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Measured crop performance

SMALL GRAIN
1962

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PERFORMANCE OF SMALL GRAIN VARIETIES IN NORTH CAROLINA

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INTRODUCTION

Performance tests of small grain varieties are important in that they provide information for growers and agricultural workers to use in evaluating varieties for planting. Evaluation trials are located throughout the small grain producing area of the state and are conducted to determine the value and suitability of commercially available and prospective varieties of wheat, oats and barley for planting in North Carolina.

Seasonal conditions differ from year to year; therefore, a variety which looks superior for one year may not be consistently good, hence, varieties should be evaluated on the basis of performance over several years.

Information on varietal performance is presented from six test locations in the state, three in the Piedmont area and three in the Coastal Plain area. In comparing the performance of varieties, data from the area which most nearly represents the growers' conditions should be used. All available data ^{2/} were used in determining the pathologic and agronomic characteristics of the varieties.

EXPERIMENTAL PROCEDURE

Commercial varieties and experimental lines developed by public and private agencies are included in these tests. Any individual or firm

^{1/} Professor in Charge of Variety Testing, Agricultural Research Supervisor and Agricultural Research Assistant, Department of Crop Science, North Carolina State College, respectively.

^{2/} Special acknowledgment is due Drs. T. T. Hebert and C. F. Murphy for assistance in describing the characteristic of varieties.

may make application for having entries included by writing the Department of Crop Science, North Carolina State College. A fee is charged on an entry basis for all private entries. Personnel of the testing program may include entries about which further information is desired.

Agencies Sponsoring Entries

Arkansas Agricultural Experimental Station	Fayetteville, Ark.
Coker Pedigreed Seed Company	Hartsville, S. C.
Georgia Agricultural Experimental Station	Experiment, Ga.
Indiana Agricultural Experimental Station	Lafayette, Ind.
North Carolina Agricultural Experiment Sta.	Raleigh, N. C.
South Carolina Agricultural Experiment Sta.	Clemson, S. C.
T. W. Woods and Sons	Richmond, Va.
Virginia Agricultural Experimental Station	Blacksburg, Va.

Test Locations

Seven locations were used in 1962 with four in the Piedmont and three in the Coastal Plain as shown in Figure 1. The Iredell County test was discarded due to freeze damage resulting in an extremely poor stand. All tests, except the test in Columbus County on the Border Belt Tobacco Research Station, were located on private farms. ^{1/} A randomized block design with four replications was used at each location. ^{2/} Varieties were planted in three-row plots 16 feet long and the center row was harvested for yield.

Cultural Practices

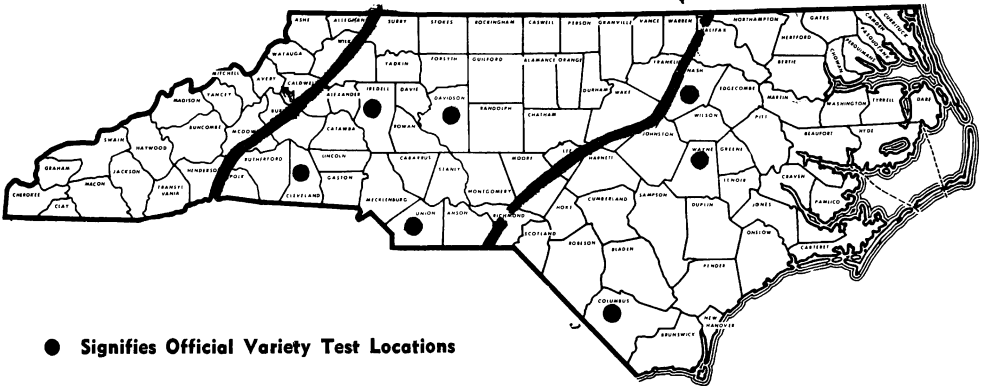
Cultural practices, such as seed bed preparation, date of planting, fertilization and topdressing were in accord with good farming practices and were uniform for all entries at a given location, Table 1. The plots

^{1/} The cooperative spirit and civic-minded service rendered by the farmers who provided land and the necessary cultural practices for these trials and the cooperation of the county agents are gratefully acknowledged.

