Revised 1996

SMALL GRAINS IN 1996

The following are the small grain variety recommendations for Virginia in 1996. 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[sb]	Callao	Callao	Callao
Nomini[a]	Nomini	Nomini	Nomini
Pamunkey[lb]	Pamunkey	Pamunkey	Pamunkey
Starling[a]	Starling	Starling	Starling
Mollybloom[sb]	Mollybloom	--------	--------
Wheat			
GA-Gore	GA-Gore	----------	----------
Hickory	Hickory	Hickory	Hickory
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
Jackson	Jackson	Jackson	Jackson
FFR 555W	FFR 555W	FFR 555W	FFR 555W
Wakefield*	Wakefield*	Wakefield*	Wakefield*

* These varieties have good yield potential but are susceptible to powdery mildew and must be scouted to determine if a fungicide is needed.

a Awnleted (no beards).

lb Long beards.

sb Short beards.

COMMERCIAL BARLEY ENTRIES

University of Georgia, GA Station, 1109 Experiment Street, Griffin, GA 30223 - Venus, GA-Luttrell.
North Carolina State University and North Carolina Crop Improvement Association, 3709 Hillsborough Street, Raleigh, NC 27607 - Anson, Boone, Mollybloom and Mulligan.
Pennsylvania State University, Department of Agronomy, University Park, PA 16802 - Pennbar 66.
Virginia Tech and Virginia Crop Improvement Association, 9142 Atlee Station Road, Mechanicsville, VA 23111 - Callao, Nomini, Pamunkey, Starling and Wysor.

COMMERCIAL WHEAT ENTRIES

Agripro Seeds, Inc., PO Box 2962, Shawnee Mission, KS 66201-1362 - Clemens, Elkhart, Foster, Hickory, Mason, and Sawyer.
Featherstone Seed Company, 13941 Genito Road, Amelia, VA 23002 - Featherstone 520
University of Georgia, GA Station, 1109 Experiment Street, Griffin, GA 30223 - GA-Gore, GA-Dozier, GA-Stuckey, and Morey. Certified seed of GA-Gore is being produced in Virginia.
Hoffman Seeds, Inc., 144 Main Street, Landisville, PA 17538 - Hoffman 14, Hoffman 95, and Hoffman 89.
Kentucky-American Seeds, Inc., PO Box 1104, Hopkinsville, KY 42240 - Patriot.
Novartis Seeds, Inc., Box 340, Hartsville, SC 29550 - NK Coker 9663, NK Coker 9803, NK Coker 9835, and NK Coker 9904.
Pioneer Hibred International, Inc., Eastern Division, Tipton, IN 47072 - Pioneer Brand 2580, Pioneer Brand 2643, Pioneer Brand 2552, Pioneer Brand 2684, Pioneer Brand 2568, 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 555W, FFR 502W, FFR 568W, and FFR 523W.
Virginia Tech and Virginia Crop Improvement Association, 9142 Atlee Station Road, Mechanicsville, VA 23111 - Massey, Saluda, Madison, Wakefield and Jackson.

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Conducted and summarized by the following Virginia Tech employees: Dr. Daniel E. Brann, Extension Agronomist, Grains; Dr. Carl Griffey, Small Grains Breeder; Ms. Elizabeth Rucker Bender, Research Associate; Mr. Harry Behl, Agricultural Supervisor; Dr. Modan Das, Research Associate; Mr. Tom Pridgen, Research Associate; and Mrs. Judy Keister, Secretary Senior.

Location Supervisors: Mr. Tom Custis and Dr. Bob Baldwin (Painter); Mr. Bobby Ashburn (Holland); Mr. Mark Vaughn, Mr. Bill Sisson, and Mr. Lynn Barrack (Warsaw); Mr. Bill Wilkinson III and Mr. Bud Wilmouth (Blackstone); Dr. Carl Griffey, Dr. Modan Das, and Mr. Tom Pridgen (Blacksburg); Mr. Bill Brockett, Mr. James Williams, and Mr. Gary Hornbaker (Loudoun); Mr. David Starner and Mr. Denton Dixon (Orange).

