

SMALL GRAINS IN 1998

The following are the small grain variety recommendations for Virginia in 1998. The recommendations are based on the agronomic performance in barley and wheat variety tests conducted by the Research and Extension Divisions of Virginia Tech in the various agricultural regions of the state.

SMALL GRAIN VARIETIES RECOMMENDED			
Arranged in Order of Maturity			
COASTAL PLAIN	PIEDMONT		WEST OF BLUE RIDGE
	South of James River	North of James River	
<i>Barley</i>			
Callao ^{sb}	Callao	Callao	Callao
Nomini ^a	Nomini	Nomini	Nomini
Starling ^a	Starling	Starling	Starling
<i>Wheat</i>			
Pioneer Brand 2691	Pioneer Brand 2691	Pioneer Brand 2691	Pioneer Brand 2691
Pocahontas	Pocahontas	Pocahontas	Pocahontas
Pioneer Brand 2684	Pioneer Brand 2684	Pioneer Brand 2684	Pioneer Brand 2684
Pioneer Brand 2580	Pioneer Brand 2580	Pioneer Brand 2580	Pioneer Brand 2580
NK Coker 9803	NK Coker 9803	NK Coker 9803	NK Coker 9803
Madison	Madison	Madison	Madison
FFR 523W	FFR 523W	FFR 523W	FFR 523W
Pioneer Brand 2643	Pioneer Brand 2643	Pioneer Brand 2643	-----
NK-Coker 9835	NK-Coker 9835	-----	-----
Featherstone 520	Featherstone 520	Featherstone 520	Featherstone 520
USG 3408	USG 3408	USG 3408	USG 3408
Roane	Roane	Roane	Roane
Jackson	Jackson	Jackson	Jackson
NK Coker 9663	NK Coker 9663	NK Coker 9663	NK Coker 9663
FFR 555W	FFR 555W	FFR 555W	FFR 555W
AgriPro Foster	AgriPro Foster	AgriPro Foster	AgriPro Foster
^a	Awnleted (no beards).		
^{sb}	Short beards.		

COMMERCIAL BARLEY ENTRIES

Virginia Tech and Virginia Crop Improvement Association, 9142 Atlee Station Road, Mechanicsville, VA 23116 - Callao, Nomini, and Starling.

COMMERCIAL WHEAT ENTRIES

Ag-Chem, Inc., PO Box 2178, Salisbury, MD 21802-2178 - DynaGro 422, DynaGro 424, and DynaGro 426.
AgriPro Seeds, Inc., PO Box 2962, Shawnee Mission, KS 66201-1362 - AgriPro Foster, AgriPro Mason, AgriPro Patton, and AgriPro Shelby.
University of Arkansas, Dept. of Agronomy, 115 Plant Science, Fayetteville, AR 72701 - Jaypee.
Clemson University, 277 Poole Ag. Center Box 340359, Clemson, SC 29634 - Clemson 201.
Featherstone Seed Company, 13941 Genito Road, Amelia, VA 23002 - Featherstone 520.
University of Georgia, GA Station, 1109 Experiment Street, Griffin, GA 30223 - Fleming, Roberts.
Hoffman Seeds, Inc., 144 Main Street, Landisville, PA 17538 - Hoffman 14, Hoffman 37, Hoffman 57, and Hoffman 95.
Monsanto (HybriTech), 6075 Westbrooke Drive, Salisbury, MD 21801 - Quantum 706, Quantum 708, and Quantum 7203.
Novartis Seeds, Inc., Box 340, Hartsville, SC 29550 - NK Coker 9134, NK Coker 9663, NK Coker 9704, NK Coker 9803, and NK Coker 9835.
Pioneer Hibred International, Inc., Eastern Division, Tipton, IN 47072 - Pioneer Brand 2580, Pioneer Brand 2643, Pioneer Brand 2684, and Pioneer Brand 2691.
Resource Seeds, Inc., 2355 Rice Pike, Union, KY 41091 - Trical 498 (triticale).
Southern States Cooperative, PO Box 26234, Richmond, VA 23260 - FFR 502W, FFR 518W, FFR 522W, FFR 523W, FFR 555W, and FFR 566W.
Stine Seed Company, Inc., PO Box 231, Sheridan, IN - Stine 455, Stine 480, Stine 481, and Stine 488.
Uni-South Genetics, 2640-C Nolensville Road, Nashville, TN 37211 - USG 3408.
Virginia Tech and Virginia Crop Improvement Association, 9142 Atlee Station Road, Mechanicsville, VA 23111 - Massey, Madison, Jackson, Pocahontas, and Roane.

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Location Supervisors: Mr. Tom Custis (Painter); Mr. Bobby Ashburn (Holland); Mr. Mark Vaughn, Mr. Bill Sisson, and Mr. Lin Barrack (Warsaw); Mr. Bill Wilkinson III and Mr. Bud Wilmouth (Blackstone); Dr. Carl Griffey and Mr. Tom Pridgen (Blacksburg); Mr. Bobby Clark, Mr. Tom Stanley, and the Mathias Brothers (Shenandoah); Mr. David Starner and Mr. Denton Dixon (Orange).

INTRODUCTION

The attached tables present results from barley and wheat varietal tests conducted in Virginia in 1997-98. Yield data are given for individual locations; yield and other performance characteristics are averaged over the number of locations indicated. Performance of a given variety often varies widely over locations and years which makes multiple location-year averages a more valid indication of expected performance than data from a single year or location. All tests in 1997-98 were grown in seven-inch rows planted at 22 seeds per row foot with the exception of Blacksburg and Warsaw which were grown in six-inch rows at 22 seeds per row foot. The plots were trimmed during the winter to 9 feet in length. Details about management practices for barley and wheat are included in the bulletin. The only herbicide used at most locations was Harmony Extra®.

Appreciation is expressed to Ag-Chem, Inc., AgriPro Seeds, Inc., Featherstone Seed Co., Hoffman Seeds, Inc., Monsanto Company, Novartis Seeds, Inc., Pioneer Hibred International, Inc., Resource Seeds, Inc., Southern States Cooperative, Stine Seed Company, Inc., Virginia Crop Improvement Association and the Virginia Small Grains Check-Off Board for their financial support of the small grains variety testing program at Virginia Tech.

BARLEY VARIETIES

Virginia's climate makes it possible to produce 110+ bu/acre field yields of well-managed barley most seasons. The better barley varieties entered in Virginia Tech tests have averaged above 110 bu/acre over five locations over three years. So what?! At the prices paid at harvest in 1998 many farmers will not plant barley this fall!

Barley is considered good feed for horses, dairy animals, beef, sheep, and some laying hens. The problem is that these industries in Virginia use only limited quantities of barley. Profitable barley production on more than 50,000 acres in Virginia is going to require revived international market opportunities and/or development of barley varieties that the poultry and swine feeders want to buy. International markets will improve sometime, but they may not be much better by June of 1999. When the international market does improve, we will need high test weight varieties to participate. Dr. Carl Griffey, Virginia Tech's small grains breeder, has developed higher test weight barley lines that stand better than Callao, and he is trying to put the poultry and swine industries back in the barley buying mode by developing hullless barley varieties. We have not given up on barley, but we have recognized the brick wall of low prices. We are exploring alternative routes to barley success.

The importance of Virginia's barley breeding program to the state and region is evident in the yield results. Note that four of the top five entries are Virginia Tech lines that were advanced to the state test for the first time in 1996, have excellent test weight, varying maturity and generally stand better than Callao. The breeding program is preparing for the time when international markets return.

Nomini and Starling continue to perform well and have good but not excellent test weight. Nomini is earlier than average whereas Starling is later than average. Callao has EXCELLENT test weight, was the top variety in the 1998 results and the multiple year averages. The test weight of Callao averaged 48.1 lbs/bu in 1998, and 53.7 lbs/bu in 1997. Callao is early, short, and has good barley yellow dwarf tolerance. It has short beards similar to Boone that generally come off easily during harvest. The major negative characteristic of Callao is its tendency to lodge if fertilized to develop high yields. Callao has similar standability to Boone. The use of the plant growth regulator Cerone® and intensive management should be a part of the decision to grow Callao.

Starling is similar to Nomini in yield, but has less than average test weight. Starling is susceptible to net blotch, but generally has the best disease resistance and "stay green" available in any barley. Starling is about three days later than Nomini, and thus should make an excellent companion barley for those wishing to grow barley for silage. It is recommended statewide, but will likely show its maximum benefit in the piedmont and mountainous areas. Seed of Nomini, Callao, and Starling barley should be available to producers in adequate quantities.

The standability of all released barley varieties is greatly improved with the application of Cerone®. Consideration of Cerone® application is recommended when all current barley varieties are fertilized to develop in excess of 100 bu/acre yields. Close cooperation between the barley breeding programs in Virginia and North Carolina and greater communication with current and potential barley markets can hopefully develop a bright future for a premium quality feed grain.