^{2/} Statistical analysis were made in the statistical Laboratory under the supervision of John O. Rawlins. This assistance is gratefully acknowledged.

FIGURE 1

LOCATION OF SMALL GRAIN PERFORMANCE TRIALS 1962



CO-OPERATORS

PIEDMONT

Davidson County: J. H. Beck, Route 1, Lexington, N. C.
County Agricultural Agent, C. E. Barnhardt.

Iredell County: Allan Morrow, Route 2, Cleveland, N. C.
County Agricultural Agent, Wayne Franklin.

Cleveland County: Worth Spangle, Route 2, Lawndale, N. C.
County Agricultural Agent, H. R. Clapp.

Union County: Brite Baucom, Monroe, N. C.
County Agricultural Agent, Jim Marsh.

COASTAL PLAIN

Columbus County: Whiteville Experiment Station, Whiteville, N. C.
County Agricultural Agent, C. D. Raper.

Wayne County: Wilbert Hall, Route 2, Fremont, N. C.
County Agricultural Agent, G. M. Goforth.

Nash County: W. M. Winstead, Route 3, Nashville, N. C.
County Agricultural Agent, J. P. Woodard.

were hand-harvested, threshed, cleaned and weighed. Di-syston was applied on seed after planting and before covering to aid in control of yellow dwarf.

Seasonal Conditions

The variety test plantings were made under extremely dry conditions and seed germination was slow, taking up to three weeks. However, final stands were fair to good at all locations. The Piedmont tests were planted a little late due to the dry period. A dry spring and early summer throughout the area affected yields.

The Davidson County test was about three weeks coming up due to the extremely dry weather. There was about 10% freeze injury in early February; however, the plants made good growth resulting in moderate yields.

The Cleveland County test also required about three weeks to emerge due to dry weather. Extremely dry weather during the late spring and early summer caused a severe reduction in yields. The average yield of the Cleveland County test was 20 bushels per acre compared with 44 for the Union County test of wheat.

The Iredell County test was around three weeks coming up as a result of the dry weather. About 80% of the oats and 65% of the barley froze during early February and the wheat was severely injured due to the heaving of the soil. Late dry weather further cut the yields so this entire test was discarded.

The Union County test was normal in emerging and made normal growth. Yields were somewhat reduced due to the general dry season through the Piedmont.

The Columbus County test was good for the year. There was a good stand and good growth. Some lodging occurred, particularly in the barley.

The Wayne and Nash County tests varied in coming up from October 27 to December 1 due to the dry period. Yield was affected as a result of the dry early summer on these tests.

The general seasonal conditions were not conducive to good yields; however, the tests in general were representative of the respective areas of production.

RESULTS AND DISCUSSION

The data are presented in tabular form by crop and area showing the performances for 1962 and the previous two and three years. Since environment is very important in determining the genetic potential of a variety it is best to have several years data from which to draw conclusions. Comparisons should be made within a column in a table and not between columns. For example, if a variety appears in the two year average but not in the three year average, then it must be compared only within the two years and not with the data in the three year average, since it is possible that the third year could have been extremely good or poor and not comparable.

The yield data presented in this report have been analyzed statistically and the least significant difference (L.S.D.), in terms of bushels per acre, is given at the bottom of each 1962 yield column. Unless the yield difference between two varieties is greater than the L.S.D., the varieties should not be considered as having yielded differently from each other.

Barley Tests

The performance of barley in the Piedmont is shown in Table 5. The varieties and breeding lines yielded in a rather narrow range and showed

no statistical differences either by individual locations or when combined over locations. Colonial 2, Wade and Davie had the highest three year average yields of the varieties tested. Wade and Rogers had the highest test weight (lbs/bu).

In the Coastal Plain area (Table 6) there were yield differences in 1962, with the varieties Colonial 2, Wade, Rogers and Ga-Jet averaging over 34 bushels per acre. Wade, Rogers and Hudson had test weights in excess of 44 pounds per bushel. When comparing the varieties over three years there was very little difference in yield except that James was lowest. Wade and Rogers had the highest test weights. There were location differences and a variety x location interaction. Varieties failed to respond the same, relative to each other, at the different locations. For example, Rogers, one of the lower yielders at Nash County was the highest yielder at Wayne County. James appeared to be not well adapted to the Coastal Plain area.