INTRODUCTION

The attached tables present results from barley and wheat varietal tests conducted in Virginia in 1995-96. 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 1995-96 were grown in seven inch rows planted at 20 seeds per row foot. The plots were trimmed during the winter to either 9 or 12 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 Agri-Pro Seeds, Featherstone Seed, Inc., Hoffman Seeds, Inc., Kentucky-American Seeds, Inc., Northrup King-Coker, Pioneer Hibred International, Inc., Resource Seeds, Inc., Southern States Cooperative, 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. Variety selection is one of the most important steps toward achieving high yields in an economic and environmentally sound manner.

One of the biggest problems reducing the profitability of barley in Virginia is the continued relatively low price compared to other feed grains. Check-off supported research is being conducted by Dr. Julian Brake of the Department of Animal and Poultry Sciences at Virginia Tech to evaluate the feed value of the newer varieties of barley. This information will be beneficial toward the objective of developing barley varieties that have higher market value than current varieties. The test weight of some of the newer varieties is excellent! Excellent test weight indicates plump kernels.

The importance of Virginia's barley breeding program to the state and region is evident in the yield results. Four of the top five yielding lines in 1995-96 were Virginia Tech varieties or lines. One of these lines was a selection advanced to the state test for the first time in 1995.

Nomini continues to demonstrate its tremendous yield potential. It produced the highest yield of released varieties in 1995-96 and over the two year average at all locations (115 bu/acre). Nomini is early, has moderate test weight, and good disease resistance.

Starling, a relatively new Virginia Tech release, 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 was added to the recommended list statewide but will likely show its maximum benefit in the piedmont and mountainous areas. Seed of Starling barley should be available to producers in adequate quantities for fall 1996 planting.

GA-Luttrell, a University of Georgia release, has yielded well the past three years, but it has less than average test weight, has tough beards, and is about the same maturity as Nomini. GA-Luttrell has good disease resistance. The program will continue to evaluate the effect of low test weight barley on markets before GA-Luttrell is added to the recommended variety list.

Callao barley will be available to small grains producers for the first time this fall. It has the BEST test weight of all barley varieties tested. The test weight of Callao was over 50 lbs/bu at four of the six test locations in 1995 and one location in 1996. Callao barley also has one of the most plump, prettiest kernels ever produced east of the Mississippi. This variety will hopefully help develop new and expanded markets for barley. Callao has yielded well at all locations over years but has been about 5 bu/acre less than Nomini. Callao is about one to two days earlier than Nomini, shorter than average and lodges about like Boone. Callao will require the application of Cerone® to keep it standing to achieve its true yield potential. A lodging rating above 5.0 indicates significant harvest problems. Note that the average lodging score was 7.3 for Callao and 7.5 for Boone. Do not plant Callao barley on high-producing, well-fertilized soils without a plan to apply Cerone®.

Pamunkey, a Virginia Tech release, had a relatively poor year again in 1995-96. Its two- and three-year yields are less than average. Pamunkey has long beards that can be difficult to remove in humid weather until the crop is "truly mature". Some producers had problems in the poor weather harvest season of 1995 getting the combine to adequately remove the beards when harvesting as soon as the grain moisture reached 14 percent. Pamunkey does have excellent test weight.

Mollybloom and Mulligan continue to perform similar to Boone under Virginia conditions. They have yielded less than average, lodged more than average and are relatively late.

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.

WHEAT VARIETIES

The 1995-1996 wheat growing season was COLD and WET from planting through heading. The November-December period was 100 growing degree days less than normal. Colder than normal weather continued through March resulting in wheat starting into the jointing stage with only the main stem or one additional tiller, even on timely planted wheat. Lack of tiller development was the major yield limiting factor in most wheat fields this past season. Leaf and head diseases such as glume blotch and scab were also increased by the wetter than normal conditions. Heading was about a week later than last year but individual varieties headed from six to nine days later than last year.

Virginia Tech's wheat breeding program continues to be successful as shown by the fact that eight of the top ten wheat varieties in the 1996 tests were Virginia Tech lines or varieties. The rest of the good news is that private companies continue to breed wheat varieties that are well adapted to Virginia and produce yields matching the 85-100 bu/acre achieved in these tests.