SUMMARY OF BARLEY MANAGEMENT PRACTICES FOR THE 1998 HARVEST SEASON

Blacksburg - Planted October 6, 1997. Preplant fertilizer was 25 lbs N, 60 lbs P₂O₅, and 90 lbs K₂O applied October 3, 1997. Harmony Extra® was applied at 0.5 oz on March

27, 1998 with 60-0-0-7. Harvest occurred on June 16, 1998.

Blackstone - Planted October 24, 1997. Preplant fertilizer was 500 lbs 5-10-10 and 1 ton lime on September 29, 1997. Forty lbs N was applied February 11, 1998 with 0.5 oz Harmony Extra®. Seventy-five lbs N was applied March 27, 1998. One pt Lannate® with 4 oz Tilt® was applied April 8, 1998 for control of cereal leaf beetle. Harvest occurred on June 16-17, 1998.

Holland - Planted November 5, 1997. One ton lime was applied October 2, 1997. Preplant fertilizer was 500 lbs 5-15-20 October 29, 1997. On January 22, 1998 60 units of N + 0.33 oz Harmony Extra® was applied. Forty units N was applied March 16, 1998. Harvest did not occur.

Painter - Planted October 31, 1997. Preplant fertilizer was 500 lbs/A 5-10-10 October 30, 1997. Ninety lbs N using 30% and 0.5 oz Harmony Extra® were applied March 3, 1998. Harvest occurred on June 18-19, 1998.

Warsaw - Planted October 22, 1997. Preplant fertilizer was 30 lbs N, 80 lbs P₂O₅, and 120 lbs K₂O applied October 8, 1997. Sixty lbs N was applied February 10, 1998. One pt Bucktril® was applied March 4, 1998. Fifty lbs N was applied March 25, 1998. Two oz of Karate® were applied April 25, 1998 for control of cereal leaf beetle. Harvest occurred June 8, 1998.

Orange - Planted October 9, 1997. Preplant fertilizer was 25-50-60 applied September 8, 1997. Sixty lbs N were applied March 27, 1998. Harvest occurred on June 9, 1998.

Table 1. Yield performance of entries in the Virginia Tech Barley Test, 1998 harvest (bu/acre).*

Brand/Variety	Blacksburg	Painter	Blackstone	Warsaw	Orange	Average
VA96B-248	107 +	102 +	136	130 +	91	115 +
VA96-44-278	99	100 +	141 +	129	89	112 +
CALLAO	106 +	97	141 +	125	86	112 +
VA97B-178	109 +	95	130	121	98 +	111 +
VA96-44-318	106 +	95	131	130 +	88	111 +
STARLING	105 +	94	135	124	80	109 +
VA96-44-321	98	94	122	134 +	82	108 +
VA96B-302	99	96	132	122	83	108 +
VA96B-323	104	92	126	125	80	107
VA97B-153	99	91	131	126	84	107
VA96-44-307	105 +	91	129	112	95	107
VA96B-315	111 +	87	132	112	83	106
NOMINI	102	84	125	119	100 +	106
VA97B-415	102	82	130	128	85	106
VA96B-301	86	91	133	124	94	106
VA97B-416	93	90	131	119	92	105
VA96-44-304	92	87	136	124	81	105
VA92-44-279	106 +	81	126	117	93	105
VA95-42-58	103	86	115	125	84	104
VA95-42-33	99	86	120	124	84	104
VA97B-262	89	97	132	119	72	104
VA96-41-39	92	90	118	119	91	103
VA96-41-17	94	87	117	123	82	102
VA97B-34	90	90	138	112	74	102
VA97B-177	102	84	133	112	73	102
VA95-41-28	92	85	122	117	87	101
VA95-41-33	86	84	124	121	87	101
VA96B-150	90	82	120	131	76	101
VA97B-258	85 -	88	141 +	111	76	101
VA97B-283	96	83	122	115	71	99
VA97B-33	79 -	83	144 +	111	62 -	97 -
VA96B-263	90	79	115	120	73	97 -
VA97B-191	84 -	85	126	113	72	97 -
VA95-42-28	92	82	117	113	76	97 -
VA96-41-25	87	84	112 -	116	75	96 -
WYSOR	88	83	116	114	71	96 -
VA96-41-26	92	82	117	109 -	63 -	95 -
VA95-41-23	90	77 -	120	110 -	69	95 -
VA96B-267	75 -	81	120	116	73	94 -
VA96B-265	81 -	82	105 -	114	80	93 -
LSD (0.05)	10	11	13	10	17	5
Location Average	95	88	127	120	81	103
Statewide Average	103					

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

Table 2. Two year average yield performance (bu/acre) of entries in the Virginia Tech Barley Tests, 1997 and 1998.*

Brand/Variety	Blacksburg	Painter	Warsaw	Orange	Average
VA96-44-318	112	114 +	127	105	115
CALLAO	116	110	127	98	114
STARLING	114	111	124	99	113
VA95-42-33	119 +	101	121	110	113
VA96-44-278	114	109	125	99	113
VA95-42-58	113	103	124	106	112
VA96-44-321	107	111	124	99	111
VA96-41-39	107	100	124	110	111
VA96-44-307	116	106	116	105	111
VA96-41-17	113	103	122	102	111
VA92-44-279	114	100	121	103	110
NOMINI	113	101	117	102	109
VA95-42-28	110	97	118	104	108
VA95-41-33	105	105	121	98	108
VA96-44-304	108	105	120	97	108
VA96-41-26	110	97	120	95	107
VA95-41-28	108	100	118	100	107
VA95-41-23	106	96	115	99	105
VA96-41-25	103	101	117	98	105
WYSOR	102 -	100	116	100	105
LSD (0.05)	8	9	9	12	5
Location Average	110	104	121	101	110
Statewide Average	110				

Table 3. Three year average yield performance (bu/acre) of entries in the Virginia Tech Barley Tests, 1996, 1997, and 1998.*

Brand/Variety	Blacksburg	Warsaw	Orange	Average
CALLAO	112 +	125	99	113 +
NOMINI	113 +	120	103	112
VA95-42-33	103	125	106	112
VA95-42-58	106	122	102	111
VA92-44-279	104	123	100	110
STARLING	101	122	99	108
VA95-41-33	98	123	98	107
VA95-41-28	98	121	97	106
VA95-42-28	91 -	118	99	103 -
WYSOR	95 -	117	95	103 -
VA95-41-23	90 -	118	97	102 -
LSD (0.05)	6	8	9	5
Location Average	101	121	100	108
Statewide Average	108			

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

Table 4. Summary of performance of entries in the Virginia Tech Barley Test, 1998 harvest (bu/acre).*

Brand/Variety	Yield (Bu/A) (5)	Test Weight (Lb) (5)	Date		Lodging_ (0.2-10) (5)	Scald (0-9)◆ (1)	Leaf Rust (0-9) (1)	Net Blotch (0-9) (1)
			Headed (Mar. 31+) (4)	Height (In) (4)				
VA96B-248	115 +	48.7 +	17	36	4.5	4	3	4 +
VA96-44-278	112 +	48.7 +	15 -	33 -	5.7 +	5	3	1 -
CALLAO	112 +	48.1 +	15 -	33 -	7.6 +	5	3	2 -
VA97B-178	111 +	48.3 +	18 +	34 -	4.4	5	3	1 -
VA96-44-318	111 +	48.5 +	21 +	37 +	7.1 +	4	2 -	2 -
STARLING	109 +	44.8 -	19 +	40 +	3.7	6	2 -	4 +
VA96-44-321	108 +	47.9 +	18 +	36	2.8 -	4	3	5 +
VA96B-302	108 +	45.9	15 -	33 -	5.1	6	3	2 -
VA96B-323	107	46.7	19 +	35 -	5.0	6	4 +	4 +
VA97B-153	107	46.3	16 -	34 -	6.1 +	5	4 +	2 -
VA96-44-307	107	47.2 +	15 -	33 -	3.0 -	8 +	2 -	1 -
VA96B-315	106	46.4	20 +	36	5.7 +	6	2 -	2 -
NOMINI	106	45.8	14 -	41 +	2.5 -	5	3	1 -
VA97B-415	106	46.7	15 -	34 -	4.4	6	4 +	2 -
VA96B-301	106	46.9	13 -	34 -	2.1 -	6	4 +	3
VA97B-416	105	47.7 +	14 -	34 -	4.9	6	5 +	2 -
VA96-44-304	105	46.5	13 -	33 -	3.9	6	4 +	2 -
VA92-44-279	105	46.5	17	37 +	2.8 -	5	2 -	3
VA95-42-58	104	46.8	18 +	39 +	2.2 -	4	3	3
VA95-42-33	104	46.4	18 +	39 +	2.6 -	6	2 -	4 +
VA97B-262	104	46.5	17	34 -	7.4 +	6	5 +	3
VA96-41-39	103	44.2 -	15 -	38 +	1.8 -	5	4 +	3
VA96-41-17	102	44.4 -	18 +	38 +	1.8 -	4	2 -	4 +
VA97B-34	102	46.8	17	32 -	6.0 +	6	4 +	2 -
VA97B-177	102	46.5	17	33 -	6.1 +	7 +	2 -	2 -
VA95-41-28	101	44.9 -	14 -	37 +	3.0 -	6	3	4 +
VA95-41-33	101	46.0	17	39 +	2.8 -	4	2 -	4 +
VA96B-150	101	44.2 -	19 +	36	2.6 -	4	2 -	5 +
VA97B-258	101	46.2	17	33 -	8.6 +	6	4 +	3
VA97B-283	99	46.3	21 +	37 +	7.6 +	6	4 +	2 -
VA97B-33	97 -	46.9	16 -	32 -	6.6 +	5	4 +	2 -
VA96B-263	97 -	45.4 -	16 -	35 -	1.9 -	5	3	6 +
VA97B-191	97 -	47.6 +	15 -	33 -	6.6 +	5	2 -	3
VA95-42-28	97 -	45.5 -	18 +	37 +	1.8 -	6	3	5 +
VA96-41-25	96 -	43.7 -	15 -	37 +	3.4	5	4 +	7 +
WYSOR	96 -	45.4 -	20 +	41 +	3.9	5	5 +	3
VA96-41-26	95 -	44.4 -	15 -	37 +	3.4	6	3	6 +
VA95-41-23	95 -	45.6	18 +	39 +	2.1 -	7 +	2 -	5 +
VA96B-267	94 -	46.0	19 +	39 +	3.7	5	3	7 +
VA96B-265	93 -	44.3 -	18 +	38 +	4.0	5	3	8 +
LSD (0.05)	5	0.8	1	1	1.2	2	1	1
Test Average	103	46.3	17	36	4.3	5	3	3