Oat Tests

A summary of the oat performance trials in the Piedmont is shown in Table 7. In 1962 Roanoke yielded 54.4 bushels per acre and Moregrain, Carolee, Earlygrain, Sumter and Fairfax yielded over 40 bushels per acre. However when compared over two years Moregrain, Roanoke and Carolee yielded the highest and were equal.

Data from the oat trials in the Coastal Plain are given in Table 8. Sumter led the test in 1962 with a yield of 80.6 bushels per acre. Roanoke, Carolee, Suregrain, and Fairfax yielded above 60 bushels per acre. In the three year period, 1960 - 1962, Carolee and Suregrain topped the tests with yields over 74 bushels. Moregrain, Roanoke and Earlygrain were very close with yields ranging from 64 to 68 bushels per acre.

Wheat Tests

Data on the wheat tests in the Piedmont are presented in Table 9. Of the commercially available varieties all yielded in excess of 30 bushels per acre in 1962 except Anderson and Seneca. All had good test weights in 1962. When compared over the three year period, (1960-1962) all the varieties tested yielded in the same general range and had comparable test weights.

Performance of wheat varieties in the Coastal Plain is shown in Table 10. In 1962 most of the commercially available varieties performed well and quite similar with Anderson, LaPorte and Redcoat being on the lower end of the scale. When considering the three year period, 1960 - 1962 Coker 47-27, Atlas 66, Coker 59-11 and Wakeland yielded essentially the same and slightly above Anderson and Coker 57-6. Test weights followed the same pattern.

Table 1. Cultural practices for small grain tests 1962.^{1/}

Area and cooperator	Fertilizer lbs/A	Topdress ^{2/} lbs/A	Date of planting	Date of harvesting
Piedmont Area				
Davidson Co. J. H. Britt	500 5-10-10	60 N	October 23	June 20
Iredell Co. Allan Morrow	800 5-10-10	60 N	October 23	June 19
Cleveland Co. Worth Spangle	800 5-10-10	45 N	October 24	June 19
Union Co. Brite Baucom	600 10-10-10	30 N	October 20	June 20
Coastal Plain Area				
Border Belt Res. Sta. Wallace Dickens	350 5-10-10	60 N	October 25	June 11
Wayne Co. Wilbert Hall	400, 0-14-14 400, 2-12-12	30 N	October 26	June 18
Nash Co. W. M. Winstead	600 5-10-10	60 N	October 27	June 18

^{1/} Di-syston was applied to the seed after planting and prior to covering to aid in control of yellow dwarf.

^{2/} Ammonium nitrate.

Table 2. Characteristics of barley varieties.*

Variety	Loose smut resistance	Mildew resistance	Rust resistance	Scald resistance	Lodging resistance	Winter hardiness	Maturity	Amount of straw	Test Weight lb/bu.
Colonial 2	Poor	Poor	Poor	Poor	Fair	Fair	Med.	Light	Med.
Davie	Poor	Fair	Excellent	Fair	Fair	Fair	Early	Light	Med.
Wade	Poor	Fair	Excellent	Fair	Good	Fair	Early	Light	High
Early Marconee	Poor	Fair	Poor	Poor	Fair	Fair	Early	Light	Med.
Ga-Jet	Good	Fair	Fair	Fair	Poor	Fair	Very early	Light	Med.
James	Poor	Good	Good	----	Good	Good	Early	Light	Med.
Rogers	Poor	Excellent	Fair	Fair	Good	Good	Late	Light	High
Hudson	Poor	Good	Poor	Excellent	Good	Good	Late	Light	High

