Revised 1999

SMALL GRAINS IN 1999

The following are the small grain variety recommendations for Virginia in 1999. 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	
	Barley		
Callao	Callao	Callao	Callao
Nomini	Nomini	Nomini	Nomini
Starling	Starling	Starling	Starling
	Wheat		
Pioneer Brand 2691	Pioneer Brand 2691	Pioneer Brand 2691	Pioneer Brand 2691
FFR 518W	FFR 518W	FFR 518W	FFR 518W
USG 3209	USG 3209	USG 3209	USG 3209
Pocahontas	Pocahontas	Pocahontas	Pocahontas
Pioneer Brand 26R46	Pioneer Brand 26R46	Pioneer Brand 26R46	Pioneer Brand 26R46
Pioneer Brand 2684	Pioneer Brand 2684	Pioneer Brand 2684	Pioneer Brand 2684
Pioneer Brand 2580	Pioneer Brand 2580	Pioneer Brand 2580	Pioneer Brand 2580
Madison	Madison	Madison	Madison
FFR 523W	FFR 523W	FFR 523W	FFR 523W
Century II	Century II	Century II	Century II
Pioneer Brand 2643	Pioneer Brand 2643	Pioneer Brand 2643	----------
Quantum 7203	Quantum 7203	Quantum 7203	Quantum 7203
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

COMMERCIAL BARLEY ENTRIES

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

COMMERCIAL WHEAT ENTRIES

Ag-Chem, Inc., PO Box 2178, Salisbury, MD 21802-2178 - DynaGro 419, DynaGro 422, and DynaGro 424.
AgriBiotech, Inc., 120 Corporate Park Drive, Henderson, NV 89014 - HTW9850 and HTW215.
Agripro Seeds, Inc., PO Box 2962, Shawnee Mission, KS 66201-1362 - AgriPro Foster, AgriPro Mason, and AgriPro Patton.
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 and Featherstone XB98.
University of Georgia, GA Station, 1109 Experiment Street, Griffin, GA 30223 - 89482E7 and Roberts.
Hoffman Seeds, Inc., 144 Main Street, Landisville, PA 17538 - Hoffman 95, Hoffman 37, Hoffman EXP614, and Century II.
University of Kentucky, Kentucky Foundation Seed Project, PO Box 11950, Lexington, KY 40579 - KY86C-61-8.
Monsanto (HybriTech), 6075 Westbrooke Drive, Salisbury, MD 21801 - Quantum 706, Quantum 7123, Quantum 7203, and EH 9839.
North Carolina State University, 840 Method Rd, Unit 3, Box 7629, Raleigh, NC 27695-7629 - Arcia (triticale).
Novartis Seeds, Inc., Box 340, Hartsville, SC 29550 - NK Coker 9663, NK Coker 9835, NK Coker 9704, and NK Coker BL931167.
Pioneer Hibred International, Inc., Eastern Division, Tipton, IN 47072 - Pioneer Brand 2580, Pioneer Brand 2643, Pioneer Brand 26R46, Pioneer Brand 26R61, Pioneer Brand 2684, Pioneer Brand 2691, Pioneer Brand XW672, and Pioneer Brand XW674.
Resource Seeds, Inc., 2355 Rice Pike, Union, KY 41091 - Trical 498 (triticale).
Southern States Cooperative, PO Box 26234, Richmond, VA 23260 - FFR 518W, FFR 522W, FFR 523W, FFR 555W, FFR 566W, and FFR EXP2704..
Uni-South Genetics, 2640-C Nolensville Road, Nashville, TN 37211 - USG 3209, USG 3408, USG EXP 97-20, and USG EXP 97-41.
Virginia Tech and Virginia Crop Improvement Association, 9142 Atlee Station Road, Mechanicsville, VA 23111 - Massey, Madison, Jackson, Pocahontas, and Roane.

Appreciation is expressed to Ag-Chem, Inc., Agribiotech, 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, UniSouth Genetics, 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.

Conducted and summarized by the following Virginia Tech employees: Dr. Daniel E. Brann, Extension Agronomist, Grains; Dr. Carl Griffey, Small Grains Breeder; Mr. Harry Behl, Agricultural Supervisor; Ms. Elizabeth Rucker and Mr. Tom Pridgen, Research Associates. Location Supervisors: Mr. Tom Custis (Painter); Mr. Bobby Ashburn (Holland); Mr. Bob Pitman and Mr. Mark Vaughn (Warsaw); Mr. Bill Wilkinson III and Mr. Bud Wilmouth (Blackstone); Dr. Carl Griffey and Mr. Tom Pridgen (Blacksburg); Mr. Tom Stanley and the Martin Family (Augusta); Mr. David Starner and Mr. Denton Dixon (Orange).

INTRODUCTION

The attached tables present results from barley and wheat varietal tests conducted in Virginia in 1997-99. 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 1998-99 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®.

BARLEY VARIETIES

Virginia is barley country - or at least it could be with expanded markets. In one of the driest May and June periods on record, barley plots averaged 127 bu/acre with improved lines averaging up to 137 bu/acre. Entries in these variety tests as well as producer fields had yields in excess of 150 bu/acre.

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. When the international market does improve, we will need varieties with genetic potential of test weights exceeding 50 lb/bu.. Dr. Carl Griffey, Virginia Tech's small grains breeder, has developed barley lines that stand better than Callao and have **excellent** test weight. He is also trying to put the poultry and swine industries back in the barley buying mode by developing hulless barley varieties. We have not given up on barley! We continue to explore alternative routes to success with barley.

The importance of Virginia's barley breeding program to the state and region is evident in the yield results. Note that the top entries are Virginia Tech lines that have excellent test weight, varying maturity and they generally stand better than Callao. The breeding program is preparing for the time when international and regional 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, a short bearded variety, has EXCELLENT test weight with a three-year average above 50 lb/bu. Callao is early, short, and has good barley yellow dwarf tolerance. The major negative characteristic of Callao is its tendancy to lodge if

fertilized to develop high yields. 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. Starling 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 1999 HARVEST SEASON

Blacksburg - Planted October 14, 1998. Dolomitic limestone was applied at 1.5 ton October 5, 1998. Preplant fertilizer was 25-100-100 October 6, 1998. Harmony Extra® was applied at 0.5 oz on March 11, 1999. Site was fertilized with 60-0-0 using 30% UAN solution plus 0.5 oz Harmony Extra® March 31, 1999. Harvest occurred on June 18, 1999.
Painter - Planted October 21, 1998. Preplant fertilizer was 500 lbs/A 5-10-10 October 20, 1998. Eighty lbs N using 30%and 0.5 oz Harmony Extra® were applied March 24, 1999. Harvest occurred on June 7-8, 1999.
Warsaw - Planted October 19, 1998. Preplant fertilizer was 30 lbs N, 30 lbs P_2O_5, and 100 lbs K_2O applied October 5, 1998. Twenty lbs N was applied December 5, 1998 with 0.4 oz Harmony Extra®. Thirty lbs N was applied February 1, 1999. Fifty lbs N was applied March 30, 1999. Two oz Karate® was applied May 6, 1999 for control of cereal leaf beetle. Harvest occurred June 3, 1999.
Orange - Planted October 15, 1998. Preplant fertilizer was 500 lbs 5-10-10-6 applied September 14, 1998. Harmony Extra® was applied February 1, 1999 at 0.5 oz. Sixty lbs N were applied February 26, 1999 using 18.5 gal N and 18.5 gal water. Harvest occurred on June 4, 1999.

Table 1. Yield performance (bu/acre) of entries in the Virginia Tech Barley Test, 1999 harvest (bu/acre).*

Brand/Variety	Blacksburg	Orange	Warsaw	Painter	Average
VA97B-178	159 +	125 +	161 +	105	137 +
VA97B-388	159 +	129 +	138 -	106	133 +
VA96-44-321	148	115	159	109	133 +
VA96-44-307	153	113	161 +	103	133 +
VA97B-176	157 +	109	167 +	97	132
VA97B-415	152	115	166 +	93	132
VA97B-275	149	108	163 +	100	130
VA96B-248	145	117	155	103	130
STARLING	141	119	146	106	129
WYSOR	143	110	144	99	128
VA97B-389	149	113	147	101	128
VA97B-398	145	114	156	93	127
VA95-42-58	150	114	143	91	127
NOMINI	140	111	149	93	127
VA96-44-304	147	111	159	89	126
VA97B-284	143	108	151	100	126
VA92-44-279	148	114	143	99	126
VA95-42-33	145	102	146	102	125
CALLAO	142	109	147	103	125
VA96B-75	142	112	144	99	124
VA97B-401	137	111	142	86	124
VA96B-301	142	116	145	94	124
VA97B-416	141	100 -	154	97	123
VA97B-146	148	109	137 -	94	122
VA96B-76	138	99 -	137 -	92	116 -
VA96B-70	134 -	102	138 -	91	116 -
LSD (0.05)	10	12	10	13	6
Location Average	146	112	150	98	127
Statewide Average	127				

Table 2. Two year average yield performance (bu/acre) of entries in the Virginia Tech Barley Tests, 1998 and 1999*.