Wakefield demonstrates its high yield potential when aphid populations and barley yellow dwarf infection are low. Other top yielding varieties include Jackson-B ("-B" means that a variety was tested with Baytan seed treatment). Jackson is a relatively new release from Virginia Tech that averaged five bushels above average. Jackson has excellent test weight, medium height and maturity. Jackson produced above average yields and excellent test weights without application of the growth regulator Cerone®. Jackson will produce high yields on many soil types without significant lodging in most seasons. However, when managed to its full yield potential on highly productive soils, Cerone® should be a part of the management plan. Pioneer Brand 2580-B continues to show its excellent yield potential, good standability and early maturity. This variety has been a consistently high yielder over locations and years.

NK Coker 9663 was new in the test for 1996. It yielded average or significatly above average at all locations and produced 88 bu/acre statewide. NK Coker 9663 has excellent test weight. It is taller than average but has good standability. This variety will be available only to seed growers in the fall of 1996. If it performs as well in the 1997 tests, it will be a good variety for producers who want excellent yields, test weight and relatively high straw yields.

Pioneer Brand 2643-B has yielded above average over the past three years but yielded only average in 1995-96. This variety has excellent yield potential but it did not develop and tiller as rapidly as some of the other varieties in this colder than normal winter. Timely planting MAY dramatically increase yields of this variety. Pioneer Brand 2643-B is the "perfect height" for farmers with conventional cutter bar headers that do not sell straw. It has the best standability of all the wheat varieties tested the past three years and excellent test weight.

FFR 555W-B has had above average yields for the past three years and has been in the top group each year. This variety continues to offer opportunities for producers to achieve high yields from a variety with good standability.

Featherstone 520, a new release by Featherstone Seed, Inc. has yielded well over three years of testing. It has excellent test weight, moderate disease and lodging resistance and medium maturity. Seed should be available to producers this fall.

NK Coker 9835-B has been a good yielding variety the past three years, especially when it is Baytan seed treated. Note that Baytan increased the yield by 13, 7, and 5 bu/acre at Blackstone, Holland and Orange, respectively. This variety is shorter than average, has moderate standability, and less than average test weight. Varieties such as NK Coker 9803 continue to yield above 75 bu/acre in Virginia but newer varieties offer the opportunity to obtain an additional 10 bu/acre with similiar inputs.

Other new and potentially promising varieties for 1996 include FFR 523W-B, AgriPro Foster and AgriPro Mason. FFR 523W-B yielded well at all locations and averaged 81 bu/acre statewide. It is a new Southern States release that is early, short with modeate standability, and less than average test weight. Foster and Mason averaged 83 bu/acre statewide, have moderate test weight, and good to excellent standability.

Earliness is one of the characteristics that all farmers want in at least some wheat acreage. Pioneer Brand 2691-B heads about the same time as FFR 523W-B and Mason. However, visual observations of the plots the past two years indicate that Pioneer Brand 2691-B may be ready to harvest slightly earlier than other varieties tested. Pioneer Brand 2691-B is short, has moderate standability and good disease resistance. Test weight has been less than average.

Hessian Fly has been and is present in many wheat fields in Virginia. It has caused economic damage over the years in southwestern, eastern, and the eastern shore regions of Virginia. Hessian Fly has not been a problem in most fields, most years due to delaying of planting until the first fall frost and POSSIBLY due to moderate to low population pressure. Hessian Fly was identified in the spring of 1996 in a number of fields but especially in wheat fields where wheat was planted following double-cropped wheat with only disking or no-till. Note that this wheat would have been planted in November and 1996 was a colder than normal winter. THE POINTS ARE! Hessian Fly is around in Virginia. The predominant race collected from samples across the state in 1989 and the sample from New Kent County in 1996 show that over 70 percent of our Hessian Fly is biotype L and most of the remainder is biotype D. Research by Dr. Roger Ratcliffe at the USDA-ARS Laboratory at Purdue showed that NONE of the varieties currently grown in Virginia have resistance to Biotype L and only Pioneer Brand 2691-B showed seedling resistance to biotype D. Planting wheat into wheat stubble with reduced tillage is risky! Reduce the probability of general Hessian Fly problems by beginning to plant wheat no earlier than one week before the first fall frost.