Table 3. Characteristics of oat varieties.*

Variety	Rust resistance	Smut resistance	Blight resistance	Mosaic resistance	Maturity	Winter hardiness	Lodging resistance	Amount of straw	Test weight lb/bu.
Arlington	Fair	Good	Poor	Good	Med. late	Good	Fair	Heavy	Med.
Victorgrain 48-93	Fair	Good	Poor	Fair	Med.	Fair	Good	Med.	Med.
Fulwood	Fair	Good	Poor	Fair	Med. early	Good	Good	Light	Med.
Forkedeer	Poor	Poor	Good	Fair	Late	Excellent	Fair	Med.	Med.
Suregrain	Good	Excellent	Good	Poor	Early	Poor	Good	Light	High
Moregrain	Good	Good	Good	Fair	Early	Fair	Good	Light	High
Carolee	Fair	Good	Good	Fair	Med.	Good	Good	Light	Med.
Roanoke	Fair	Poor	Good	Fair	Med. late	Good	Fair	Heavy	Med.
Earlygrain	Poor	Good	Good	Fair	Early	Fair	Good	Light	Med.
Sumter	Fair	----	Good	Good	Med. early	Good	Good	Light	Med.
Fairfax	Fair	Poor	Good	Fair	Med. late	Good	Fair	Heavy	Med.

* These characterizations based upon all available observations.

Table 4. Characteristics of wheat varieties.*

	Leaf rust resist- ance	Mildew resist- ance	Mosaic resist- ance	Maturity	Winter Hardiness	Lodging resist- ance	Height of straw	Test Weight lb/bu.
Atlas 66	Fair	Fair	Poor	Medium	Fair	Good	Med.	Low
Coker 47-27	Fair	Poor	Poor	Medium	Fair	Good	Tall	High
Anderson	Fair	Fair	Fair	Medium	Good	Good	Tall	Med.
Thorne	Poor	Poor	Good	Late	Excellent	Fair	Tall	Med.
Seneca	Poor	Poor	Good	Late	Excellent	Fair	Tall	Med.
Knox	Good	Fair	Good	Early	Good	Good	Short	High
Taylor 49	Fair	Poor	Good	Medium	Good	Fair	Med.	Med.
Wakeland	Fair	Good	Poor	Early	Fair	Good	Short	High
Ace	Good	Fair	Good	Medium	Excellent	Excellent	Med.	Low
LaPorte	Fair	Excellent	Good	Medium	Excellent	----	Med.	Med.
Monon	Excellent	Poor	Good	Early	Excellent	Good	Short	Med.
Redcoat	Excellent	Excellent	Good	Medium	Excellent	Excellent	Med.	Med.
Ga. 1123	Good	Fair	Good	Medium	Fair	Excellent	Med.	Med.
Bledsoe	Fair	Fair	Good	Medium	Excellent	Good	Tall	High
Reed	Excellent	Poor	Good	Medium	Excellent	Good	Med.	High
Dual	Excellent	Poor	Good	Medium	Good	Good	Med.	Med.
Knox 62	Good	Fair	Good	Early	Good	Good	Short	High
Genesee	Poor	Poor	Good	Medium	Good	Fair	Med.	Low

* These characterizations based upon all available observations.

Table 5. Summary of barley performance trials in the Piedmont.

Variety or Line	1 yr. ave. ^{1/} 1962		2 yr. ave. ^{2/} 1961-1962		3 yr. ave. ^{3/} 1960-1962	
	bu/A	lbs/bu	bu/A	lbs/bu	bu/A	lbs/bu
Davie	35.9	37.2	42.0	39.5	47.0	40.6
Coloni	36.6	37.3	48.1	39.6	53.5	40.2
Wade	37.4	42.4	49.5	43.4	47.5	44.3
Calhoun x Bolivia 954 ^{4/}	38.8	39.6	48.4	41.4	51.4	42.4
James	34.8	39.3	43.7	41.6	42.6	41.2
Taylor 502-4255 ^{4/}	40.2	36.2	50.6	39.6	49.8	40.6
Rogers	37.9	44.5	50.7	45.4	42.2	45.2
Early Marconee	42.6	38.6	42.5	39.9		
Ga-Jet	33.2	36.8	40.1	39.0		
Davie x Hudson SC 59-1018 ^{4/}	39.9	41.8				
Davie x (Y 868-Y 506) SC 58-1097 ^{4/}	36.9	36.7				
Y 71 x Y 635-2173 ^{4/}	39.6	36.8				
Davie x (Y 868 - Y 506) 3982 ^{4/}	31.2	41.2				
Hudson	38.8	44.5				
L.S.D. (.05)	N.S.					
(.01)	N.S.					
C. V. (%)	28					

^{1/} Average of Union, Cleveland and Davidson County locations.

^{2/} Average of seven locations.

^{3/} Average of eleven locations.

^{4/} Experimental lines.