* Varieties are ordered in descending yield averages. The number in parentheses below column headings indicates the number of locations on which data are based. A plus or minus sign indicates performance significantly above or below the the test average, respectively.

_ Belgian Lodging Scale = Area X Intensity X 0.2. Area = 1-10, where 1 is barley is unaffected and 10 is entire plot affected and Intensity=1-5, where 1 is barley standing upright and 5 is barley lying totally flat.

◆ The 0-9 ratings indicate relative disease intensity where 0=none and 9=total plant infection.

WHEAT VARIETIES

The 1997-98 growing season was the worst for wheat that I have experienced in over two decades at Virginia Tech. It rained too much during the winter through early June and some fields were hurt by a severe freeze on March 10th. Portions of fields “drowned”. Root diseases like “take all”, leaf diseases, and head diseases such as scab were terrible in untreated fields and certain rotations. Implementation of intensive wheat management principles resulted in increased yields but not the high yields traditionally obtained. The only good news is that this challenging season gave us an opportunity to evaluate differences in disease resistance among varieties. Ratings were made for leaf rust, powdery mildew, tan spot, septoria, and scab. The scab and tan spot ratings were done on a test that was no-tilled into corn grain residue.

Virginia Tech’s wheat breeding program continues to be successful as shown by nine of the top fifteen entries being varieties or lines from the program. The Virginia Tech line VA 94-52-60 was the top yielding wheat over both two and three year averages. However, it was surpassed by several newer Virginia Tech lines in 1998.

Before discussing the results of specific varieties it is necessary to take seed treatment used on the varieties into consideration. Entries in this test have different seed treatments that may greatly impact performance. Seed treatments are indicated by an acronym in parentheses following the name. For example, AgriPro Patton (RG) indicates that this entry was treated with Raxil and Gaucho. “A” is Apron, “B” is Baytan, “C” is Captan, “D” is Dividend, “G” is Gaucho, “R” is Raxil, “T” is Thiram, and “V” is Vitavax. No seed treatment was used on Virginia Tech experimental lines nor on some of the public varieties such as Madison and Roane.

Roane, Virginia Tech’s newest release, has the highest three-year five-location average for released varieties with 80 bu/acre. Roane has excellent disease resistance as shown by its superior yields at Painter in 1998 and the ratings in Table 8. Roane has excellent test weight, average height, and good standability. It is about the same maturity as Jackson and FFR 555. Seed of this variety will be available to seedsmen in the fall of 1998 and for general production in the fall of 1999.

Pocahontas (RT), a relatively new Virginia Tech release, was a top yielder in 1998. In 1997, however, it produced only moderate yields due at least in part to its susceptibility to wheat spindle streak and barley yellow dwarf virus. Pocahontas has good resistance to powdery mildew and septoria which were major problems in 1998. Pocahontas may be an especially good variety to plant in the second half of the planting season considering the above research experience and the results from a date of planting study in 1998. Pocahontas is early, has excellent test weight, is shorter than average, and has good standability. Seed will be available in limited quantities for fall of 1998.

Another top-yielding variety in the 1998 test was AgriPro Patton. This new variety was tested with Baytan-Captan (BC) and with Raxil-Gaucho (RG) seed treatments. Seed treatment with Gaucho may have been a significant advantage since the RG-treated seed averaged 84 bu/acre compared to 78 bu/acre for the BC-treated seed. Patton is of medium maturity, stands well, yields well and has excellent resistance to powdery mildew and leaf rust. Patton will be available to seedsmen in the fall of 1998 with certified seed available by fall of 1999.

The new generation of hybrid wheat was entered in the tests for the first time. Monsanto entered Quantum 706 (R), Quantum 708 (R), and Quantum 7203 (R). All three hybrids yielded quite well at all locations. The statewide average yield of the Quantums ranged from 77 bu/acre for 708 to 79 bu/acre for 706 and 7203. The hybrid wheats were equal to the best varieties in these tests. All three hybrids are taller than average, have excellent standability and good test weight.

Pioneer Brand 2580 (B), Jackson, Dyna-Gro 424, FFR 518W, and Coker 9663 are among the top varieties averaging 73-76 bu/acre over years and locations. Pioneer Brand 2580 has excellent standability, and moderate test weight. Jackson has excellent test weight and moderate standability. Dyna-Gro 424 is later than average, taller than average, and has less than average test weight. FFR 518W is a new release by FFR that has performed well for two years especially in the Coastal Plains area of the state. FFR 518W is early, relatively short, of average test weight, and lodges more than average. Coker 9663 has excellent test weight, is susceptible to powdery mildew and is taller than average. In 1998, Coker 9663 performed much better in the Piedmont and Blue Ridge Region than in the Coastal Plain Region.

Varieties that continue to be in the top half of all entries and yield at the state average or above include AgriPro Mason (B), Pioneer Brand 2684 (B), FFR 555W (B), Madison, AgriPro Foster (B), Coker 9134 (B), Pioneer Brand 2643 (B), USG 3408 and Hoffman 95 (R).

Refer to Tables 5 and 8 for performance of other varieties that were not in the top-yielding group. These data are as important in deciding which varieties not to grow.

Variety performance is a combination of genetics, environment, and management. All of these tests were planted at 22 seeds/row foot. Some varieties such as Pioneer Brand 2643 may yield more at higher than 22 seeds/row foot. Other varieties may perform better under no-till conditions. For these and other reasons, a wheat variety test was planted no-till into corn stubble near Warsaw last fall. Results of this test will be discussed separately.

SUMMARY OF WHEAT MANAGEMENT PRACTICES FOR THE 1997 HARVEST SEASON

Blacksburg - Planted October 7, 1997. Preplant fertilizer was 25 lbs N, 60 lbs P₂O₅, and 90 lbs K₂O applied October 3, 1997. Harmony Extra® was applied at 0.5 oz on March 7, 1997 with 60-0-0-7. Harvest occurred on July 1, 1998.

Warsaw - Planted October 22, 1997. Preplant fertilizer was 30 lbs N, 80 lbs P₂O₅, and 120 lbs K₂O applied October 8, 1998. Sixty lbs N were applied February 10, 1998. One pt Bucril® was applied March 4, 1998. Sixty lbs N was applied March 25, 1998. Two oz of Karate® were applied April 25, 1998 for control of cereal leaf beetle. Harvest occurred June 18, 1998.

Painter - Planted October 31, 1997. Preplant fertilizer was 500 lbs/A 5-10-10 October 30, 1997. Ninety lbs N using 30% and 0.5 oz Harmony Extra® were applied March 3, 1998. Harvest occurred on June 18-19, 1998.

Holland - Planted November 5, 1997. Preplant fertilizer was 500 lbs 5-15-20 + 1000 lb lime October 29, 1997. On January 22, 1998 60 units of N + 0.33 oz Harmony Extra® was applied. Sixty units N was applied March 16, 1998. Karate® was applied April 13, 1998 at 2.5 oz. Harvest occurred June 26, 1998.

Blackstone - Planted October 24, 1997. Preplant fertilizer was 500 lbs 5-10-10 and 1 ton lime on September 29, 1997. Forty lbs N were applied February 11, 1998 with 0.5 oz Harmony Extra®. Seventy-five lbs N were applied March 27, 1998. One pt Lannate® + 4 oz Tilt® were applied April 8, 1998 for control of cereal leaf beetle. Harvest occurred on June 16, 1998.

