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Measured crop performance

Part I Cotton Varieties
Part II Soybean Varieties
1963

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PERFORMANCE OF COTTON AND SOYBEAN VARIETIES IN NORTH CAROLINA

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Information on cotton and soybeans is important to the same general areas of production in North Carolina, that is, the Coastal Plain and Piedmont areas. The results of tests on each of these crops are compiled in one bulletin for easy assessability.

The bulletin is divided into two parts according to these crops. Part I is concerned with Cotton, whereas Part II deals with Soybeans. Each part is complete in that it contains information on experimental procedure, locations of the tests, discussion of the data, and the data for 1963. Summary tables for the past two and three years for cotton are also presented. Soybeans have been tested only one year in this program; therefore, only data for 1963 are presented in this report.

The increase in the number of varieties available for planting makes it mandatory that information be available to growers, seedsmen and agricultural workers so that comparisons can be made to determine the usability of these new varieties.

Part I

COTTON VARIETIES

Cotton has been a major agricultural crop in North Carolina for many years. It is becoming increasingly more important as efficiency of production increases. Higher yielding varieties are playing an important role in helping to make cotton production more profitable.

Through the continued efforts of plant breeders, more varieties are being developed to suit the various environmental conditions and production systems which are present in North Carolina. The variety picture has

changed notably within recent years and indications are that this trend will continue. Today, several high yielding varieties are available for planting. Varieties with more disease resistance are being developed which will be beneficial to North Carolina cotton producers.

The cotton producer thus has a choice of varieties for planting, and his success in production may be influenced considerably by his selection. Choice of variety is influenced not only by production potential, but also by suitability for mechanical harvesting, earliness of maturity, quality of fiber, storm resistance, and disease resistance.

This report provides information on the performance of commercial varieties and experimental lines grown in various geographical areas of the state. This information serves as a guide to cotton breeders in their future development of varieties, to agricultural workers, and to growers for use in choosing a variety to plant.

The results of the North Carolina Official Cotton Variety Trials for the 1963 season, and summaries of the tests conducted during the past three years are presented in this report.

EXPERIMENTAL PROCEDURE

Experimental lines and commercial varieties developed by public and private agencies are included in this report. One requirement for acceptance is quantitative data from experiments in which the proposed entry is compared with recognized varieties. These data must reveal meritorious performance in order for a variety to qualify for the tests.

Any individual or firm may make application for having entries included. A fee is charged on an entry basis. Personnel of the testing program may include entries about which further information is desired.

Agencies Sponsoring Entries

Arkansas Agricultural Experiment Station, Fayetteville, Arkansas

Auburn 56 Pedigreed Seed Association, Troy, Alabama

Bobshaw Pedigreed Seed Company, Indianola, Mississippi

Coastal Plain Experiment Station, U.S.D.A., Tifton, Georgia

Coker's Pedigreed Seed Company, Hartsville, South Carolina

DeKalb Agricultural Association, Inc., Bogart, Georgia

Delta and Pine Land Company, Scott, Mississippi

Empire Pedigreed Seed Company, Haralson, Georgia

McNair Seed Company, Laurinburg, North Carolina

North Carolina Agricultural Experiment Station, Raleigh, N. C.

Test Locations

Four locations were used in 1963 with two in the Coastal Plain Area and two in the Piedmont as shown in Figure 1. Three of the tests were located on private farms[1/] and the fourth was on an experiment station.

Seasonal Conditions

The 1963 growing season was characterized by unfavorably cool weather conditions at planting time. As a result of the cool temperature, seed emergence was very poor and all tests had to be planted a second time. Some were planted three times before an adequate stand was obtained; consequently, the yields were affected by the late planting date.

The Edgecomb County test was planted three different times before an adequate stand was obtained. The growing season was fair for production

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1/ The co-operative spirit and civic-minded service rendered by the farmers who provided land and the necessary cultural practices for these trials and the co-operation of the County Extension Chairmen are gratefully acknowledged.

Figure 1. Locations of N. C. Cotton Trials

Scotland County

Gilchrist Farms, A. F. McMillan, Manager, Laurinburg, N. C.
Scotland County Extension Chairman J. B. Caudill.

Union County

R. W. Howey, Waxhaw, N. C.
Union County Extension Chairman J. A. Marsh.

Rutherford County

Van McDaniels, Ellenboro, N. C.
Rutherford County Extension Chairman J. A. Crawford.

Edgecombe County

Upper Coastal Plain Research Station
Clyde McSwain Supt., Rocky Mount, N. C.
Edgecombe County Extension Chairman J. C. Powell.

of cotton, once a stand was obtained. The yields were good for the test considering the lateness of planting and the amount of rainfall in this area. No rain during the harvest period was beneficial in that more of the late bolls opened.

Three plantings were required in Scotland County to obtain an adequate stand. The growing season was good following emergence of the plants. A good harvest period also improved the yields in this county.