The two triticale entries (Trical 498 and NC 91-1085) in the test yielded better than average at most locations and over locations. Trical 498 has produced the top average yield over all locations the past three years (89 bu/acre). Triticales are only sold for feed, but they were tested here for comparison and convenience.

SUMMARY OF BARLEY MANAGEMENT PRACTICES FOR 1995-1996

Blacksburg - Planted October 2, 1995. Preplant fertilizer was 25 lbs N, 60 lbs P_2O_5, and 60 lbs K_2O applied September 21, 1995. Harmony Extra® was applied at 0.5 oz/A on November 27, 1995. Sixty lbs N were applied April 12, 1996. Harvest occurred on June 24, 1996.
Blackstone - Planted October 18, 1995. Preplant fertilizer was 500 lbs 6-12-18 and 1 ton lime on October 10, 1995. One-half oz Harmony Extra® was applied on February 26, 1996. One hundred and twenty lbs ammonium nitrate was applied February 27, 1996. Sixty lbs N was applied March 25, 1996. One lb Sevin® 80 S was applied May 8, 1996 for control of cereal leaf beetle. Harvest occurred on June 13, 1996.
Holland - Planted October 26, 1995. Preplant fertilizer was 1000 lbs 5-15-20. One hundred and five lbs N and 0.5 oz Harmony Extra® were applied March 1, 1996. Harvest occurred June 18, 1996.
Painter - Planted October 27, 1995. Preplant fertilizer was 500 lbs/A 5-10-10 October 19, 1995. One hundred lbs N and 0.35 oz Harmony Extra® were applied March 15, 1996. The plots were in a wetter area of the field where water stood on part of the plots during the winter. Loss of the stand during the wet winter season and lodging before head fill resulted in the decision not to harvest these plots.
Warsaw - Planted October 18, 1995. Preplant fertilizer was 30 lbs N, 60 lbs P_2O_5, and 80 lbs K_2O applied October 11, 1995. Harmony Extra® at 0.5 oz was applied December 5, 1995. Sixty-seven lbs N was applied February 1, 1996. Thirty lbs N and 1.5 pts Buctril® were applied in March 1996. Karate® was applied at 2.5 oz on May 4, 1996. Harvest occurred on June 17, 1996.
Orange - Planted October 13, 1995. Preplant fertilizer was 30-60-0 applied September 22, 1995. Sixty lbs N were applied February 26, 1996. Twenty lbs N were applied on reps 1 and 2 on April 8, 1996. Harvest occurred on June 17, 1996.