Orange - Planted October 9, 1997. Preplant fertilizer was 25-50-60 applied September 8, 1997. Harmony® at 0.5 oz was applied December 3, 1997. Sixty lbs N were applied March 27, 1998. Harvest occurred on June 24-25, 1998.

Shenandoah - Planted October 22, 1997. Forty lbs N + 0.6 oz Harmony Extra® were applied February 22, 1998. Sixty lbs N were applied April 4, 1998. Harvest occurred July 2, 1998.

Table 5. Yield performance of entries in the Virginia Tech Wheat Test, 1998 harvest (bu/acre).* [Note: Seed treatments can greatly affect variety performance. Refer to wheat discussion for acronym information that identifies specific seed treatments.]

Brand/Variety	Coastal Plain Region				Piedmont and Blue Ridge Region				Statewide	
	Holland	Painter	Warsaw	Average	Blackstone	Blacksburg	Orange	Shenandoah	Average	Average
AGRIPRO PATTON (RG)	52	66 +	79 +	66 +	92	90 +	98 +	108 +	97 +	84 +
VA96W-247	49	66 +	72 +	63 +	96 +	89 +	95 +	92	93 +	80 +
VA96-54-234	55	71 +	69 +	65 +	94	89 +	92 +	94	92 +	80 +
VA96W-250	60 +	68 +	68 +	65 +	96 +	86 +	84	99 +	91 +	80 +
VA97W-375	57 +	72 +	67 +	65 +	98 +	81	93 +	95	92 +	80 +
POCAHONTAS (RT)	47	70 +	66	61 +	89	93 +	88	97	92 +	79 +
QUANTUM 706 (R)	50	60 +	72 +	61 +	97 +	86 +	88	103 +	93 +	79 +
QUANTUM 7203 (R)	59 +	61 +	66	62 +	90	89 +	85	105 +	92 +	79 +
VA96W-56	51	51	73 +	58	89	86 +	102 +	92	92 +	78 +
AGRIPRO PATTON (BC)	44	59	72 +	59 +	86	86 +	98 +	102 +	93 +	78 +
QUANTUM 708 (R)	62 +	59	63	61 +	91	88 +	82	100 +	90 +	78 +
ROANE	53	69 +	64	62 +	87	85 +	84	98	89 +	77 +
AGRIPRO MASON (B)	54	61 +	66	60 +	90	95 +	77	96	89 +	77 +
PIONEER BRAND 2580 (B)	54	56	63	58	84	90 +	92 +	97	91 +	76 +
DYNAGRO 424 (D)	48	50 -	68 +	55	90	78	95 +	96	90 +	75 +
VA96W-348	64 +	63 +	73 +	67 +	96 +	70	70 -	88	81	75 +
VA97W-533	51	62 +	64	59 +	92	77	84	92	86	75 +
AR 494B-2-2	50	54	66	57	90	73	81	101 +	86	74 +
VA96-54-326	52	62 +	59	58	97 +	74	82	89	86	74 +
STINE 455 (V)	50	55	63	56	93	82	88	85	87	74 +
STINE 488 (V)	50	54	62	55	72 -	83	90	103 +	87	73
JACKSON (B)	53	64 +	66	61 +	87	69	83	87	82	73
MADISON	51	48 -	59	52	80 -	91 +	82	100 +	88	73
FFR 555W (B)	51	44 -	57	51 -	91	87 +	92 +	88	90 +	73
NK-COKER 9663 (D)	48	48 -	56	50 -	94	82	87	95	90 +	73
FFR 522W (B)	55	61 +	61	59 +	92	68	78	96	83	73
USG 3408	51	68 +	58	59 +	91	76	78	80 -	81	72
PIONEER BRAND 2684 (B)	50	52	61	54	84	79	89	91	86	72
FFR 566W (R)	42	61 +	58	54	89	76	80	96	86	72
PIONEER BRAND XW662 (B)	50	64 +	62	59 +	90	81	84	73 -	82	72
FFR 518W (V)	54	64 +	62	60 +	90	69	78	87	81	72
DYNAGRO 426 (D)	42	53	57	51 -	89	78	78	99 +	86	71
HOFFMAN 95 (RA)	49	54	58	54	80	74	82	100 +	84	71
PIONEER BRAND 2643 (B)	49	49 -	54 -	51 -	88	87 +	81	91	87	71
AGRIPRO FOSTER (BC)	44	58	52 -	51 -	83	79	84	92	84	70
AGRIPRO SHELBY (B)	46	57	56	53	84	70	89	86	82	70
HOFFMAN 14 (RA)	41	40 -	47 -	43 -	88	78	98 +	99 +	91 +	70
DYNAGRO 422 (D)	49	45 -	65	53	88	72	79	88	82	69
STINE 480 (V)	43	44 -	56	48 -	80 -	76	86	99 +	85	69
TRICAL 498♦	47	64 +	65	58	93	54 -	50 -	110 +	77 -	69
NK-COKER 9835 (D)	48	57	55 -	54	89	64 -	80	87	80	69
NK-COKER 9134 (D)	46	52	59	52	96 +	61 -	79	82	79 -	68 -
FFR 523W (B)	45	42 -	58	48 -	92	71	80	86	82	68 -
HOFFMAN 57 (DA)	42	55	52 -	50 -	77 -	79	76	91	81	68 -
HOFFMAN 37 (DA)	47	44 -	65	52	86	65 -	78	89	79 -	68 -
AR 584A-3-1	53	59	58	57	88	69	71	80 -	77 -	68 -
KY86C-61-8	45	33 -	51 -	43 -	85	81	86	91	86	67 -
NK-COKER 9704 (D)	49	49 -	56	51 -	96 +	58 -	76	81 -	78 -	66 -
NK-COKER 9803 (D)	45	47 -	53 -	49 -	89	66 -	74	88	79 -	66 -
PIONEER BRAND XW663 (B)	44	56	55 -	52	91	55 -	67 -	95	77 -	66 -
PIONEER BRAND 2691 (B)	43	39 -	57	46 -	79 -	70	72	90	78 -	64 -
STINE 481 (V)	40 -	38 -	52 -	43 -	81	65 -	81	88	79 -	64 -
MASSEY	46	47 -	56	50 -	87	66 -	72	74 -	75 -	64 -
FEATHERSTONE 520 (B)	47	41 -	50 -	46 -	88	57 -	68 -	77 -	73 -	61 -
FLEMING (V)	38 -	53	59	50 -	80 -	43 -	61 -	89	68 -	60 -
JAYPEE	38 -	39 -	49 -	42 -	85	47 -	75	79 -	71 -	59 -
CLEMSON 201	41	47 -	48 -	45 -	81	50 -	54 -	80 -	66 -	57 -
FFR 502W (BD)	42	35 -	44 -	40 -						
ROBERTS (V)	47	40 -	47 -	45 -	85	48	53 -	74 -	65 -	56 -
LSD (0.05)	8	5	6	4	8	9	11	9	5	3
Location Average	48	55	61	55	88	75	81	90	84	71
Statewide Average	71									

* Varieties are ordered by descending statewide averages. A plus or minus sign indicates performance significantly above or below the test average within each region or statewide, respectively.

♦ This is a wheat/rye cross or triticale, not a wheat line.

Table 6. Two year average yield performance (bu/acre) of entries in the Virginia Tech Wheat Tests, 1997 and 1998.*

Brand/Variety	Blacksburg	Holland	Painter	Warsaw	Orange	Average
VA94-52-60	88 +	65	81 +	64	88 +	77 +
VA96-54-234	86 +	67	84 +	68 +	83 +	77 +
ROANE	90 +	65	82 +	66 +	78	76 +
PIONEER 2580 (B)	91 +	63	78	64	85 +	76 +
TRICAL 498 ♦	75	65	90 +	79 +	65 -	75 +
VA96-54-244	80	62	83 +	70 +	79	75 +
JACKSON (B)	77	66	83 +	63	80	74 +
DYNA-GR0 424	70	64	77	67 +	88 +	74 +
FFR 518W	75	68 +	86 +	64	77	74 +
COKER 9663 (B)	85 +	67	74	59	83 +	73 +
VA96-54-326	81	66	80	63	78	73 +
VA95-52-60	76	63	82 +	59	83 +	73 +
VA96-52-66 (B)	88 +	60	76	64	76	72
POCAHONTAS	82	63	86 +	58	75	72
AGRIPRO MASON	90 +	65	73	63	72	72
PIONEER 2684 (B)	79	61	71	64	81	71
FFR 555W (B)	82	64	72	60	81	71
MADISON	87 +	62	71	63	75	71
AGRIPRO FOSTER	81	60	75	59	82 +	71
VA96-54-372	83 +	60	75	60	77	71
COKER 9134 (B)	69 -	63	77	59	80	70
PIONEER 2643 (B)	85 +	61	70	64	73	70
USG 3408	80	62	84 +	56 -	72	70
HOFFMAN 95	72	61	75	59	77	69
VA94-54-479	73	62	73	67 +	71	69
HOFFMAN 14	76	60	66 -	56 -	88 +	69
VA96-52-71	88 +	54 -	76	60	72	69
COKER 9835 (B)	67 -	64	76	60	77	69
VA94-52-20	76	64	70	62	76	69
VA96-52-67	71	63	74	65	72	69
VA94-52-69	75	58	78	58	72	68
VA94-54-549	78	60	77	54 -	72	68
FFR 523W (B)	70	65	69 -	60	78	68
VA94-52-68	74	61	79	55 -	69	67 -
DYNA-GR0 422	68 -	61	69 -	63	74	67 -
COKER 9704 (B)	64 -	64	73	61	73	67 -
COKER 9803 (B)	68 -	61	75	59	71	67 -
PIONEER 2691 (B)	73	56 -	67 -	63	73	66 -
KY86C-61-8	77	62	60 -	51 -	80	65 -
VA93-54-258	78	57	74	52 -	68 -	65 -
HOFFMAN 57	74	55 -	72	53 -	69	65 -
ROBERTS	59 -	63	72	58	65 -	64 -
FEATHERSTONE 520 (B)	62 -	62	69 -	55 -	69	63 -
MASSEY	67 -	54 -	66 -	57	72	63 -
FLEMING	53 -	52 -	70	63	65 -	61 -
LSD (0.05)	7	6	6	5	7	3
Location Average	76	62	75	61	75	70
Statewide Average	70					

* Varieties are ordered by descending statewide averages. A plus or minus sign indicates performance significantly above or below the test average within each region or statewide, respectively.