The Rutherford County test was planted twice. A good stand was obtained the last planting and a good growing season followed. The lateness of planting hurt the yield at this location more than the seasonal conditions which followed.

The Union County test had very dry weather conditions during the fruiting period, which adversely affected the yields. The dry weather conditions, plus two different plantings required to obtain a stand, resulted in this being the poorest of the tests conducted in 1963.

Cultural Practices

Cultural practices, such as seed bed preparation, date of planting, fertilization, cultivation and insect control measures were in accord with good farming practices. These are listed for each test in Table 1. Planting, harvesting and yield measurements were directly supervised by personnel of the North Carolina Agricultural Experiment Station. All tests were harvested mechanically except the Rutherford County test which was hand picked. Due to a large number of unopened bolls at the first picking, the Edgecombe County test was picked a second time by hand.

Criteria for Evaluating Cotton Varieties

A randomized block design with six replications was used at each

location.[2] Plot size at all locations was two rows 27 feet long. Row spacing varied at each location as shown in Table 1.

Table 1. Cultural practices for cotton performance trials.

Area and co-operator	Fertilizer lbs/A	Herbicide pre-emerge	Row spacing in.	Date of last planting	Date of harvest
Scotland County A.F. McMillian	700 Drill 5-10-10 Cotton Special 250 10-20-20	Karmex	40"	June 4	Dec. 5
Upper Coastal Plain Research Station Clyde McSwain, Supt. Rocky Mount, N. C.	500 10-20-20		36"	May 24	Nov. 19 Dec. 11
Union County R. W. Howey	500 10-20-20	Karmex	38"	May 9	Oct. 28
Rutherford County Van McDaniels	250 10-20-20	Karmex	40"	June 3	Dec. 4

Yield of Seed Cotton: The plots were harvested individually and average pounds of seed cotton per acre were calculated.

Yield of Lint: This was calculated using the lint percentage of each plot and converting the pounds of seed cotton per plot to pounds of lint per acre.

Lint Percentage: A 50 boll sample was taken from each plot at each location. The weight of lint ginned from this sample of seed cotton was expressed as a percentage of the weight of seed cotton.

Staple Length:[3] A Federal Cotton Inspector determined the staple length on the ginned samples of each plot.

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[2] Statistical analyses were made in the Statistical Laboratory under the supervision of John O. Rawlings. This assistance is gratefully acknowledged.

[3] Acknowledgement is given to the Cotton Division, Agricultural Marketing Service, U.S.D.A., Raleigh, North Carolina, for making staple length determinations.

Bolls per Pound of Seed Cotton: The number of bolls required to make one pound of seed cotton was determined by weighing the 50 boll samples from each plot at each location and converting it to a pound basis.

Span Length: The length which a certain percentage of fibers from the original fiber population would span when caught at random along the length of the fiber.

Uniformity Ratio: Ratio of 50% span length to 2.5% span length.

Micronaire: The micronaire test is a test for fineness of the fiber. The micronaire instrument is used to measure the resistance to the passage of air through a 50 grain sample of cotton compressed to a given volume.

Causticaire: This is a test of maturity of the fiber.

Tensile Strength: This indicates the tensile strength of the fiber in pounds per square inch.

Key to Fiber Test Results

Fibrograph (Uniformity Ratio)	Micronaire (fineness - micrograms/in.)
45 and above - Uniform	2.9 and below - Very fine
40 - 44.9 - Average	3.0 - 3.9 - Fine
39.9 and below - Irregular	4.0 - 4.9 - Average
	5.0 - 5.9 - Coarse
	6.0 and above - Very coarse
Causticaire (Maturity Index)	**Pressley (Tensile Strength, 1000 psi)**
81 and above - Mature	96 and above - Very strong
76 - 80 - Average	86 - 95 - Strong
70 - 75 - Immature	76 - 85 - Average
69 and below - Very immature	66 - 75 - Fair
	65 and below - Weak

The operations and measurements required for the development of data on yield and such other agronomic characters as boll size and lint percentage

were performed by personnel at the experiment station. Fiber samples from three replications at all locations were sent to the North Carolina Department of Agriculture, Markets Division, Engineering Section for analyses[4/].

RESULTS

Varietal performance may vary from year to year and annual results may seem inconsistant; therefore, performance data obtained over a period of years are more reliable thanfor any one year.

The data presented in Tables 2 and 3 are summary data for various years and locations and indicate how varieties have been performing over a period of years at various locations. A three year average performance is shown for lines and varieties in Table 2. Four of the eight varieties tested over a three year period averaged over 700 pounds of lint per acre. These were: DeKalb 108A, DeKalb 108, DeKalb 108D and Coker Carolina Queen.