SUMMARY OF WHEAT MANAGEMENT PRACTICES FOR 1995-1996

Blacksburg - Planted October 2, 1995. Preplant fertilizer was 25 lbs N, 60 lbs P_2O_5, and 60 lbs K_2O. Harmony Extra® was applied at 0.5 oz/A on November 27, 1995. Sixty lbs N were applied April 12, 1996. Harvest occurred on July 10, 1996.
Warsaw - Planted October 18, 1995. Preplant fertilizer was 30 lbs N, 60 lbs P_2O_5, 80 lbs K_2. Harmony Extra® was applied at 0.5 oz on December 5, 1995. Sixty-seven lbs N were applied February 1, 1996. Forty lbs N and 1.5 pts Buctril® were applied in March 1996. Karate® was applied at 2.5 oz on May 4, 1996. Harvest occurred on June 27, 1996.
Painter - Planted October 26, 1995. Preplant fertilizer was 500 lbs 5-10-10 October 19, 1995. One hundred and twenty lbs N and 0.4 oz/A Harmony Extra® were applied March 15, 1996. Harvest was on June 25, 1996.
Holland - Planted October 26, 1995. Preplant fertilizer was 1000 lbs 5-15-20. One hundred and five lbs N and 0.5 oz Harmony Extra® were applied March 1, 1996. Harvest occurred June 18, 1996.
Blackstone - Planted October 18, 1995. Preplant fertilizer was 500 lbs/A 6-12-18 and 1 ton lime on October 10, 1995. One-half oz Harmony Extra® was applied on February 26, 1996. One hundred and twenty lbs ammonium nitrate was applied February 27, 1996. Sixty lbs N was applied March 25, 1996. One lb Sevin® 80 S was applied May 8, 1996 for control of cereal leaf beetle. Harvest occurred on June 19, 1996.
Orange - Planted October 13, 1995. Preplant fertilizer was 30-60-0 September 22, 1995. Sixty lbs N were applied February 26, 1996. Twenty lbs N were applied in April of 1996. Harvest occurred June 26, 1996.
Loudoun - Planted October 12, 1995. Preplant fertilizer was 50 lb urea, 125 lb MAP, and 135 lb potash. By early December, a nearly perfect uniform stand was obtained. Eighty lb N and 0.5 oz Harmony Extra® were applied in February. On this shale-derived soil that is only 15-20" deep, the extraordinarily wet and cold winter resulted in wheat being totally heaved out of the ground. No genetic differences justified harvest so this location was abandoned.

MILLING AND BAKING QUALITY

Quality evaluation has been an important aspect of the wheat breeding program at Virginia Tech and other breeding programs. This new section of the variety evaluation publication is evidence of renewed committment to Virginia being among the best producers of wheat that meets the needs of the milling and baking industry, both in this region and internationally.

The milling and baking quality data presented here and in Table 9 represent data from five 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 among years, data over years and locations is needed to accurately define quality of a given cultivar.

Wheat samples from entries grown in the 1994-95 Virginia Tech Tests at five locations (Blackstone, Holland, 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 from each location. Quality data averaged over the five locations (Over Location Analyses) are presented along with quality data obtained from analyses of a 3000 gram composite consisting of 600 grams from the five locations, which was bulked prior to quality analyses. Milling and baking quality of the entries was compared to an optimal benchmark cultivar Caldwell and with the local check cultivar Massey, which was selected as the standard.

Entries at each of the five locations were analyzed separately for quality, using Massey as the standard check cultivar (No data presented). Average test weights for trials grown at Loudoun, Holland, Painter, Blackstone, and Warsaw were 55.0, 56.6, 56.8, 57.8, and 60.0 lbs/bu. Entries grown at Blackstone and Holland generally scored lower for milling quality, while those from Loudoun scored slightly higher which is surprising considering that this location had the lowest test weight average. Samples from Warsaw generally scored higher for baking quality, which may be partially due to the less-weathered grain with higher test weights.

Milling and baking quality scores averaged over locations showed most entries had acceptable to good scores (Table 9). The cultivars Madison, FFR 523W, FFR 555W, GA-Dozier, VA93-52-60, VA94-52-20, and VA94-52-60 had the highest milling quality scores. Surprisingly, the later two lines had average test weights of 54.5 and 55.1, yet milled well. Madison had significantly higher flour yields than Massey. Pioneer 2580, Pioneer 2691, Morey, and four experimental lines had significantly (L.S.D. = 0.05) lower milling quality scores than Massey. Cultivars Featherstone 520, Coker 9835, Coker 9904, Hickory, Saluda, and Pioneer 2691 had the highest baking quality scores. Morey and VA93-52-60 had significantly lower baking quality scores than Massey.

From analyses of composite samples for each entry, only three entries, Coker 9835, Coker 9904, and VA93-52-60 were similar to or surpassed Massey in milling quality score. Entries having flour yields similar to or higher than Massey were: Coker 9904, FFR 555W, Hickory, GA-Dozier, Elkhart, and VA93-52-60. Entries scoring below "A" for milling quality score had low flour yields. Entries that surpassed Massey in baking quality score were: Coker 9904, FFR 555W, Hickory, Clemens, Featherstone 520, Wakefield, Madison, Pioneer 2643, Sawyer, and Pioneer 2691. Entries scoring "C" or higher for baking quality score were acceptable.