♦ This is a wheat/rye cross or triticale, not a wheat line.

Table 7. Three year average yield performance (bu/acre) of entries in the Virginia Tech Wheat Tests, 1996, 1997, and 1998.*

Brand/Variety	Blacksburg	Holland	Painter	Warsaw	Orange	Average
VA94-52-60	95 +	70	85 +	71 +	90 +	82 +
ROANE	91 +	71	84 +	70 +	82	80 +
TRICAL 498♦	82	74 +	90 +	80 +	74 -	80 +
JACKSON (B)	83	72	87 +	71 +	81	79 +
PIONEER 2580 (B)	91 +	69	79	71 +	87 +	79 +
VA95-52-60	84	71	84 +	67	84	78 +
COKER 9663	91 +	71	79	65	85 +	78 +
POCAHONTAS	90 +	67	86 +	66	82	78 +
FFR555W (B)	88	72	76	63	83	76
USG 3408	85	69	84 +	65	79	76
AGRIPRO MASON	92 +	71	77	65	75 -	76
PIONEER 2684 (B)	83	65	75	70 +	84	75
VA94-52-20	79	70	77	66	81	75
MADISON	89 +	65	74	68	80	75
AGRIPRO FOSTER	87	67	77	62 -	84	75
VA94-52-69	81	67	79	65	77	74
COKER 9835 (B)	73 -	71	79	67	81	74
VA94-54-549	83	67	81	63	76	74
VA94-54-479	77 -	65	74	70 +	77	73
FFR 523W (B)	74 -	69	75	64	82	73
VA94-52-68	82	68	79	63	76	73
PIONEER 2643 (B)	87	64	74	68	75 -	73
HOFFMAN 14	83	65	68 -	58 -	89 +	73
VA93-54-258	87	66	78	62 -	75 -	73
HOFFMAN 95	77 -	66	76	63	79	72 -
PIONEER 2691 (B)	79	61 -	71 -	68	76	71 -
FEATHERSTONE 520 (B)	69 -	69	73 -	59 -	75 -	69 -
MASSEY	69 -	63	68 -	61 -	72 -	67 -
LSD (0.05)	6	6	5	4	5	3
Location Average	83	68	78	66	80	75
Statewide Average	75					

* Varieties are ordered by descending statewide averages. A plus or minus sign indicates performance significantly above or below

the test average within each region or statewide, respectively.

♦ This is a wheat/rye cross or triticale, not a wheat line.

Table 8. Summary of performance of entries in the Virginia Tech Wheat Test, 1998 harvest.*

Brand/Variety	Yield (Bu/A) (7)	Test Weight (Lb) (7)	Date Headed (Mar 31+) (4)	Height (In) (3)	Lodging_ (0.2-10) (6)	Powdery	Leaf	Head	Spring
						Mildew (0-9)□ (1)	Rust (0-9) (1)	Disease★ (0-9) (1)	Freeze Injury (%) (1)
AGRIPRO PATTON (RG)	84 +	55.6 +	26 -	40 +	1.3 -	1 -	3 -	4 -	1
VA96W-250	80 +	55.8 +	26 -	34 -	3.6 +	1 -	4	4 -	2
VA96W-247	80 +	55.6 +	27	37 -	2.8	2 -	4	3 -	1
VA96-54-234	80 +	56.0 +	25 -	36 -	1.2 -	0 -	2 -	4 -	1
VA97W-375	80 +	55.1	25 -	35 -	2.2	1 -	1 -	3 -	1
POCAHONTAS (RT)	79 +	55.8 +	24 -	37 -	2.3	0 -	6	4 -	2
QUANTUM 7203 (R)	79 +	56.7 +	26 -	40 +	0.7 -	2 -	8 +	5	0
QUANTUM 706 (R)	79 +	56.0 +	27	41 +	1.7 -	4 +	7 +	4 -	0
AGRIPRO PATTON (BC)	78 +	55.2	26 -	40 +	1.3 -	1 -	1 -	5	0
VA96W-56	78 +	54.9	29 +	39 +	0.5 -	2 -	7 +	4 -	0
QUANTUM 708 (R)	78 +	55.1	29 +	43 +	1.4 -	5 +	1 -	4 -	0
AGRIPRO MASON (B)	77 +	55.7 +	26 -	41 +	2.3	3	0 -	5	0
ROANE	77 +	57.8 +	28 +	38	2.5	2 -	5	3 -	0
PIONEER BRAND 2580 (B)	76 +	54.7	25 -	38	1.1 -	1 -	6	5	1
DYNAGRO 424 (D)	75 +	53.0 -	32 +	43 +	2.0	4 +	5	3 -	1
VA96W-348	75 +	54.2 -	26 -	37 -	5.3 +	1 -	6	4 -	0
VA97W-533	75 +	55.0	27	37 -	2.9	1 -	7 +	3 -	4
VA96-54-326	74 +	56.6 +	25 -	37 -	3.3 +	1 -	8 +	5	3
STINE 455-V	74 +	53.7 -	27	40 +	3.3 +	4 +	5	4 -	0
AR 494B-2-2	74 +	56.4 +	30 +	42 +	3.5 +	4 +	7 +	4 -	0
STINE 488 (V)	73	55.8 +	32 +	43 +	1.4 -	2 -	6	3 -	0
NK-COKER 9663 (D)	73	56.4 +	28 +	43 +	3.0	6 +	0 -	3 -	0
FFR 555W (B)	73	54.7	29 +	39 +	0.8 -	7 +	8 +	5	1
MADISON	73	54.7	25 -	40 +	2.3	4 +	6	7 +	0
FFR 522W (B)	73	56.6 +	26 -	39 +	3.2	2 -	0 -	5	1
JACKSON (B)	73	56.1 +	28 +	38	4.7 +	4 +	6	4 -	2
FFR 566W (R)	72	56.4 +	31 +	41 +	1.9	3	0 -	3 -	0
USG 3408	72	55.0	28 +	38	3.9 +	2 -	6	3 -	1
PIONEER BRAND XW662 (B)	72	55.4	27	38	1.3 -	1 -	3 -	3 -	4
PIONEER BRAND 2684 (B)	72	56.4 +	24 -	38	2.0	2 -	7 +	5	0
FFR 518W (V)	72	54.4	26 -	35 -	5.0 +	1 -	0 -	4 -	16 +
DYNAGRO 426 (D)	71	57.9 +	29 +	43 +	1.8	5 +	5	3 -	0
HOFFMAN 95 (RA))	71	56.4 +	29 +	41 +	1.0 -	5 +	6	4 -	0
PIONEER BRAND 2643 (B)	71	55.8 +	26 -	33 -	0.3 -	3	6	5	2
AGRIPRO SHELBY (B)	70	56.0 +	29 +	41 +	2.4	3	3 -	4 -	0
AGRIPRO FOSTER (BC)	70	56.0 +	29 +	40 +	0.7 -	3	7 +	3 -	0
HOFFMAN 14 (RA)	70	52.9 -	29 +	35 -	0.3 -	5 +	5	7 +	0
DYNAGRO 422 (D)	69	53.5 -	26 -	39 +	0.8 -	5 +	8 +	5	2
NK-COKER 9835 (D)	69	53.6 -	28 +	35 -	1.8	4 +	6	5	1
TRICAL 498♦	69	45.6 -	24 -	43 +	3.0	0 -	4	5	22 +
STINE 480 (V)	69	55.2	28 +	41 +	1.5 -	7 +	5	5	0
FFR 523W (B)	68 -	52.9 -	25 -	35 -	1.5 -	5 +	3 -	7 +	0
HOFFMAN 37 (DA)	68 -	53.7 -	27	39	1.0 -	5 +	7 +	5	4
NK-COKER 9134 (D)	68 -	54.3 -	27	39 +	4.6 +	3	5	5	5
AR 584A-3-1	68 -	55.0	28 +	42 +	4.6 +	6 +	1 -	3 -	3
HOFFMAN 57 (DA)	68 -	55.8 +	27	40 +	1.3 -	4 +	8 +	4 -	1
KY86C-61-8	67 -	54.9	26 -	38	2.2	8 +	5	8 +	3
NK-COKER 9704 (D)	66 -	55.7 +	25 -	35 -	4.6 +	6 +	4	6 +	6
PIONEER BRAND XW663 (B)	66 -	56.6 +	28 +	38	1.3 -	3	4	4 -	10
NK-COKER 9803 (D)	66 -	55.8 +	25 -	35 -	3.9 +	6 +	5	6 +	3
PIONEER BRAND 2691 (B)	64 -	53.2 -	23 -	35 -	1.7 -	2 -	1 -	7 +	9
STINE 481 (V)	64 -	54.1 -	29 +	41 +	0.8 -	8 +	7 +	5	0
MASSEY	64 -	55.9 +	28 +	41 +	4.5 +	3	8 +	5	1
FEATHERSTONE 520 (B)	61 -	54.8	27	35 -	4.7 +	4 +	6	6 +	7
FLEMING (V)	60 -	55.1	24 -	35 -	3.1	0 -	0 -	5	48 +
JAYPEE	59 -	53.9 -	24 -	35 -	5.6 +	5 +	3 -	7 +	10
CLEMSON 201	57 -	54.8	30 +	40 +	5.0 +	5 +	0 -	5	21 +
ROBERTS (V)	56 -	52.1 -	24 -	34 -	5.8 +	4 +	4	7 +	63 +
LSD (0.05)	3	0.6	1	1	0.8	1	2	1	6
Test Average	71	54.9	27	38	2.5	3	5	5	5