In Table 3 entries are compared which have been in the tests for the past two years. Nine of the ten varieties tested yielded close to 700 pounds or more of lint per acre. The range in yield of these entries was very narrow. There was little difference in lint percent for the varieties tested. The range was from 34.8 for Auburn 56 to 36.8 for Coker Carolina Queen. Bolls per pound of seed cotton ranged from 60 to 76 for Dixie King and Stoneville 7A, respectively.

The data in Table 4 are a summary of the three locations tested in 1963. The experimental line Coker Carolina Queen 61-230 was at the top of the test on yield of lint, although there were no statistical differences in any of the entries. The varieties Coker Carolina Queen 61-230, Coker Carolina Queen 12901, McNair 60-1032 and Coker 801-61 had yields of lint

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4/ Fiber analysis was made in the Markets Division, Engineering Section, N.C.D.A., under the supervision of Charles B. Elks. The assistance of Mr. Elks and his staff is gratefully acknowledged.

in excess of 700 pounds. There were differences in lint percent and staple length for the varieties. Lint percent for all varieties ranged from 33.0 to 38.4. Bolls per pound of seed cotton ranged from 62 to 89.

Fiber properties, Table 4, are also presented in this report from three replications each of the four tests. Each of these properties are important to the cotton mills and should be studied as they relate to varieties. For example, tensile strength, "Pressley", indicated that Atlas 61-107 had a strong fiber although its yield is only moderate. Most varieties and lines showed good uniformity for fiber length. Varieties also differed for fiber elongation and micronaire. Fiber properties are important to the manufacturer and should be considered in choosing a variety for quality.

Individual location data are presented in Tables 5, 6, 7, and 8. Although there were statistical differences for most characters in the individual locations, the performance of a single location can be misleading. For example, there was a highly significant variety X location interaction for lint pounds and pounds of seed cotton. This indicates that varieties failed to respond the same from location to location. There is no definite pattern from location to location, so it would be more reliable to use the data averaged across locations in deciding what variety to plant.

In selecting a variety for planting, characteristics that influence a profitable production should be studied. Amount of lint produced per acre is an important criterion, yet the variety should be resistant to prevalent diseases, particularly fusarium wilt. If the cotton is to be mechanically harvested, then it should mature uniformly and be compact. Seed quality is most important to the successful production of cotton.

Weak seed do not perform well under adverse weather conditions at planting time. Other plant characteristics considered in selecting a variety of cotton are storm resistance, plant type and boll size. Lint characteristics, such as staple length, gin turnout, and fiber quality affect prices, harvesting costs and market demands.

Table 2. Summary of cotton performance trials. Three year average - 1961-1962-1963. Average of 10 locations.

Variety or line	Lint Lbs/A	Seed cotton Lbs/A	Lint %	Staple length in.	Bolls/lbs of seed cotton
DeKalb 108A	734	2086	35.5	1 3/32	65
DeKalb 108	720	2074	34.9	1 1/8	63
DeKalb 108D	712	1967	36.3	1 3/32	62
Coker Carolina Queen	703	1964	35.9	1 3/32	70
Auburn 56	678	1957	34.2	1 3/32	69
Rex	678	1941	35.7	1 1/8	61
Mean of Test	673	1907	35.6	1 3/32	68
Coker 100A	670	1912	35.4	1 3/32	70
Dixie King	654	1823	36.3	1 3/32	59

Table 3. Performance of cotton varieties. Two year average - 1962 - 1963. Average of 7 locations.

Variety or line	Lint Lbs/A	Seed cotton Lbs/A	Lint %	Staple length in.	Bolls/lbs of seed cotton
Coker Carolina Queen	788	2160	36.8	1 1/8	74
DeKalb 108A	742	2098	35.8	1 1/8	68
DeKalb 220	738	2052	36.3	1 1/8	68
DeKalb 108D	738	2052	36.2	1 1/8	66
DeKalb 108	734	2074	35.6	1 1/8	65
Dixie King	726	2016	36.6	1 1/8	60
Auburn 56	706	1997	34.8	1 3/32	72
Rex	703	2016	36.0	1 1/8	64
Mean of Test	693	1950	36.0	1 1/8	70
Coker 100A	687	1944	35.9	1 1/8	74
Stoneville 7A	595	1671	36.6	1 1/8	76

Table 4. Performance of cotton varieties. Average of four locations - Rutherford, Union, Scotland and Edgecomb Counties - 1963.

