 barley lines and varieties tested in 2013, the FHB index varied from 3 to 70 with FHB incidence ranging from 65% to 100% and FHB severity ranging from 5% to 70% (Table 22). 'Nomini' was the most FHB resistant variety in 2013. Twenty four lines and five varieties had FHB index values lower than the mean (<23). Based on two year mean data for 2012 and 2013 (Table 23), four lines and two varieties had FHB index values lower than the test mean (<9) and DON content values lower than the test mean (20.12 ppm) in 2012. Two hulled barley lines (VA92-42-46 and VA08B-89) and five varieties (Nomini, Barsoy, and Callao) tested across three years (2011-2013) had average FHB index values lower than the test mean of 5.41 and DON content values lower than the test mean of 20.12 ppm in 2012 (Table 24).

Table 19. Summary of reaction of entries in the Virginia Tech State Hulless Barley Test to Fusarium head blight (scab), 2013 harvest.

LINE	FHB Incidence[1] (%)		FHB Severity[2] (%)		FHB Index[3] (0-100)		Rank FHB Index	Date Headed (Julian)	
Eve	33	-	2		1		1	104	-
VA11H-89 WS	70		2		1		2	104	-
VA10H-29	75		2		2		3	105	-
VA08H-65	65		6		4		4	106	-
VA11H-97 WS	75		5		4		5	106	
VA10H-64	70		8		6		6	104	-
VA09H-112(2R)	65		10		7		7	108	
VA09H-110(2R)	70		10		7		8	108	
VA10H-55	70		10		8		9	105	-
VA10H-34	90		13		12		10	106	-
VA08H-5BS	85		15		14		11	108	
Dan	90		15		14		12	108	
VA10H-57	95		18		17		13	107	
VA11H-63	85		23		19		14	107	
VA10H-79WS (2R)	95		20		19		15	109	+
VA08B-85	85		23		21		16	106	
Atlantic	95		23		22		17	105	-
VA08H-79WS	100		23		23		18	109	+
Doyce	90		30		27		19	105	-
VA11H-83	100		30		30		20	111	+
Thoroughbred	100		40		40		21	109	+
VA07H-35WS	100		43	+	43	+	22	108	
VA06H-25	100		43	+	43	+	23	109	+
VA07H-31WS	100		48	+	48	+	24	108	
VA06H-79	100		50	+	50	+	25	109	+
VA08H-72	100		55	+	55	+	26	108	
Average	85		22		20			107	
LSD (0.05)	21		20		20			1	
C.V.	12		44		48			1	

Released cultivars are shown in bold print. Varieties are ordered by ascending index averages.

A plus or minus sign indicates a performance significantly above or below the average.

Entries were planted in 6-row plots, 13 ft in length cut back to 9 ft at Mt. Holly, VA and were inoculated at 50% and 100% heading stages with Fusarium graminearum spore suspension (50,000 spores/ml).

[1]Scab Incidence (%): Percentage of infected spikes among 10 randomly selected spikes.

[2]Scab Severity (%): Percentage of infected spikelets among 10 infected spikes.

[3]Scab Index = Incidence X Severity/100 (overall indicator of scab resistance/susceptibility level.)

WS indicates white seed and (2R) indicates a 2-row type.

Table 20. Two year average summary of reaction of entries in the Virginia Tech State Hulless Barley Tests to Fusarium head blight (scab), 2012 and 2013 harvests.

LINE	FHB Incidence[1] (%)		FHB Severity[2] (%)		FHB Index[3] (0-100)		Rank FHB Index	Date Headed (Julian)		DON[4] (ppm)	
Eve	34	-	14		5		1	94	-	5.88	
VA09H-110(2R)	58		10		6		2	102	+	7.30	
VA09H-112(2R)	58		10		6		3	100		8.28	
VA10H-64	50		24		9		4	95	-	20.84	
VA08H-5BS	60		14		9		5	101	+	7.04	
VA08H-65	60		26		14		6	98	-	20.62	
VA08H-79WS	90	+	16		15		7	105	+	41.88	+
Doyce	68		26		20		8	96	-	10.34	
Dan	80		25		22		9	101	+	7.32	
VA06H-25	75		31		26		10	102	+	21.34	
VA07H-31WS	80		31		28		11	102	+	14.32	
VA08H-72	68		35		30		12	100		28.18	
VA07H-35WS	90	+	34		31		13	102	+	31.72	
VA06H-79	80		44	+	36	+	14	103	+	14.60	
Average	68		24		18			100		17.12	
LSD (0.05)	22		17		16			1		16.45	
C.V.	22		46		55			1		34.93	

Released cultivars are shown in bold print. Varieties are ordered by ascending index averages.

A plus or minus sign indicates a performance significantly above or below the average.

Entries were planted in 6-row plots, 13 ft in length cut back to 9 ft at Mt. Holly, VA and were inoculated at 50% and 100% heading stages with Fusarium graminearum spore suspension (50,000 spores/ml).

[1]Scab Incidence (%): Percentage of infected spikes among 10 randomly selected spikes.

[2]Scab Severity (%): Percentage of infected spikelets among 10 infected spikes.

[3]Scab Index = Incidence X Severity/100 (overall indicator of scab resistance/susceptibility level.)

[4]DON values were measured from the 2012 harvest year.

WS indicates white seed and (2R) indicates a 2-row type.

Table 21. Three year average summary of reaction of entries in the Virginia Tech State Hulless Barley Tests to Fusarium head blight (scab), 2011 - 2013 harvests.

LINE	FHB Incidence[1] (%)		FHB Severity[2] (%)		FHB Index[3] (0-100)		Rank FHB Index	DON[4] (ppm)
Eve	34	-	10		4		1	5.88
VA09H-112(2R)	48		8		4		2	8.28
VA09H-110(2R)	55		9		5		3	7.30
VA08H-5BS	52		11		6		4	7.04
VA08H-79WS	77		13		11		5	41.88
Dan	62		18		15		6	7.32
Doyce	72		24		18		7	10.34
VA06H-25	63		23		18		8	21.34
VA07H-31WS	63		22		19		9	14.32
VA07H-35WS	75		24		22		10	31.72
VA08H-72	63		26		22		11	28.18
VA06H-79	72		31	+	25	+	12	14.60
Average	61		18		14			17.12
LSD (0.05)	18		11		11			16.45
C.V.	25		54		66			34.93

Released cultivars are shown in bold print. Varieties are ordered by ascending index averages.

A plus or minus sign indicates a performance significantly above or below the average.

Entries were planted in 6-row plots, 13 ft in length cut back to 9 ft at Mt. Holly, VA and were inoculated at 50% and 100% heading stages with Fusarium graminearum spore suspension (50,000 spores/ml).

[1]Scab Incidence (%): Percentage of infected spikes among 10 randomly selected spikes.

[2]Scab Severity (%): Percentage of infected spikelets among 10 infected spikes.

[3]Scab Index = Incidence X Severity/100 (overall indicator of scab resistance/susceptibility level.)

[4]DON values were measured from the 2012 harvest year.

WS indicates white seed and (2R) indicates a 2-row type.

Table 22. Summary of reaction of entries in the Virginia Tech State Barley Test to Fusarium head blight (scab), 2013 harvest.

LINE	FHB Incidence[1] (%)		FHB Severity[2] (%)		FHB Index[3] (0-100)		Rank FHB Index	Date Headed (Julian)	
Nomini	65	-	5		3		1	105	
VA09B-35	85		5		4		2	105	-
Wysor	75	-	6		5		3	106	
VA08B-95	70	-	8		6		4	105	-
VA92-42-46	75	-	8		6		5	106	
VA11B-126	80		8		6		6	104	-
VA11B-134	83		8		6		7	104	-
VA08B-109	85		8		7		8	106	
Endeavor	85		8		7		9	108	+
VA09B-34	80		10		8		10	104	-
Barsoy	80		10		9		11	104	-
VA10B-9	85		10		9		12	104	-
Novosadski 183	95		10		10		13	108	
VA11B-130	95		10		10		14	104	-
VA11B-140	80		13		10		15	105	-
VA11B-127	85		13		11		16	104	-
VA08B-89	90		13		12		17	105	
VA06B-48	95		13		12		18	105	
Callao	95		15		15		19	105	
VA11B-133	100		15		15		20	106	
VA11B-125	100		15		15		21	107	
VA12B-7	100		18		18		22	107	
VA10B-20	90		20		18		23	105	
VA11B-143	95		20		20		24	105	
VA08B-108	95		20		20		25	105	-
MD08-09BF6-7-7	100		20		20		26	104	-
VA11B-165	100		20		20		27	107	
VA11B-71	100		20		20		28	108	
VA11B-26	95		23		22		29	107	
VA11B-15	100		23		23		30	105	-
Price	100		23		23		31	106	
Thoroughbred	100		23		23		32	108	
VA11B-131	95		25		24		33	104	-
VA08B-85	95		25		25		34	106	
VA10B-11	95		25		25		35	107	
Atlantic	95		25		25		36	105	-
VA11B-108	90		28		25		37	106	
VA11B-30	100		28		28		38	106	
VA10B-6	100		28		28		39	107	
VA11B-141	100		30		30		40	108	
VA11B-102	100		30		30		41	109	+

Table 22. Summary of reaction of entries in the Virginia Tech State Barley Test to Fusarium head blight (scab), 2013 harvest, cont'd.

LINE	FHB Incidence[1] (%)		FHB Severity[2] (%)		FHB Index[3] (0-100)		Rank FHB Index	Date Headed (Julian)	
STARS 1014B	95		33		31		42	120	+
VA11B-4	100		33		33		43	107	
VA10B-36	100		35		35		44	107	
VA11B-10	100		38		38		45	108	+
VA10B-3	100		38		38		46	109	+
VA11B-37	95		40		39		47	106	
VA11B-29	98		45		44		48	107	
VA08B-84	100		48	+	48	+	49	106	
VA11B-87	100		53	+	53	+	50	107	
VA11B-43	100		53	+	53	+	51	110	+
VA11B-55	100		58	+	58	+	52	109	+
VA11B-56	100		63	+	63	+	53	109	+
VA10B-43	100		70	+	70	+	54	109	+
Average	93		24		23			106	
LSD (0.05)	16		22		22			2	
C.V.	8		46		48			1	

Released cultivars are shown in bold print. Varieties are ordered by ascending index averages.

A plus or minus sign indicates a performance significantly above or below the average.

Entries were planted in 6-row plots, 13 ft in length cut back to 9 ft at Mt. Holly, VA and were inoculated at 50% and 100% heading stages with Fusarium graminearum spore suspension (50,000 spores/ml).

[1]Scab Incidence (%): Percentage of infected spikes among 10 randomly selected spikes.

[2]Scab Severity (%): Percentage of infected spikelets among 10 infected spikes.

[3]Scab Index = Incidence X Severity/100 (overall indicator of scab resistance/susceptibility level.)

Table 23. Two year average summary of reaction of entries in the Virginia Tech State Barley Tests to Fusarium head blight (scab), 2012 and 2013 harvests.

LINE	FHB Incidence[1] (%)	FHB Severity[2] (%)	FHB Index[3] (0-100)	Rank FHB Index	Date Headed (Julian)	DON[4] (ppm)
Nomini	38	5	2	1	96 -	5.48 -
VA92-42-46	43	7	3	2	98	8.38
Wysor	45	10	4	3	99	28.02
Barsoy	48	11	5	4	95 -	6.04
VA09B-34	53	13	6	5	97	30.82
VA08B-95	58	8	6	6	98	22.80
Novosadski 183	70	8	6	7	99 +	16.62
VA09B-35	55	16	7	8	97	19.96
VA08B-89	55	14	7	9	98	15.30
VA08B-109	68	14	8	10	99	33.32
VA06B-48	60	12	8	11	98	20.96
Callao	63	14	10	12	96 -	9.70
VA08B-108	65	15	12	13	98	27.00
Price	65	19	14	14	98	26.86
Thoroughbred	68	20	14	15	101 +	31.50
VA08B-85	64	19	15	16	99	18.14
Atlantic	65	24	18	17	98	29.96
VA08B-84	65	34 +	27 +	18	98	11.36
Average	58	14	9		98	20.12
LSD (0.05)	21	14	11		1	14.45
C.V.	26	66	77		1	31.74

Released cultivars are shown in bold print. Varieties are ordered by ascending index averages.

A plus or minus sign indicates a performance significantly above or below the average.

Entries were planted in 6-row plots, 9 ft in length at Mt. Holly, VA. They were inoculated at 50% and 100% heading stages with Fusarium graminearum spore suspension (50,000 spores/ml).

[1]Scab Incidence (%): Percentage of infected spikes among 10 randomly selected spikes.

[2]Scab Severity (%): Percentage of infected spikelets among 10 infected spikes.

[3]Scab Index = Incidence X Severity/100 (overall indicator of scab resistance/susceptibility level.)

[4]DON values were measured from the 2012 harvest year.

Table 24. Three year average summary of reaction of entries in the Virginia Tech State Barley Tests to Fusarium head blight (scab), 2011 - 2013 harvests.

LINE	FHB Incidence[1] (%)	FHB Severity[2] (%)	FHB Index[3] (0-100)	Rank FHB Index	DON[4] (ppm)
Nomini	42	6	2	1	5.48 -
VA92-42-46	38	6	3	2	8.38
Wysor	48	9	4	3	28.02
VA09B-34	48	10	4	4	30.82
Barsoy	43	9	4	5	6.04
VA08B-95	60	8	5	6	22.80
VA08B-89	55	11	6	7	15.30
VA06B-48	58	10	7	8	20.96
VA08B-109	67	12	7	9	33.32
Callao	63	12	8	10	9.70
VA08B-108	57	11	8	11	27.00
Thoroughbred	58	15	10	12	31.50
Price	60	15	10	13	26.86
VA08B-85	63	15	11	14	18.14
Atlantic	67	19	14	15	29.96
VA08B-84	60	24 +	19 +	16	11.36
Average	55	12	8		20.12
LSD (0.05)	20	8	7		14.45
C.V.	31	60	78		31.74

Released cultivars are shown in bold print. Varieties are ordered by ascending index averages.

A plus or minus sign indicates a performance significantly above or below the average.

Entries were planted in 6-row plots, 9 ft in length at Mt. Holly, VA. They were inoculated at 50% and 100% heading stages with Fusarium graminearum spore suspension (50,000 spores/ml).

[1]Scab Incidence (%): Percentage of infected spikes among 10 randomly selected spikes.

[2]Scab Severity (%): Percentage of infected spikelets among 10 infected spikes.

[3]Scab Index = Incidence X Severity/100 (overall indicator of scab resistance/susceptibility level.)

[4]DON values were measured from the 2012 harvest year.

Section 3: Malt Barley Management Research

Barley and other minor cereal crops have been struggling to survive on the east coast, due to low prices and lack of profitable markets. Therefore our program is trying to focus on developing barley having acceptable malt quality for potential use in the micro-brewing industry. In this regard, the Virginia Tech breeding program has evaluated several winter malting type barley lines over the past several years, primarily for use as parents in our breeding program. One of the two parents of our hulled barley variety Thoroughbred is 'Plaisant', a French malting variety. Thoroughbred has reasonably good malt extract but lacks the desired enzymes for large scale beer production.

Subsequently, increased interest in growing malt-type barley for use in the craft and specialty brewing industries has prompted the program to develop malt type barley varieties adapted to the mid-Atlantic and south eastern United States. As a result, we are currently involved in a cooperative national winter malt barley research trial that includes a total of 13 locations in 10 states around the country. One constraint in most of the currently available winter malt barley cultivars developed elsewhere is that they do not have the desired level of disease resistance required in our region. Our typical variety tests do not employ fungicides, however in this case we wanted to assess the relative performance of these malt-type barley cultivars under a management regime that would be recommended to commercial growers.

Two experiments were conducted in 2012-13 to measure the effect of cultivar disease resistance and fungicide application in current and promising malt-type barley lines and standard cultivar comparisons. Charles and Endeavor are winter malt barley cultivars developed by USDA-ARS in Idaho. Thoroughbred was developed by Virginia Tech and has been widely grown in the mid-Atlantic region. Novosadski 183 and 283 were developed in Yugoslavia and were originally identified in early screening in the 1990's as being at least partially adapted to Virginia conditions. Lines designated with a VA- are experimental cultivars developed in the Virginia Tech program. Listing and usage of the fungicides in this test does not imply endorsement of these products over others. They were chosen because these products are in common use by producers in the region.

Over locations Thoroughbred, VA10B-43, and VA09B-29 were the highest yielding entries, followed by Endeavor. When Tilt (at GS 48) and Prosaro (GS 58) fungicides were applied, yields were higher than when no fungicide was applied or when Tilt alone was used. This implies that protection from late season diseases such as leaf rust and head scab was advantageous this season.

Table 25. Summary of performance of entries in the Virginia Tech Malt Barley Management Test, 2013 harvest.

Line	Yield (Bu/a @ 48 lb/bu)	Test Weight (Lb/bu)	Lodging 0-9
Throughbred	100.5	44.4	1.8
VA10B-43	99.2	44.1	1.7
VA09B-29	96.8	43.1	1.2
Endeavor	87.6	42.7	1.9
VA09B-35	85.1	44.9	2.9
VA09B-34	80.4	44.6	2.2
Novosadski 183	75.2	44.2	2.1
Novosadski 293	75.2	43.0	1.9
Charles	65.6	39.3	3.0
Average	85.1	43.4	2.1
LSD (0.05)	8.9	2.1	ns

Fungicide	Yield (Bu/a @ 48 lb/bu)	Test Weight (Lb/bu)	Lodging 0-9
None	82.7	43.4	2.3
Tilt	81.1	43.0	1.9
Prosaro	87.2	43.8	2.0
Tilt+Prosaro	88.3	44.2	2.1
Average	84.8	43.6	2.1
LSD (0.05)	5.6	ns	ns

ns - no significant differences

Table 26. Summary of performance of entries in the Virginia Tech Malt Barley Management Test at Painter, 2013 harvest.