Brand/Variety	Blacksburg	Painter	Warsaw	Orange	Average
VA97B-178	134 +	100	141	99	118 +
VA96B-248	126	103 +	142	96	117 +
VA96-44-321	123	101 +	146 +	91	115
VA97B-415	127	88	147 +	93	114
VA96-44-307	129	97	137	94	114
STARLING	123	99	135	95	113
CALLAO	124	100	136	90	113
NOMINI	121	87 -	134	100	112
VA92-44-279	127	90	130 -	96	111
VA95-42-58	126	88	134	91	111
VA96-44-304	120	88	142	90	110
VA96B-301	114 -	93	134	98	110
VA97B-416	117	93	137	88	109
VA95-42-33	115 -	92	134	87	108 -
WYSOR	115 -	89	129 -	88	106 -
LSD (0.05)	8	7	7	9	4
Location Average	123	94	137	93	112
Statewide Average	112				

Table 3. Three year average yield performance (bu/acre) of entries in the Virginia Tech Barley Tests, 1997, 1998, and 1999.*

Brand/Variety	Blacksburg	Warsaw	Painter	Orange	Average
VA96-44-321	120	135	110 +	96	116
VA96-44-307	128	131	105	99	116
STARLING	123	132	109	99	116
CALLAO	125	134	108	95	115
VA92-44-279	125	128	100	100	114
VA95-42-58	125	130	99	100	114
NOMINI	122	127	99	100	113
VA96-44-304	121	133	99	95	112
VA95-41-33	119	130	104	93	112
WYSOR	116	125	99	97	110 -
LSD (0.05)	7	7	7	8	4
Location Average	122	131	103	97	114
Statewide Average	114				

Table 4. Summary of performance (bu/acre) of entries in the Virginia Tech Barley Test, 1999 harvest.*

Brand/Variety	Yield (Bu/A) (4)	Test Weight (Lb) (4)	Date Headed (Mar. 31+) (3)	Height (In) (3)	Lodging** (0.2-10) (4)	Powdery Mildew (0-9) (1)	Leaf Rust (0-9) (1)
VA97B-178	137 +	51.3 +	21 +	36 -	0.7	1	3 -
VA97B-388	133 +	50.1	27 +	38 +	0.2 -	2 +	9 +
VA96-44-321	133 +	50.3	22 +	37	0.3 -	1	5
VA96-44-307	133 +	50.3	19 -	35 -	0.8	1	2 -
VA97B-176	132	51.7 +	19 -	37	0.8	1	5
VA97B-415	132	49.5 -	21 +	36 -	0.8	1	7 +
VA97B-275	130	51.2 +	20	37	1.3	1	5
VA96B-248	130	50.1	21 +	38 +	1.1	1	7 +
STARLING	129	47.9 -	24 +	40 +	0.9	1	3 -
WYSOR	128	48.8 -	24 +	42 +	0.9	1	9 +
VA97B-389	128	51.3 +	24 +	38 +	0.2 -	2 +	9 +
VA97B-398	127	50.8 +	19 -	35 -	0.7	1	5
VA95-42-58	127	49.3 -	22 +	40 +	0.4	1	4 -
NOMINI	127	47.6 -	21 +	43 +	0.6	1	7 +
VA96-44-304	126	49.4 -	17 -	35 -	1.3	1	3 -
VA97B-284	126	51.6 +	21 +	39 +	0.6	1	4 -
VA92-44-279	126	49.2 -	22 +	37	0.6	2 +	4 -
VA95-42-33	125	49.1 -	20	39 +	0.4	1	5
CALLAO	125	51.2 +	19 -	35 -	4.0 +	1	6 +
VA96B-75	124	51.4 +	19 -	35 -	1.6 +	1	6 +
VA97B-401	124	48.1 -	21 +	41 +	0.4	1	2 -
VA96B-301	124	50.1 +	17 -	36 -	0.6	1	6 +
VA97B-416	123	49.9	19 -	37	1.5 +	1	8 +
VA97B-146	122	48.7 -	18 -	35 -	1.3	2 +	5
VA96B-76	116 -	50.9 +	17 -	35 -	0.7	1	4 -
VA96B-70	116 -	50.7 +	17 -	35 -	0.7	2 +	7 +
LSD (0.05)	6	0.5	1	1	0.6	1	1
Test Average	127	50.1	20	37	0.9	1	5

WHEAT VARIETIES

When considering wheat variety performance, 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, "Re" is Reldan, "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.

Virginia's well-drained soils are highly productive for wheat in extremely wet springs like 1998 and in very low-rainfall springs like 1999. Note that the best varieties of wheat yielded above 100 bu/acre at two locations and averaged over 80 bu/acre statewide. The major current problem in Virginia-style wheat production is low prices.

The Virginia Tech's small grain variety testing program continues to evaluate varieties statewide from Painter on the Eastern Shore to Blacksburg in southwestern Virginia. The no-till test into corn stubble was repeated near Warsaw, Virginia and is planned to be a regular part of the program. In 1999 we expanded the tests at Blacksburg, Warsaw and Painter to evaluate the varietal responses to application of a foliar fungicide at heading by treating three of the six replications with 4 oz/acre of Tilt®.

The extreme variation in weather conditions of the past two seasons demonstrate the importance of evaluating a variety over locations and years. Patton, the top-yielding variety in 1998 produced only average yields in 1999. USG 3209 was the highest-yielding released variety in 1999, but it is only average in yield over the past two years. It is desirable to pick varieties that are in the top-yielding group over years and locations, because none of us know what the weather will be like most seasons.

Varieties in the top-yielding group over three years of testing include FFR518W, Century II, Roane, Jackson, and Pioneer Brand 2580. FFR 518W is a new release marketed by Southern States that has yielded especially well in the coastal plains region and about average in the northern piedmont and mountainous regions of the state. FFR 518W is early, has good resistance to powdery mildew, is shorter than average and has average test weight. Standability of FFR 518W is adequate for moderate nitrogen rates but lodging could be a problem when pushed with nitrogen to full yield potential.

Century II, a new release from Hoffman Seed Company, has also performed especially well in the coastal plains region and produced at least average yields in the mountains. Century II is medium maturity, medium height, and has good test weight. Century II has moderate resistance to powdery mildew, leaf rust, and barley yellow dwarf virus. It is, however, susceptible to wheat spindle streak and therefore would not be the best choice on fields where this soil-borne disease is more likely to be a problem. Roane, a Virginia Tech release that will be available in limited quantities for the first time this fall, has excellent resistance to powdery mildew, leaf rust, septoria, and barley yellow dwarf virus. It is susceptible to wheat spindle streak. Roane is shorter than average, has excellent test weight and is similar to FFR 555W in maturity.

Jackson and Pioneer Brand 2580 continue to yield in the top group. As Virginia Tech hopes to replace Jackson with Roane, Pioneer is planning to replace Pioneer Brand 2580 with newer varieties such as Pioneer Brand 26R61. When comparing performance over the past two seasons, the hybrid wheats of Quantum 706 and 7203 are in the top group but not significantly higher-yielding than varieties such as Pioneer Brand 26R46, Jackson, Pioneer Brand 2580, Pocahontas, Roane, and Century II. Both of the above hybrids are taller than average and later-heading. Pioneer Brand 26R46 has been in the top-yielding group each of the past two years statewide. Pioneer Brand 26R46 is early, shorter than average with good resistance to powdery mildew and leaf rust. It has excellent standability and excellent test weight.

Other varieties that have performed well over three years are the UniSouth Genetics varieties USG 3209 and USG 3408. USG 3209 was the top-yielding released variety in 1999 with a statewide average of 85 bu/acre. USG 3209 is early, short and has good test weight. It has good resistance to powdery mildew and leaf rust. Refer to Tables 5 through 7 for additional information on both new and old varieties that have yielded less than average over 1, 2, and 3 years respectively.