Variety or line	Lint lbs/A	Seed cotton lbs/A	Lint %	Staple length in.	Bolls/lb. of seed cotton	Fiber Properties: Span Length 66.7% (expressed in in.)	Span Length 50% (expressed in in.)	Span Length 2.5% (expressed in in.)	Uniformity Ratio	Micronaire	Causticaire Maturity Index	Tensile Strength "Pressley"
Coker Carolina Queen 61-230	744	1972	38.4	1 3/32	79	38	50	1.08	46	4.8	80	79.2
Coker Carolina Queen 12901	715	1915	38.2	1 3/32	79	38	50	1.06	47	4.8	80	79.4
McNair 60-1032	703	1965	36.2	1 1/16	79	38	50	1.04	48	4.7	81	84.1
Coker 801-61	700	2006	35.6	1 3/32	70	38	50	1.12	44	4.4	78	83.3
Dixie King	699	1934	37.0	1 3/32	64	38	50	1.05	48	4.6	80	82.4
Dixie King 48C-6374	695	1877	37.7	1 1/16	73	37	48	1.04	46	4.7	80	82.2
Coker Carolina Queen	686	1890	36.9	1 3/32	79	39	52	1.10	47	4.7	80	81.6
Rex	682	1963	35.8	1 3/32	71	37	49	1.07	46	4.2	76	78.0
DeKalb 108	672	1934	35.2	1 3/32	68	39	50	1.09	47	4.4	78	80.5
DeKalb 108D	669	1922	35.4	1 3/32	65	39	52	1.10	46	4.4	77	81.7
DeKalb 220	662	1894	35.8	1 3/32	72	38	50	1.08	46	4.4	78	81.0
Mean of Test	658	1870	35.9	1 3/32	74	38	50	1.08	46	4.4	78	81.9
Empire BBR 18SL	556	1617	35.0	1 3/32	70	37	50	1.07	46	4.2	76	80.6
Rex SLL	649	1907	34.9	1 3/32	67	38	50	1.08	46	4.3	77	79.5
Stoneville 7A	646	1877	35.5	1 3/32	81	38	50	1.08	46	4.5	79	81.5
Coker 60-111	643	1853	35.7	1 3/32	73	40	52	1.12	47	4.2	78	79.6
Empire W.R.-61	637	1834	35.4	1 3/32	62	38	51	1.09	46	4.2	76	81.9
Atlas x AHA x Th-61-123	637	1871	34.7	1 3/32	73	39	51	1.08	47	4.6	80	88.4
DeKalb 108A	636	1829	35.4	1 3/32	72	39	50	1.10	46	4.5	79	81.7
Deltapine 7139	634	1774	36.6	1 3/32	81	39	51	1.08	47	4.4	78	78.3
Auburn 56	626	1830	34.9	1 1/16	74	38	50	1.07	46	4.5	79	79.9
Atlas 61-107	625	1934	33.0	1 3/32	73	39	51	1.05	48	4.5	80	95.8
Coker 100A (WR)	624	1771	36.0	1 3/32	76	40	52	1.12	46	4.4	78	79.5
Coker 100A 60-64	623	1729	36.6	1 3/32	77	39	52	1.12	46	4.6	80	81.2
Coker 61-4123	618	1777	35.8	1 3/32	89	40	51	1.12	47	3.9	74	84.4
L.S.D. (.05)	NS	NS	.9	.4/32	4							
(.01)	NS	NS	1.2	.5/32	5							
C. V. (%)	16	15	3	2	7							

Table 5. Performance of cotton varieties - Union County - 1963.

Variety or line	Lint lbs/A	Seed cotton lbs/A	Lint %	Staple length in.	Bolls/lb. of seed cotton	Fiber Properties: Span Length 66.7% (expressed in in.)	Span Length 50% (expressed in in.)	Span Length 2.5% (expressed in in.)	Fiber Properties: Uniformity Ratio	Fiber Properties: Micronaire	Fiber Properties: Causticaire Maturity Index	Fiber Properties: Tensile Strength "Pressley"
Coker Carolina Queen 61-230	599	1403	42.6	1 1/32	85	35	45	.99	46	5.7	85	80.5
Stoneville 7A	550	1359	41.4	1 1/32	84	34	44	.95	46	5.5	85	80.5
McNair 60-1032	541	1372	39.4	1 1/32	85	34	45	.96	46	5.5	86	87.0
Rex	522	1272	41.1	1 1/32	75	32	42	.94	44	5.3	83	80.9
Coker 100A 60-64	515	1247	41.3	1 1/32	83	34	45	1.00	45	5.3	85	84.3
Coker Carolina Queen 12901	514	1200	42.9	1 1/32	83	32	42	.92	46	5.8	87	80.3
DeKalb 108	513	1287	39.9	1 1/32	75	35	45	.99	46	5.3	84	83.0
Dixie King	513	1238	41.5	1 1/32	71	33	43	.94	46	5.4	85	83.2
Coker 100A (WR)	504	1244	40.5	1 1/32	81	37	48	1.01	48	5.2	83	80.1
DeKalb 108A	500	1244	40.1	1 1/32	77	34	44	.99	45	5.4	85	83.7
Coker Carolina Queen	492	1208	40.7	1 1/32	85	35	46	1.01	45	5.7	86	81.4
Rex SLL	491	1214	40.5	1 1/32	73	32	42	.95	44	5.3	84	80.9
DeKalb 108D	488	1234	39.3	1 1/32	71	36	46	1.00	46	5.3	84	83.3
DeKalb 220	479	1176	40.7	1 1/32	80	34	45	.97	46	5.3	84	83.5
Mean of Test	479	1191	40.3	1 1/32	80	34	45	.98	46	5.4	85	83.0
Empire W.R.-61	477	1199	40.0	1 1/32	68	33	44	.98	45	5.3	85	83.7
Coker 801-61	470	1174	40.0	1 1/32	80	33	44	1.01	43	5.3	84	85.2
Deltapine 7139	469	1166	40.9	1 1/16	88	35	46	1.00	47	5.3	85	77.1
Auburn 56	458	1185	38.7	1 1/32	79	33	44	.95	46	5.1	83	81.7
Atlas x AHA x Th-61-123	448	1164	38.5	1 1/32	79	36	46	.98	47	5.4	85	85.1
Dixie King 48C-6374	423	1016	41.4	1 1/32	81	33	42	.92	46	5.5	86	83.2
Atlas 61-107	416	1147	36.8	1 1/16	81	35	46	.94	49	5.4	87	96.0
Empire BBR 18SL	397	1002	39.5	1 1/32	77	35	46	.99	46	5.2	85	82.0
Coker 61-4123	380	996	39.8	1 1/32	103	36	48	1.02	47	4.7	82	85.8
Coker 60-111	328	828	39.6	1 1/32	77	34	45	.99	46	5.3	85	79.8
L.S.D. (.05)	87	203	1.3	N.S.	7							
(.01)	115	269	1.7	N.S.	9							
C. V. (%)	16	15	3	1	8							