Line	Yield (Bu/a @ 48 lb/bu)	Test Weight (Lb/bu)	Lodging 0-9
VA09B-29	105.0	44.2	2.4
Throughbred	102.6	45.0	3.3
VA10B-43	101.6	44.0	2.9
Endeavor	101.5	43.7	3.7
Novosadski 183	86.8	44.5	4.0
VA09B-35	86.3	45.3	4.7
VA09B-34	84.3	44.6	3.8
Charles	82.4	41.4	5.0
Novosadski 293	81.2	41.5	3.8
Average	92.4	43.8	3.7
LSD (0.05)	10.1	ns	0.7

Fungicide	Yield (Bu/a @ 48 lb/bu)	Test Weight (Lb/bu)	Lodging 0-9
None	89.1	43.4	4.0
Tilt	88.2	42.8	3.5
Prosaro	96.6	44.2	3.6
Tilt+Prosaro	93.9	44.7	3.7
Average	91.9	43.8	3.7
LSD (0.05)	6.7	ns	ns

ns - no significant differences

Table 27. Summary of performance of entries in the Virginia Tech Malt Barley Management Test at Orange, 2013 harvest.

Line	Yield (Bu/a @ 48 lb/bu)	Test Weight (Lb/bu)	Lodging 0-9
Throughbred	98.4	43.9	0.3
VA10B-43	96.7	44.3	0.5
VA09B-29	88.6	42.0	0.0
VA09B-35	83.9	44.4	1.2
VA09B-34	76.6	44.6	0.7
Endeavor	73.7	41.7	0.2
Novosadski 293	69.1	44.5	0.0
Novosadski 183	63.5	43.9	0.3
Charles	48.8	37.2	0.9
Average	77.7	42.9	0.4
LSD (0.05)	9.2	1.5	0.9

Fungicide	Yield (Bu/a @ 48 lb/bu)	Test Weight (Lb/bu)	Lodging 0-9
None	76.2	43.4	0.6
Tilt	74.1	43.2	0.3
Prosaro	77.8	43.4	0.3
Tilt+Prosaro	82.8	43.7	0.5
Average	77.7	43.5	0.4
LSD (0.05)	6.1	ns	ns

ns - no significant differences

Section 4: Wheat Varieties

Wheat trials were planted in seven-inch rows at Blackstone, Orange, Holland, Painter, and Shenandoah Valley. They were planted in six-inch rows at Blacksburg. They were planted in seven and one-half-inch rows at the Warsaw No-Till location. All no-till locations (Holland and Warsaw No-Till) and Shenandoah Valley were planted at 28 seeds per row foot. All other locations were planted at 22 seeds per row foot.

Selecting the best wheat varieties is challenging but becomes easier with adequate information on performance over multiple environments. Past seasons across Virginia have provided the opportunity to evaluate day length sensitivity, spring freeze damage, glume blotch, scab (Fusarium head blight), and general plant health. Many newer wheat varieties and lines performed well in all environments tested.

The future for wheat varieties adapted to Virginia conditions is very positive. Dr. Carl Griffey, Virginia Tech's small grains breeder, has many lines starting with "VA" shown in the by- and over-location tables that are in the top-yielding group and that display good disease resistance.

The released varieties that yielded significantly higher than the statewide mean in 2013 were USG 3404, Pioneer 25R40, USG 3013, USG 3523, USG 3438, Pioneer 26R10, AgriMaxx 434, SY Harrison, SY 474, AgriMAXX 415, Steyer Hunker, USG 3251, Progeny 357, and Pioneer 26R41. SY 474, AgriMAXX 415, and USG 3251 also had test weight that was significantly higher than the mean of all lines tested. Average yield of all lines tested in 2012-13 was 74 bu/ac.

USG 3251 had the highest two-year average yield. USG 3612, USG 3438, Shirley, and Pioneer 26R41 all had grain yield significantly above the mean over the 2012 and 2013 harvests. USG 3251 also had test weight that was significantly higher than the two-year mean of all lines tested. The two-year average grain yield over all locations and varieties was 76 bu/ac.

Producers who grow large acreages of wheat should plant two or more varieties having significantly different maturity dates in order to ensure harvest of high quality grain having high test weight and no sprouting. In Virginia it is typical for sporadic or consistent rain showers to interrupt harvest. These wetting and drying cycles and subsequent delays and significantly reduce grain test weight and quality. Growers can circumvent this problem by planting varieties that differ significantly in maturity. Early maturing varieties often can be harvested first and prior to significant rain showers, and later maturing varieties harvested subsequently will suffer less damage and losses in test weight and quality due to exposure to such a rain event.

Summary of wheat management practices for the 2013 harvest season (All rates are given on a per acre basis.)

Blacksburg - Planted September 24, 2012. Preplant fertilizer was 30-60-80 September 21, 2012. Site was sprayed with .75 oz Harmony Extra SG® on November 30, 2012. Site was fertilized with 45 lb N plus 0.6 oz Harmony Extra SG® on February 21, 2013 and with 60 lb N on March 22, 2013. Harvest occurred July 10, 2013.

Blackstone - Planted October 19, 2012. Preplant fertilizer was 300 lb 10-10-10 on October 17, 2012. Site was top-dressed with 60 lb N using 14-0-14 on February 6, 2013 and again on March 22, 2013. Site was sprayed with 4 oz Harmony Extra SG® on February 6, 2013. Harvest occurred July 9, 2013.

Warsaw - Planted no-till October 12, 2012. Preplant fertilizer was 30-80-60-5 applied October 11, 2012 after one ton of lime was applied on October 2, 2012. Site was fertilized using 12-0-0-1.5 at 25 lb on December 14, 2012 and at 50 lb using 24-0-0-3 on March 10, 2013. Site was treated with 1.5 qt Brandt EDTA Zinc (9% chelated zinc) on March 15, 2012. Site was treated with 6.5 oz Starane® and .75 oz Harmony Extra SG® on December 17, 2012. The fungicide-treated plots were sprayed with 4 oz Tilt® on April 25, 2013 and with 8 oz Prosaro® on May 2, 2013. Harvest occurred June 24-26, 2013.

Painter - Planted October 23, 2012. Preplant fertilizer was 30 lb N using 30% UAN on October 22, 2012. Site was fertilized with 60 lb N using 30%UAN and 0.75 oz Harmony Extra SG® March 5, 2013. Site was fertilized with 60 lb N using 30% UAN March 30, 2013. Harvest occurred June 23, 2013.

Holland - Planted no-till October 22, 2012. Preplant fertilizer was 1.5 ton lime on October 12, 2012 and 300 lb 6-16-36 on October 17, 2012. Site was sprayed with 4.75 oz Osprey® December 4, 2012. Site received 60 lb N and 1.5 lb Mn plus 0.6 oz Harmony Extra SG® on February 21, 2013. Site was fertilized with 60 lb N on March 15, 2013 using 24-0-0-3 and 1 lb of Mn. Site was treated with 2 oz Baythroid® on May 4, 2013 for cereal leaf beetle control. Harvest occurred July 10, 2013.

Orange - Planted October 11, 2012. Preplant fertilizer was 30-60-40 September 26, 2012. Sixty lb N and 0.4 oz Harmony Extra SG® were applied March 15, 2013. Harvest occurred June 24-25, 2013.

Shenandoah Valley - Planted on November 9, 2012. Sixty lb N were applied February 21 and March 29, 2013. Site was abandoned before harvest.

Table 28. Summary of performance of entries in the Virginia Tech Wheat Test, 2013 harvest.

Line	Yield (Bu/a) (6)		Test Weight (Lb/bu) (5)		Date Headed (Julian) (2)		Height (In) (3)		Lodging (0-9) (5)		Early Lodging[1] (0-9) (1)		Leaf Rust (0-9) (2)		Powdery Mildew (0-9) (2)		Barley Yellow Dwarf Virus (0-9) (1)		Hessian Fly Resistance (Biotype)[2]	Awns[3]
VA10W-21	91	+	56.2		126		37		4		2		0	-	1		2			TA
USG 3404	89	+	54.5	-	128	+	38		4		0		2	+	3	+	1	-	BCDOL	A
Pioneer 25R40	88	+	57.1	+	128	+	36	-	2	-	0		3	+	0	-	2		O	A
SY 474	87	+	57.1	+	128	+	40	+	3		1		2	+	1		3		BC	TA
USG 3013	87	+	55.9		127	+	40	+	4		1		4	+	4	+	3			TA
AgriMAXX 434	87	+	54.7	-	126		36	-	3	-	0		4	+	2		1	-		A
Pioneer 26R10	86	+	56.5		127	+	37	-	2	-	0		3	+	2		4	+	BCDOL	A
VA11W-108	86	+	55.9		126		38		2	-	0		0	-	1	-	2		BCD	A
USG 3612	86	+	54.9	-	N/A		40	+	4		N/A		0	-	1		2			TA
USG 3523	86	+	56.1		128	+	39		4		1		4	+	2		3			A
Progeny PGX 12-10	86	+	53.7	-	125	-	38		4		1		4	+	1		2			A
VA11W-31	86	+	57.0	+	125	-	38		3		1		0	-	0	-	2		C	A
VA11W-165	85	+	54.9	-	127		36	-	3		1		0	-	1		3			AL
Steyer Hunker	85	+	55.9		127	+	40	+	4		1		4	+	4	+	3		BCDOL	TA
Pioneer 26R41	85	+	55.3		128	+	35	-	2	-	0		0	-	1		2		BCDOL	A
SY Harrison	85	+	55.1		126		37		3	-	0		3	+	3	+	3			A
USG 3438	85		54.7	-	125	-	35	-	2	-	0		1		2	+	3			A
AgriMAXX 415	85		57.2	+	126		37		3		1		1		3	+	3		C	A
VA11W-301	84		55.4		127		36	-	3		2		0	-	0	-	3			AL
SS 8340	84		57.3	+	127		38		3	-	0		2		3	+	2			A
USG 3251	83		56.7	+	129	+	40	+	4		1		3	+	2		3		C	A
Mercer Brand 11-V-258	83		55.9		128	+	40	+	4		1		2		2		1	-	CO	TA
Featherstone VA 258	83		55.3		129	+	39	+	5		2		2	+	2		1	-	CO	TA
VA10W-96	83		57.0	+	124	-	39		4		4		0	-	1	-	2			A
VA11W-106	83		56.4		127	+	37		3		1		0	-	1		3			A
VA10W-140	82		57.4	+	127		38		4		3		0	-	1		4	+		TA
AgriMAXX 438	82		55.6		127	+	40	+	4		1		4	+	4	+	2			TA
Progeny 185	82		56.6		127		40	+	2	-	0		2		3	+	3		CDO	TA
VA07W-415*	82		55.3		127		38		4		5	+	2		1	-	3		BCDOL	TA
VA11W-230	82		56.7	+	125	-	36	-	4		4		0	-	1	-	1	-	BCDOL	A

Table 28. Summary of performance of entries in the Virginia Tech Wheat Test, 2013 harvest, continued.

Line	Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Early Lodging[1] (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)		Barley Yellow Dwarf Virus (0-9)		Hessian Fly Resistance (Biotype)[2]	Awns[3]
	(6)		(5)		(2)		(3)		(5)		(1)		(2)		(2)		(1)			
Progeny 357	82		53.5	-	128	+	39		3		2		4	+	4	+	3			A
Progeny 308	82		56.8	+	127		38		2	-	0		3	+	1		2		O	A
VA10W-123	81		55.7		124	-	38		5	+	3		3	+	0	-	2			TA
Dyna-Gro 9171	81		54.3	-	125	-	35	-	2	-	1		2		2	+	4	+	C	A
USG 3201	81		57.2	+	127		37		3		2		2		2	+	2		C	A
Dyna-Gro 9223	81		55.2		128	+	40	+	4		2		4	+	4	+	3			TA
AgriMAXX 413	81		54.3	-	126		35	-	3		1		2		2		4	+	C	A
VA09W-73*	81		57.0	+	129	+	38		4		4	+	0	-	1		2			TA
Dyna-Gro 9042	81		55.7		127		38		2	-	0		4	+	2	+	4	+	O	TA
Steyer Heilman	81		56.6		127		43	+	4		2		3	+	2		3		BCDOL	TA
Progeny 117	80		54.6	-	122	-	39		4		3		1		2		2			TA
Pioneer 26R12	80		55.7		127		40	+	3		0		1		3	+	2			A
SS 5205	80		55.8		126		34	-	4		3		0	-	1		2			TA
NC08-140	80		55.8		126		39		6	+	4	+	0	-	0	-	1	-	C	TA
Shirley	80		55.3		127	+	37		3		1		0	-	0	-	2		C	AL
VA10W-118	80		57.1	+	124	-	38		4		2		0	-	1		2			A
VA11W-196	80		55.7		129	+	33	-	3		0		0	-	0	-	2		O	A
SS 8412	80		57.6	+	126		37	-	3		0		0	-	1		3			TA
AgriMAXX Exp 1342	80		56.3		127	+	37		4		2		1	-	2		3			A
AgriMAXX 427	80		54.9	-	126		38		4		1		4	+	2		3			TA
ARS08-0047	80		53.9	-	124	-	37		5	+	5	+	1	-	1		2		B	A
Pioneer XW11G	80		56.8	+	127		38		5		2		1		3	+	3			A
Steyer Pierson	79		56.5		128	+	40	+	4		3		1		3	+	2		CDO	TA
Progeny 125	79		53.4	-	121	-	35	-	3		0		3	+	2		4	+		TA
Yorktown	79		56.6		126		36	-	4		4		0	-	0	-	2			TA
VA10W-42	79		55.7		124	-	40	+	3		3		0	-	3	+	2		BCD	A
VA09W-52	79		56.4		125	-	38		4		2		0	-	2		3		O	TA
Mercer Brand 12-W-296	79		56.3		127		44	+	3		0		3	+	1		3			TA
Oakes	79		58.3	+	129	+	38		3		3		3	+	2	+	3			TA
VA10W-126	79		55.3		125	-	38		4		2		1	-	2	+	3		CD	A
SS 8700	79		55.1		131	+	39	+	4		2		3	+	1	-	3		CO	A

Table 28. Summary of performance of entries in the Virginia Tech Wheat Test, 2013 harvest, continued.

Line	Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Early Lodging[1] (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)		Barley Yellow Dwarf Virus (0-9)		Hessian Fly Resistance (Biotype)[2]	Awns[3]
	(6)		(5)		(2)		(3)		(5)		(1)		(2)		(2)		(1)			
USG 3120	79		55.9		122	-	38		5	+	4	+	0	-	2		1	-		A
Progeny 870	79		54.1	-	126		35	-	2	-	1		1		2	+	5	+		A
USG 3993	79		56.6		127		40	+	4		3		1		2	+	3			TA
VA08MAS-369	78		57.6	+	126		37		4		3		1		0	-	3			AL
VA10W-119	78		56.7	+	124	-	39		5	+	5	+	0	-	2		1	-	BCDOL	A
SS 8500	78		55.9		129	+	41	+	3		2		2		2		3		CO	A
VA09W-188WS*	78		51.5	-	123	-	39	+	4		3		1		1		1	-	O	A
VA11W-278	78		56.3		123	-	37	-	4		3		0	-	1		2		BCDOL	AL
Pioneer 26R53	78		56.9	+	127	+	35	-	2	-	1		2		2		2		B	A
USG 3555	78		55.4		125	-	34	-	4		4		4	+	0	-	1	-		AL
Pioneer 26R20	78		55.9		128	+	39		4		3		2		1		2		CO	A
GA-031134-10E29	78		55.1		126		36	-	5	+	5	+	1		1	-	2		BCDOL	A
NC-Cape Fear	78		56.3		124	-	37		5	+	4		0	-	0	-	2			TA
VA11W-195	78		55.6		125	-	35	-	4		2		0	-	1		2			A
Mercer Brand 12-V-251	78		55.2		126		35	-	5	+	3		0	-	1		2		C	TA
Dyna-Gro 9343	78		56.3		127	+	40	+	4		2		1		2		3			TA
SS 520	77		53.6	-	124	-	38		4		2		0	-	1		4	+		TA
Mercer Brand 12-W-270	77		56.3		127		40	+	4		1		1		2		3			TA
VA11W-323WS	77		53.8	-	127		37		4		2		0	-	1	-	3			AL
SS 8404	77		57.0	+	126		35	-	3		0		0	-	2		2			A
VA10W-669	77		54.7	-	126		36	-	5		3		0	-	1		2			TA
VA09W-75*	76		55.8		124	-	37	-	4		1		0	-	0	-	1	-		TA
MD04W249-11-7	76		57.2	+	126		39	+	4		5	+	4	+	0	-	3			A
Pioneer 26R22	76		57.0	+	127		39	+	3		1		1		2		2		C	A
VA10W-28	76		54.9	-	129	+	40	+	3		0		0	-	2		3			A
VA09W-110	76		54.6	-	127		35	-	4		5	+	0	-	1		3			TA
SS 8350	75		54.7	-	129	+	37		1	-	0		0	-	5	+	3			A
GA-04570-10E46	75		56.6		124	-	38		3		2		0	-	1	-	1	-		A
Pioneer 25R32	75		56.9	+	129	+	38		4		1		3	+	1	-	3		BCDOL	A
Merl	75		57.3	+	126		36	-	4		1		3	+	1	-	4	+		TA

Table 28. Summary of performance of entries in the Virginia Tech Wheat Test, 2013 harvest, continued.