Test weight is averaged over 6 locations. At most locations the test weight was excellent. However, ten days of rainy weather after wheat was mature at Holland and Painter resulted in test weights less than 55 lb/bu. The degree of seed sprouting in the head varied among varieties. Actual percent sprouting by varieties is being determined and will be reported later.

There is also interest worldwide in white seeded wheat. The Virginia 96W-403WS is a white seeded soft wheat. It yielded well statewide and has good disease resistance. It produced good quality wheat at several locations, but sprouted badly at Painter and Holland. Sprouting in the head is a known challenge with white seeded wheat varieties - a challenge that must be addressed if Virginia producers are to grow white wheat.

This fall is truly a time when producers should evaluate new varieties. Yield potential of new wheat varieties continues to increase. At today's prices an additional ten bu/acre could double net income.

Table 5. Yield performance (bu/acre) of entries in the Virginia Tech Wheat Test, 1999 harvest.*

	Coastal Plain Region	Piedmont and Blue Ridge Region	Statewide

Brand/Variety	Holland	Painter	Warsaw	Average	Blacksburg	Orange	Augusta	Average	Average
VA97W-24	60	115 +	85 +	87 +	109 +	88 +	77 +	91 +	89 +
PIONEER XW674(B)	60	115 +	94 +	89 +	94	87 +	67	83 +	86 +
USG 3209	61	108	86 +	85 +	105 +	80	70	85 +	85 +
VA96W-250	62	111 +	84	86 +	102 +	80	68	83 +	84 +
VA96W-158	63	113 +	83	87 +	91	84 +	68	82 +	84 +
VA97W-213	66 +	106	84	83 +	109 +	80	70	86 +	84 +
JACKSON(B)	65 +	103	83	84 +	95	80	74 +	83 +	83 +
QUANTUM 7123(R)	66 +	103	73	81	101 +	86 +	68	85 +	83 +
FFR 518(V)	62	112 +	89 +	87 +	91	84 +	58	78	83 +
PIONEER 26R46(B)	48	102	98 +	83 +	94	83	76 +	84 +	83 +
VA97W-533	67 +	101	81	83 +	100 +	77	66	82 +	83 +
89482E7	58	115 +	85 +	82 +	105 +	80	62	82 +	82 +
ROBERTS	54	100	83	79	103 +	87 +	58	83 +	81 +
CENTURY II	60	116 +	87 +	87 +	89	78	58	75	81 +
VA96W-348	59	100	90 +	83 +	91	75	69	78	80 +
VA96W-247	63	104	76	81	100 +	73	64	78	80 +
USG 3408	53	109 +	92 +	85 +	93	78	55	76	80 +
QUANTUM 706(R)	65 +	102	67	78	93	83	67	81 +	80 +
ROANE	64 +	95	78	79	99	79	62	80	79 +
VA97W-375	52	105	83	80	96	72	66	77	79 +
TRICAL 498♦	56	82 -	72	70 -	118 +	74	76 +	88 +	79 +
QUANTUM 7203(R)	59	100	75	78	83	84 +	70	79	79 +
VA96W-403WS	59	97	79	78	101 +	80	59	80	79 +
COKER 9835(D)	59	94	76	77	96	79	61	79	78
USG EXP97-20	56	102	84	81	92	72	63	76	78
VA96-54-326	63	106	82	84 +	90	67	57	71	77
PIONEER 2580(B)	59	106	83	83 +	83	74	60	72	77
PIONEER 2691(B)	49	104	70	74	88	78	72	79	77
POCAHONTAS	57	111 +	86 +	85 +	80	74	56	70	77
PIONEER 26R61(B)	52	106	76	78	86	79	65	77	77
PIONEER XW672(B)	44 -	111 +	82	79	84	81	51 -	73	76
FFR EXP2704(D)	60	102	75	79	91	72	58	73	76
FSTONE 520(B)	53	100	78	77	81	81	65	75	76
MADISON(B)	48	100	77	75	85	76	63	75	75
AGRIPRO MASON(B)	53	106	65	75	86	72	63	74	74
COKER 9704(D)	52	104	72	76	86	71	60	72	74
COKER 9663(D)	59	96	64	73	92	75	59	76	74
AGRIPRO FOSTER(B)	59	90	70	74	86	71	60	72	73
FSTONE XB98(R)	52	85 -	69	69 -	84	82	64	77	73
JAYPEE	51	93	73	72	83	78	61	74	73
AGRIPRO PATTON(B)	50	101	66	73	93	69	58	73	73
FFR 522(B)	52	94	68	71	91	79	54	75	73
PIONEER 2643(B)	53	102	73	76	87	69	55	70	73
ARCIA(V)♦	56	91	73	73	85	65 -	66	71	72
PIONEER 2684(B)	47	106	77	77	82	64 -	60	68 -	72
FFR 523W(B)	54	87 -	73	72	81	75	63	73	72
DYNAGRO 422(DA)	48	95	73	72	82	74	62	73	72
USG EXP97-41	52	95	70	72	87	68	58	71	71 -
HTW215(RT)	49	100	71	73	83	67	57	69 -	71 -
DYNAGRO 424(DA)	56	85 -	64	68 -	89	73	60	74	71 -
HOFFMAN 37(DARe)	52	90	72	71	83	66 -	62	70	71 -
QUANTUM EH9839(R)	54	90	55 -	66 -	85	73	60	73	70 -

Table 5. Yield performance (bu/acre) of entries in the Virginia Tech Wheat Test, 1999 harvest, continued.*

		Coastal Plain Region			Piedmont and Blue Ridge Region				Statewide
Brand/Variety	Holland	Painter	Warsaw	Average	Blacksburg	Orange	Augusta	Average	Average
KY 86C-61-8(RARe)	56	89 -	54 -	66 -	86	75	61	74	70 -

FFR 555W(B)	55	86 -	56 -	65 -	84	73	57	71	69 -			
FFR 566(D)	57	95	65	72	74 -	66 -	52	64 -	68 -			
COKER BL931167(D)	49	93	66	69 -	75 -	77	45 -	67 -	68 -			
HOFFMAN 95(RA)	49	89 -	56 -	65 -	75 -	73	57	69 -	67 -			
CLEMSON 201	48	83 -	59 -	64 -	76 -	73	57	69 -	67 -			
HTW9850(RT)	48	85 -	39 -	57 -	72 -	71	71	71	65 -			
DYNAGRO 419(DA)	49	83 -	31 -	55 -	84	65 -	65	71	63 -			
LSD (0.05)	9	10	12	6	11	9	11	6	4			
Location Average	55	99	73	76	89	75	62	75	75			
Statewide Average	75											

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

♦ Wheat/rye cross (triticale), not a wheat line.

SUMMARY OF WHEAT MANAGEMENT PRACTICES FOR THE 1999 HARVEST SEASON

Blacksburg - Planted October 15, 1998. Dolomitic limestone was applied October 5, 1998 at 1.5 ton. Preplant fertilizer was 25-100-100 applied October 6, 1998. Harmony Extra® was applied at 0.5 oz on February 11, 1998. Harmony Extra® was applied again March 31, 1999 at 0.5 oz with 60-0-0 using 30% UAN solution. Harvest occurred on July 4, 1999.

Warsaw - Planted October 20, 1998. Preplant fertilizer was 30-30-100 applied October 5, 1998. Twenty lbs N was applied December 5, 1998 with 0.4 oz Harmony Extra®. Thirty lbs N was applied February 1, 1999. Sixty lbs N was applied March 30, 1999. Two oz of Karate® were applied May 6, 1999 for control of cereal leaf beetle. Harvest occurred June 24, 1999.

Painter - Planted October 21, 1999. Preplant fertilizer was 500 lbs/A 5-10-10 + one ton lime October 21, 1998. One hundred lbs N using 30%and 0.5 oz Harmony Extra® were applied March 3, 1998. Harvest occurred on June 24, 1999.

Holland -Planted November 10, 1998. Preplant fertilizer was 600 lbs 5-15-20 October 21, 1998. On February 9, 1999 40 units of N + 0.33 oz Harmony Extra® was applied. Forty units N + 0.33 oz Harmony Extra® was applied March 2, 1999. Forty units N was applied March 24, 1999. Harvest occurred June 23, 1999.

Orange -Planted October 15, 1998. Preplant fertilizer was 500 lbs 5-10-10-6 applied September 14, 1998. Harmony Extra® was applied February 1, 1999 at 0.5 oz. Sixty lbs N were applied February 26, 1999 using 18.5 gal N and 18.5 gal water. Harvest occurred on June 4, 1999.