Table 6. Performance of cotton varieties - Rutherford County - 1963.

Variety or line	Lint lbs/A	Seed cotton lbs/A	Lint %	Staple Length in.	Bolls/lb. of seed cotton	Fiber Properties						
						Span Length 66.7% (expressed in in.)	Span Length 50% (expressed in in.)	Span Length 2.5% (expressed in in.)	Uniformity Ratio	Micronaire	Causticaire Maturity Index	Tensile Strength "Pressley"
McNair 60-1032	663	1771	37.4	1 1/8	84	40	52	1.06	50	4.2	78	80.2
Coker 801-61	655	1816	36.1	1 5/32	70	40	53	1.16	45	3.8	73	80.1
Atlas x AHA x Th-61-123	647	1823	35.6	1 5/32	77	40	52	1.10	47	4.0	75	88.2
Coker Carolina Queen 61-230	643	1656	38.9	1 5/32	81	39	52	1.11	47	4.0	74	77.4
Atlas 61-107	624	1834	34.0	1 5/32	76	42	55	1.09	50	3.6	73	94.3
DeKalb 108D	604	1710	35.4	1 5/32	64	41	54	1.14	47	3.7	72	80.0
Coker Carolina Queen	594	1589	37.1	1 5/32	78	43	57	1.15	49	4.1	76	80.1
Deltapine 7139	590	1626	36.4	1 5/32	84	41	54	1.11	48	3.5	71	76.2
Coker 61-4123	586	1590	36.8	1 5/32	85	40	53	1.13	46	3.3	70	77.5
DeKalb 108	572	1637	34.3	1 5/32	66	40	52	1.12	47	3.9	72	77.5
Dixie King 48C-6374	568	1510	37.5	1 1/8	73	38	50	1.06	47	4.0	76	80.4
Coker Carolina Queen 12901	566	1477	38.3	1 5/32	83	40	52	1.10	48	3.7	73	79.3
DeKalb 108A	549	1524	35.8	1 5/32	72	40	53	1.14	47	3.7	73	80.7
Mean of Test	546	1512	36.0	1 5/32	74	40	53	1.12	47	3.6	73	79.5
Stonville 7A	521	1434	36.2	1 5/32	88	38	51	1.12	46	3.7	73	78.7
Rex	521	1465	35.5	1 5/32	69	40	53	1.11	48	3.7	72	75.2
Rex SLL	515	1509	34.1	1 5/32	63	40	53	1.13	47	3.8	74	73.9
Auburn 56	492	1390	35.3	1 5/32	75	39	52	1.10	47	4.1	76	78.2
Dixie King	490	1317	37.4	1 5/32	64	39	51	1.06	48	3.9	74	78.8
Empire W.R.-61	485	1396	34.7	1 5/32	58	41	53	1.12	47	3.6	73	78.3
Coker 100A 60-64	460	1273	36.0	1 5/32	78	42	55	1.14	48	3.9	75	79.8
DeKalb 220	450	1272	35.4	1 1/8	74	40	54	1.14	48	3.8	73	78.5
Empire BBR 18SL	450	1297	34.6	1 5/32	66	38	51	1.10	46	3.4	70	77.4
Coker 100A (WR)	448	1208	36.6	1 1/8	80	41	54	1.16	46	3.8	74	77.1
Coker 60-111	417	1171	35.6	1 1/8	76	42	55	1.15	48	3.5	71	79.2
L.S.D. (.05)	128	329	1.7	.9/32	6							
(.01)	170	436	2.3	1.2/32	7							
C. V. (%)	19	17	4	2	6							

Table 7. Performance of cotton varieties - Scotland County - 1963.