* Varieties are ordered by descending statewide averages. The number in parentheses below column headings indicates the number or locations on which data are based. A plus or minus sign indicates a performance significantly above or below the test average.

_ Belgian Lodging Scale = Area X Intensity X 0.2. Area = 1-10, where 1 is wheat is unaffected and

10 is entire plot affected and Intensity=1-5, where 1 is wheat standing upright and 5 is wheat lying totally flat.

□ The 0-9 ratings indicate relative disease intensity where 0=none and 9=total plant infection.

★ This was most likely bacterial pseudomonas although there may have been septoria nodorum present.

♦ This is a wheat/rye cross or triticale, not a wheat line.

WHEAT PLANTED NO-TILL INTO CORN STUBBLE

Seventy-six varieties/lines of wheat were planted no-till into corn grain stubble with a Hege plot drill at 30 seeds/row foot on October 27, 1997. Fall fertilizer of 30-80-120 was applied preplant followed by 30 lb nitrogen on January 1, 30 lb March 13, and 60 lb March 31. Leaf disease and scab ratings were made. Scab ratings were made by evaluating 50 heads for disease. Wheat yields were much lower in the no-till test than in other tests conducted at the Warsaw research station in 1998. Scab was the major problem reducing yields.

The same varieties were among the top yielders in the no-till and conventionally tilled variety tests. Ratings of scab incidence showed that the top five yielding varieties had less than 40% scab incidence. In contrast, the lower-yielding varieties in the test generally had above 50% scab incidence with incidence as high as 77%. Several of the lower-yielding varieties in the no-till test have produced good yields over years in conventionally tilled Virginia Tech tests.

Scab incidence and severity on wheat is dependent on rainfall at the flowering stage. Scab incidence results among varieties may vary over years. The results this year show varieties with high scab incidence from the early Pioneer Brand 2684 which headed April 25th to AgriPro Shelby which headed six days later. The top-yielding low scab-diseased varieties were heading and flowering at the same time as the varieties with high scab incidence and low yields.

Further research is needed before varieties can be confidently rated relative to degree of scab resistance. The ratings will need to consider initial infection sites on the wheat head as well as the degree of damage done to the total head.

Further research is planned for next season.

Table 9. Summary of performance of entries in the Virginia Tech No-Till Wheat Test at Warsaw, 1998 harvest.*

Brand/Variety	Yield (Bu/A)	Test Weight (Lb)	Date Headed (Mar 31+)	Height (In)	Lodging_ (0.2-10)	Powdery Mildew (0-9)□	Tan Spot (0-9)	Leaf Septoria (0-9)	Scab Incidence (%)
QUANTUM 706 (R)	60 +	53.8 +	27	36 +	0.2	2	5 +	7 +	38
TRICAL 498♦	55 +	43.2 -	18 -	41 +	0.2	1 -	2 -	4 -	19 -
AGRIPRO PATTON (RG)	53 +	52.5 +	27	35 +	0.2	2	2 -	4 -	32
AGRIPRO PATTON (BC)	52 +	52.2	27	35 +	0.2	1 -	2 -	3 -	25 -
QUANTUM 7203 (R)	51 +	54.3 +	27	34 +	0.2	1 -	6 +	7 +	30 -
VA96W-348	51 +	50.9	25 -	32	0.3	1 -	3 -	4 -	52
QUANTUM 708 (R)	49 +	50.8	31 +	36 +	0.2	1 -	4	6 +	37
VA96-54-326	48 +	53.8 +	25 -	33 +	0.2	1 -	3 -	4 -	27 -
VA96W-250	48 +	51.7	20 -	29 -	0.6 +	1 -	6 +	5	43
HOFFMAN 57 (DA)	48 +	54.3 +	26	35 +	0.2	2	4	5	28 -
PIONEER BRAND 2643 (B)	48 +	53.3 +	24 -	28 -	0.2	1 -	3 -	5	37
VA96-54-234	47	52.2	25 -	30 -	0.2	1 -	5 +	6 +	47
FFR 518W (V)	46	50.7	24 -	32	0.2	1 -	2 -	3 -	40
NK-COKER 9704 (D)	46	52.9 +	21 -	31 -	0.4	2	6 +	6 +	42
FLEMING (V)	46	53.5 +	25 -	33 +	0.2	1 -	3 -	7 +	44
FFR 522W (B)	45	52.6 +	25 -	34 +	0.2	1 -	3 -	6 +	48
MADISON	45	51.4	25 -	35 +	0.3	2	5 +	5	45
NK-COKER 9803 (D)	45	52.6 +	23 -	31 +	0.5	2	6 +	6 +	32
VA96W-247	45	51.2	24 -	30 -	0.6 +	1 -	6 +	6 +	43
AGRIPRO MASON (B)	44	52.3 +	28	34 +	0.2	1 -	3 -	5	41
PIONEER BRAND XW663 (B)	44	53.1 +	27	35 +	0.2	1 -	3 -	5	55
NK-COKER 9663 (D)	44	51.2	29 +	40 +	1.0 +	3 +	4	6 +	52
POCAHONTAS (RT)	44	51.0	26	32	0.2	1 -	3 -	6 +	40
ROBERTS (V)	44	49.9	22 -	30 -	0.3	1 -	5 +	6 +	63
FEATHERSTONE 520 (B)	43	51.4	25 -	33 +	0.3	2	6 +	6 +	58
AGRIPRO FOSTER (BC)	43	51.0	29	33 +	0.2	1 -	4	5	36
JAYPEE	42	52.8 +	23 -	31 -	1.0 +	4 +	4	5	65
DYNAGRO 424 (D)	42	46.2 -	31 +	34 +	0.3	2	5 +	4 -	52
AR 494B-2-2	42	50.1	32 +	36 +	0.3	2	4	4 -	54
MASSEY	42	53.5 +	28	38 +	0.8 +	1 -	4	4 -	37
STINE 455 (V)	42	48.6 -	29 +	34 +	0.2	2	5 +	7 +	26 -
KY86C-61-8	41	51.1	26	33 +	0.2	6 +	4	5	49
STINE 480 (V)	41	52.3 +	28	34 +	0.2	5 +	4	6 +	41
PIONEER 2552	41	53.0 +	30 +	30 -	0.2	1 -	4	5	57
CLEMSON 201	40	51.6	21 -	31 -	0.6 +	3 +	6 +	6 +	43
NK-COKER 9134 (D)	39	49.5	29 +	34 +	0.2	1 -	4	6 +	42
JACKSON-B	39	51.0	31 +	32	0.2	2	3 -	4 -	54
PIONEER BRAND 2691 (B)	39	49.9	21 -	30 -	0.2	1 -	7 +	7 +	48
USG 3408	38	50.2	27	33 +	0.2	1 -	4	5	60
FFR 523W (D)	38	51.0	26	36 +	0.3	3 +	6 +	6 +	36
PIONEER BRAND 2580 (B)	37	49.6	26	32	0.2	1 -	6 +	6 +	61
STINE 488 (V)	37	51.3	33 +	35 +	0.2	2	3 -	5	54
HOFFMAN 95 (R)	37	50.5	31 +	33 +	0.2	2	4	4 -	53
ROANE	36 -	53.4 +	31 +	30 -	0.2	1 -	5 +	4 -	52
FFR 566W (R)	36 -	47.8 -	32 +	33 +	0.2	1 -	4	6 +	66 +
FFR 523W (B)	36 -	47.3 -	27	28 -	0.2	2	6 +	6 +	61
NK-COKER 9835 (D)	35 -	47.9 -	31 +	28 -	0.2	2	4	5	67 +
DYNAGRO 426 (D)	34 -	52.0	31 +	33 +	0.2	2	4	5	51
FFR 555W (B)	34 -	49.0 -	31 +	32	0.2	3 +	5 +	5	60
VA96W-56	34 -	46.6 -	31 +	31 -	0.2	1 -	5 +	6 +	55
HOFFMAN 14 (R)	34 -	47.0 -	30 +	29 -	0.2	6 +	4	6 +	58
AGRIPRO SHELBY (B)	33 -	50.9	31 +	34 +	0.2	1 -	5 +	7 +	42
PIONEER BRAND 2684 (B)	32 -	51.0	26	31 -	0.2	2	6 +	6 +	60
STINE 481 (V)	32 -	49.8	30 +	33 +	0.2	5 +	5 +	6 +	66 +
PIONEER BRAND XW662 (B)	28 -	47.0 -	27	33 +	0.2	1 -	4	6 +	77 +
LSD (0.05)	6	1.5	2	1	0.3	1	1	1	18
Test Average	42	50.8	27	32	0.3	2	4	5	48