Augusta - Planted October 14, 1998. Forty lbs N + 0.5 oz Harmony Extra® were applied February 9, 1999. Sixty lbs N were applied March 31, 1999. Two pt Sevin® was applied May 11 for control of cereal leaf beetle. Harvest occurred June 28, 1999.

Warsaw No-Till - Planted October 22, 1999. Preplant fertilizer was 30-60-100 applied October 4. Roundup® was applied March 7 at a rate of 1.75 qt. Twenty lb N plus 0.4 oz Harmony Extra® was applied December 12, 1998. Twenty lb N was applied January 28, 1999. Thirty lb N plus 0.6 oz Harmony Extra® was applied March 2, 1999. Sixty lb N was applied March 30, 1999. Two oz Karate® was applied May 6, 1999. Warrior® was applied at 2.56 oz May 17, 1999. Wheat was harvested June 25, 1999.

Warsaw Date of Planting - Planted October 13, November 2, and November 30. Fertilizer was applied preplant at 30-30-100 October 5, 1998. Twenty lb N was applied December 12, 1998 with 0.4 oz Harmony Extra®. Twenty lb N was applied February 2 and again on March 5, 1999. Sixty lb N was applied March 30, 1999. Karate® was applied at 2 oz on May 5, 1999. Harvest occurred June 26, 1999.

Table 6. Two year average yield performance (bu/acre) of entries in the Virginia Tech Wheat Tests, 1998 and 1999.*

Brand/Variety	Holland	Painter	Warsaw	Blacksburg	Orange	Augusta	Average
VA96W-250	60 +	95 +	80 +	98 +	82	82 +	84 +
QUANTUM 706	59 +	90 +	78	93 +	83	78	81 +
VA96W-247	55	90 +	80 +	97 +	84	78	81 +
QUANTUM 7203	59 +	86 +	75	89	84	86 +	80 +
VA97W-375	54	91 +	76	91 +	83	79	80 +
PIONEER BRAND 26R46	49	88 +	83 +	88	84	75	79 +
FFR 518W	55	90 +	83 +	86	81	72	79 +
JACKSON	56	90 +	79 +	86	82	78	79 +
PIONEER BRAND 2580	56	87 +	78	89	83	77	79 +
POCAHONTAS	50	93 +	77	89	81	75	79 +
ROANE	57	86 +	76	94 +	82	78	79 +
VA94-52-60	53	84	79 +	92 +	83	78	79 +
CENTURY II	52	93 +	79 +	86	83	70	78 +
VA96W-56	53	82	78	92 +	87 +	76	78 +
USG 3408	52	94 +	80 +	86	78	65 -	77
VA96-54-234	54	89 +	71	89	80	75	77
VA96W-348	62 +	86 +	82 +	83	73	75	77
AGRIPRO MASON	52	86 +	71	89	75	78	76
AGRIPRO-PATTON	46 -	86 +	69	91 +	83	78	76
USG 3209	51	86 +	78	85	76	75	76
VA96-54-326	57	89 +	74	84	75	73	76
VA96W-329	57	76 -	79 +	86	80	75	76
MADISON	49	79	73	88	79	81	75
TRICAL 498	51	77 -	72	94 +	62 -	95 +	75
FFR 522	52	81	69	83	79	74	74
NK-COKER 9663	52	75 -	67 -	89	81	76	74
NK-COKER 9835	54	80	73	83	80	74	74
PIONEER BRAND 2643	50	82	71	88	75	76	74
PIONEER BRAND 2684	48	85	74	82	77	76	74
AGRIPRO-FOSTER	50	78 -	66 -	86	78	74	73
DYNAGRO 424	50	70 -	70	86	84	79	73
PIONEER BRAND 2691	44 -	78 -	72	84	75	78	73
VA96W-391	49	80	71	85	78	73	73
PIONEER BRAND 26R61	47	85	69	75 -	73	80	72 -
DYNAGRO 422	48	75 -	73	79 -	76	73	71 -
FFR 555	52	70 -	64 -	87	83	70	71 -
FFR 523	48	71 -	70	79 -	78	73	70 -
FFR 566	48	83	65 -	78 -	73	72	70 -
HOFFMAN 37	49	72 -	73	77 -	72	75	70 -
HOFFMAN 95	49	76 -	62 -	76 -	78	77	70 -
KY86C-61-8	48	66 -	62 -	86	81	74	70 -
NK-COKER 9704	50	80	70	75 -	73	68 -	70 -
ROBERTS	51	76 -	72	80	70 -	65 -	70 -
FEATHERSTONE 520	49	75 -	69	73 -	75	68 -	69 -
MASSEY	51	77 -	65 -	73 -	75	64 -	68 -
JAYPEE	44 -	71 -	66 -	72 -	76	70	67 -
CLEMSON 201	45 -	69 -	58 -	70 -	64 -	68 -	62 -
LSD (0.05)	6	4	6	6	7	7	3
Location Average	52	82	73	85	78	75	75
Statewide Average	75						

Table 7. Three year average yield performance (bu/acre) of entries in the Virginia Tech Wheat Tests, 1997, 1998, and 1999.*

Brand/Variety	Holland	Painter	Warsaw	Blacksburg	Orange	Average
VA94-52-60	61	91 +	75 +	91 +	82 +	81 +
FFR 518W	64	95 +	78 +	86	79	81 +
CENTURY II	61	96 +	72	86	81 +	80 +
ROANE	64	88	74	95 +	78	80 +
JACKSON	64	94 +	73	87	80	80 +
PIONEER 2580	61	90	75 +	90 +	81 +	80 +
TRICAL 498	62	88	78 +	98 +	68 -	79 +
USG 3408	59	95 +	72	87	74	78
VA96-54-234	61	92 +	70	87	78	78
VA96-54-326	64	92 +	72	85	74	78
USG 3209	60	89	77 +	87	74	78
POCAHONTAS	59	96 +	69	84	75	77
COKER 9663	63	82	66	89 +	81 +	76
COKER 9835	62	84	70	81	78	76
PIONEER 2643	57	85	72	87	71 -	75
AGRIPRO-FOSTER	59	82	66	86	78	75
MASON	60	86	68	88	72	75
PIONEER 2684	55 -	87	72	81	75	75
MADISON	56	83	71	86	76	75
DYNA-GR0 424	60	80 -	69	81	83 +	75
ROBERTS	60	84	71	80	72	74
PIONEER 2691	52 -	83	71	83	75	73 -
FFR 555W	60	79 -	64 -	84	78	73 -
COKER 9704	60	85	69	75 -	72	73 -
FFR 523W	60	78 -	67	77 -	77	72 -
DYNA-GR0 422	56	80 -	70	76 -	74	72 -
FEATHERSTONE 520	58	81 -	67	73 -	73	71 -
HOFFMAN 95	57	82	61 -	75 -	76	70 -
KY86C-61-8	58	72 -	59 -	83	78	70 -
MASSEY	55 -	79 -	63 -	72 -	74	69 -
LSD (0.05)	5	5	5	5	5	3
Location Average	60	86	70	84	76	76
Statewide Average	76					

Table 8. Summary of performance of entries in the Virginia Tech Wheat Test, 1999 harvest.*