Line	Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Early Lodging[1] (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)		Barley Yellow Dwarf Virus (0-9)		Hessian Fly Resistance (Biotype)[2]	Awns[3]
	(6)		(5)		(2)		(3)		(5)		(1)		(2)		(2)		(1)			
NC-Yadkin	75	-	55.9		126		38		5		2		1	-	1	-	1	-		AL
NC09-22402	75	-	55.6		126		37		4		5	+	1	-	1	-	4	+		TA
VA10W-112	74	-	57.6	+	124	-	37		5		3		0	-	1		2		BCDO	A
SS 8302	74	-	56.7	+	128	+	39	+	3		3		4	+	4	+	4	+	CO	A
Jamestown	74	-	57.0	+	122	-	37	-	4		5	+	1		0	-	1	-	BCD	A
VA08W-672	74	-	55.7		127		37	-	4		4		3	+	1		3			TA
SY 483	73	-	54.6	-	130	+	40	+	4		3		3	+	1		4	+		TA
GA-031257-10LE34	72	-	56.9	+	126		36	-	4		2		0	-	1	-	1	-		A
NC08-21273	71	-	56.7	+	127		37		4		4		0	-	2		3			AL
Massey	62	-	55.7		125	-	41	+	5	+	6	+	6	+	1		3		B	AL
Average	79		55.9		126		38		4		2.1		1.4		1.5		2.4			
LSD (O.05)	5		0.8		1		1		1		2.2		0.7		0.7		0.9			
C.V.	10		2.1		1		3		34		82		46		51		28			

Released cultivars are shown in bold print. Varieties are ordered by descending yield averages. A plus or minus sign indicates a performance significantly above or below the test average. The 0-9 ratings indicate a genotype's response to disease or lodging, where 0 = highly resistant and 9 = highly susceptible.

The number in parentheses below column headings indicates the number of locations on which data are based.

* Released line yet to be named.

[1]Entries noted as lodging very early when assessed at the end of April were injured by spring freeze.

[2]Seedlings of all lines were tested for resistance to biotypes B, C, D, O, and L of Hessian Fly. Letter in column indicates varietal resistance. Lines lacking letter were susceptible.

[3]A=awned, AL=awnletted, TA=tip awned.

N/A indicates that data was not available.

Table 29. Two year average summary of performance of entries in the Virginia Tech Wheat Tests, 2012 and 2013 harvests.

Line	Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)		Barley Yellow Dwarf Virus (0-9)		Early Height[1] (In)	
	(12)		(11)		(4)		(6)		(8)		(4)		(6)		(4)		(2)	
VA10W-21	88	+	59.1	+	118		36		3		0	-	0	-	2		7	
USG 3612	84	+	57.0	-	111	-	36		4		1		2		2		5	-
VA10W-123	84	+	58.1		115	-	37	+	4	+	2		0	-	3		8	+
USG 3251	83	+	58.7	+	122	+	38	+	3		2	+	1		2		4	-
SS 5205	83	+	58.3		117	-	32	-	4		0	-	1	-	2	-	6	
Pioneer 26R41	82		57.6	-	121	+	34	-	2	-	0	-	1		2		5	-
USG 3438	82		56.3	-	119		34	-	2	-	1	-	2		4	+	5	-
VA10W-140	82		59.8	+	119	+	37		4		0	-	2		3		7	
Featherstone VA 258	82		57.7		120	+	38	+	5	+	2		1		2	-	9	+
Shirley	82		57.4	-	120	+	35		2		0	-	0	-	3		5	-
USG 3120	82		58.4	+	112	-	37		4	+	0	-	1	-	2	-	9	+
Pioneer 26R10	82		58.0		121	+	36		1	-	3	+	2		3		4	-
SY Harrison	82		56.9	-	120	+	36		2	-	2	+	3	+	3		5	-
USG 3555	81		57.7		115	-	33	-	4	+	3	+	1	-	2	-	9	+
VA09W-188WS*	81		55.0	-	115	-	38	+	4	+	1		1	-	2	-	7	
Progeny 185	81		58.2		118		38	+	2	-	3	+	3	+	3		5	-
Progeny 308	81		58.8	+	120	+	36		2	-	3	+	1		2		5	-
VA09W-73*	81		59.1	+	121	+	35		4	+	0	-	1	-	2	-	8	+
AgriMAXX 427	81		57.2	-	119		36		4		4	+	2		3		4	-
AgriMAXX 413	81		56.2	-	119		34	-	2	-	1		1		4	+	5	-
VA07W-415*	81		58.1		118		37	+	4	+	1		0	-	4	+	9	+
Progeny 117	81		57.1	-	113	-	38	+	5	+	2		3	+	3		9	+
SS 8340	81		59.0	+	120	+	36		2	-	1		3	+	3		5	-
SS 8412	80		59.4	+	117		35	-	3		0	-	1	-	3		9	+
AgriMAXX 415	80		58.9	+	120	+	36		3		1		3	+	3		5	-
Yorktown	80		58.8	+	117	-	35	-	4		0	-	0	-	2		9	+
Dyna-Gro 9042	80		57.8		120	+	36		2		4	+	2		4	+	5	-

Table 29. Two year average summary of performance of entries in the Virginia Tech Wheat Tests, 2012 and 2013 harvests, continued.

Line	Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)		Barley Yellow Dwarf Virus (0-9)		Early Height[1] (In)	
	(12)		(11)		(4)		(6)		(8)		(4)		(6)		(4)		(2)	
Pioneer 26R20	80		58.6	+	122	+	37	+	4		1		1		3		5	-
VA09W-110	80		57.3	-	117	-	33	-	4	+	0	-	1	-	3		8	+
USG 3201	80		59.1	+	119	+	36		2		1		2	+	2	-	6	-
Progeny 357	79		55.9	-	122	+	37	+	3		5	+	3	+	3		5	-
Mercer Brand 12-V-251	79		57.4	-	117	-	34	-	5	+	0	-	1	-	2	-	9	+
Merl	79		59.3	+	118		35		3		2	+	0	-	3	+	7	
SS 520	79		56.7	-	114	-	36		4	+	1	-	1	-	4	+	10	+
Dyna-Gro 9171	79		56.2	-	118		34	-	2	-	1		2		5	+	5	-
VA09W-52	78		58.4	+	115	-	36		4		0	-	2		3		9	+
Progeny 870	78		56.0	-	119		33	-	1	-	1		2		5	+	4	-
VA10W-119	78		58.6	+	114	-	37	+	5	+	0	-	1		2	-	9	+
Oakes	78		59.9	+	121	+	37	+	3		2		3	+	3		6	
Dyna-Gro 9223	78		57.5	-	121	+	38	+	3		4	+	4	+	4	+	5	-
SS 8404	78		59.1	+	117	-	33	-	3		0	-	2		2	-	9	+
VA09W-75*	78		58.1		116	-	35		4		0	-	0	-	2	-	8	+
Pioneer 26R53	78		58.8	+	120	+	34	-	2	-	1		2	+	2	-	5	-
NC-Cape Fear	78		58.8	+	114	-	35	-	5	+	0	-	0	-	2		8	+
VA08MAS-369	78		59.7	+	118		35		3		1	-	1	-	3		9	+
SS 8500	77		57.6	-	120	+	40	+	2	-	1		2		3		5	-
Pioneer 25R32	77		58.8	+	122	+	37	+	3		3	+	1	-	3		3	-
Jamestown	77		59.1	+	113	-	35	-	4	+	1		0	-	2	-	10	+
VA10W-28	77		57.2	-	121	+	39	+	3		0	-	2		3		5	-
NC-Yadkin	76		58.1		119		37	+	4		0	-	0	-	2	-	7	
Progeny 125	76	-	55.9	-	112	-	34	-	2	-	3	+	2		3	+	9	+
SS 8350	75	-	57.0	-	122	+	35	-	1	-	0	-	5	+	3		5	-
Pioneer 26R12	73	-	58.6	+	120	+	38	+	2	-	1		2		2		5	-

Table 29. Two year average summary of performance of entries in the Virginia Tech Wheat Tests, 2012 and 2013 harvests, continued.

Line	Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)		Barley Yellow Dwarf Virus (0-9)		Early Height[1] (In)	
	(12)		(11)		(4)		(6)		(8)		(4)		(6)		(4)		(2)	
Pioneer 26R22	71	-	59.0	+	120	+	37	+	2	-	1		2		3		6	
SS 8302	70	-	58.8	+	120	+	38	+	3		4	+	4	+	4	+	7	
Massey	62	-	57.8		116	-	39	+	5	+	7	+	1	-	4	+	9	+
Average	78		58.0		118		36		3		1.5		1.6		2.9		6.7	
LSD (O.05)	3		0.3		1		1		1		0.6		0.5		0.6		0.9	
C.V.	10		1.3		1		4		43		49		51		28		13	

Released cultivars are shown in bold print. The number in parentheses below column headings indicates the number of location-years on which data are based. Varieties are ordered by descending yield averages. A plus or minus sign indicates a performance significantly above or below the test average.

The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

* Released line yet to be named.

[1]Early plant height, assessed in early spring when wheat begins to elongate, provides information related to photoperiod sensitivity.

Table 30. Three year average summary of performance of entries in the Virginia Tech Wheat Tests, 2011, 2012, and 2013 harvests.

Line	Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)		Barley Yellow Dwarf Virus (0-9)	
	(20)		(19)		(8)		(10)		(15)		(8)		(10)		(6)	
Featherstone VA 258	89	+	58.2	-	121	+	38	+	4	+	1		1		2	-
VA07W-415*	89	+	58.5		120		37	+	3	+	2		0	-	3	+
Pioneer 26R10	88	+	58.2	-	121	+	36		1	-	3	+	2	+	3	+
Shirley	88	+	57.6	-	121	+	35	-	2	-	0	-	0	-	2	
USG 3438	88	+	56.8	-	119		34	-	1	-	2		2	+	4	+
USG 3251	87	+	58.7		122	+	38	+	2		3	+	2		2	
SS 8340	87		59.5	+	120	+	36		2	-	2		3	+	2	
SS 8412	87		59.8	+	120		35	-	2	-	1	-	1	-	2	
Dyna-Gro 9171	87		56.9	-	119		34	-	2	-	2		2	+	4	+
USG 3555	87		58.0	-	118	-	33	-	3		4	+	1	-	1	-
Progeny 870	87		56.8	-	119		34	-	1	-	2		2	+	4	+
SS 520	87		57.5	-	117	-	37		4	+	2		1	-	4	+
USG 3120	86		59.2	+	115	-	37		3	+	1	-	1	-	2	-
Mercer Brand 12-V-251	86		58.1	-	119		34	-	4	+	0	-	1	-	2	-
VA09W-188WS*	86		56.3	-	117	-	39	+	4	+	2		1	-	1	-
Yorktown	86		59.5	+	119		36		3		0	-	0	-	2	-
SS 5205	86		58.9	+	119		33	-	3	+	1	-	1	-	2	-
VA09W-110	86		57.8	-	120	+	33	-	3		0	-	1		3	
Merl	85		59.8	+	119		36		2		3	+	0	-	3	
VA08MAS-369	85		60.1	+	120		35	-	2		2		1	-	3	
USG 3201	85		59.6	+	120	+	36		2	-	2		3	+	2	-
Pioneer 26R20	85		58.9	+	122	+	37	+	3		2		1	-	3	
VA09W-73*	85		59.4	+	122	+	36		3		1	-	1	-	2	-
Progeny 357	85		56.1	-	122	+	37	+	2		4	+	4	+	3	
VA10W-119	85		59.2	+	117	-	38	+	4	+	1	-	2		2	-
Progeny 117	84		58.2	-	116	-	38	+	4	+	3	+	3	+	2	
Progeny 185	84		58.4		120		38	+	2	-	4	+	3	+	2	
Jamestown	84		60.0	+	116	-	35	-	3		2		1	-	2	-

Table 30. Three year average summary of performance of entries in the Virginia Tech Wheat Tests, 2011, 2012, and 2013 harvests, continued.

Line	Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)		Barley Yellow Dwarf Virus (0-9)	
	(20)		(19)		(8)		(10)		(15)		(8)		(10)		(6)	
Pioneer 25R32	83		59.2	+	122	+	37		3		4	+	1	-	3	
VA09W-52	83		58.7		118	-	37		3	+	1	-	2		2	
Progeny 125	83		57.6	-	115	-	35	-	1	-	4	+	3	+	3	
NC-Cape Fear	83		59.4	+	117	-	35	-	4	+	1	-	0	-	2	
VA09W-75*	83		58.9	+	118	-	36	-	3		0	-	0	-	1	-
SS 8500	83		58.4		120	+	40	+	1	-	3	+	1		3	
Oakes	83		60.1	+	122	+	37	+	2		3		3	+	2	
SS 8404	81	-	60.0	+	120		34	-	2	-	1	-	3	+	2	-
NC-Yadkin	81	-	58.4		120		36		3	+	1	-	0	-	2	-
Pioneer 26R12	80	-	59.6	+	121	+	38	+	2	-	2		2	+	2	
Pioneer 26R22	79	-	58.7		120	+	37	+	2	-	3		3	+	3	
SS 8302	77	-	59.1	+	121	+	38	+	2	-	5	+	4	+	4	+
Massey	67	-	58.3	-	119		40	+	4	+	8	+	1	-	3	+
Average	84		58.7		119		36		3		2.1		1.7		2.3	
LSD (O.05)	3		0.3		1		1		1		0.6		0.4		0.5	
C.V.	9		1.5		1		4		51		56		55		34	

Released cultivars are shown in bold print. The number in parentheses below column headings indicates the number of location-years on which data are based. Varieties are ordered by descending yield averages. A plus or minus sign indicates a performance significantly above or below the test average.

The 0-9 ratings indicate a genotype's response to disease or lodging where 0 = highly resistant and 9 = highly susceptible.

* Released line yet to be named.

Table 31. Summary of performance of entries in the Virginia Tech Wheat Test planted No-Till at Warsaw, 2013 harvest.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		FHB Rating (%)[1]		White Heads (%)[2]		Glume Blotch (0-9)	
USG 3404					89	+	58.2		121	+	32		0		1		5		1	
USG 3013					89	+	58.6		121	+	36	+	0		1		4		1	
Steyer Hunker					88	+	57.9		121	+	35	+	0		2		4		1	
AgriMAXX 438					87	+	58.7		121	+	35	+	1		1		3	-	1	
VA10W-21			83		87	+	58.3		119		31		1		2		7		1	
VA10W-123			86	+	85	+	58.5		115	-	33		2	+	1		7		2	
Pioneer 26R10	97		82		83		58.1		121		31		0		2		4		1	
VA08MAS-369	101	+	85	+	83		59.7	+	118		32		1		2		18	+	1	
Mercer Brand 11-V-258					83		57.2		120		34	+	1		1		8		1	
Progeny 357	91		76		82		56.1	-	122	+	32		0		4	+	12		1	
SY 474					82		58.0		122	+	35	+	0		1		3	-	1	
USG 3251	96		83		82		58.6		122	+	34	+	0		1		12		1	
AgriMAXX 434					81		56.4	-	119		30	-	0		2		6		1	
Progeny PGX 12-10					81		55.7	-	118		33		0		1		8		3	+
SY Harrison			79		81		58.1		120		31		0		2		8		1	
AgriMAXX 413			83		81		56.8		118		30	-	0		1		8		1	
VA07W-415*	102	+	86	+	81		58.1		118		31		2	+	5	+	17	+	1	
AgriMAXX 427			79		81		57.0		119		33		1		1		5		1	
VA11W-31					80		59.2		118		33		0		3		17	+	1	
Mercer Brand 12-V-251	95		75		80		58.3		119		30	-	1		2		7		1	
USG 3438	98	+	83		80		57.0		118		29	-	0		0		7		1	
AgriMAXX 415			78		79		59.0		120		32		0		1		2	-	1	
SS 8340	98	+	80		79		58.2		120		33		0		1		3	-	2	
Pioneer XW11G					79		58.6		120		33		1		4		13	+	1	
USG 3523					78		58.3		122	+	33		0		0		3	-	1	
Dyna-Gro 9042			78		78		58.8		121	+	32		0		1		2	-	1	
Pioneer 26R12	90		77		78		56.8		119		35	+	0		2		12		1	
Progeny 117	93		79		78		56.9		115	-	34	+	2	+	0		4		1	
VA10W-96					78		59.1		116	-	34	+	1		1		10		1	
VA09W-52	97		80		78		58.5		116	-	33		1		2		7		1	