Variety or line	Lint lbs/A	Seed cotton lbs/A	Lint %	Staple length in.	Bolls/lb. of seed cotton	Fiber Properties: Span Length 66.7% (expressed in in.)	Span Length 50% (expressed in in.)	Span Length 2.5% (expressed in in.)	Uniformity Ratio	Micronaire	Causticaire Maturity Index	Tensile Strength "Pressley"
Coker 60-111	894	2608	34.2	1 3/32	66	43	56	1.20	47	4.5	81	81.0
Coker Carolina Queen 61-230	854	2308	37.0	1 1/16	74	39	52	1.14	46	5.0	82	80.0
Dixie King 48C-6374	833	2274	36.6	1 1/16	69	41	54	1.15	47	5.0	82	83.0
DeKalb 220	829	2428	34.2	1 1/16	67	39	52	1.15	45	4.6	81	83.9
DeKalb 108	823	2441	33.7	1 3/32	66	41	55	1.15	48	4.6	80	81.3
Coker Carolina Queen 12901	805	2238	35.9	1 3/32	73	42	54	1.14	48	5.0	82	80.0
Coker Carolina Queen	803	2251	35.7	1 1/16	74	41	54	1.14	48	4.6	80	83.8
DeKalb 108D	803	2378	33.8	1 3/32	61	42	55	1.17	47	4.2	76	82.4
Auburn 56	794	2427	32.7	1 3/32	69	40	54	1.14	47	4.5	79	81.5
Coker 801-6	790	2328	33.9	1 1/16	62	40	54	1.19	45	4.4	78	84.1
Rex	788	2327	33.9	1 1/16	65	42	55	1.16	48	4.2	79	77.5
Empire BBR 18SL	774	2298	33.6	1 1/16	62	40	53	1.12	47	4.2	77	83.0
Mean of Test	709	2249	34.2	1 3/32	68	41	54	1.15	47	4.6	80	83.4
Dixie King	764	2199	34.8	1 3/32	61	40	53	1.11	48	4.9	83	84.9
Empire W.R. 61	764	2240	34.1	1 3/32	59	41	55	1.15	47	4.1	76	83.1
DeKalb 108A	764	2281	33.5	1 3/32	66	42	56	1.18	47	4.7	82	83.4
Coker 61-4123	742	2189	33.8	1 1/8	84	43	57	1.20	48	3.9	75	86.4
Coker 100A (WR)	738	2196	33.6	1 3/32	69	41	55	1.19	46	4.5	79	81.2
McNair 60-1032	735	2132	34.4	1 1/16	74	40	52	1.10	47	4.8	82	86.3
Atlas 61-107	717	2301	31.1	1 3/32	71	40	53	1.11	48	4.6	80	97.0
Rex SLL	716	2171	33.0	1 3/32	66	42	56	1.16	48	4.4	77	85.3
Coker 100A 60-64	715	2074	34.4	1 1/16	72	43	57	1.21	48	4.6	80	79.6
Stoneville 7A	708	2112	33.6	1 3/32	72	39	52	1.14	46	4.6	81	80.4
Deltapine 7139	698	1964	35.5	1 1/16	74	41	53	1.13	46	4.7	81	79.6
Atlas x AHA x Th-61-123	599	1812	33.1	1 3/32	67	42	55	1.13	49	4.8	82	92.0
L.S.D. (.05)	124	355	.9	.6/32	5							
(.01)	N.S.	N.S.	1.2	.8/32	7							
C. V. (%)	14	14	2	2	6							

Table 8. Performance of cotton varieties - Edgecomb County - 1963.