Brand/Variety	Yield (Bu/A) (6)	Test Weight (Lb) (6)	Date Headed (Mar 31+) (3)	Height (In) (3)	Lodging_ (0.2-10) (1)	Powdery Mildew (0-9)❐ (2)	Leaf Rust (0-9) (3)	Septoria♣ (0-9) (2)	Barley Yellow Dwarf (0-9) (2)
VA97W-24	89 +	58.8 +	37 +	40 +	0.2 -	1 -	2 -	4 +	3 +
PIONEER XW674(B)	86 +	59.5 +	34 -	40 +	1.5	1 -	3	3	2
USG 3209	85 +	58.4	33 -	34 -	2.6 +	2	2 -	4 +	1 -
VA96W-250	84 +	58.4	36	36 -	2.6 +	2	2 -	2 -	2
VA96W-158	84 +	58.3	32 -	38	1.9	1 -	4 +	4 +	3 +
VA97W-213	84 +	57.3 -	39 +	35 -	0.2 -	3 +	2 -	2 -	2
JACKSON(B)	83 +	59.3 +	37 +	40 +	2.9 +	3 +	4 +	2 -	2
QUANTUM 7123(R)	83 +	59.3 +	37 +	40 +	0.4	3 +	2 -	2 -	2
FFR 518(V)	83 +	58.3	32 -	36 -	4.3 +	1 -	0 -	3	2
PIONEER 26R46(B)	83 +	58.7 +	34 -	37 -	0.5	1 -	3	4 +	2
VA97W-533	83 +	58.7 +	37 +	36 -	1.6	0 -	3	2 -	2
89482E7	82 +	58.9 +	34 -	37 -	0.7	1 -	0 -	4 +	1 -
ROBERTS	81 +	57.5 -	32 -	38	3.7 +	1 -	3	4 +	2
CENTURY II	81 +	58.9 +	35 -	38	2.3 +	4 +	3	2 -	2
VA96W-348	80 +	57.0 -	37 +	35 -	3.0 +	0 -	3	3	2
VA96W-247	80 +	58.2	38 +	35 -	1.8	1 -	1 -	3	3 +
USG 3408	80 +	59.3 +	36	39 +	2.4 +	2	4 +	3	1 -
QUANTUM 706(R)	80 +	58.4	38 +	40 +	0.3 -	4 +	4 +	3	3 +
ROANE	79 +	60.1 +	39 +	36 -	1.7	1 -	3	1 -	1 -
VA97W-375	79 +	57.8	38 +	34 -	1.6	0 -	0 -	2 -	2
TRICAL 498♦	79 +	50.8 -	24 -	43 +	0.2 -	1 -	2 -	4 +	1 -
QUANTUM 7203(R)	79 +	59.3 +	36	39 +	0.6	3 +	4 +	4 +	2
VA96W-403WS	79 +	56.0 -	39 +	38	1.2	2	3	3	1 -
COKER 9835(D)	78	57.5 -	35 -	35 -	3.0 +	2	7 +	2 -	2
USG EXP97-20	78	56.6 -	36	36 -	0.2 -	1 -	7 +	4 +	2
VA96-54-326	77	59.3 +	34 -	38	1.4	1 -	3	2 -	1 -
PIONEER 2580(B)	77	57.6 -	33 -	37 -	0.7	2	4 +	3	2
PIONEER 2691(B)	77	57.0 -	30 -	34 -	1.9	1 -	2 -	4 +	2
POCAHONTAS	77	58.9 +	34 -	37 -	0.8	2	4 +	4 +	3 +
PIONEER 26R61(B)	77	60.1 +	33 -	39 +	1.0	2	1 -	3	1 -
PIONEER XW672(B)	76	58.2	35 -	38	1.0	1 -	2 -	5 +	1 -
FFR EXP2704(D)	76	60.1 +	37 +	35 -	2.6 +	1 -	4 +	2 -	2
FSTONE 520(B)	76	60.1 +	35 -	38	2.2	2	4 +	2 -	2
MADISON(B)	75	57.2 -	34 -	39 +	2.0	2	3	3	2
AGRIPRO MASON(B)	74	57.7 -	33 -	39 +	1.5	4 +	0 -	3	2
COKER 9704(D)	74	60.0 +	36	36 -	2.5 +	2	2 -	2 -	2
COKER 9663(D)	74	58.7 +	35 -	42 +	2.2	3 +	0 -	3	1 -
AGRIPRO FOSTER(B)	73	58.7 +	39 +	38	0.5	4 +	3	2 -	2
FSTONE XB98(R)	73	58.3	36	39 +	0.3 -	3 +	4 +	4 +	2
JAYPEE	73	58.6 +	33 -	36 -	2.7 +	3 +	2 -	2 -	1 -
AGRIPRO PATTON(B)	73	57.7 -	36	39 +	0.6	1 -	1 -	4 +	3 +
FFR 522(B)	73	60.1 +	37 +	37 -	1.0	4 +	0 -	2 -	3 +
PIONEER 2643(B)	73	58.8 +	34 -	33 -	0.2 -	1 -	4 +	2 -	2
ARCIA(V)♦	72	54.2 -	26 -	47 +	0.2 -	0 -	0 -	3	1 -
PIONEER 2684(B)	72	59.4 +	32 -	37 -	1.2	3 +	4 +	3	2
FFR 523W(B)	72	57.3 -	36	34 -	2.5 +	3 +	1 -	2 -	3 +
DYNAGRO 422(DA)	72	58.4	35 -	38	0.8	3 +	4 +	4 +	2
USG EXP97-41	71 -	58.6 +	36	39 +	0.5	2	4 +	4 +	2
HTW215(RT)	71 -	56.3 -	37 +	38	0.2 -	4 +	6 +	5 +	2
DYNAGRO 424(DA)	71 -	55.5 -	40 +	39 +	0.5	5 +	1 -	3	3 +

Table 8. Summary of performance of entries in the Virginia Tech Wheat Test, 1999 harvest, continued.*

Brand/Variety	Barley

Brand/Variety	Yield (Bu/A) (6)	Test Weight (Lb) (6)	Date Headed (Mar 31+) (3)	Height (In) (3)	Lodging_ (0.2-10) (1)	Powdery Mildew (0-9)❒ (2)	Leaf Rust (0-9) (3)	Septoria♣ (0-9) (2)	Yellow Dwarf (0-9) (2)
HOFFMAN 37(DARe)	71 -	58.2	36	39 +	0.3 -	3 +	4 +	5 +	2
QUANTUM EH9839(R)	70 -	57.9	40 +	42 +	0.2 -	3 +	0 -	2 -	3 +
KY 86C-61-8(RARe)	70 -	58.0	37 +	38	1.0	7 +	1 -	4 +	2
FFR 555W(B)	69 -	57.7 -	40 +	37 -	0.6	5 +	5 +	2 -	4 +
FFR 566(D)	68 -	58.6 +	38 +	39 +	1.0	1 -	0 -	3	3 +
COKER BL931167(D)	68 -	57.2 -	41 +	38	0.2 -	1 -	0 -	4 +	2
HOFFMAN 95(RA)	67 -	58.8 +	38 +	39 +	0.6	3 +	2 -	3	4 +
CLEMSON 201	67 -	57.9	34 -	38	4.3 +	5 +	0 -	3	1 -
HTW9850(RT)	65 -	58.3	41 +	39 +	0.3 -	2	4 +	2 -	3 +
DYNAGRO 419(DA)	63 -	58.4	40 +	39 +	0.2 -	3 +	3	3	4 +
LSD (0.05)	4	0.4	1	1	1.0	1	1	1	1
Test Average	75	58.1	36	38	1.3	2	3	3	2

* Varieties are ordered by descending statewide averages. The number in parentheses below column headings indicates the number of 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.

♣ Caused by *Stagonospora nodorum.*

♦ Wheat/rye cross (triticale), not a wheat line.

WHEAT PLANTED NO-TILL INTO CORN STUBBLE

Seventy-four varieties/lines of wheat were planted into corn stubble with a Hege plot drill at 30 seeds/row foot on October 22, 1998. Fall fertilization of 30 lb N, 60 lb P_2O, and 100 lb K_2O was applied pre-plant followed by 20 lb N on December 12, 20 lb N on January 28, 30 lb N March 2, and 60 lb N on March 30, 1999. Roundup® was applied preplant and Harmony Extra® was applied at 0.4 oz December 12 and 0.6 oz March 2. Karate® was applied May 6 at 2 oz and Warrior® was applied at 2.56 oz May 17. Powdery mildew, barley yellow dwarf and wheat spindle streak ratings were made on the plots. There was no scab in the plots in this dry season even though the plot area was innoculated with "scabby" grain.

An excellent wheat stand was obtained. However the wheat grew slowly all winter due at least in part to surface soil compaction. The surface texture of this soil is very compactable, being described as "moist but hard at planting". Wheat planted the same time following conventional tillage grew and developed more quickly.

Leaves of wheat varieties susceptible to wheat spindle streak turned reddish-purple and yellow during January and grew very little until the soil warmed in March. Varieties such as Pocahontas with otherwise good yield potential yielded near the bottom in this test due in part to wheat spindle streak and poor root development.

The no-till wheat test results for 1998 and 1999 were so radically different in disease pressure and varietal performance that it was decided to include the 1998 data rather than present two-year averages. The 1998 data gives valuable information on scab incidence and performance when tan spot is significant.

Quantum 706 is the only released wheat that was in the top-yielding group both years. Others in the top third of yields both years include Pioneer Brand 26R61, Pioneer Brand 2643, and Featherstone 520. Virginia Tech breeding lines VA96W-348, VA96W-247, VA96W-250, and VA96-540326 were also among the higher-yielding varieties both seasons. This research will be continued.