Table 31. Summary of performance of entries in the Virginia Tech Wheat Test planted No-Till at Warsaw, 2013 harvest, continued.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		FHB Rating (%)[1]		White Heads (%)[2]		Glume Blotch (0-9)	
VA11W-106					78		58.5		121	+	32		0		1		10		1	
VA10W-126					77		58.3		118	-	32		1		2		12		1	
Pioneer 26R53			79		77		58.0		119		29	-	0		2		5		1	
VA11W-165					77		58.0		119		31		1		2		13	+	1	
Dyna-Gro 9171	96		79		77		56.6	-	118		30	-	0		1		8		1	
Featherstone VA 258	101	+	80		77		57.3		121	+	33		0		1		8		1	
USG 3555	93		75		77		58.0		116	-	28	-	0		5	+	7		1	
VA09W-75*	94		77		76		58.4		115	-	31		1		1		4		1	
VA11W-230					76		59.9	+	117	-	30	-	0		4	+	15	+	1	
SS 8412	94		81		76		59.0		117	-	31		0		3		10		1	
VA11W-278					76		58.6		115	-	31		1		3		7		1	
VA09W-73*	93		76		75		59.2		122	+	33		1		1		4		1	
MD04W249-11-7					75		58.9		120		33		0		2		5		1	
GA-031134-10E29					75		57.0		119		31		1		3		20	+	2	+
Shirley	94		80		75		56.2	-	121	+	31		0		1		10		1	
Pioneer 25R40					75		58.4		123	+	31		0		1		5		1	
VA10W-42					75		58.4		116	-	34	+	1		2		12		2	
ARS08-0047					75		56.2	-	116	-	31		3	+	5	+	18	+	1	
NC08-140					75		58.5		119		33		2	+	2		8		1	
Dyna-Gro 9223			78		75		56.8		122	+	34	+	0		1		2	-	1	
SY 483					75		56.5	-	124	+	34	+	1		0		1	-	1	
VA10W-119	95		80		75		59.6	+	116	-	32		1		2		7		1	
Progeny 308			74		74		59.3	+	120		32		0		3		15	+	2	
Mercer Brand 12-W-270					74		59.5	+	119		35	+	1		0		1	-	1	
VA09W-188WS*	97		80		74		54.0	-	116	-	34	+	1		4		23	+	2	+
NC09-22402					74		58.2		118		32		1		2		12		3	+
AgriMAXX Exp 1342					74		57.5		121	+	32		0		1		3	-	2	
VA11W-323WS					74		56.2	-	120		32		0		2		17	+	1	
VA09W-110	97		84		74		57.6		119		28	-	0		1		8		1	
VA11W-108					74		58.5		119		32		0		2		12		2	+
Progeny 185	89	-	78		73		58.0		121		34	+	1		1		5		1	

Table 31. Summary of performance of entries in the Virginia Tech Wheat Test planted No-Till at Warsaw, 2013 harvest, continued.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		FHB Rating (%)[1]		White Heads (%)[2]		Glume Blotch (0-9)	
VA08W-672					73		57.6		118		31		1		4		23	+	3	+
SS 5205	91		76		73		57.8		118		27	-	1		1		4		4	+
USG 3993					73		58.6		120		35	+	1		1		2	-	1	
VA11W-301					73		56.9		121		30	-	0		1		12		1	
Pioneer 26R20	97		80		73		58.0		121	+	34	+	1		1		12		1	
NC-Cape Fear	92		77		72		59.3	+	116	-	31		2	+	4		7		1	
Steyer Heilman					72		58.4		121	+	38	+	1		1		3	-	1	
Pioneer 25R32	91		75		71		59.0		124	+	34	+	0		0		0	-	1	
VA10W-140			75		71		59.5	+	119		33		1		1		5		1	
Yorktown	97	+	80		71		58.6		118		31		1		1		5		1	
Progeny 870	94		72		71		56.5	-	118		29	-	0		0		7		1	
Progeny 125	87	-	72		71		56.4	-	114	-	28	-	0		2		7		4	+
SS 520	97		76		70		56.7	-	116	-	33		1		2		4		1	
VA10W-669					70		56.4	-	118	-	30	-	1		3		7		1	
SS 8700					70		57.0		125	+	33		0		0		1	-	1	
USG 3120	96		81		70		58.6		116	-	32		0		3		10		1	
SS 8302	86	-	72		70		59.3	+	121	+	32		0		2		7		2	+
Steyer Pierson					69		58.2		122	+	35	+	1		0		1	-	1	
Pioneer 26R41			77		69		57.4		121		29	-	0		2		10		2	
Mercer Brand 12-W-296					69		57.4		121	+	37	+	1		0		4		1	
USG 3201	94		74		68		58.3		121	+	31		0		0		3	-	2	
VA11W-196					68		57.2		123	+	28	-	0		0		10		1	
Dyna-Gro 9343					68		58.4		121	+	34	+	1		0		1	-	1	
SS 8404	87	-	76		68		58.3		119		29	-	0		5	+	12		1	
SS 8350			72		68		57.4		122	+	31		0		1		3	-	1	
Jamestown	91		75		67		59.3	+	114	-	31		1		1		10		1	
VA11W-195					67		58.7		117	-	27	-	0		1		7		1	
VA10W-28			72		66		56.5	-	122	+	34	+	0		0		5		2	
NC-Yadkin	89	-	70	-	66		58.0		119		31		1		2		5		2	+
SS 8500	87	-	70	-	66	-	57.6		123	+	35	+	0		1		6		1	

Table 31. Summary of performance of entries in the Virginia Tech Wheat Test planted No-Till at Warsaw, 2013 harvest, continued.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		FHB Rating (%)[1]		White Heads (%)[2]		Glume Blotch (0-9)	
Merl	93		74		66	-	57.9		121		29	-	0		1		7		1	
NC08-21273					65	-	58.8		119		32		1		4		18	+	1	
Oakes	85	-	72		65	-	59.5	+	122	+	32		1		1		3	-	2	+
Pioneer 26R22	89		69	-	65	-	58.3		121		32		0		3		10		1	
Massey	73	-	63	-	64	-	58.6		118		36	+	2	+	0		4		1	
GA-04570-10E46					64	-	58.3		118		32		0		4		20	+	1	
VA10W-112					64	-	58.9		116	-	31		0		4		17	+	1	
VA10W-118					61	-	58.8		116	-	31		0		4		15	+	2	+
GA-031257-10LE34					61	-	58.4		118		30	-	0		9	+	22	+	1	
Average	96		80		75		58.0		119		32		0.5		1.7		8.2		1.3	
LSD (O.05)	4		6		9		1.3		2		2		0.9		2.0		5.1		0.6	
C.V.	6		7		7		1.4		1		3		102		73		38		28	

Released cultivars are shown in bold print. Varieties are ordered by descending yield averages. A plus or minus sign indicates a performance significantly above or below the test average. The 0-9 ratings indicate a genotype's response to disease or lodging, where 0 = highly resistant and 9 = highly susceptible.

* Released line yet to be named.

[1]Rating takes into account FHB incidence and severity on May 23.

[2]White heads: While % of visible white heads on May 30 are predominantly due to scab, some lines also had white heads due to freeze injury or saw fly.

Table 32. Summary of performance of fungicide-treated entries in the Virginia Tech Wheat Test planted No-Till at Warsaw, 2013 harvest.

Line	2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)	FHB Rating (%)[1]	White Heads (%)[2]		Glume Blotch (0-9)	
VA07W-415*	91	+	86	+	58.2		119		32		1	2	8	+	1	
USG 3013			86	+	58.6		122	+	34	+	0	1	2		1	
AgriMAXX 438			85	+	58.0		121		34	+	0	1	4		1	
AgriMAXX 434			83	+	57.3		120		29	-	0	1	2		1	
AgriMAXX 413	78		82	+	57.7		119		28	-	0	1	3		1	
Steyer Hunker			81	+	57.7		121		33	+	0	1	2		1	
Progeny 357	79		81		56.4	-	124	+	32		0	1	7		1	
SS 520	83		81		55.9	-	116	-	32		1	1	3		1	
VA10W-123	82		81		58.5		117	-	32		0	1	4		2	+
VA10W-126			81		58.5		119		31		0	1	7		1	
Dyna-Gro 9171	85	+	80		57.3		118	-	28	-	0	1	4		1	
Merl	80		80		59.0		120		31		0	2	7		1	
Pioneer 26R10	82		79		58.2		122	+	31		0	1	2		1	
USG 3251	79		79		58.2		124	+	33	+	0	1	4		1	
Mercer Brand 12-V-251	83		79		57.9		120		30		1	1	3		1	
SS 8412	80		79		58.8		119		31		0	1	4		1	
Progeny PGX 12-10			79		56.0	-	120		31		0	1	5		3	+
VA09W-73*	80		79		58.9		123	+	32		1	1	2		1	
USG 3120	82		78		61.0	+	115	-	32		1	1	5		1	
VA11W-323WS			78		57.1		121		32		0	2	10	+	1	
AgriMAXX 415	78		78		59.2		120		32		0	0	2		1	
Mercer Brand 11-V-258			78		57.6		122	+	33	+	1	1	7		1	
Featherstone VA 258	77		78		58.1		121		33	+	1	1	6		1	
USG 3523			78		57.7		122	+	31		0	0	1		1	
Pioneer XW11G			78		58.2		121		31		0	1	7		1	
AgriMAXX 427	80		78		57.3		119		31		0	1	3		1	
Dyna-Gro 9223	81		78		57.4		122	+	33	+	0	1	2		1	
VA09W-110	78		77		58.1		120		27	-	0	1	2		1	
VA11W-165			77		58.4		119		29	-	1	1	4		1	

Table 32. Summary of performance of fungicide-treated entries in the Virginia Tech Wheat Test planted No-Till at Warsaw, 2013 harvest, continued.

Line	2-year Average Yield (Bu/a)	Yield (Bu/a)	Test Weight (Lb/bu)	Date Headed (Julian)	Height (In)	Lodging (0-9)	FHB Rating (%)[1]	White Heads (%)[2]	Glume Blotch (0-9)
Jamestown	81	77	59.9 +	114 -	29 -	0	1	3	1
Dyna-Gro 9042	76	77	58.8	122 +	31	0	1	1 -	1
VA11W-31		77	60.0 +	119	32	0	2	10 +	1
Steyer Pierson		77	58.8	121	34 +	1	1	0 -	1
Pioneer 25R40		76	58.8	124 +	30	0	1	7	1
VA10W-119	83	76	59.3	117 -	31	1	1	4	1
USG 3438	80	76	56.6 -	120	28 -	0	0	2	1
SY 474		76	58.7	123 +	33 +	0	1	1	1
VA10W-21	76	76	59.1	121	30	0	1	2	1
MD04W249-11-7		75	59.6 +	119	32	0	1	4	1
USG 3404		75	57.7	123 +	30	0	1	2	1
VA11W-106		75	58.5	121	31	0	1	7	1
ARS08-0047		75	57.2	118 -	29 -	1	2	7	1
Mercer Brand 12-W-270		75	58.6	122 +	35 +	1	0	1 -	1
VA10W-42		75	58.6	117 -	33 +	0	1	5	1
SY 483		75	56.2 -	124 +	34 +	0	0	1 -	1
SY Harrison	75	75	56.8 -	121	29 -	0	1	6	1
Shirley	78	75	56.7 -	122 +	30	0	1	5	1
SS 8302	73	75	59.6 +	121	32	0	1	4	2
VA10W-669		75	57.5	118 -	29 -	0	2	4	1
Progeny 117	84	75	57.6	116 -	33 +	1	1	3	1
VA08W-672		75	58.8	118 -	29 -	0	2 +	15 +	2
VA10W-96		75	60.0 +	117 -	32	0	1	4	1
GA-04570-10E46		75	59.3	118 -	33 +	0	1	8 +	1
VA10W-140	75	75	59.2	120	32	0	1	5	1
NC08-140		75	58.2	119	32	1	1	5	1
Pioneer 26R20	80	75	58.9	122 +	33 +	0	1	10 +	1
USG 3993		74	58.2	121	34 +	1	0	1 -	1
VA10W-28	74	74	57.7	121	34 +	0	1	4	3 +
USG 3201	75	74	59.2	121	31	0	0	1 -	1

Table 32. Summary of performance of fungicide-treated entries in the Virginia Tech Wheat Test planted No-Till at Warsaw, 2013 harvest, continued.

Line	2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		FHB Rating (%)[1]		White Heads (%)[2]		Glume Blotch (0-9)	
SS 5205	76		74		59.2		119		27	-	1		1		2		4	+
VA09W-52	79		74		58.7		117	-	32		0		1		3		1	
Pioneer 26R41	82		74		57.6		122	+	28	-	0		1		7		1	
VA11W-301			74		57.2		122	+	29	-	0		0		4		1	
VA09W-188WS*	79		74		54.5	-	117	-	33	+	1		2	+	10	+	2	+
Pioneer 26R53	75		74		58.3		122	+	29	-	0		1		5		1	
Pioneer 26R12	73		74		57.4		120		33	+	0		1		7		1	
VA09W-75*	78		74		58.6		118	-	31		0		1		2		1	
VA11W-278			73		58.9		116	-	29	-	0		1		5		2	
NC09-22402			73		58.7		120		30		0		1		7		3	+
VA11W-230			73		60.3	+	117	-	29	-	0		2	+	5		2	
GA-031134-10E29			73		57.9		120		30		0		1		10	+	1	
VA11W-195			73		57.9		118	-	27	-	0		1		5		1	
Progeny 870	75		73		57.0	-	119		28	-	0		0		3		1	
Dyna-Gro 9343			72		59.0		122	+	33	+	1		0		1	-	1	
SS 8700			72		57.8		126	+	32		0		0		3		1	
Progeny 308	75		72		59.3		120		31		0		2		6		1	
Yorktown	78		72		58.7		118	-	30		0		1		1		1	
AgriMAXX Exp 1342			72		58.2		123	+	30		0		0		1		1	
Progeny 185	71		72		58.0		120		33	+	1		0		5		1	
NC-Cape Fear	77		72		59.7	+	116	-	31		1		2		6		2	
VA10W-118			72		59.3		115	-	31		0		2	+	6		2	
Progeny 125	74		72		57.3		115	-	27	-	0		0		2		3	+
Oakes	69	-	71		59.5		122	+	32		0		1		3		3	+
VA08MAS-369	76		71		59.9	+	119		31		0		1		4		1	
VA11W-108			71		57.5		118	-	31		0		2		7		2	+
VA11W-196			71		57.6		122	+	26	-	0		1		7		1	
SS 8350	77		71		56.8	-	124	+	30		0		1		3		1	
SS 8404	77		71		60.0	+	119		27	-	0		1		3		1	
VA10W-112			70		59.8	+	116	-	30		0		1		7		2	+

Table 32. Summary of performance of fungicide-treated entries in the Virginia Tech Wheat Test planted No-Till at Warsaw, 2013 harvest, continued.

Line	2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)	FHB Rating (%)[1]		White Heads (%)[2]		Glume Blotch (0-9)	
USG 3555	78		70		58.1		118	-	27	-	0	2		3		1	
SS 8340	70	-	70		59.3		122	+	31		0	1		1	-	1	
SS 8500	69	-	69		58.6		123	+	34	+	0	0		4		1	
Pioneer 25R32	74		69		58.8		123	+	32		0	0		0	-	2	
Steyer Heilman			69		58.0		123	+	36	+	1	0		2		1	
NC-Yadkin	73		68	-	58.2		120		32		0	1		4		2	+
Massey	71		66	-	59.6	+	119		35	+	1	0		2		1	
GA-031257-10LE34			66	-	59.3		118	-	29	-	0	3	+	10	+	1	
Mercer Brand 12-W-296			65	-	57.0	-	122	+	36	+	0	1		3		1	
NC08-21273			65	-	59.4		120		29	-	0	0		4		1	
Pioneer 26R22	68	-	64	-	60.2	+	121		30		0	1		7		2	
Average	80		75		58.3		120		31		0.3	0.9		4.3		1.3	
LSD (O.05)	7		6		1.2		1		1		0.5	0.9		3.4		0.6	
C.V.	8		5		1.3		1		3		114	64		50		28	

Released cultivars are shown in bold print. Varieties are ordered by descending yield averages. A plus or minus sign indicates a performance significantly above or below the test average. The 0-9 ratings indicate a genotype's response to disease or lodging, where 0 = highly resistant and 9 = highly susceptible.

* Released line yet to be named.

[1]Rating takes into account FHB incidence and severity on May 23.

[2]White heads: While % of visible white heads on May 30 are predominantly due to scab, some lines also had white heads due to freeze injury or saw fly.

Table 33. Summary of performance of entries in the Virginia Tech Wheat Test, Eastern Shore AREC, Painter, VA, 2013 harvest.