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

_ Belgian Lodging Scale = Area X Intensity X 0.2. Area = 1-10, where 1 is none of the plot affected and 10 is entire plot affected and Intensity=1-5, where 1 is wheat standing upright.

□ The 0-9 ratings indicate relative disease intensity where 0=none and 9=total plant infection.

♦ This is a wheat/rye cross or triticale, not a wheat line.

EVALUATION OF ELEVEN WHEAT VARIETIES/LINES PLANTED EARLY, ON TIME, AND LATE

One of the problems with dropping barley from the cropping system is the challenge to get even more extensive wheat acreage planted and harvested timely. Wheat varieties that can be planted earlier than optimum and varieties that can be planted later than optimum need to be identified. A cooperative Virginia Tech and N.C. State study was initiated in 1997-98 to help Virginia and North Carolina farmers with variety/planting date information. One of the goals of this study was to identify wheat varieties that are day-length sensitive and/or have a long vernalization period. Day-length sensitive varieties can be planted early, but even in a warm winter they would not joint before the longer days of March. The second major objective was to identify wheat varieties that would grow rapidly and produce good yields when planted late.

Wheat varieties included were Coker 9663, Coker 9704, Coker 9835, Pioneer 2684, Pioneer 2691, Pocahontas, Roane, and Quantum 7203. Plots were planted three weeks before the average first frost, about the time of the first frost, and six weeks after the average first frost. A northern adapted Pioneer variety, two Virginia lines and Callao barley were included for comparison. Plots were planted by Drs. Randy Weisz and Paul Murphy at Kinston, North Carolina, and by Carl Griffey and me at Warsaw, Virginia. This was a good year to initiate the study. At Warsaw we had an extremely warm February which resulted in early planted wheat being over 15 inches tall with the head at least 6 inches above ground by the first of March. The temperature dipped to less than 18 degrees on March 12. The first date of planting (October 2) resulted in the primary tillers on MOST varieties being killed. There was little to no damage to any of the eleven varieties from the timely planting date of October 24, and no freeze damage on March 12 to the December 2 planting.

As mentioned, the October 2 planting date is about three weeks before the average first frost. The March freeze damaged all 11 lines or varieties but generally caused more damage to very early varieties such as Pioneer 2691, and to the early Virginia Tech line. Extremely early wheat varieties that are not day-length sensitive should not be planted early. Full season varieties that have a long vernalization requirement such as the new Virginia Tech variety "Roane" MAY BE a good choice when planting earlier than optimum. Other varieties that yielded well when planted early were Pocahontas (a new Virginia Tech release), and Quantum 7203. Callao barley planted October 2nd had significant tillers damaged but barley generally tillers more than wheat so later tillers quickly replaced the primary tillers. As important, or more important, than variety selection for early planting is the choice of seed treatment. Powdery mildew pressure was so bad with the first planting date with most varieties that the plots had to be sprayed in October with Bayleton. The other concern with extremely early wheat planting is Hessian fly, aphids, and other insects. Insect pests were controlled with Gaucho seed treatment in this test. The cost of Gaucho may limit its use to situations where extremely early planting is considered essential. Also, Bayleton seed treatment to control fall infection by powdery mildew would be an excellent choice on most wheat varieties when planting extremely early.

Timely planting (October 24) resulted in an average yield of 74 bu/acre compared to 65 bu/acre when planted early and 44 bu/acre when planted December 2. It should, however, be remembered that the early planted was protected against insects and required at least one additional spray for disease control.

Pocahontas, Roane, and Quantum 7203 were among the top five varieties at each planting date. The very early Pioneer 2691 was among the lowest in yield when planted early and among the highest when planted late. Refer to Table 10 for detailed data.

More work is needed before many conclusions are drawn from these data and the results from Kinston need to be more fully incorporated into the discussion. I believe, however, that the first step toward longer planting seasons on the early side is to re-invent a market for barley.

Carl Griffey at Virginia Tech is developing hullless barley lines for feed and for human consumption. Hullless barley should make excellent swine and poultry feed. We need the market provided by the vertically integrated livestock industry for our small grains. Hopefully, hullless barley will be a part of our future.

Table 10. Yield (bu/acre) of eleven wheat varieties/lines planted early, on time, and late at the Eastern VA AREC at Warsaw, VA in 1997 and harvested in 1998.*

Brand/Variety	Planting Date		
	Oct 2	Oct 24	Dec 2
COKER9663	64	68	35 -
COKER9704	49 -	56 -	40
COKER9835	62	72	33 -
P2552	75	78	34 -
P2684	69	71	38
P2691	55 -	64 -	47
POCAHONTAS	75	88 +	49
QUANTUM 7203	73	81	54
ROANE	74	82	48
VA94-52-20	50 -	72	40
VA96W-250	73	87 +	39
CALLAO	90 +	87 +	94 +
LSD (0.05)	11	10	11
Location Average	67	75	46

Table 11. Test weight (lb/bu) of eleven wheat varieties/lines planted early, on time, and late at the Eastern VA AREC at Warsaw, VA in 1997 and harvested in 1998.*

Brand/Variety	Planting Date		
	Oct 2	Oct 24	Dec 2
COKER9663	53.5	55.2	52.5
COKER9704	53.3	55.5	53.6 +
COKER9835	52.7	53.9	50.5 -
P2552	55.9 +	57.6 +	53.6 +
P2684	55.1 +	56.1 +	53.4
P2691	52.0	53.5 -	53.0
POCAHONTAS	53.5	56.1 +	53.0
QUANTUM 7203	56.1 +	56.9 +	55.1 +
ROANE	56.2 +	58.0 +	56.0 +
VA94-52-20	49.2 -	52.2 -	49.6 -
VA96W-250	53.8	55.9 +	51.9
CALLAO	46.3 -	47.2 -	49.5 -
LSD (0.05)	1.6	1.0	1.0
Location Average	53.1	54.8	52.6

Table 12. Heading date (from March 31st) of eleven wheat varieties/lines planted early, on time, and late at the Eastern VA AREC at Warsaw, VA in 1997 and harvested in 1998.*

Brand/Variety	Planting Date		
	Oct 2	Oct 24	Dec 2
COKER9663	18 +	21 +	36 +
COKER9704	17 +	19	32
COKER9835	17 +	22 +	35 +
P2552	18 +	20 +	35 +
P2684	14	18 -	32
P2691	14	18 -	30 -
POCAHONTAS	15	18 -	32
QUANTUM 7203	17 +	19	33 +
ROANE	18 +	21 +	33 +
VA94-52-20	13 -	18 -	33 +
VA96W-250	15	18 -	32
CALLAO	6 -	11 -	24 -
LSD (0.05)	2	1	1
Location Average	15	19	32

Table 13. Height (inches) of eleven wheat varieties/lines planted early, on time, and late at the Eastern VA AREC at Warsaw, VA in 1997 and harvested in 1998.*

Brand/Variety	Planting Date		
	Oct 2	Oct 24	Dec 2
COKER9663	35 +	38 +	37 +
COKER9704	31	32 -	30
COKER9835	31	32 -	28 -
P2552	34	36 +	29 -
P2684	32	33	30
P2691	32	33	32
POCAHONTAS	32	35	32
QUANTUM 7203	36 +	37 +	34 +
ROANE	34	35	29 -
VA94-52-20	31	34	31
VA96W-250	30	32 -	26 -
CALLAO	26 -	28 -	28 -
LSD (0.05)	3	2	2
Location Average	32	34	31

Table 14. Lodging (Belgian scale) of eleven wheat varieties/lines planted early, on time, and late at the Eastern VA AREC at Warsaw, VA in 1997 and harvested in 1998.*

Brand/Variety	Planting Date		
	Oct 2	Oct 24	Dec 2
COKER9663	1.3	0.2 -	3.7
COKER9704	4.2	2.2	6.3
COKER9835	2.2	1.0	1.5 -
P2552	0.7	0.5	3.8
P2684	1.2	1.3	6.5
P2691	3.0	2.3	3.3
POCAHONTAS	3.3	0.8	5.3
QUANTUM 7203	0.8	0.3 -	6.2
ROANE	2.2	0.8	6.8
VA94-52-20	5.3	1.7	3.5
VA96W-250	4.0	0.8	3.8
CALLAO	8.7 +	8.5 +	6.5
LSD (0.05)	2.9	1.3	2.6
Location Average	3.1	1.7	4.8

Belgian Lodging Scale = Area X Intensity X 0.2. Area = 1-10, where 1 is wheat is unaffected and 10 is entire plot affected and Intensity=1-5, where 1 is wheat standing upright and 5 is wheat lying totally flat.