Table 6. Summary of barley performance trials in the Coastal Plain.

Variety or Line	1 Yr. ave. ^{1/} 1962		2 Yr. ave. ^{2/} 1961-1962		3 Yr. ave. ^{3/} 1960-1962	
	bu/A	lbs/bu	bu/A	lbs/bu	bu/A	lbs/bu
Davie	28.7	38.7	43.8	39.6	36.2	39.2
Colonial 2	34.9	38.8	49.4	39.0	42.2	38.8
Wade	34.6	44.4	49.2	43.4	43.1	42.2
Calhoun x Bolivia 954 ^{4/}	33.8	40.5	44.8	40.9	39.4	41.5
James	18.8	39.8	33.2	40.6	25.5	40.6
Taylor's 502-4255 ^{4/}	31.2	39.1	47.5	40.3	39.1	39.6
Rogers	37.8	45.8	46.6	43.9	35.6	43.6
Early Marconee	26.9	40.6	38.6	40.4		
Ga-Jet	34.6	36.8	42.7	37.3		
Davie x Hudson SC 59-1018 ^{4/}	33.9	43.8				
Davie x (Y 868-Y 506) SC 58-1097 ^{4/}	27.4	36.3				
Y 71 x Y 635-2173 ^{4/}	34.2	39.1				
Davie x (Y 868-Y 506) 3982 ^{4/}	29.9	41.5				
Hudson	28.4	45.8				
L.S.D. (.05)	6.3					
(.01)	8.4					
C. V. (%)	25					

^{1/} Average of Wayne, Nash and Columbus county locations.

^{2/} Average of six locations.

^{3/} Average of nine locations.

^{4/} Experimental lines.

Table 7. Summary of oat performance trials in the Piedmont.

Variety or Line	1 Yr. ave. ^{1/} 1962		2 Yr. ave. ^{2/} 1961-1962		3 Yr. ave. ^{3/} 1960-1962
	bu/A	lbs/bu	bu/A	lbs/bu	bu/A
Moregrain BRS	48.9	32.4	62.7	34.0	57.1
Arlington	33.2	30.3	44.8	31.8	42.2
Vict. 48-93	38.6	30.8	48.4	32.0	41.2
Roanoke	54.4	31.8	61.7	34.0	56.8
Carolee	44.3	30.2	57.0	31.9	55.2
Fulwood	30.8	29.9	41.5	31.0	40.5
Earlygrain	43.1	29.9	51.4	30.5	44.4
Coker 60-123 (58-6) ^{4/}	49.6	29.7	62.6	32.2	
Coker 60-159 (58-7) ^{4/}	42.7	31.3	58.0	33.2	
Sumter	49.7	29.9	62.6	31.8	
SC 58-332 ^{4/}	48.6	28.8	59.9	31.0	
SC 59-10081-82 ^{4/}	37.3	30.0	55.6	32.2	
SC 59-12702 ^{4/}	38.3	31.2	49.0	32.6	
Coker 61-39 (56-18) ^{4/}	38.2	31.8			
Fairfax	46.2	32.3			
SC 59-12704 ^{4/}	39.4	31.5			
L.S.D. (.05)	9.2				
(.01)	12.2				
C. V. (%)	27				

^{1/} Average of Davidson, Cleveland, and Union County locations.

^{2/} Average of seven locations.

^{3/} Average of eleven locations.

^{4/} Experimental lines.

Table 8. Summary of oat performance trials in the Coastal Plain.

Variety or Line	1 Yr. ave. ^{1/} 1962		2 Yr. ave. ^{2/} 1961-1962		3 Yr. ave. ^{3/} 1960-1962
	bu/A	lbs/bu	bu/A	lbs/bu	bu/A
Moregrain BRS	54.8	36.0	69.5	30.5	67.6
Arlington	44.7	33.3	52.2	32.1	57.4
Vict. 48-93	43.2	33.5	51.1	32.1	52.1
Roanoke	61.8	34.0	70.0	33.8	68.4
Carolee	69.4	33.5	75.8	32.9	76.8
Fulwood	25.4	31.6	42.8	31.8	50.4
Earlygrain	50.1	32.0	59.2	31.4	64.3
Suregrain	60.9	35.2	75.6	38.7	74.0
Coker 60-123(58-6) ^{4/}	62.4	33.9	73.6	34.2	
Sumter	80.6	33.4	88.4	33.8	
Coker 60-159 (58-7) ^{4/}	58.6	36.5			
Coker 61-39(56-18) ^{4/}	60.0	35.5			
Fairfax	65.6	33.8			
SC 58-332 ^{4/}	67.3	33.2			
SC 59-10081-82 ^{4/}	52.4	34.1			
SC 59-12702 ^{4/}	52.4	32.1			
SC 59-12704 ^{4/}	43.0	33.9			
L.S.D. (.05)	12.6				
(.01)	16.7				
C. V. (%)	28				