Line	Yield (Bu/a)		Test Weight (Lb/bu)		Leaf Rust (0-9)		Powdery Mildew (0-9)	
VA10W-21	94	+	58.5	+	0		1	
Progeny 117	88	+	57.3		0		2	+
VA10W-140	88	+	59.1	+	0		1	
VA07W-415*	87	+	57.1	-	0		0	-
VA11W-301	86		57.8		0		0	-
VA11W-230	85		59.4	+	0		0	-
VA11W-31	85		58.1		0		0	-
USG 3120	85		58.2		0		1	
VA10W-96	85		58.2		0		1	
Pioneer 25R40	83		58.4	+	0		1	
AgriMAXX 434	83		56.1	-	0		2	+
Steyer Pierson	83		58.1		0		1	
NC08-140	83		58.6	+	0		1	
VA10W-126	82		57.9		0		2	+
Pioneer 26R41	82		57.1	-	0		1	
USG 3612	82		55.4	-	0		1	
VA10W-669	82		56.1	-	0		1	
Yorktown	82		58.1		0		0	-
SS 8412	82		58.5	+	0		1	
Pioneer 26R22	81		58.9	+	0		2	
VA11W-165	81		57.2		0		1	
VA09W-110	81		57.2		0		1	
Dyna-Gro 9343	81		58.2		0		1	
NC-Cape Fear	81		59.0	+	0		0	-
SY 474	81		58.5	+	0		1	
Progeny PGX 12-10	81		54.9	-	0		1	
VA11W-106	81		58.4	+	0		1	
Mercer Brand 12-V-251	80		57.0	-	0		1	
SS 5205	80		58.0		0		1	
Dyna-Gro 9223	80		56.4	-	0		4	+
Featherstone VA 258	80		57.3		0		2	
MD04W249-11-7	80		58.3		0		0	-
VA10W-123	80		57.9		0		0	-
SS 8700	80		56.4	-	0		0	-
Mercer Brand 11-V-258	80		57.6		0		1	
ARS08-0047	80		56.2	-	0		1	
VA09W-52	80		57.2		0		2	
VA10W-118	80		58.8	+	0		0	-
Oakes	79		60.1	+	0		1	
VA11W-278	79		58.7	+	0		0	-
VA11W-108	79		57.7		0		0	-
AgriMAXX 438	79		57.3		0		4	+
AgriMAXX 415	79		58.9	+	0		3	+

Table 33. Summary of performance of entries in the Virginia Tech Wheat Test, Eastern Shore AREC, Painter, VA, 2013 harvest, continued.

Line	Yield (Bu/a)		Test Weight (Lb/bu)		Leaf Rust (0-9)		Powdery Mildew (0-9)	
Pioneer 26R12	79		56.2	-	0		3	+
USG 3993	79		58.5	+	0		1	
USG 3201	79		58.5	+	0		2	+
Pioneer 26R20	79		58.8	+	0		1	
VA10W-119	79		58.1		0		1	
Steyer Hunker	79		57.0	-	0		4	+
VA09W-73*	78		59.2	+	0		1	
Dyna-Gro 9171	78		56.8	-	0		3	+
VA11W-195	78		57.8		0		1	
USG 3013	78		57.1	-	0		3	+
USG 3404	78		57.6		0		3	+
VA11W-323WS	78		57.8		0		0	-
SS 8404	78		59.3	+	0		2	
Shirley	78		57.8		0		0	-
Jamestown	77		58.8	+	0		0	-
USG 3555	77		57.3		0		0	-
Progeny 125	77		55.2	-	0		2	+
GA-031134-10E29	77		57.1	-	0		1	
Mercer Brand 12-W-270	77		58.4	+	0		1	
Pioneer XW11G	76		58.4	+	0		3	+
Pioneer 26R10	76		58.2		0		2	+
NC09-22402	76		58.3		0		1	
VA11W-196	76		57.6		0		0	-
VA08MAS-369	76		59.0	+	0		0	-
SS 520	75		55.8	-	0		0	-
Progeny 185	75		58.4	+	0		2	+
SS 8500	75		58.2		0		1	
VA10W-42	75		57.2		0		2	
SY Harrison	75		56.9	-	0		3	+
VA09W-188WS*	75		54.3	-	0		0	-
VA10W-28	75		57.5		0		1	
VA09W-75*	75		57.9		0		0	-
USG 3251	75		58.7	+	0		1	
USG 3523	74		57.8		0		3	+
SY 483	74		56.1	-	0		1	
GA-04570-10E46	74		59.1	+	0		1	
AgriMAXX Exp 1342	74		57.8		0		1	
VA10W-112	74		58.7	+	0		0	-
NC-Yadkin	74		58.1		0		0	-
AgriMAXX 427	73		56.7	-	0		1	
SS 8302	73		58.7	+	0		3	+
SS 8350	73		57.1	-	0		4	+

Table 33. Summary of performance of entries in the Virginia Tech Wheat Test, Eastern Shore AREC, Painter, VA, 2013 harvest, continued.

Line	Yield (Bu/a)		Test Weight (Lb/bu)		Leaf Rust (0-9)		Powdery Mildew (0-9)	
Dyna-Gro 9042	73		56.5	-	0		2	+
Steyer Heilman	73		57.7		0		1	
GA-031257-10LE34	72		59.4	+	0		1	
Progeny 870	72		56.9	-	0		2	+
USG 3438	72		57.0	-	0		2	+
Progeny 308	72		58.7	+	0		1	
AgriMAXX 413	72		57.1	-	0		2	
SS 8340	72		59.2	+	0		4	+
Merl	71		59.3	+	0		0	-
Mercer Brand 12-W-296	69		57.3		0		1	
NC08-21273	69		59.4	+	0		1	
VA08W-672	69	-	57.1	-	0		0	-
Progeny 357	68	-	55.3	-	0		4	+
Pioneer 25R32	66	-	57.5		0		1	
Pioneer 26R53	61	-	59.0	+	0		3	+
Massey	61	-	58.1		4	+	1	
Average	78		57.7		0.0		1.2	
LSD (O.05)	9		0.6		0.1		0.7	
C.V.	8		0.7		287		45	

Released cultivars are shown in bold print. Varieties are ordered by descending yield averages. A plus or minus sign indicates a performance significantly above or below the test average. The 0-9 ratings indicate a genotype's response to disease or lodging, where 0 = highly resistant and 9 = highly susceptible.

* Released line yet to be named.

Table 34. Summary of performance of entries in the Virginia Tech Wheat Test, Southern Piedmont AREC, Blackstone, VA, 2013 harvest.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Lodging (0-9)		Barley Yellow Dwarf Virus (0-9)	
USG 3523					82	+	52.9		4		3	
VA07W-415*	79		71		81	+	52.1		4		3	
USG 3404					80	+	46.5	-	4		1	-
Featherstone VA 258	86	+	80		79		52.6		5		1	-
SY Harrison			79		79		51.8		3		3	
USG 3612			81	+	78		51.6		4		2	
Progeny 357	79		74		77		48.6		3		3	
VA09W-73*	79		70		77		54.1		3		2	
USG 3013					77		53.5		4		3	
AgriMAXX 434					77		51.7		3		1	-
VA10W-21			77		76		50.4		3		2	
Pioneer 26R41			76		76		50.8		3		2	
AgriMAXX 438					75		52.8		4		2	
AgriMAXX Exp 1342					75		53.5		4		3	
Pioneer 25R40					75		53.3		3		2	
VA10W-118					74		53.6		5		2	
AgriMAXX 415			74		74		53.5		3		3	
VA10W-96					74		53.2		4		2	
Oakes	80		74		74		56.3	+	3		3	
USG 3438	82		76		74		51.1		3		3	
Shirley	84		77		73		52.8		3		2	
USG 3251	81		76		73		52.8		4		3	
SY 474					73		54.6		2		3	
Mercer Brand 12-W-296					73		53.3		4		3	
VA11W-301					73		53.3		4		3	
VA11W-108					73		51.0		2		2	
SS 5205	85	+	79		73		50.4		4		2	
USG 3201	79		73		72		54.2		2		2	
VA11W-165					72		46.6	-	3		3	
VA11W-31					72		53.4		3		2	
VA11W-196					72		51.6		4		2	
SS 8340	81		72		71		54.0		3		2	
Steyer Pierson					71		52.2		5		2	
Pioneer 26R12	76		70		71		52.1		3		2	
SS 520	80		74		71		47.8	-	5		4	+
VA11W-106					71		52.2		4		3	
NC-Yadkin	78		74		71		52.4		5		1	-
NC-Cape Fear	82		77		71		51.3		5		2	
Progeny PGX 12-10					71		48.3	-	3		2	
SS 8404	78		71		70		52.1		3		2	
SS 8500	78		71		70		52.0		3		3	
USG 3993					70		52.2		4		3	

Table 34. Summary of performance of entries in the Virginia Tech Wheat Test, Southern Piedmont AREC, Blackstone, VA, 2013 harvest, continued.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Lodging (0-9)		Barley Yellow Dwarf Virus (0-9)	
VA10W-119	81		77		69		51.5		5	+	1	-
VA11W-195					69		51.3		5		2	
VA10W-140			71		69		52.8		4		4	+
Progeny 308			74		69		52.7		3		2	
Pioneer 26R22	74		71		69		53.0		3		2	
VA09W-52	79		75		69		52.9		3		3	
Progeny 117	78		74		68		48.7		5		2	
Dyna-Gro 9223			70		68		52.6		4		3	
VA11W-230					68		48.1	-	5		1	-
Pioneer 26R20	75		68		68		52.6		5	+	2	
Mercer Brand 11-V-258					67		53.1		4		1	-
USG 3555	82		75		67		51.4		4		1	-
VA09W-110	85	+	77		67		49.6		4		3	
Merl	81		73		67		54.7		3		4	+
Pioneer 25R32	75		67		67		53.4		4		3	
GA-031257-10LE34					67		53.4		3		1	-
SS 8412	81		71		67		54.5		3		3	
NC09-22402					67		49.9		4		4	+
AgriMAXX 413			74		67		50.5		3		4	+
Pioneer 26R53			72		67		53.5		2		2	
SY 483					67		51.3		4		4	+
VA11W-323WS					67		46.8	-	4		3	
Steyer Heilman					67		53.2		3		3	
AgriMAXX 427			72		66		51.1		3		3	
VA10W-42					66		51.9		2		2	
Dyna-Gro 9343					66		50.9		5		3	
NC08-140					66		50.7		7	+	1	-
Jamestown	79		72		66		52.3		2	-	1	-
Steyer Hunker					66		52.9		4		3	
VA10W-123			79		66		50.2		5	+	2	
Progeny 185	78		73		66		52.7		3		3	
Dyna-Gro 9042			70		65		51.2		2		4	+
Yorktown	79		68		65		53.1		3		2	
VA08MAS-369	79		68		65		54.5		2		3	
Pioneer XW11G					65		53.7		5	+	3	
Progeny 870	78		68		64		51.0		2	-	5	+
VA11W-278					64		51.8		3		2	
ARS08-0047					64		49.4		5		2	
SS 8700					63		52.1		4		3	
Mercer Brand 12-W-270					63		51.6		5		3	
Progeny 125	79		73		63		46.8	-	3		4	+
Dyna-Gro 9171	77		69		63		51.0		3		4	+
Pioneer 26R10	75		67		63		53.3		2	-	4	+
NC08-21273					63		53.5		4		3	

Table 34. Summary of performance of entries in the Virginia Tech Wheat Test, Southern Piedmont AREC, Blackstone, VA, 2013 harvest, continued.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Lodging (0-9)		Barley Yellow Dwarf Virus (0-9)	
USG 3120	84		76		63		50.0		6	+	1	-
Massey	69	-	63	-	63		51.3		4		3	
VA10W-126					63		49.0		4		3	
SS 8350			68		62		51.4		3		3	
VA09W-75*	77		69		62		50.8		3		1	-
VA10W-112					62		54.5		5		2	
MD04W249-11-7					61		53.3		5		3	
GA-031134-10E29					61		49.2		5		2	
VA10W-28			69		61		50.6		3		3	
GA-04570-10E46					61		49.9		3		1	-
VA10W-669					61		49.6		4		2	
VA09W-188WS*	78		71		59		42.0	-	5	+	1	-
VA08W-672					59		52.8		4		3	
Mercer Brand 12-V-251	77		67		57	-	49.3		6	+	2	
SS 8302	70	-	62	-	55	-	50.2		2	-	4	+
Average	80		74		69		51.6		3.6		2.4	
LSD (O.05)	6		8		11		3.2		1.5		0.9	
C.V.	9		11		12		4.3		30.7		28.1	

Released cultivars are shown in bold print. Varieties are ordered by descending yield averages. A plus or minus sign indicates a performance significantly above or below the test average. The 0-9 ratings indicate a genotype's response to disease or lodging, where 0 = highly resistant and 9 = highly susceptible.

* Released line yet to be named.

Table 35. Summary of performance of entries in the Virginia Tech Wheat Test, Northern Piedmont Center, Orange, VA, 2013 harvest.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Height (In)	
VA10W-21			96	+	109	+	61.1	+	38	
Steyer Hunker					107	+	59.4		41	+
USG 3013					107	+	58.7		41	+
USG 3523					106	+	58.9		39	
Progeny 357	97	+	94	+	106	+	57.2	-	39	
NC08-140					105	+	58.8		40	
Pioneer 26R10	100	+	91		103	+	59.2		38	
USG 3404					102		58.5		39	
VA11W-108					101		59.6		40	
USG 3251	94		91		100		59.1		41	+
VA09W-188WS*	95		92	+	100		58.2	-	41	
Dyna-Gro 9223			91		100		58.7		40	
Featherstone VA 258	94		92	+	100		58.8		40	
ARS08-0047					99		58.3	-	39	
Dyna-Gro 9171	98	+	89		99		56.5	-	36	-
Progeny PGX 12-10					99		58.0	-	40	
Progeny 185	95		91		99		59.4		42	+
Steyer Pierson					98		59.9		39	
SY Harrison			91		98		58.0	-	38	
Mercer Brand 11-V-258					98		58.4		42	+
SS 8700					98		59.7		40	
VA10W-42					98		59.8		42	+
VA11W-31					98		60.4	+	39	
Pioneer 25R40					98		60.3	+	37	-
USG 3612			90		98		57.9	-	40	
VA10W-140			87		97		61.5	+	40	
Oakes	94		88		97		60.3	+	40	
Pioneer 26R41			90		97		59.1		37	-
AgriMAXX 434					97		57.5	-	36	-
NC08-21273					97		60.5	+	38	
SY 474					97		59.6		41	+
SS 8340	93		88		97		60.7	+	39	
Yorktown	86		86		97		59.6		38	
VA11W-165					96		59.3		36	-
USG 3201	92		85		96		60.3	+	38	
AgriMAXX 413			86		95		55.9	-	36	-
VA09W-73*	88		88		95		60.5	+	39	
VA10W-126					95		59.9		40	
VA08W-672					95		59.5		38	
VA11W-106					95		59.9		38	
Dyna-Gro 9042			84		95		59.5		38	
VA11W-196					95		58.6		33	-

Table 35. Summary of performance of entries in the Virginia Tech Wheat Test, Northern Piedmont Center, Orange, VA, 2013 harvest, continued.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Height (In)	
VA11W-230					95		61.7	+	37	
SS 5205	93		89		95		59.6		36	-
VA09W-52	82	-	84		94		60.1		39	
Mercer Brand 12-W-270					94		59.5		40	
USG 3555	96		91		94		59.9		36	-
Pioneer XW11G					94		59.0		38	
VA10W-669					94		58.6		37	-
VA10W-96					94		60.4	+	40	
Progeny 870	94		86		93		56.7	-	35	-
VA10W-123			88		93		59.0		39	
USG 3438	93		87		93		57.3	-	36	-
AgriMAXX Exp 1342					93		59.1		38	
VA11W-301					93		58.7		37	
SS 8350			87		93		57.7	-	38	
AgriMAXX 427			87		93		58.6		40	
VA10W-28			84		92		57.5	-	42	+
NC-Cape Fear	89		82		92		60.4	+	39	
USG 3120	91		87		92		58.9		41	+
GA-031134-10E29					92		58.9		37	-
Pioneer 26R12	83		78	-	92		59.1		41	
AgriMAXX 415			85		92		60.0		37	
USG 3993					92		59.7		40	
Mercer Brand 12-V-251	92		85		92		58.6		36	-
AgriMAXX 438					92		57.9	-	42	+
Progeny 308			88		91		59.8		39	
Steyer Heilman					91		59.1		45	+
VA11W-195					91		59.0		37	-
Pioneer 26R53			87		91		59.6		37	-
SS 520	92		82		91		57.9	-	38	
Progeny 117	87		87		91		58.8		39	
Merl	93		87		90		60.5	+	38	
SS 8412	89		81		90		61.2	+	38	
Pioneer 26R20	91		88		90		59.0		40	
VA10W-118					90		59.9		40	
Progeny 125	87		70	-	89		56.4	-	36	-
Dyna-Gro 9343					89		59.7		40	
Shirley	91		85		89		58.9		38	
VA09W-75*	90		86		89		60.2	+	38	
VA10W-112					88		60.3	+	40	
GA-031257-10LE34					88		60.7	+	38	
SS 8500	88		81		88		58.3	-	43	+
VA11W-278					88		60.2		37	-

Table 35. Summary of performance of entries in the Virginia Tech Wheat Test, Northern Piedmont Center, Orange, VA, 2013 harvest, continued.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Height (In)	
GA-04570-10E46					88		60.7	+	40	
VA11W-323WS					88		58.6		39	
Pioneer 25R32	91		82		87		59.8		39	
NC09-22402					86		59.6		39	
MD04W249-11-7					86		60.7	+	41	
Mercer Brand 12-W-296					86		58.4		46	+
VA09W-110	86		82		86		58.9		36	-
Jamestown	93		84		86		60.7	+	38	
SS 8302	80	-	75	-	85		60.5	+	41	+
VA08MAS-369	87		80		85		61.2	+	39	
VA07W-415*	98	+	79		84		59.2		39	
NC-Yadkin	84		81		84	-	59.0		41	
SS 8404	87		86		83	-	60.1		36	-
VA10W-119	83	-	76	-	82	-	59.7		41	+
SY 483					78	-	58.0	-	41	+
Massey	71	-	68	-	74	-	59.2		42	+
Pioneer 26R22	81	-	69	-	73	-	60.6	+	39	
Average	94		89		93		59.3		39	
LSD (O.05)	7		7		9		0.9		2	
C.V.	10		8		7		1.1		3	

Released cultivars are shown in bold print. Varieties are ordered by descending yield averages. A plus or minus sign indicates a performance significantly above or below the test average. The 0-9 ratings indicate a genotype's response to disease or lodging, where 0 = highly resistant and 9 = highly susceptible.