MILLING AND BAKING QUALITY

The milling and baking quality data presented here and in Table 15 represent data from four Virginia locations for a single year and, therefore, should not be used as a definitive measure of a given cultivar's milling and baking quality. Because quality of a given cultivar can vary from location to location and between years, data over years and locations is needed to accurately define quality of a given cultivar.

Wheat samples from entries grown in the 1996-97 Virginia Tech Test at four locations (Blacksburg, Loudoun, Painter, and Warsaw, VA) were evaluated for milling and baking quality at the USDA-ARS Soft Wheat Quality Laboratory in Wooster, Ohio. Quality was assessed for each entry by location using 50 gram samples that were milled with a Quadrumat mill. Quality data averaged over the four locations (Over-Location Analyses) are presented in Table 15. In addition, quality data were obtained from analyses of 2000 gram composite samples (Composite Analyses), which consisted of 500 grams from each of the four locations.

Milling and baking quality of the entries were compared with the local check cultivar Madison, which was selected as the standard. Madison ranks 60th among a total of 179 modern wheat lines evaluated for milling quality by the USDA-ARS Soft Wheat Quality Lab. Therefore, Madison is a fairly stringent standard as it ranks among the top 33% of lines for milling quality.

As expected, milling quality scores were fairly consistent across locations and therefore, differences were primarily due to variety effect rather than environment. Baking quality scores were uniformly higher for entries from Loudoun, and often were higher for entries from Blacksburg, than those from Painter and Warsaw. Entries from Loudoun and Blacksburg generally produced softer flour with lower water absorption, and those from Painter and Warsaw generally had higher protein content.

In the "Over-Location Analyses", maximum, minimum, and mean milling quality scores were 104.3, 88.7, and 94.4, respectively, compared with 99.4 for Madison. Only four entries surpassed Madison in milling score; these were FFR 555W, Foster, Dyna-Gro 422, and KY 86C-61-8. Baking quality scores varied from 81.4 to 104.9 with a mean of 94. Fifteen entries had baking quality scores that were equal to or higher than Madison at 97.8.

For the "Composite Analyses", milling scores ranged from 70.1 to 108.6 with a mean of 89.7 compared with 99.9 for Madison. Eight lines surpassed Madison for milling score. Baking scores varied from 43.3 to 105.7 with a mean of 73.6 compared to 100 for Madison. Only two lines surpassed Madison for baking quality.

Table 15. Milling and baking quality of entries in the Virginia Tech Wheat Test based on evaluations of the 1997 crop. ↕

ENTRY	Over-Locations Analysis			Composite Analysis				
	Milling Quality score	Baking Quality score	Flour Yield %	Micro Test Weight lb/bu	Milling Quality score	Baking Quality score	Flour Yield %	Cookie Diameter cm
MADISON=STANDARD	99.4	97.8	72.28	61.5	99.9	100.0	77.0	17.77
MASSEY	97.7	98.1	71.77	63.3	94.5	84.3	76.5	17.42
MADISON	99.4	97.8	72.28	61.5	99.9	100.0	77.0	17.77
JACKSON	93.3	96.1	70.44	63.1	80.7	82.7	74.9	17.42
USG 3408	92.6	91.6	70.22	63.9	80.9	60.8	75.2	17.00
VA 93-52-55	89.3	93.7	69.23	63.2	74.1	73.0	74.9	17.32
POCAHONTAS	97.6	89.8	71.74	63.7	99.4	59.8	76.9	17.01
VA 93-54-258	91.4	86.8	69.88	63.1	82.3	55.8	76.0	16.95
ROANE	88.7	87.2	69.08	64.2	70.1	52.7	74.2	16.79
VA 94-52-20	97.4	93.1	71.67	60.9	90.8	89.2	76.4	17.63
VA 94-52-60	96.3	89.6	71.33	61.6	92.1	70.1	76.9	17.30
VA 94-52-68	90.5	87.7	69.61	63.6	79.7	53.5	75.5	16.78
VA 94-52-69	90.4	86.3	69.59	63.3	79.9	51.3	75.4	16.58
VA 94-54-479	90.7	81.4	69.66	63.0	75.4	43.3	75.8	16.91
VA 94-54-549	89.7	85.8	69.36	63.2	72.3	50.7	75.1	16.68
VA 95-52-60	95.9	91.2	71.23	63.2	98.0	66.7	77.1	17.14
VA 96-52-66	93.9	91.1	70.64	63.8	84.3	87.3	76.2	17.63
VA 96-52-67	97.0	103.4	71.55	61.5	101.9	105.7	77.0	17.93
VA 96-52-68	95.6	96.0	71.13	61.0	92.3	74.1	76.6	17.22
VA 96-52-71	93.9	89.4	70.63	61.9	86.1	54.0	76.6	16.74
VA 96-54-38	93.0	93.7	70.34	61.3	89.9	69.6	76.9	17.17
VA 96-54-46	94.3	95.9	70.75	61.4	94.7	75.5	77.2	17.27
VA 96-54-234	89.8	86.4	69.40	63.1	77.4	62.7	75.4	17.18
VA 96-54-244	89.8	90.0	69.39	63.0	78.9	64.0	75.2	17.20
VA 96-54-326	98.9	93.7	72.13	63.7	102.7	71.0	77.2	17.17
VA 96-54-361	95.2	99.5	71.03	62.5	93.8	85.8	76.5	17.47
VA 96-54-372	89.7	94.1	69.36	62.1	79.3	54.5	75.0	16.64
NCV931007	98.6	98.9	72.04	62.7	101.6	82.2	76.8	17.40
FFR 518W	90.8	98.6	69.68	62.6	79.7	94.5	75.1	17.74
ROBERTS	95.6	96.0	71.15	62.6	91.3	72.9	76.3	17.25
FLEMING	94.7	86.7	70.87	63.4	92.0	48.6	76.8	16.61
FEATHERSTONE 520	95.6	99.6	71.13	64.3	94.8	73.8	76.6	17.13
FFR 502W	91.4	98.0	69.86	63.3	85.9	96.4	75.6	17.79
FFR 523W	94.8	94.5	70.91	62.2	92.9	59.9	76.4	16.90
FFR 555W	100.7	99.3	72.67	62.0	108.6	97.3	78.1	17.71
COKER 9803	93.7	97.3	70.58	64.0	88.7	86.3	75.7	17.52
COKER 9835	94.4	100.2	70.77	62.1	94.9	85.0	76.2	17.62
COKER 9663	91.8	86.2	69.98	63.0	83.4	49.5	76.1	16.55
COKER 9134	97.0	98.2	71.55	63.1	94.7	65.6	76.3	17.01
COKER 9704	93.8	98.0	70.61	64.2	87.4	76.2	75.7	17.29
PIONEER 2580	89.1	89.2	69.20	62.7	76.3	53.5	74.7	16.80
PIONEER 2684	93.5	94.4	70.50	63.6	90.9	78.2	76.3	17.33
PIONEER 2643	93.5	96.1	70.50	63.3	86.6	72.4	75.8	17.27
PIONEER 2691	91.8	102.0	70.00	63.0	82.8	70.5	75.3	17.11
PIONEER 2552	98.3	92.6	71.93	63.6	96.5	75.6	76.7	17.42
MASON	93.4	97.7	70.46	63.0	89.8	72.6	75.9	17.15
AGRIPRO FOSTER	102.0	97.3	73.04	62.7	105.7	98.8	77.9	17.94
HOFFMAN 14	92.3	99.8	70.16	62.0	80.9	79.3	75.5	17.42
HOFFMAN 95	98.2	96.7	71.93	62.6	102.7	88.3	77.3	17.56
HOFFMAN 57	93.2	88.3	70.41	63.0	89.1	56.3	75.9	17.01
DYNA-GRO 422	101.3	104.	72.83	62.1	106.2	79.8	77.3	17.28
DYNA-GRO 424	94.1	102.5	70.68	61.2	89.0	103.5	75.5	18.02
KY 86C-61-8	104.3	85.0	73.75	62.7	107.5	52.6	78.6	16.45