Table 9. Summary of performance of entries in the Virginia Tech No-Till Wheat Test at Warsaw, 1999 harvest.*

Brand/Variety	Yield (Bu/A)	Test Weight (Lb)	Date Headed (Mar 31+)	Height (In)	Powdery Mildew (0-9)❐	Wheat Spindle Streak Virus (0-9)	Barley Yellow Dwarf Virus (0-9)
PIONEER 26R61	77 +	61.6 +	29 -	33 +	4	6	1 -
VA96W-348	75 +	57.3 -	31 -	29 -	3 -	5 -	2
TRICAL 498✧	73 +	50.0 -	20 -	38 +	4	3 -	1 -
VA96W-247	73 +	58.5	34 +	29 -	3 -	6	2
VA97W-24	73 +	59.6 +	34 +	32 +	4	5 -	3 +
VA96W-250	71 +	59.0 +	32 -	29 -	4	6	2
VA96W-270	71 +	59.3 +	29 -	32 +	4	3 -	2
QUANTUM 706	70 +	58.5	34 +	33 +	4	6	1 -
VA97W-213	69 +	57.1 -	34 +	27 -	3 -	5 -	1 -
VA97W-533	69 +	59.3 +	35 +	29 -	5 +	8 +	1 -
USG 3209	68	59.3 +	33	27 -	3 -	8 +	1 -
MASSEY	68	59.9 +	32 -	34 +	5 +	4 -	1 -
VA97W-361	68	58.9	33	31 +	4	4 -	2
USG EXP97-20	68	57.4 -	32 -	28 -	3 -	5 -	2
VA96W-158	68	58.6	28 -	32 +	3 -	4 -	2
FSTONE 520	68	61.0 +	34 +	30	4	6	1 -
PIONEER 2643	67	59.8 +	33	26 -	3 -	6	1 -
FFR 555W	67	58.3	35 +	29 -	5 +	5 -	2
VA97W-375	66	58.7	34 +	29 -	3 -	6	2
VA96W-329	66	58.1	34 +	27 -	3 -	6	1 -
VA96-54-326	66	60.3 +	31 -	31 +	4	6	2
MADISON	66	57.5 -	28 -	32 +	5 +	4 -	2
ROBERTS	66	57.8 -	32 -	30	4	7 +	2
QUANTUM 7203	66	59.4 +	34 +	32 +	3 -	6	3 +
ARCIA✧	66	55.2 -	23 -	39 +	3 -	3 -	1 -
HOFFMAN 37	65	58.5	32 -	33 +	5 +	5 -	1 -
COKER 9704	65	60.2 +	32 -	30	4	5 -	2
COKER 9835	65	57.8 -	34 +	27 -	3 -	8 +	1 -
PIONEER 2684	65	60.3 +	30 -	29 -	5 +	6	1 -
AGRIPRO FOSTER	65	58.6	36 +	31 +	4	6	2
VA96W-49	64	59.4 +	29 -	31 +	4	4 -	2
VA96-54-234	64	59.0 +	34 +	29 -	4	5 -	4 +
PIONEER XW674	64	59.5 +	34 +	31 +	4	8 +	1 -
QUANTUM EH9839	64	58.3	37 +	34 +	4	5 -	3 +
JACKSON	63	59.5 +	36 +	31 +	4	7 +	1 -
JAYPEE	63	59.4 +	27 -	29 -	5 +	6	1 -
PIONEER 2691	63	58.3	25 -	28 -	4	6	2
COKER 9663	62	58.8	34 +	34 +	4	7 +	1 -
DYNAGRO 422	62	58.7	33	32 +	5 +	5 -	2
FFR 518	62	58.7	32 -	29 -	3 -	8 +	2
VAN97W-385	61	56.5 -	35 +	29 -	3 -	7 +	3 +
FFR EXP2704	61	60.1 +	35 +	28 -	4	6	1 -
PIONEER 26R46	61	59.2 +	34 +	30	4	8 +	2
VA96W-254	60	57.0 -	33	28 -	3 -	6	3 +
VA97W-677	60	57.0 -	35 +	29 -	4	5 -	1 -
FFR 566	59	58.5	36 +	32 +	3 -	7 +	2
VA96W-403WS	59	55.6 -	36 +	31 +	4	5 -	2
FSTONE XB98	59	58.5	33	31 +	5 +	5 -	1 -
FFR 523W	59	57.7 -	34 +	28 -	5 +	7 +	2
KY 86C-61-8	59	58.5	33	31 +	5 +	5 -	2
CENTURY II	59	59.6 +	34 +	30	4	8 +	2

Table 9. Summary of performance of entries in the Virginia Tech No-Till Wheat Test at Warsaw, 1999 harvest, continued.*

Brand/Variety	Yield (Bu/A)		Test Weight (Lb)		Date Headed (Mar 31+)		Height (In)		Powdery Mildew (0-9)❒		Wheat Spindle Streak Virus (0-9)		Barley Yellow Dwarf Virus (0-9)	
HTW9850	58		59.2	+	37	+	32	+	5	+	5	-	2	
AGRIPRO PATTON	58		58.0	-	35	+	32	+	3	-	5	-	3	+
DYNAGRO 424	58		54.9	-	38	+	31	+	4		6		2	
ROANE	58		59.9	+	37	+	27	-	3	-	8	+	1	-
QUANTUM 7123	58		59.2	+	34	+	33	+	3	-	7	+	3	+
89482E7	58		58.9		34	+	30		4		8	+	1	-
PIONEER 2580	57		57.1	-	34	+	30		4		8	+	3	+
PIONEER XW672	57		58.6		35	+	30		3	-	9	+	2	
USG EXP97-41	57		58.6		34	+	32	+	5	+	6		2	
AGRIPRO MASON	57		58.4		33		32	+	5	+	6		2	
CLEMSON 201	56		58.9		34	+	30		5	+	7	+	2	
USG 3408	56		59.5	+	36	+	29	-	4		9	+	1	-
HTW215	55	-	57.3	-	34	+	28	-	6	+	8	+	2	
FFR 522	55	-	60.2	+	34	+	29	-	4		8	+	3	+
VA96W-342	55	-	60.4	+	33		31	+	4		6		2	
VA96W-56	54	-	58.2		36	+	30		3	-	6		2	
DYNAGRO 419	54	-	59.0	+	36	+	33	+	4		5	-	2	
HOFFMAN 95	54	-	59.0	+	35	+	31	+	4		5	-	4	+
VA96W-391	53	-	58.5		35	+	29	-	4		7	+	2	
VA96W-219	52	-	56.8	-	35	+	31	+	4		8	+	3	+
COKER BL931167	49	-	57.7	-	39	+	29	-	4		9	+	2	
POCAHONTAS	48	-	58.7		34	+	28	-	3	-	9	+	2	
INW 9824	43	-	58.3		36	+	29	-	4		6		3	+
LSD (0.05)	7		0.5		1		1		1		1		1	
Test Average	62		58.5		33		30		4		6		2	

* Varieties are ordered by descending yield averages. A plus or minus sign indicates a performance signigicantly above or below the test average. Plots were no-tilled into corn grain stubble that had been shredded.

❒ 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.

Table 10. 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 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 FUNGICIDE/VARIETY INTERACTIONS

The response of wheat varieties to foliar fungicides at heading varies based on the level of disease present. One of the primary factors affecting disease levels is genetic resistance to diseases such as powdery mildew, leaf rust, tan spot, septoria, etc. These trials were initiated in 1999 to evaluate the genetic yield potential of current wheat varieties when foliar diseases are uncontrolled compared to fungicide treatment at heading. Dry weather resulted in low disease pressure during heading in 1999. Yield changes over locations related to Tilt® application ranged from no difference to 12 bu/acre depending on variety. The response to Tilt® application over varieties averaged a high of 11 bu/acre at Warsaw, 4 bu/acre at Blacksburg, and no yield change at Painter. This test will need to be repeated more years to draw specific varietal conclusions but it does show that all varieties at all locations should **NOT** be treated equally with fungicide. A better approach is scouting using disease thresholds.