* Released line yet to be named.

Table 36. Summary of performance of entries in the Virginia Tech Wheat Test, Kentland farm, Blacksburg, VA, 2013 harvest.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)		Early Lodging[1] (0-9)	
Pioneer 26R10	88	+	85		106	+	53.9		132		41		3	-	6	+	2		0	
Pioneer 25R40					106	+	55.5	+	132		39	-	3	-	6	+	0	-	0	
USG 3438	91	+	89	+	104	+	51.6	-	131		38	-	4		2		3		0	
SY 474					102	+	55.3	+	133	+	43	+	7		5	+	2		1	
VA11W-108					101	+	53.5		131		42		4	-	1	-	1		0	
SS 8340	86		84		100	+	54.8	+	132		40		4		3		1		0	
Progeny 308			83		99	+	54.4		133		40		4	-	6	+	1		0	
Steyer Heilman					98		54.1		132		46	+	7		7	+	2		2	
AgriMAXX 415			81		97		55.2	+	131		41		6		3		3		1	
Pioneer 26R41			85	+	97		52.9		133	+	39	-	4	-	1	-	2		0	
Progeny PGX 12-10					97		52.4		131		42		7		7	+	1		1	
VA11W-165					96		52.5		132		41		4		0	-	2		1	
Mercer Brand 12-W-296					95		54.7	+	131		48	+	4		7	+	2		0	
Progeny 185	85		84		95		54.7	+	132		44	+	3	-	4		4	+	0	
VA11W-301					95		51.5	-	132		40		5		0	-	0	-	2	
Progeny 125	88	+	84		94		53.2		127	-	40		4		6	+	2		0	
USG 3404					94		52.5		133	+	42		6		5	+	4	+	0	
VA10W-118					93		55.7	+	130	-	41		7		0	-	1		2	
Pioneer 26R53			81		93		54.5		133	+	38	-	3	-	3		2		1	
VA11W-31					92		54.4		131		41		4		0	-	0	-	1	
Dyna-Gro 9042			82		91		53.1		132		42		4		9	+	3		0	
Progeny 870	87		81		91		50.1	-	131		39	-	3	-	3		3		1	
SY Harrison			75		91		51.4	-	131		41		4		5	+	4	+	0	
AgriMAXX 434					90		51.7		132		39	-	4	-	7	+	2		0	
Pioneer 26R22	72	-	66	-	90		55.0	+	132		43	+	5		2		3		1	
AgriMAXX 413			79		89		50.8	-	131		39	-	5		3		2		1	
SS 8500	87		83		89		54.1		133	+	45	+	5		3		3		2	
VA11W-106					88		53.6		132		41		6		0	-	1		1	

Table 36. Summary of performance of entries in the Virginia Tech Wheat Test, Kentland farm, Blacksburg, VA, 2013 harvest, continued.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)		Early Lodging[1] (0-9)	
Dyna-Gro 9171	84		78		87		50.5	-	131		38	-	3	-	3		2		1	
Mercer Brand 11-V-258					87		52.7		134	+	43	+	6		4		3		1	
USG 3251	84		82		87		54.0		135	+	43	+	7		7	+	2		1	
Steyer Hunker					87		52.2		132		43	+	7		8	+	3		1	
VA10W-119	80		73		87		54.0		130	-	41		8		0	-	2		5	+
VA11W-196					87		53.0		134	+	38	-	6		1	-	0	-	0	
USG 3523					87		53.3		132		42		6		8	+	1		1	
USG 3201	82		78		87		54.1		131		40		5		4		2		2	
SS 8302	72	-	66	-	86		55.2	+	132		43	+	6		7	+	4	+	3	
VA10W-21			84		86		53.9		132		40		6		1	-	1		2	
AgriMAXX 427			75		86		51.8		132		41		7		8	+	2		1	
VA10W-28			82		86		53.3		134	+	43	+	5		0	-	2		0	
GA-031134-10E29					86		53.1		132		39	-	7		2		1		5	+
VA08MAS-369	84		76		86		54.4		133		39	-	8		2		0	-	3	
VA10W-140			76		85		55.2	+	133		40		7		0	-	2		3	
Pioneer XW11G					85		55.0	+	131		40		7		2		3		2	
Shirley	89	+	85		85		51.1	-	132		41		6		0	-	1		1	
SS 8412	90	+	83		84		55.1	+	133	+	40		5		0	-	1		0	
VA11W-230					84		55.5	+	131		40		8		0	-	1		4	
USG 3013					84		52.4		132		41		7		8	+	4	+	1	
VA10W-123			85		83		52.2		130	-	42		7		5	+	1		3	
SS 8404	77		72		83		55.4	+	131		39	-	6		1	-	3		0	
GA-04570-10E46					83		53.7		129	-	41		6		0	-	1		2	
Progeny 117	84		78		83		54.4		128	-	41		6		2		2		3	
Pioneer 25R32	82		79		83		54.5	+	133	+	41		6		7	+	1		1	
USG 3120	78		73		83		53.2		127	-	41		7		1	-	3		4	+
VA11W-278					83		52.8		129	-	41		8		0	-	2		3	
VA10W-96					82		54.9	+	129	-	41		7		0	-	1		4	
VA10W-112					82		55.9	+	130	-	40		8		0	-	2		3	
AgriMAXX 438					82		52.7		132		42		5		7	+	4	+	1	

Table 36. Summary of performance of entries in the Virginia Tech Wheat Test, Kentland farm, Blacksburg, VA, 2013 harvest, continued.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)		Leaf Rust (0-9)		Powdery Mildew (0-9)		Early Lodging[1] (0-9)	
Dyna-Gro 9343					82		53.9		132		44	+	7		2		2		2	
AgriMAXX Exp 1342					82		53.7		132		40		7		2	-	2		2	
SS 520	83		79		81		51.8		130	-	42		6		1	-	2		2	
VA09W-188WS*	82		78		81		49.6	-	129	-	42		6		3		2		3	
SS 8700					81		51.0	-	136	+	42		7		6	+	1		2	
Mercer Brand 12-W-270					81		53.1		132		43	+	5		2		2		1	
Pioneer 26R12	74	-	63	-	80		53.7		133	+	44	+	4		3		3		0	
Dyna-Gro 9223			66	-	80		51.9		132		44	+	6		8	+	4	+	2	
Oakes	73	-	69		80		56.1	+	134	+	42		6		5	+	4	+	3	
ARS08-0047					80		50.2	-	129	-	40		7		1	-	2		5	+
VA10W-42					80		52.1		130	-	42		5		0	-	4	+	3	
VA11W-195					80		52.2		132		39	-	6		1	-	1		2	
VA09W-75*	82		78		80		52.2		132		39	-	8		0	-	0	-	1	
SS 8350			72		79		50.9	-	135	+	41		1	-	0	-	6	+	0	
Merl	83		76		79		54.2		131		40		8		6	+	1		1	
Mercer Brand 12-V-251	80		77		79		52.2		132		38	-	7		0	-	1		3	
Pioneer 26R20	82		77		79		51.0	-	134	+	41		6		4		1		3	
SS 5205	78		76		79		53.5		131		37	-	7		0	-	1		3	
USG 3993					78		53.3		132		45	+	7		2		4	+	3	
VA11W-323WS					78		50.1	-	132		40		7		0	-	1		2	
MD04W249-11-7					77		54.4		132		41		7		9	+	0	-	5	+
VA07W-415*	85		76		77		52.0		134	+	42		8		4		1		5	+
VA10W-126					77		52.3		131		42		7		1	-	3		2	
NC-Yadkin	77		74		76		52.7		131		41		7		1	-	1		2	
Yorktown	84		80		76		53.0		132		40	-	8		0	-	0	-	4	
Featherstone VA 258	84		76		76		51.0	-	134	+	43	+	8		5	+	2		2	
VA09W-73*	84		80		76		52.8		135	+	40		8		0	-	2		4	+
Progeny 357	77		72		76		49.8	-	133	+	43	+	7		8	+	4	+	2	
VA10W-669					75		51.7		132		40		8	+	0	-	2		3	
NC-Cape Fear	75		72		75		53.3		129	-	39	-	9	+	0	-	1		4	
VA09W-52	73	-	67	-	75		52.8		131		40		8		1	-	2		2	

Table 36. Summary of performance of entries in the Virginia Tech Wheat Test, Kentland farm, Blacksburg, VA, 2013 harvest, continued.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Date Headed (Julian)		Height (In)		Lodging (0-9)	Leaf Rust (0-9)		Powdery Mildew (0-9)		Early Lodging[1] (0-9)	
USG 3555	85		79		74		51.7		131		37	-	7	8	+	1		4	
SY 483					73		51.7		134	+	43	+	6	7	+	1		3	
Steyer Pierson					73		53.5		132		44	+	7	2		4	+	3	
Jamestown	77		69		72		54.7	+	129	-	39	-	8	2		0	-	5	+
VA08W-672					72		52.1		133	+	40	-	8	6	+	2		4	
NC08-140					71		52.9		132		42		7	0	-	0	-	4	+
VA09W-110	74		65	-	70		50.3	-	133	+	39	-	8	0	-	2		5	+
NC09-22402					69	-	51.4	-	132		39	-	7	1	-	1		5	+
GA-031257-10LE34					69	-	53.1		133		40		7	0	-	1		2	
NC08-21273					67	-	52.7		132		41		7	0	-	3	+	4	
Massey	54	-	45	-	51	-	52.1		131		43	+	8	9	+	1		6	+
Average	83		78		82		52.9		132		41		6.2	2.8		1.8		2.2	
LSD (O.05)	7		9		15		1.5		1		1		2.3	1.3		1.3		2.2	
C.V.	10		11		13		2.0		1		2		27.3	32.6		52.4		81.9	

Released cultivars are shown in bold print.

Varieties are ordered by descending yield averages. A plus or minus sign indicates a performance significantly above or below the test average.

[1]Entries noted as lodging very early when assessed at the end of April were injured by spring freeze.

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

* Released line yet to be named.

Table 37. Summary of performance of entries in the Virginia Tech Wheat Test, planted No-Till at Tidewater AREC, Holland, VA, 2013 harvest.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Lodging (0-9)	
Progeny 357	72	+	68	+	69	+	51.2		2	
USG 3404					62	+	54.0		2	
USG 3251	69	+	66	+	61	+	54.0		2	
Pioneer 26R53			63		60	+	54.5		2	
USG 3523					59	+	53.8		3	
VA11W-108					59	+	52.6		2	
AgriMAXX 415			61		58	+	53.9		2	
SY Harrison			66	+	58	+	52.9		2	
USG 3438	65		60		58	+	52.2		2	
USG 3201	64		61		56	+	54.0		2	
Pioneer 25R40					56	+	52.6		2	
Pioneer 26R12	62		60		55		52.2		2	
VA11W-106					55		53.6		3	
Progeny PGX 12-10					54		50.5	-	2	
Pioneer 26R10	65		60		54		53.4		2	
AgriMAXX 413			62		53		51.2		3	
Shirley	69	+	64		53		53.1		2	
SS 8340	62		55		53		54.2		2	
Pioneer 26R41			60		53		52.1		2	
SS 8404	64		60		53		54.9		3	
Dyna-Gro 9171	65		58		53		52.0		2	
SS 8302	66		60		53		54.5		1	
USG 3120	67		62		53		53.9		3	
VA11W-230					52		55.5	+	2	
Pioneer 26R20	64		60		52		54.2		2	
SY 483					52		52.1		1	
VA11W-165					52		53.3		3	
Pioneer XW11G					52		53.6		4	+
VA10W-126					51		53.1		3	
AgriMAXX Exp 1342					51		53.9		3	
Progeny 870	61		56		51		51.6		2	
VA10W-96					51		55.1	+	4	+
USG 3612			63		51		52.2		3	
NC09-22402					50		52.2		3	
MD04W249-11-7					50		54.6		2	
VA10W-28			55		50		52.9		2	
VA11W-195					49		52.9		2	
GA-031257-10LE34					49		54.3		2	
Pioneer 26R22	64		56		49		54.6		2	
GA-04570-10E46					48		52.5		3	
VA11W-31					48		54.6		3	
SS 8500	60		56		48		53.0		2	

Table 37. Summary of performance of entries in the Virginia Tech Wheat Test, planted No-Till at Tidewater AREC, Holland, VA, 2013 harvest, continued.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Lodging (0-9)	
SS 8350			56		47		51.8		2	
Steyer Hunker					47		53.7		2	
VA11W-196					47		53.0		2	
USG 3013					46		53.6		1	
VA09W-52	64		59		46		54.3		2	
SY 474					46		54.9		2	
Progeny 117	62		56		46		52.4		4	+
AgriMAXX 434					46		51.5		2	
Pioneer 25R32	62		57		46		53.8		2	
SS 8700					46		53.2		3	
Progeny 308			56		45		54.1		3	
GA-031134-10E29					45		51.6		3	
VA10W-119	65		60		45		53.2		4	+
VA11W-278					45		52.9		3	
Massey	57	-	54		45		54.3		4	+
VA10W-123			57		44		52.6		3	
ARS08-0047					44		51.3		3	
Dyna-Gro 9223			60		44		53.0		2	
SS 5205	62		59		43		53.2		3	
VA11W-301					43		53.4		2	
VA10W-118					43		54.0		3	
VA08W-672					42		52.4		3	
USG 3555	60		57		42		52.4		3	
Progeny 125	61		55		42		49.8	-	3	
NC08-21273					42		53.8		3	
AgriMAXX 438					42		53.5		2	
VA10W-42					42		53.0		2	
SS 520	67		61		42		51.2		3	
NC-Yadkin	59		53		41		53.2		3	
Oakes	64		59		41		56.3	+	2	
VA10W-669					41		50.7	-	3	
Progeny 185	61		54		41		53.6		2	
Jamestown	61		57		41		55.0		3	
VA10W-112					41		54.3		3	
VA08MAS-369	61		53		40		55.1	+	2	
Mercer Brand 12-W-270					40		53.2		2	
SS 8412	63		56		40		53.8		2	
Merl	60		54		40		54.7		2	
NC-Cape Fear	60		54		39		53.6		4	+
VA09W-188WS*	60		56		39		48.4	-	3	
VA07W-415*	60		53		38		52.5		4	+
VA09W-110	65		60		38		52.0		3	

Table 37. Summary of performance of entries in the Virginia Tech Wheat Test, planted No-Till at Tidewater AREC, Holland, VA, 2013 harvest, continued.

Line	3-year Average Yield (Bu/a)		2-year Average Yield (Bu/a)		Yield (Bu/a)		Test Weight (Lb/bu)		Lodging (0-9)	
Mercer Brand 12-V-251	64		58		38		51.7		2	
Steyer Pierson					38		53.4		2	
Dyna-Gro 9343					37		53.4		3	
Yorktown	62		53		37		53.1		2	
AgriMAXX 427			61		37		51.3		2	
NC08-140					35		52.7		5	+
USG 3993					32	-	53.8		2	
Steyer Heilman					31	-	54.5		1	
Mercer Brand 11-V-258					31	-	53.1		1	
Featherstone VA 258	58		45	-	29	-	53.3		2	
VA09W-75*	56	-	50	-	28	-	52.4		2	
Dyna-Gro 9042			53		26	-	50.8		1	-
VA09W-73*	57	-	49	-	22	-	53.4		2	
Mercer Brand 12-W-296					22	-	54.8		1	-
VA10W-21			47	-	21	-	46.1	-	2	
VA11W-323WS					14	-	49.6	-	1	
VA10W-140			45	-	13	-	38.8	-	1	-
Average	65		60		45		52.9		2.3	
LSD (O.05)	5		7		11		2.1		1.1	
C.V.	11		12		16		2.7		33	

Released cultivars are shown in bold print. Varieties are ordered by descending yield averages. A plus or minus sign indicates a performance significantly above or below the test average. The 0-9 ratings indicate a genotype's response to disease or lodging, where 0 = highly resistant and 9 = highly susceptible.

* Released line yet to be named.

Section 5: Milling and Baking Quality

Grain samples for 75 entries in Virginia's 2012 State Wheat Test grown at Warsaw, VA were submitted to the USDA-ARS Soft Wheat Quality Lab in Wooster, OH for advanced milling and baking quality evaluations. The standard quality data were compared to the average for the cultivar checks given for this nursery, and quality scores for all entries were adjusted to the check average. A table of observed and historical quality scores for the checks is given below.

The adjusted average values of the provided checks are predicted to have decreased milling, baking, and softness equivalent scores when compared to the historical average. The observed scores for the checks correlated to the historical scores for milling, baking, and softness equivalence at a level of r>0.7, r>0.8, and r>0.9, respectively. The relative scores are consistent and the results of the following quality scores are likely predictive of future results.