Variety or line	Lint lbs/A	Seed cotton lbs/A	Lint %	Staple length in.	Bolls/lb. of seed cotton	Fiber Properties: Span Length 66.7% (expressed in in.)	Span Length 50% (expressed in in.)	Span Length 2.5% (expressed in in.)	Uniformity Ratio	Micronaire	Causticaire Maturity Index	Tensile Strength "Pressley"
Dixie King	994	2877	34.6	1 1/16	62	40	53	1.09	48	4.2	79	82.7
Coker Carolina Queen 12901	949	2671	35.5	1 3/32	78	39	51	1.09	46	4.5	79	78.2
Dixie King 48C-6374	934	2647	35.2	1 1/16	71	37	48	1.05	46	4.4	78	82.3
Coker 60-111	895	2692	33.4	1 3/32	74	40	53	1.15	46	3.7	73	78.6
Coker 801-6	876	2673	32.7	1 3/32	66	37	49	1.11	44	4.1	75	83.8
Rex	871	2706	32.6	1 3/32	73	35	47	1.07	44	3.8	71	78.6
McNair 60-1032	865	2552	33.9	1 1/16	75	39	51	1.04	48	4.2	78	83.0
Coker Carolina Queen 61-230	862	2468	35.1	1 3/32	77	37	49	1.08	45	4.3	77	79.0
Atlas x AHA x Th-61-123	854	2677	31.9	1 3/32	71	38	50	1.11	45	4.1	77	88.4
DeKalb 220	853	2595	32.8	1 3/32	69	37	50	1.08	45	4.0	75	78.3
Rex SLL	850	2666	31.8	1 3/32	65	38	50	1.09	46	3.6	72	77.8
Coker Carolina Queen	838	2460	34.1	1 3/32	80	38	50	1.10	46	4.3	78	81.0
Mean of Test	817	2467	33.1	1 3/32	72	38	50	1.09	46	4.1	76	81.8
Empire W.R. 61	796	2428	32.7	1 3/32	62	39	52	1.10	47	3.8	72	82.6
Stoneville 7A	783	2529	31.0	1 3/32	81	39	51	1.10	46	4.1	76	86.3
Coker 100A (WR)	778	2344	33.4	1 3/32	76	39	51	1.12	45	4.0	75	79.5
Coker 100A 60-64	775	2247	34.6	1 3/32	75	37	49	1.11	44	4.4	78	81.0
Deltapine 7139	773	2314	33.6	1 3/32	79	40	52	1.09	47	4.0	76	80.2
DeKalb 108D	771	2330	33.2	1 3/32	66	38	51	1.10	46	4.3	77	81.2
DeKalb 108	762	2321	32.9	1 3/32	65	40	49	1.10	48	4.0	75	80.2
Coker 61-4123	760	2302	32.8	1 3/32	84	39	47	1.14	46	3.6	71	87.7
Atlas 61-107	742	2439	30.3	1 3/32	66	38	50	1.05	47	4.3	78	96.1
Auburn 56	737	2246	32.9	1 1/16	73	38	51	1.09	46	4.2	77	78.1
DeKalb 108A	716	2217	32.3	1 3/32	72	40	49	1.10	44	4.1	76	79.1
Empire BBR 18SL	584	1816	32.2	1 3/32	73	36	48	1.06	45	3.8	73	80.1
L.S.D. (.05)	139	419	1.4	.6/32	6							
(.01)	159	555	1.8	.8/32	8							
C. V. (%)	15	15	4	2	8							

Part II

SOYBEAN VARIETIES

The soybean is a valuable member of our agricultural crop family. It is becoming more important each year as a cash crop in North Carolina. This is reflected by the increase in acreage planted the last few years. Since 1954, the acreage has more than doubled to over an estimated 600 thousand acres planted in 1963. In 1962, around 91% of the soybeans produced in the United States went into edible uses and 9% into industrial uses. This type of use would indicate continued demands for soybeans.

With the improvement in cultural practices and varieties, yields are higher than ever before. Prices received by growers in recent years have been good, making it more profitable for farmers to produce soybeans.

Four different maturity groups are grown in North Carolina - Groups V, VI, VII and VIII - with maturity dates ranging from September 16 to November 10, depending upon the group in which the variety is classified. Group V is the earliest and Group VIII the latest maturing.

There are several high yielding varieties available to the producer from which he may choose according to desired maturity date, lodging resistance, etc. Information on the performance of commercial varieties and experimental lines grown in different locations in the state is provided in this report. This information serves as a guide to growers and agricultural workers in choosing a variety and to soybean breeders in their development of varieties.

EXPERIMENTAL PROCEDURE

Experimental lines and commercial varieties developed by public and private agencies are included in this program. In order to qualify

for acceptance, the proposed entry must reveal meritorious performance when compared with recognized varieties.

Any individual or firm may make application for having entries included. A fee is charged on an entry basis. Personnel of the testing program may include entries about which further information is desired.

Agencies Sponsoring Entries

Coker's Pedigreed Seed Company, Hartsville, South Carolina

N. C. Agricultural Experiment Station and U.S.D.A., Raleigh, N. C.

Test Locations

Five tests were conducted in 1963 with three in the Coastal Plain Area and two in the Piedmont Area, as shown in Figure 2. All were located on private farms except the test in Rowan County, which was conducted on an experiment station.