Table 11. Yield performance of entries in the Virginia Tech Wheat Test, 1999 harvest (bu/acre), foliar fungicide versus untreated plots at three locations.*

	Blacksburg		Warsaw		Painter		Statewide Average		Difference
Brand/Variety	**Treated**	**Untreated**	**Treated**	**Untreated**	**Treated**	**Untreated**	**Treated**	**Untreated**	
PIONEER XW674	107 +	94	105 +	94 +	118 +	115 +	110 +	101 +	9
89482E7	107 +	105 +	104 +	85 +	114 +	115 +	108 +	100 +	8
VA96W-158	101	91	103 +	83	115 +	113 +	106 +	96 +	10
FFR 518	104 +	91	106 +	89 +	104	112 +	105 +	97 +	8
VA96W-250	109 +	102 +	91	84	115 +	111 +	105 +	99 +	6
VA97W-24	101	109 +	98	85 +	109 +	115 +	103 +	103 +	0
CENTURY II	102 +	89	91	87 +	113 +	116 +	102 +	97 +	5
VA96W-247	105 +	100 +	93	76	109 +	104	102 +	93 +	9
JACKSON	100	95	92	83	111 +	103	101 +	94 +	7
USG 3408	94	93	96	92 +	113 +	109 +	101 +	98 +	3
USG 3209	98	105 +	96	86 +	106	108	100 +	100 +	0
VA97W-213	101	109 +	92	84	106	106	100 +	99 +	1
PIONEER 26R46	93	94	96	98 +	107 +	102	99 +	98 +	1
PIONEER 2580	95	83	94	83	109 +	106	99 +	91	8
QUANTUM 7123	107 +	101 +	94	73	97	103	99 +	92	7
USG EXP97-20	95	92	96	84	106	102	99 +	93 +	6
PIONEER 2691	98	88	92	70	105	104	98 +	87	9
ROBERTS	98	103 +	94	83	101	100	98 +	96 +	2
TRICAL 498	122 +	118 +	82	72	89 -	82 -	98 +	91	7
PIONEER 2643	92	87	91	73	106	102	96	88	8
QUANTUM 7203	95	83	88	75	105	100	96	86	10
ROANE	99	99	90	78	100	95	96	91	5
COKER 9835	97	96	92	76	96	94	95	89	6
FFR EXP2704	97	91	86	75	102	102	95	89	6
PIONEER 2684	87	82	88	77	109 +	106	95	88	7
VA96-54-326	89	90	85	82	109 +	106	95	93 +	2
VA97W-375	100	96	81	83	103	105	95	95 +	0
POCAHONTAS	93	80	83	86 +	106	111 +	94	93 +	1
QUANTUM 706	98	93	89	67	96	102	94	87	7
VA96W-348	90	91	86	90 +	103	100	93	94 +	-1
VA97W-533	93	100 +	84	81	101	101	93	94 +	-1
AGRIPRO PATTON	96	93	68 -	66	108 +	101	91	87	4
COKER 9663	95	92	85	64	92	96	91	84	7
PIONEER 26R61	91	86	79	76	103	106	91	89	2
VA96W-403WS	94	101 +	91	79	87 -	97	91	92	-1
AGRIPRO FOSTER	94	86	82	70	93	90	90	82	8
AGRIPRO MASON	85	86	85	65	101	106	90	86	4
COKER 9704	86	86	87	72	96	104	90	87	3
FFR 522	95	91	79	68	96	94	90	84	6
FSTONE 520	87	81	88	78	96	100	90	86	4
HTW215	86	83	83	71	101	100	90	85	5
JAYPEE	95	83	83	73	92	93	90	83	7

Table 11. Yield performance of entries in the Virginia Tech Wheat Test, 1999 harvest (bu/acre), foliar fungicide versus untreated plots at three locations, continued.*

Brand/Variety	Blacksburg Treated	Blacksburg Untreated	Warsaw Treated	Warsaw Untreated	Painter Treated	Painter Untreated	Statewide Average Treated	Statewide Average Untreated	Difference
MADISON	86	85	87	77	99	100	90	88	2
USG EXP97-41	95	87	84	70	89 -	95	90	84	6
DYNAGRO 422	87	82	84	73	94	95	88	83	5
FFR 523W	88	81	82	73	95	87 -	88	81 -	7
KY 86C-61-8	93	86	84	54 -	89 -	89 -	88	76 -	12
PIONEER XW672	88	84	69 -	82	108 +	111 +	88	92	-4
FFR 555W	90	84	81	56 -	90 -	86 -	87	75 -	12
HOFFMAN 37	87	83	84	72	91 -	90	87	82	5
FFR 566	85	74 -	75	65	99	95	86 -	78 -	8
ARCIA	83 -	85	81	73	91 -	91	85 -	83	2
DYNAGRO 424	94	89	79	64	83 -	85 -	85 -	80 -	5
FSTONE XB98	89	84	79	69	89 -	85 -	85 -	79 -	6
COKER BL931167	79 -	75 -	81	66	85 -	93	82 -	78 -	4
CLEMSON 201	90	76 -	69 -	59 -	83 -	83 -	81 -	73 -	8
HOFFMAN 95	81 -	75 -	71 -	56 -	90 -	89 -	81 -	73 -	8
QUANTUM EH9839	87	85	61 -	55 -	90 -	90	80 -	76 -	4
HTW9850	85	72 -	50 -	39 -	79 -	85 -	71 -	65 -	6
DYNAGRO 419	85	84	41 -	31 -	80 -	83 -	69 -	66 -	3
LSD (0.05)	9	11	13	12	8	10	6	6	
Location Average	93	89	84	73	99	99	92	87	
Treated Statewide Average		92							
Untreated Statewide Average		87							

* Varieties are ordered by descending statewide treated averages. A plus or minus sign indicates a performance significantly above or below the test average. Tilt® at a rate of 4 oz/acre was applied at heading (Feekes Growth Stage 10 or Zadoks 45).

EVALUATION OF 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, USG 3209, Patton, and Quantum 7123. 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 and two Virginia lines were included for comparison. Plots were planted by Dr. Randy Weisz and Dr. Paul Murphy at Kinston, North Carolina, and by Dr. Carl Griffey and Dr. Dan Brann and Mr. Mark Vaughn at Warsaw, Virginia. Data are presented for Warsaw 1999 only. A complete summary of the data over locations and years will be published after completing next years' trials.

The weather in the 1998-1999 wheat growing season favored early planting because there was an early March freeze that damaged early developed tillers only on a few varieties and June turned hot and dry. It must be remembered that the early planted test is also favored because all seed is treated with Baytan® for disease control and Gaucho® for insect control. Timely and late planting would not likely require these seed treatments. The average yield over varieties was 103 bu/acre for planting dates of October 13, 89 bu/acre for November 2, and 70 bu/acre for November 30. This reinforces the yield benefit of fall, early-winter developed tillers that develop deeper root systems before hot weather in the spring.

The only variety that did not yield more when planted on October 13 than on November 2 was Pioneer Brand 2691. This very early variety had a significant number of tillers killed on April 5 by cold temperatures. As the compny stated when they released this variety, "Do not plant it early!" The freeze injury ratings in Table 17 explain why other varieties such as Coker 9663 and Coker 9835 did not produce dramatically higher yields when

planted early. All varieties produced higher yields when planted November 2 than on November 30. The yield reduction when planted later showed a group of varieties with yield reductions of only 16-18 bu/acre such as Pioneer Brand 2691, Roane, and Quantum 7123. This and last years' data indicate that Pioneer Brand 2691, Roane, and Pocahontas may be good varieties to select when planting late.

Seeding rate is also an important consideration. This season studies were initiated to evaluate seeding rates with current varieties. Six varieties or lines were evaluated at 10 compared to 22 seeds/row foot when planted on October 13, 15 versus 22 seeds/row foot when planted on November 2, and 22 versus 30 seeds/row foot when planted on November 30. When planted early, the yield was the same for all varieties when planted at 10 seeds/row foot or 22 seeds/row foot. Early planted wheat has time to develop fall tillers that can produce grain yields equal to main tillers produced from the seed. Thus, select the best varieties and best seed available. If seed costs **per acre** needs to be reduced **seeding rate can be reduced when planting early**. It may also be important to spend additional money when planting early on seed treatments such as Gaucho® that will reduce aphids, barley yellow dwarf, and possibly Hessian fly. When planting extremely early, it may be important to add Baytan® for powdery mildew. The above seed treatments at 10-15 seeds/row foot in a well-prepared seed bed may be more important than higher seeding rates. This seeding rate information would also be important as one considers planting hybrid wheat because of increased cost of seed.

When planted timely (November 2) yields were similar with most varieties at 15 and 22 seeds/row foot. This is to be expected in a warm winter like 1998-1999. This comparison will be interesting over years. When planting late, seeding rate should be increased. This statement agrees with the data this year on most varieties but the yield increase to planting at 30 seeds compared to 22 seeds/ row foot generally was only about 3 bu/acre. More years are needed before drawing major conclusions. Until more data is available increasing seeding rates when planting late continues to be recommended.