2012 Advanced Quality Test Data versus Historical Database Values for Checks

	From Advanced Milling Database Scoring						Predicted from Measured Data					
ENTRY	Milling Quality Score		Baking Quality Score		Softness Equivalent Score		Milling Quality Score		Baking Quality Score		Softness Equivalent Score	
Jamestown	61.13	C	49.23	E	67.01	C	56.26	D	44.16	E	56.66	D
Massey	71.41	B	53.81	D	64.46	C	59.47	D	34.88	F	51.38	D
Merl	68.63	C	68.59	C	73.31	B	63.46	C	43.05	E	51.57	D
Shirley	67.67	C	67.21	C	66.46	C	71.26	B	69.40	C	71.10	B
Pioneer 25R32	71.08	B	27.11	F	37.90	F	68.24	C	4.18	F	15.70	F
USG 3555	58.30	D	34.04	F	59.28	D	48.72	E	42.65	E	55.55	D
Branson	68.26	C	72.03	B	81.31	A	59.41	D	55.08	D	71.75	B
Average	66.64		53.15		64.25		60.97		41.91		53.39	
Adjustment Bias for Trial	5.67		11.23		10.86							
Diagnostics - Correlations	0.7		0.8		0.9							

Additional Information on Quality Analysis

During grain inspection, slight FHB (scab) and pre-harvest sprouting was present along with moderate weathering. The soft wheat quality trait averages indicate that milling yield, softness equivalence, flour protein, and sucrose SRC (Solvent Retention Capacity) were within the limits for soft wheat characteristics. The SRC's of lactic acid, water, and sodium carbonate had higher than average values for soft wheat (only data for lactic acid is included in Table 38).

Of the characteristics of quality measured at the Soft Wheat Quality Laboratory, flour yield is the most reproducible and perhaps most important because it is genetically and environmentally associated with good soft wheat flour quality. Out of the 75 samples, 5 lines had greater flour yields than the check Shirley (70.1%). These lines included SS 8500, VA09W-188WS, VA07W-415, Dyna-Gro 9223, and USG 3244. The overall test average for flour yield was 69.0%.

After milling yield, the second trait that is recommended for use in selection is softness equivalent. Larger values are preferred for most soft wheat manufactured goods, particularly cakes and other high sugar baked products. The average softness equivalence for this test was 55.1% with SS 5205 having the best softness equivalent value at 61.7%.

Sucrose SRC is probably the best predictor of cookie quality. Sucrose SRC typically increases in wheat samples with lower flour yield and lower softness equivalent. A combination of low sucrose SRC, low flour protein, and high softness equivalence can typically produce a larger cookie diameter and higher baking scores. This is evident in the sample of USG 3612 as it has the lowest sucrose SRC absorption at 82.8%, lowest flour protein at 6.7%, and one of the largest softness equivalence values at 60.7% amongst all the samples. This resulted in USG 3612 having a top baking quality score of 97.2 and a large cookie diameter at 19.5 cm. The test average for cookie diameter was 18.3 cm and ranged from 16.1 to 19.5 cm.

Flour protein concentration ranged from 6.74% to 9.67% with a test average of 7.70%. Gluten strength was measured by the lactic acid SRC. The lactic acid SRC also correlates to flour protein concentration, but the effect is dependent on genotypes and growing conditions. The average lactic acid SRC for this group was 109.9% and is considered "strong" for gluten strength (lactic acid greater than 105%). The strongest lactic acid SRC was found in Dyna-Gro 9042 with a value of 131.6%, whereas SS 8404 generated a value of 87.9%. Stronger gluten strength is desired in production of crackers and some bread type products.

To select the best lines for milling and baking quality, the data was sequentially sorted for flour yield to identify lines with greater flour yield than the nursery average. Next the selected lines were sorted for softness equivalent and then solvent retention capacities of sucrose, lactic acid, water, and sodium carbonate, selecting lines that were better than average in each case. The lines with the best overall quality in this set were Dyna-Gro 9223, SY Harrison, SS 5205, Progeny 870, SS 8500, and PGX 11-14. SS 8500 was also the only line that scored an "A" on all three quality scores.

Table 38. Milling and baking quality of entries in the Virginia Tech Wheat Test based on evaluation of the 2012 harvest.

ENTRY	Modified Milling Quality Score		Modified Baking Quality Score		Modified Softness Equivalent Score		Test Weight (LB/BU)		Flour Yield (%)		Softness Equivalent (%)		Flour Protein (at 14%)		As Is Lactic Acid SRC (%)		Cookie Diameter (cm)	
12V51	67.43	C	59.94	D	59.42	D	62.53		69.17		52.08		7.50		93.26	w	18.31	
USG 3409	72.68	B	61.65	C	62.49	C	64.59		70.23	+	53.16		8.41		112.99		18.31	
5187J	68.24	C	50.66	D	57.50	D	64.15		69.33		51.40	q	7.83		116.70	s	18.16	
VA09W-73	61.27	C	54.64	D	62.49	C	63.23		67.93	q	53.16		8.02		113.69	s	18.00	
Jamestown	61.93	C	55.39	D	67.52	C	63.12		68.06		54.94		7.64		112.53		18.01	
USG 3244	77.07	B	54.95	D	78.92	B	61.94		71.11	+	58.97	+	7.78		93.83	w	17.90	
Massey	65.13	C	46.11	E	62.24	C	62.24		68.71		53.07		9.67	q	130.60	s	17.98	
Pioneer 26R20	61.49	C	59.04	D	60.34	C	63.00		67.98	q	52.40		7.42	+	109.36		18.37	+
Dyna-Gro 9042	53.61	D	41.52	E	53.43	D	63.28		66.39	q	49.96	q	8.45	q	131.64	s	17.74	
Progeny 357	59.00	D	63.90	C	65.73	C	61.49		67.47	q	54.31		8.28		114.93	s	18.68	+
SS 8302	59.07	D	46.70	E	71.41	B	63.54		67.49	q	56.32	+	8.76	q	123.61	s	17.87	
SY Harrison	76.87	B	84.60	A	80.35	A	60.75		71.07	+	59.48	+	7.31	+	116.25	s	18.91	+
Merl	69.13	C	54.28	D	62.43	C	63.57		69.51		53.14		8.56	q	108.01	w	18.00	
SY 9978	70.38	B	65.42	C	55.34	D	62.21		69.76		50.63	q	8.28		105.52	w	18.49	+
Pioneer 26R41	67.25	C	55.96	D	63.09	C	62.84		69.13		53.37		8.40		122.09	s	18.07	
MAS #23	63.87	C	78.11	B	66.11	C	61.72		68.45		54.44		8.13		106.80	w	18.84	+
USG 3315	62.01	C	46.95	E	70.88	B	62.39		68.08		56.13	+	8.55	q	127.91	s	17.76	
AGS 2038	74.11	B	61.37	C	66.36	C	62.50		70.51	+	54.53		8.24		96.45	w	18.13	
Shirley	76.92	B	80.63	A	81.96	A	60.45		71.08	+	60.05	+	7.12	+	90.17	w	18.95	+
USG 3438	72.22	B	79.98	B	67.89	C	60.90		70.13	+	55.07		7.30	+	99.15	w	18.96	+
VA09W-52	44.14	E	51.07	D	73.08	B	62.77		64.49	q	56.91	+	7.64		115.88	s	17.72	
Pioneer 26R53	68.30	C	66.47	C	66.39	C	62.64		69.35		54.54		8.18		112.55		18.61	+
VA09W-110	70.51	B	79.64	B	74.84	B	62.24		69.79		57.53	+	7.10	+	114.11	s	18.96	+
Pioneer 26R12	61.35	C	54.66	D	65.04	C	62.77		67.95	q	54.06		8.29		118.87	s	18.34	+
Progeny 125	48.88	E	62.24	C	83.79	A	60.41		65.44	q	60.70	+	7.86		129.11	s	18.51	+
USG 3201	69.33	C	65.58	C	58.49	D	63.49		69.55		51.75		8.31		117.21	s	18.39	+

Table 38. Milling and baking quality of entries in the Virginia Tech Wheat Test based on evaluation of the 2012 harvest, continued.

ENTRY	Modified Milling Quality Score		Modified Baking Quality Score		Modified Softness Equivalent Score		Test Weight (LB/BU)		Flour Yield (%)		Softness Equivalent (%)		Flour Protein (at 14%)		As Is Lactic Acid SRC (%)		Cookie Diameter (cm)	
Dyna-Gro 9012	72.57	B	71.04	B	60.88	C	63.23		70.20	+	52.59		8.17		112.23		18.88	+
Dyna-Gro 9223	77.12	B	91.07	A	74.55	B	62.01		71.12	+	57.43	+	7.65		116.49	s	19.48	+
USG 3172	68.29	C	72.62	B	76.07	B	63.18		69.34		57.97	+	7.62		118.15	s	18.84	+
W1566	63.66	C	55.54	D	63.14	C	61.71		68.41		53.39		8.15		101.96	w	18.15	
MAS #21	61.67	C	43.68	E	53.90	D	63.54		68.01	q	50.12	q	8.13		117.12	s	17.89	
Progeny 117	72.66	B	57.29	D	65.75	C	62.23		70.22	+	54.31		8.10		120.38	s	18.03	
Dyna-Gro 9922	58.03	D	60.04	C	62.89	C	63.40		67.28	q	53.30		7.77		110.15		18.34	+
Pioneer 25R32	73.90	B	15.41	F	26.57	F	63.00		70.47	+	40.45	q	7.38	+	108.45	w	16.18	q
NC-Cape Fear	56.21	D	41.90	E	56.82	D	64.45		66.91	q	51.15	q	8.63	q	129.87	s	17.85	
Dyna-Gro 9171	75.15	B	81.08	A	63.21	C	61.55		70.72	+	53.41		7.83		100.24	w	19.20	+
VA09W-188WS	79.35	B	56.42	D	67.54	C	60.66		71.57	+	54.95		7.27	+	88.65	w	17.97	
AgriMAXX 415	71.10	B	62.99	C	60.73	C	63.26		69.91		52.54		7.99		112.50		18.34	+
VA07W-415	78.45	B	61.05	C	60.10	C	63.56		71.39	+	52.32		7.77		110.72		18.30	
SS 560	61.46	C	55.70	D	65.94	C	61.46		67.97	q	54.38		8.16		103.08	w	18.22	
VA09W-75	57.02	D	51.64	D	76.22	B	61.51		67.08	q	58.02	+	6.89	+	109.13		17.80	
Progeny 870	74.80	B	91.12	A	70.89	B	60.82		70.65	+	56.13	+	7.31	+	96.89	w	19.43	+
VA08MAS-369	64.92	C	67.26	C	63.02	C	63.88		68.67		53.35		7.59		114.55	s	18.76	+
MAS #7	58.57	D	62.68	C	60.12	C	62.18		67.39	q	52.32		7.40	+	120.37	s	18.62	+
Pioneer 26R15	70.58	B	65.24	C	65.20	C	62.45		69.80		54.12		7.76		118.79	s	18.26	
Featherstone VA258	55.00	D	35.53	F	61.21	C	61.61		66.67	q	52.71		7.86		115.15	s	17.73	
AgriMAXX 413	73.42	B			73.53	B	60.44		70.37	+	57.07	+	6.90	+	90.19	w		
VA10W-28	70.32	B	62.65	C	55.91	D	60.69		69.75		50.83	q	7.40	+	92.18	w	18.48	+
SS 8500	81.57	A	92.74	A	84.76	A	61.12		72.01	+	61.04	+	7.41	+	122.59	s	19.24	+
SS 5205	70.75	B	88.17	A	86.69	A	62.27		69.84		61.72	+	7.25	+	117.44	s	18.89	+
USG 3555	54.38	D	53.88	D	66.41	C	60.79		66.55	q	54.55		7.62		106.71	w	18.17	
VA10W-140	67.02	C	66.84	C	67.61	C	62.02		69.09		54.97		7.69		113.42		18.49	+

Table 38. Milling and baking quality of entries in the Virginia Tech Wheat Test based on evaluation of the 2012 harvest, continued.

ENTRY	Modified Milling Quality Score		Modified Baking Quality Score		Modified Softness Equivalent Score		Test Weight (LB/BU)		Flour Yield (%)		Softness Equivalent (%)		Flour Protein (at 14%)		As Is Lactic Acid SRC (%)		Cookie Diameter (cm)	
USG 3120	76.50	B	76.34	B	82.15	A	61.19		70.99	+	60.11	+	6.80	+	98.10	w	18.79	+
USG 3612	68.36	C	97.25	A	83.92	A	61.01		69.36		60.74	+	6.74	+	95.00	w	19.45	+
SS 8340	69.05	C	77.25	B	66.96	C	62.04		69.50		54.74		7.71		110.89		18.89	+
SY 1526	60.42	C	62.88	C	74.54	B	62.02		67.76	q	57.43	+	7.93		97.98	w	18.23	
Oakes	65.97	C	70.57	B	65.42	C	62.96		68.88		54.20		7.51		104.04	w	18.43	+
Branson	65.08	C	66.31	C	82.61	A	60.31		68.70		60.28	+	7.69		120.79	s	18.38	+
VA10W-21	69.12	C	10.27	F	45.15	E	62.10		69.51		47.03	q	7.40	+	118.90	s	16.12	q
SS 520	71.02	B	68.05	C	67.08	C	60.14		69.89		54.78		6.84	+	92.71	w	18.36	+
Yorktown	53.80	D	34.60	F	74.36	B	62.04		66.43	q	57.36	+	7.20	+	118.58	s	17.25	q
USG 3251	63.93	C	75.69	B	81.03	A	62.36		68.47		59.72	+	6.89	+	106.90	w	18.77	+
Progeny 185	75.64	B	75.35	B	75.31	B	61.46		70.82	+	57.70	+	7.29	+	108.75		18.69	+
VA10W-119	75.98	B	57.72	D	65.25	C	62.45		70.89	+	54.14		7.63		107.30	w	18.14	
SS 8412	61.47	C	60.24	C	72.31	B	62.85		67.97	q	56.63	+	7.50		112.84		18.25	
AgriMAXX Exp 1215	68.80	C	90.67	A	82.42	A	61.41		69.45		60.21	+	6.74	+	91.66	w	19.23	+
Chesapeake	58.20	D	56.05	D	69.66	C	62.65		67.31	q	55.70		7.58		98.28	w	18.34	+
PGX 11-14	76.01	B	80.99	A	82.60	A	61.23		70.90	+	60.28	+	7.01	+	105.81	w	18.48	+
NC-Yadkin	62.96	C	55.12	D	59.38	D	62.38		68.27		52.06		7.58		116.55	s	18.10	
VA10W-123	72.68	B	68.69	C	82.98	A	62.01		70.23	+	60.41	+	6.88	+	108.77		18.58	+
Progeny 308	59.87	D	63.17	C	73.17	B	62.93		67.65	q	56.94	+	7.53		106.73	w	18.38	+
MAS #25	56.72	D	55.80	D	58.37	D	62.53		67.01	q	51.70		7.61		117.95	s	18.36	+
Pioneer 26R22	60.28	C	50.54	D	69.54	C	62.50		67.73	q	55.66		7.86		112.47		17.80	
SS 8404	63.60	C	66.26	C	66.08	C	62.11		68.40		54.43		7.46	+	87.90	w	18.27	
Pioneer 26R10	66.24	C	76.61	B	86.17	A	61.84		68.93		61.54	+	7.13	+	102.83	w	18.69	+
Average	66.56		62.72		67.91		62.22		68.99		55.08		7.70		109.90		18.34	

Table 38. Milling and baking quality of entries in the Virginia Tech Wheat Test based on evaluation of the 2012 harvest, continued.

ENTRY	Modified Milling Quality Score	Modified Baking Quality Score	Modified Softness Equivalent Score	Test Weight (LB/BU)	Flour Yield (%)	Softness Equivalent (%)	Flour Protein (at 14%)	As Is Lactic Acid SRC (%)	Cookie Diameter (cm)
Footnotes									
'q' - questionable or undesirable quality. Marked on lines greater than a standard deviation from the mean of the checks in a unpreferred level.									
'+' - Above average quality marked on lines with greater than a standard deviation away from mean of the checks in a preferred level									
's' - strong gluten. Greater than one standard deviation more than the mean of checks.									
'w' - weak gluten. Greater than one standard deviation less than the mean of the check.									
AgriMAXX 413 was mishandled during the analytical process resulting in missing data points for baking quality score and cookie diameter.									

Section 6: Wheat Scab Research

One of the primary research objectives of the Virginia Tech wheat breeding program is to identify and develop cultivars possessing resistance to Fusarium Head Blight (FHB) or scab. Each year all wheat entries in Virginia's Official State Variety Trials are evaluated for FHB resistance in an inoculated, irrigated nursery at the Blacksburg test site. Data from this test for the current crop year and two- and three-year averages for FHB incidence, FHB severity and FHB Index (incidence x severity / 100) are included in this bulletin (Tables 39 – 41) to aid producers in selection of cultivars on the basis of FHB resistance. Cultivars possessing complete resistance or immunity to FHB have not been identified and resistance levels in currently available cultivars vary from moderately resistant to highly susceptible.

A major goal of the breeding program is to identify and incorporate unique and complementary types of FHB resistance into cultivars to enhance the overall level of resistance. Genes controlling FHB resistance have been identified on more than six chromosomes in wheat and some of these genes are complementary in nature and effect different disease resistance components such as FHB incidence, severity, and DON toxin content. Incorporating such multiple resistance genes having additive effects on FHB resistance into cultivars will enhance the overall level of resistance. Because the individual resistance genes are located on different wheat chromosomes and each gene confers only partial resistance to FHB, identifying wheat lines having multiple resistance genes is difficult using traditional breeding techniques. To overcome this limitation, our program is currently identifying and using DNA markers located close to these resistance genes on the same chromosome as "tags" for selecting wheat lines possessing different combinations of these complementary resistance genes.