^{1/} Average of Nash, Wayne and Columbus County locations.

^{2/} Average of six locations.

^{3/} Average of nine locations.

^{4/} Experimental lines.

Table 9. Summary of wheat performance trials in the Piedmont.

Variety or Line	1 Yr. ave. ^{1/} 1962		2 Yr. ave. ^{2/} 1961-1962		3 Yr. ave. ^{3/} 1960-1962	
	bu/A	lbs/bu	bu/A	lbs/bu	bu/A	lbs/bu
Coker 47-27	34.2	57.5	40.0	57.8	38.4	57.8
Atlas 66	31.2	54.6	37.9	55.6	37.0	55.6
Coker 59-11 ^{4/}	32.8	56.3	38.2	57.0	36.6	56.6
Wakeland	35.4	56.0	40.6	56.6	40.1	56.8
Anderson	25.0	54.1	35.1	56.0	36.8	57.0
Taylor 49	31.8	55.4	39.8	56.0	39.7	56.2
Dual	33.8	55.0	39.0	55.6	38.2	55.9
Knox	35.8	57.6	39.4	57.7	37.5	57.8
Seneca	28.9	56.6	36.6	57.0	36.6	57.3
Thorne	32.6	55.6	38.1	55.8	37.6	55.8
Coker 57-6 ^{4/}	36.0	57.7	41.7	58.0		
LaPorte	31.9	56.6	37.4	56.8		
Monon	31.1	55.9	38.6	56.0		
Redcoat	33.8	56.0	37.2	56.1		
Ga. 1123	38.8	55.2	45.9	55.8		
Ace	35.5	54.4				
Bledsoe	34.4	58.0				
Reed	36.2	57.0				
Knox 62	31.2	57.7				
Genesee (N.C.)	30.4	54.3				
Genesee (Mich.)	33.6	53.9				
L.S.D. (.05)	4.5					
(.01)	5.9					
C. V. (%)	17					

^{1/} Average of Union, Cleveland and Davison County locations.

^{2/} Average of seven locations.

^{3/} Average of eleven locations.

^{4/} Experimental lines.

Table 10. Summary of wheat performance trials in the Coastal Plain.

Variety or Line	1 Yr. ave. ^{1/} 1962		2 Yr. ave. ^{2/} 1961-1962		3 Yr. ave. ^{3/} 1960-1962	
	bu/A	lbs/bu	bu/A	lbs/bu	bu/A	lbs/bu
Coker 47-27	37.6	57.4	35.5	56.8	37.8	57.9
Atlas 66	37.5	55.2	36.5	55.4	37.4	56.6
Coker 59-11 ^{4/}	36.8	57.3	35.1	57.4	38.0	58.2
Wakeland	38.8	56.8	37.0	57.2	38.8	58.2
Anderson	34.8	56.1	35.0	54.9	34.5	56.5
Taylor 49	40.9	55.0	34.4	54.4	34.0	55.7
Coker 57-6 ^{4/}	40.8	57.0	41.8	56.4		
LaPorte	35.0	56.3	35.2	55.4		
Monon	35.6	56.6	30.6	56.0		
Redcoat	27.5	54.5	32.9	54.6		
Ga. 1123	42.3	56.7	39.4	56.4		
Ace	41.6	54.5				
Bledsoe	38.4	56.9				
L.S.D. (.05)	6.7					
(.01)	8.9					
C. V. (%)	22					

^{1/} Average of Wayne, Nash and Columbus County locations.

^{2/} Average of six locations.

^{3/} Average of nine locations.

^{4/} Experimental lines