Table 12. Yield (bu/acre) of twelve wheat varieties/lines planted early, on time, and late at the Eastern VA AREC at Warsaw, VA in 1998 and harvested in 1999.*

Brand/Variety	Planting Date: Oct 13		Nov 2		Nov 30	
Seeds/row foot❐	10	22	15	22	30	22
COKER 9663	----	87 -	----	82 -	----	63 -
COKER 9835	----	95 -	----	90	----	65
PIONEER 2552	----	110 +	----	87	----	63 -
PIONEER 2684	----	100	----	87	----	64
PIONEER 2691	94 -	90 -	86	90	65	72
USG 3209	108	108	92	93	73	71
POCAHONTAS	112 +	113 +	92	95 +	72	68
VA96W-250	108	110 +	92	93	75	70
ROANE	106	101	82 -	84 -	71	68
PATTON	----	98	----	88	----	68
QUANTUM 7123	106	107	93	90	78 -	74
VA96W-247	----	108	----	88	----	72
LSD (0.05)		6		5		7
Location Average		103		89		70

❐ All lines were seeded at 22 seeds/row foot. Selected lines were seeded at additional rates of 10 seeds/row foot at the October 13 planting, 15 seeds/row foot at the November 2 planting, and 30 seeds/row foot at the November 30 planting.

Table 13. Test weight (lb/bu) of twelve wheat varieties/lines planted early, on time, and late at the Eastern VA AREC at Warsaw, VA in 1998 and harvested in 1999.*

Brand/Variety	Planting Date: Oct 13		Nov 2		Nov 30	
Seeds/row foot❐	10	22	15	22	30	22
COKER 9663	----	58.2	----	58.8 +	----	58.0
COKER 9835	----	56.5 -	----	57.8 -	----	56.8 -
PIONEER 2552	----	59.9 +	----	59.5 +	----	58.8 +
PIONEER 2684	----	58.6 +	----	59.2 +	----	59.3 +
PIONEER 2691	56.0 -	55.5 -	56.3 -	56.8 -	56.5 -	57.1 -
USG 3209	59.2 +	59.6 +	59.7 +	60.3 +	59.5 +	59.6 +
POCAHONTAS	58.3	57.9	57.6 -	57.7 -	58.6 +	58.4
VA96W-250	57.8	57.9	58.4	58.3	58.7 +	58.6 +
ROANE	59.5 +	59.3 +	58.8 +	58.8 +	58.6 +	58.3
PATTON	----	57.6 -	----	57.6 -	----	56.4 -
QUANTUM 7123	58.7 +	58.4	58.6	58.5	58.1	58.2
VA96W-247	----	57.5 -	----	57.6 -	----	58.2
LSD (0.05)		0.5		0.4		0.4
Location Average		58.1		58.3		58.2

❐ All lines were seeded at 22 seeds/row foot. Selected lines were seeded at additional rates of 10 seeds/row foot at the October 13 planting, 15 seeds/row foot at the November 2 planting, and 30 seeds/row foot at the November 30 planting.

Table 14. Heading date (days) from March 31 of eleven wheat varieties/lines planted early, on time, and late at the Eastern VA AREC at Warsaw, VA in 1998 and harvested in 1999.*

Brand/Variety	Planting Date: Oct 13		Nov 2		Nov 30	
Seeds/row foot❐	10	22	15	22	30	22
COKER 9663	----	24 -	----	33 +	----	38 +
COKER 9835	----	25	----	32 +	----	39 +
PIONEER 2552	----	29 +	----	34 +	----	38 +
PIONEER 2684	----	21 -	----	29 -	----	34 -
PIONEER 2691	18 -	18 -	27 -	25 -	33 -	33 -
USG 3209	25	26 +	31	31	36	36
POCAHONTAS	25	24 -	30 -	30 -	36	35 -
VA96W-250	25	25	30 -	30 -	36	36
ROANE	30 +	31 +	36 +	36 +	39 +	38 +
PATTON	----	26 +	----	33 +	----	37 +
QUANTUM 7123	27 +	27 +	32 +	33 +	37 +	37 +
VA96W-247	----	26 +	----	33 +	----	37 +
LSD (0.05)		1		1		1
Location Average		25		31		36

❐ All lines were seeded at 22 seeds/row foot. Selected lines were seeded at additional rates of 10 seeds/row foot at the October 13 planting, 15 seeds/row foot at the November 2 planting, and 30 seeds/row foot at the November 30 planting.

Table 15. Height (inches) of twelve wheat varieties/lines planted early, on time, and late at the Eastern VA AREC at Warsaw, VA in 1998 and harvested in 1999.*

Brand/Variety	Planting Date: Oct 13		Nov 2		Nov 30	
Seeds/row foot❐	10	22	15	22	30	22
COKER 9663	----	40 +	----	41 +	----	36 +
COKER 9835	----	35 -	----	33 -	----	28 -
PIONEER 2552	----	40 +	----	34	----	29
PIONEER 2684	----	36 -	----	35 +	----	31
PIONEER 2691	34 -	33 -	33 -	34	30	30
USG 3209	37	36 -	32 -	33 -	28 -	29
POCAHONTAS	41 +	40 +	35 +	35 +	31	30
VA96W-250	36 -	36 -	32 -	32 -	29	28 -
ROANE	38	36 -	33 -	32 -	29	29
PATTON	----	41 +	----	36 +	----	33 +
QUANTUM 7123	45 +	44 +	37 +	38 +	34 +	34 +
VA96W-247	----	37	----	32 -	----	28 -
LSD (0.05)		2		1		2
Location Average		38		34		30

❐ All lines were seeded at 22 seeds/row foot. Selected lines were seeded at additional rates of 10 seeds/row foot at the October 13 planting, 15 seeds/row foot at the November 2 planting, and 30 seeds/row foot at the November 30 planting.

Table 16. Powdery mildew ratings (0-9) of twelve wheat varieties/lines planted early, on time, and late at the Eastern VA AREC at Warsaw, VA in 1998 and harvested in 1999.*

Brand/Variety	Planting Date: Oct 13		Nov 2		Nov 30	
Seeds/row foot❐	10	22	15	22	30	22
COKER 9663	----	2 +	----	2 +	----	4 +
COKER 9835	----	1	----	3 +	----	3 +
PIONEER 2552	----	1	----	2 +	----	3 +
PIONEER 2684	----	3 +	----	2 +	----	3 +
PIONEER 2691	1	1	1	1	1 -	1 -
USG 3209	1	1	1	3 +	3 +	3 +
POCAHONTAS	1	1	2 +	1	3 +	3 +
VA96W-250	0 -	0 -	1	0 -	0 -	0 -
ROANE	0 -	0 -	0 -	0 -	0 -	0 -
PATTON	----	0 -	----	0 -	----	0 -
QUANTUM 7123	0 -	0 -	1	1	2	1 -
VA96W-247	----	0 -	----	0 -	----	0 -
LSD (0.05)		1		1		1
Location Average		1		1		2

* Ratings indicate relative disease intensity where 0=none and 9= total plant infection.
❐ All lines were seeded at 22 seeds/row foot. Selected lines were seeded at additional rates of 10 seeds/row foot at the October 13 planting, 15 seeds/row foot at the November 2 planting, and 30 seeds/row foot at the November 30 planting.

Table 17. Spring freeze injury (0-9) recorded April 5 of twelve wheat varieties/lines planted early, on time, and late at the Eastern VA AREC at Warsaw, VA in 1998 and harvested in 1999.*

Brand/Variety	Planting Date											
	Oct 13				Nov 2				Nov 30			
Seeds/row foot❐	10		22		15		22		30		22	
COKER 9663	----		4	+	----		1	+	----		0	
COKER 9835	----		6	+	----		3	+	----		0	
PIONEER 2552	----		3		----		0		----		0	
PIONEER 2684	----		3		----		0		----		0	
PIONEER 2691	5	+	6	+	2	+	2	+	0		0	
USG 3209	3		3		0		0		0		0	
POCAHONTAS	3		4	+	1	+	1	+	0		0	
VA96W-250	2	-	2	-	0		0		0		0	
ROANE	2	-	2	-	0		0		0		0	
PATTON	----		2	-	----		0		----		0	
QUANTUM 7123	1	-	2	-	0		0		0		0	
VA96W-247	----		2	-	----		0		----		0	
LSD (0.05)			1				1				0	
Location Average			3				0				0	

* Ratings indicate relative injury intensity where 0=no injury and 9=dead wheat. Injury occurred during the 20-25º F. Nights March 5-9, 1999.

❐ All lines were seeded at 22 seeds/row foot. Selected lines were seeded at additional rates of 10 seeds/row foot at the October 13 planting, 15 seeds/row foot at the November 2 planting, and 30 seeds/row foot at the November 30 planting.