Entries were inoculated two times by spreading scabby corn seeds in plots at the booting stage and a week later, and by spraying a *Fusarium graminearum* spore suspension directly onto spikes at the 50% flowering stage. A high FHB incidence and a moderate to high FHB severity were obtained in 2013. Among 101 lines and varieties tested in 2013, the FHB index varied from 0 to 56 with FHB incidence ranging from 20% to 93% and FHB severity ranging from 2% to 61% (Table 39). Twenty-one lines and 44 varieties had FHB index values lower than the mean (<10) and expressed moderate resistant to FHB in 2013. Based on two year mean data for 2012 and 2013 (Table 40), five lines and 13 varieties had FHB index values lower than the test mean (<5) and DON content lower than 2 ppm. Nineteen varieties tested across three years (2011-2013) had average FHB index values lower than the test mean of 9 and DON content lower than 2 ppm (Table 41). Varieties expressing resistance to FHB based on three-year mean data are: Pioneer 25R32, Progeny 125, Jamestown, Oakes, Progeny 117, SS 8340, Yorktown, SS 8302, SS 520, Mercer Brand 12-V-251, Progeny 185, NC-Yadkin, Massey, SS 8404, SS 5205, NC-Cape Fear, Progeny 357, and SS 8500.

Table 39. Summary of reaction of entries in the Virginia Tech State Wheat Test to Fusarium head blight (scab) and glume blotch resistance, 2013 harvest.

LINE	FHB Incidence[1] (%)		FHB Severity[2] (%)		FHB Index[3] (0-100)		Rank FHB Index
USG 3993	20	-	2		0		1
Pioneer 25R32	20	-	2		0		2
Dyna-Gro 9343	25	-	2		1		3
SS 8302	28	-	2		1		4
Progeny 125	25	-	3		1		5
MD04W249-11-7	23	-	3		1		6
Steyer Heilman	25	-	4		1		7
Steyer Pierson	33	-	3		1		8
USG 3201	30	-	3		1		9
Mercer Brand 12-W-270	33	-	3		1		10
AgriMAXX 438	33	-	4		1		11
Steyer Hunker	38		3		1		12
Yorktown	38		4		2		13
Oakes	38		4		2		14
VA10W-112	33	-	5		2		15
Dyna-Gro 9223	43		4		2		16
Jamestown	40		5		2		17
Mercer Brand 12-W-296	30	-	6		2		18
VA10W-96	38		5		2		19
AgriMAXX Exp 1342	48		4		2		20
AgriMAXX 434	30	-	8		2		21
USG 3013	53		5		2		22
Progeny 117	35		5		2		23
SY 483	35		7		3		24
VA10W-28	45		6		3		25
Pioneer 26R53	43		7		3		26
VA10W-140	45		6		3		27
VA10W-21	53		6		3		28
VA11W-108	50		6		3		29
AgriMAXX 427	50		6		3		30
Pioneer 26R10	53		6		3		31
AgriMAXX 415	48		6		4		32
VA09W-75*	48		7		4		33
VA10W-123	55		7		4		34
Progeny 870	50		7		4		35
SS 8340	43		9		4		36
Progeny 185	40		10		4		37
SS 8412	48		8		5		38
Dyna-Gro 9042	43		9		5		39
NC-Yadkin	40		12		5		40
VA09W-52	63		8		5		41
SY 474	40		11		5		42
USG 3404	45		9		5		43

Table 39. Summary of reaction of entries in the Virginia Tech State Wheat Test to Fusarium head blight (scab) and glume blotch resistance, 2013 harvest, continued.

LINE	FHB Incidence[1] (%)	FHB Severity[2] (%)	FHB Index[3] (0-100)	Rank FHB Index
USG 3438	48	11	5	44
SS 8350	63	9	6	45
VA10W-119	58	10	6	46
VA11W-31	63	9	6	47
SS 5205	65	9	6	48
AgriMAXX 413	60	10	6	49
Massey	60	10	6	50
VA11W-106	75	8	6	51
SY Harrison	70	9	7	52
VA11W-278	73	10	8	53
USG 3523	58	12	8	54
VA08MAS-369	68	12	8	55
Progeny PGX 12-10	70	11	8	56
Mercer Brand 12-V-251	63	13	8	57
Pioneer 25R40	75	10	8	58
Merl	63	13	8	59
NC09-22402	73	12	9	60
Pioneer XW11G	68	13	9	61
ARS08-0047	65	12	9	62
USG 3555	75	12	9	63
VA10W-118	63	14	9	64
USG 3251	70	13	9	65
VA10W-669	58	15	10	66
SS 520	55	16	10	67
Dyna-Gro 9171	75	13	10	68
VA11W-230	68	14	10	69
Progeny 357	70	14	10	70
Pioneer 26R12	73	14	10	71
VA09W-188WS*	60	17	11	72
VA10W-126	78	14	11	73
SS 8404	65	16	12	74
Pioneer 26R41	75	16	12	75
VA10W-42	78	15	12	76
VA11W-323WS	73	17	13	77
Progeny 308	63	19	13	78
VA09W-73*	65	18	13	79
VA11W-301	70	20	14	80
GA-031134-10E29	68	21	14	81
VA08W-672	83	17	14	82
NC08-140	68	22	15	83
SS 8500	40	38 +	15	84

Table 39. Summary of reaction of entries in the Virginia Tech State Wheat Test to Fusarium head blight (scab) and glume blotch resistance, 2013 harvest, continued.

LINE	FHB Incidence[1] (%)		FHB Severity[2] (%)		FHB Index[3] (0-100)		Rank FHB Index
Pioneer 26R22	65		24		16		85
NC-Cape Fear	80		20		16		86
USG 3120	68		24		17		87
SS 8700	80		22		18		88
VA11W-195	90	+	21		19		89
NC08-21273	88	+	21		19		90
VA09W-110	90	+	25		22		91
VA11W-165	88	+	27		24	+	92
VA07W-415*	70		38	+	27	+	93
Shirley	93	+	30	+	28	+	94
VA11W-196	93	+	31	+	28	+	95
Featherstone VA 258	80		39	+	32	+	96
Mercer Brand 11-V-258	80		39	+	32	+	97
Pioneer 26R20	100	+	33	+	33	+	98
GA-04570-10E46	85	+	42	+	36	+	99
GA-031257-10LE34	93	+	49	+	45	+	100
Coker 9835 (susceptible check)	95	+	52	+	50	+	101
Pioneer 26R46 (susceptible check)	93	+	61	+	56	+	102
Average	58		14		10		
LSD (O.05)	25		14		12		
C.V.	21		52		63		

Released cultivars are shown in bold print. Varieties are ordered by ascending index averages.

* Released line yet to be named.

A plus or minus sign indicates a performance significantly above or below the average.

Entries were planted in 2-row plots, 4 ft in length at Blacksburg, VA and were inoculated at 50% and 100% heading stages with Fusarium graminearum spore suspension (50,000 spores/ml).

[1]Scab Incidence (%): Percentage of infected spikes among 10 randomly selected spikes.

[2]Scab Severity (%): Percentage of infected spikelets among 10 infected spikes.

[3]Scab Index = Incidence X Severity/100; it is an overall indicator of scab resistance/susceptibility level.

Table 40. Two year average summary of reaction of entries in the Virginia Tech State Wheat Tests to Fusarium head blight (scab) and glume blotch resistance, 2012 and 2013 harvests.

LINE	Heading date (Julian)		FHB Incidence[1] (%)		FHB Severity[2] (%)	FHB Index[3] (0-100)	Rank FHB Index	Don Value 2012[4]
USG 3201	119	+	23	-	2	1	1	2.16
SS 8302	116		28	-	2	1	2	1.74
Progeny 125	110	-	26	-	3	1	3	0.94
Pioneer 25R32	121	+	29		3	1	4	1.54
Jamestown	110	-	24	-	3	1	5	0.80
Oakes	119	+	29		3	1	6	0.96
Yorktown	113		30		3	1	7	1.34
Progeny 117	109	-	29		4	1	8	0.50
VA10W-21	116		33		3	2	9	1.02
AgriMAXX 427	116		38		4	2	10	0.92
VA10W-140	117		38		4	2	11	2.16
AgriMAXX 415	119	+	34		4	2	12	2.24
VA10W-123	113	-	40		4	2	13	0.72
VA09W-75*	113	-	38		5	2	14	1.04
SS 8340	118	+	31		5	2	15	1.80
SS 8412	116		28	-	4	2	16	3.60
Pioneer 26R53	118	+	43		6	2	17	2.46
Progeny 185	114		35		6	3	18	1.42
VA09W-52	112	-	40		5	3	19	0.72
NC-Yadkin	118		30		7	3	20	1.04
Dyna-Gro 9223	120	+	49		6	3	21	2.26
VA10W-119	111	-	39		6	3	22	0.72
Massey	111	-	36		5	3	23	0.94
SS 5205	113	-	48		6	3	24	1.40
SY Harrison	119	+	48		6	4	25	2.16
Pioneer 26R10	119	+	55		7	4	26	4.38
Progeny 870	116		54		7	4	27	4.90
AgriMAXX 413	117		53		7	4	28	5.78
SS 8350	121	+	59		7	4	29	5.40
Dyna-Gro 9042	119	+	46		8	4	30	4.06
VA08MAS-369	114		53		7	4	31	4.36
VA10W-28	119	+	58		8	5	32	4.94
Mercer Brand 12-V-251	112	-	46		9	5	33	1.66
USG 3438	116		51		9	5	34	5.80
SS 520	111	-	38		9	5	35	0.88
VA09W-188WS*	111	-	36		10	6	36	1.10
USG 3555	109	-	61		8	6	37	0.56
Pioneer 26R12	116		53		9	6	38	2.08
Merl	116		56		10	6	39	4.42
SS 8404	113	-	48		10	6	40	0.86

Table 40. Two year average summary of reaction of entries in the Virginia Tech State Wheat Tests to Fusarium head blight (scab) and glume blotch resistance, 2012 and 2013 harvests, continued.

LINE	Heading date (Julian)		FHB Incidence[1] (%)		FHB Severity[2] (%)		FHB Index[3] (0-100)		Rank FHB Index	Don Value 2012[4]
USG 3251	121	+	65	+	10		7		41	2.32
VA09W-73*	118		41		10		7		42	2.04
Dyna-Gro 9171	117		69	+	10		7		43	4.44
Progeny 308	117		53		11		7		44	1.16
SS 8500	118	+	24	-	19	+	8		45	1.36
Progeny 357	120	+	68	+	12		9		46	1.84
Pioneer 26R22	115		53		14		9		47	4.98
USG 3120	109	-	53		14		9		48	1.04
NC-Cape Fear	110	-	58		12		9		49	0.56
Pioneer 26R41	118	+	75	+	13		10		50	5.20
VA09W-110	114		65	+	14		12	+	51	2.22
VA07W-415*	116		58		23	+	15	+	52	1.66
Shirley	118		71	+	19	+	16	+	53	2.52
Featherstone VA 258	114		69	+	24	+	19	+	54	2.18
Pioneer 26R20	121	+	81	+	21	+	19	+	55	6.08
Average	115		46		8		5			
LSD (O.05)	2		18		8		6			
C.V.	1		29		65		80			

Released cultivars are shown in bold print. Varieties are ordered by ascending index averages.

* Released line yet to be named.

A plus or minus sign indicates a performance significantly above or below the average.

Entries were planted in 2-row plots, 4 ft in length at Blacksburg, VA and were inoculated at 50% and 100% heading stages with Fusarium graminearum spore suspension (50,000 spores/ml).

[1]Scab Incidence (%): Percentage of infected spikes among 10 randomly selected spikes.

[2]Scab Severity (%): Percentage of infected spikelets among 10 infected spikes.

[3]Scab Index = Incidence X Severity/100; it is an overall indicator of scab resistance/susceptibility level.

[4] Don Values were measured from the 2012 harvest year.

Table 41. Three year average summary of reaction of entries in the Virginia Tech State Wheat Tests to Fusarium head blight (scab) and glume blotch resistance, 2011 - 2013 harvests.

LINE	Heading date (Julian)		FHB Incidence[1] (%)		FHB Severity[2] (%)		FHB Index[3] (0-100)		Rank FHB Index	Don Value 2012[4]
USG 3201	126	+	23	-	2		1		1	2.16
Pioneer 25R32	128	+	26	-	2		1		2	1.54
Progeny 125	121	-	28	-	4		1		3	0.94
Jamestown	121	-	28	-	3		1		4	0.80
Oakes	127	+	33		4		2		5	0.96
VA09W-75*	123	-	32		4		2		6	1.04
Progeny 117	121	-	33		6		2		7	0.50
SS 8340	126	+	36		7		3		8	1.80
Pioneer 26R10	127	+	47		6		3		9	4.38
Yorktown	123		42		6		3		10	1.34
SS 8302	125		35		6		3		11	1.74
Progeny 870	125		49		7		4		12	4.90
SS 520	122	-	32		7		4		13	0.88
VA10W-119	122	-	43		8		4		14	0.72
Mercer Brand 12-V-251	123	-	46		7		4		15	1.66
Progeny 185	123		40		8		4		16	1.42
VA09W-52	122	-	40		7		4		17	0.72
VA08MAS-369	124		48		8		4		18	4.36
Pioneer 26R12	125		45		7		4		19	2.08
VA09W-188WS*	122	-	38		8		4		20	1.10
USG 3438	125		46		8		4		21	5.80
NC-Yadkin	125		40		9		5		22	1.04
USG 3251	128	+	55		8		5		23	2.32
Massey	123		41		10		5		24	0.94
Dyna-Gro 9171	125		59		10		6		25	4.44
VA09W-73*	126	+	43		10		6		26	2.04
SS 8404	123		50		10		6		27	0.86
SS 5205	123	-	53		10		7		28	1.40
NC-Cape Fear	121	-	48		9		7		29	0.56
SS 8412	125		40		10		7		30	3.60
Pioneer 26R22	124		52		12		7		31	4.98
Progeny 357	127	+	63	+	12		8		32	1.84
SS 8500	126	+	34		17	+	8		33	1.36
USG 3555	121	-	61		12		9		34	0.56
Merl	125		63	+	14		9		35	4.42
USG 3120	121	-	60		15		10		36	1.04
VA07W-415*	125		52		18	+	12		37	1.66

Table 41. Three year average summary of reaction of entries in the Virginia Tech State Wheat Tests to Fusarium head blight (scab) and glume blotch resistance, 2011 - 2013 harvests, continued.

LINE	Heading date (Julian)		FHB Incidence[1] (%)		FHB Severity[2] (%)		FHB Index[3] (0-100)		Rank FHB Index	Don Value 2012[4]
Shirley	126	+	61		15		12	+	38	2.52
VA09W-110	124		65	+	15		12	+	39	2.22
Pioneer 26R20	128	+	66	+	15		13	+	40	6.08
Featherstone VA 258	124		68	+	22	+	18	+	41	2.18
Average	124		45		9		6			
LSD (O.05)	1		17		8		6			
C.V.	1		33		71		91			

Released cultivars are shown in bold print. Varieties are ordered by ascending index averages.

* Released line yet to be named.

A plus or minus sign indicates a performance significantly above or below the average.

Entries were planted in 2-row plots, 4 ft in length at Blacksburg, VA and were inoculated at 50% and 100% heading stages with Fusarium graminearum spore suspension (50,000 spores/ml).

[1]Scab Incidence (%): Percentage of infected spikes among 10 randomly selected spikes.

[2]Scab Severity (%): Percentage of infected spikelets among 10 infected spikes.

[3]Scab Index = Incidence X Severity/100; it is an overall indicator of scab resistance/susceptibility level.

[4] Don Values were measured from the 2012 harvest year.

Section 7: Triticale Varieties

Table 42. Summary of performance of entries in the Virginia Tech Triticale Test, Southern Piedmont AREC, Blackstone, VA, 2013 harvest.

Line	Yield (Bu/a)		Test Weight (Lb/bu)		Lodging (0-9)	
154	63		47.8	+	3	
08GX15	63		48.0	+	5	
NCT08-26	63		44.5		5	
NCPT01-1433	61		45.1		5	
Arcia	60		45.7		4	
NCT07-1088	59		45.4		5	
NCT05-2651	57		44.3		4	
NCT07-1031	55		44.1		5	
Trical 498	53		41.6	-	5	
Monarch	50		45.4		5	
Trical 342	50		43.8	-	7	+
Average	57		45.1		4.6	
LSD (0.05)	10		1.1		1.6	
C.V.	12		1.7		23.3	

Table 43. Summary of performance of entries in the Virginia Tech Triticale Test, planted no-till at the Tidewater AREC, Holland, VA, 2013 harvest.

Line	Yield (Bu/a)		Test Weight (Lb/bu)		Lodging (0-9)	
154	50		49.7	+	4	
Arcia	49		48.1		3	
NCT07-1031	45		47.8		3	
NCT05-2651	44		47.7		3	
NCT07-1088	41		47.6		3	
08GX15	40		51.4	+	4	
Trical 342	40		47.7		4	
Trical 498	38		45.4	-	3	
NCT08-26	37		46.1	-	4	
Monarch	35		48.2		4	
NCPT01-1433	34		48.2		4	
Average	41		48.0		3.2	
LSD (0.05)	11		1.2		2.2	
C.V.	18		1.7		47.3	

Varieties are ordered by descending yield averages. A plus or minus sign indicates a performance significantly above or below the test average. The 0-9 ratings indicate a genotype's response to disease or lodging, where 0 = highly resistant and 9 = highly susceptible.