Seasonal Conditions

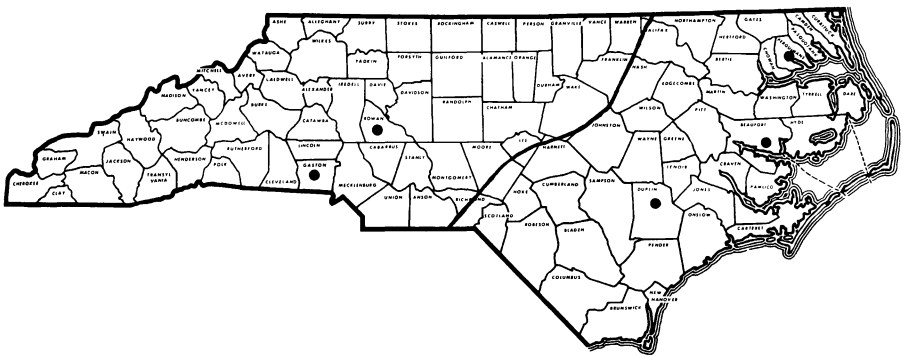
The growing season was generally favorable for the production of soybeans in the Coastal Plain of North Carolina for 1963. The Coastal Plain test had good yields. The Piedmont Area was deficient in rainfall. The Gaston County test was discarded due to the drought conditions.

All tests had good moisture at planting and good stands were obtained at all locations except at Beaufort County where a hard, packing rain after planting prevented seed emergence; consequently, this test was planted a second time.

The Rowan County test had a good stand. Adequate moisture conditions were present until late fall when dry conditions reduced the yields.

The best test was at Duplin County where ideal growing conditions were present throughout the growing season. A good stand was obtained and vigorous plant growth followed resulting in high yield.

Figure 2. Locations of N. C. Soybean Trials



Co-operators

Beaufort County

Dilday Farms, Marion Dilday, Belhaven, N. C.
Beaufort County Extension Chairman M. P. Chesnutt

Duplin County

W. G. Sullivan, Mt. Olive, N. C.
Duplin County Extension Chairman V. L. Reynolds

Perquimans County

L. L. Pierce, Hertford, N. C.
Perquimans County Extension Chairman R. M. Thompson

Rowan County

Warren Bailey, Superintendent, Piedmont Research Station, Salisbury, N. C.
Rowan County Extension Chairman P. H. Satterwhite

Gaston County

Herman Kiser, Crouse, N. C.
Gaston County Extension Chairman Max Erwin

The Perquimans County test also had a good yield. The growing season was considered good; however, not as good as in Duplin County. There was some variation between replications in this test.

Cultural Practices

Seed bed preparation, date of planting, fertilization and other cultural practices were in accord with good farming practices and are listed in Table 9. Planting, harvesting and yield measurements were directly supervised by personnel of the North Carolina Agricultural Experiment Station.

The Rowan and Beaufort County tests were harvested as the individual variety or line was mature. The Perquimans and Duplin County tests were harvested at two different dates, the earlier entries first and the later maturing ones at the second date.

Table 9. Cultural practices for soybean performance trials.

Area and Co-operator	Fertilizer lbs/A	Row Spacing Inches	Date of Planting	Date of Harvest
Coastal Plain				
Duplin County W. G. Sullivan	300 0-12-12	40"	June 4	Early Nov. 4 Late Nov. 15
Perquimans County L. L. Pierce	300 0-12-12	40"	May 24	Early Nov. 1 Late Nov. 14
Beaufort County Marion Dilday	200 0-10-20	42"	June 12	At Maturity
Piedmont				
Rowan County	400 0-10-20	36"	June 4	At Maturity

Criteria for Evaluating Soybean Varieties[5/]

Yield bu./acre. Each plot was harvested and weighed and converted to bushels per acre. All yields were adjusted to 14% moisture.

Moisture. A sample was taken from each plot immediately after the beans were weighed. The samples were placed in waterproof, plastic-coated paper bags and the moisture percent was determined on a Tag Heppenstall moisture meter.

Plant Height. Plant height was determined by measuring from the ground to top of the plant in inches.

Lodging. Lodging was rated according to the following scale:

1 All erect
2 Few plants leaning or down
3 All plants leaning at 45 degrees
4 all plants down

Maturity Group. Maturity groups ranged from Group V through Group VIII. The dates of maturity are as follows:

Group V	September 16-30
Group VI	October 1-16
Group VII	October 17-31
Group VIII	November 1-10

Description of Commercial Varieties

Hill - Early maturity, resistance to shattering, to major leaf diseases, and to purple seed stain are characteristics of Hill. Plants have brown pubescence (plant hairs) on stems and pods and have white flowers. Hill

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5/ Statistical analyses were made in the Statistical Laboratory under the supervision of John O. Rawlings. This assistance is gratefully acknowledged.

grows about 36 inches tall and reaches combine maturity about September 30. Its seeds are small, yellow, and have a light brown hilum (eye).

Hood - A variety with maturity equivalent to the once popular Ogden variety (about October 15). It has better seed quality, shatter resistance, and a yellow seed coat that is generally preferred over the green seed coat of Ogden. It is resistant to such leaf diseases as bacterial pustule, wildfire, frogeye, and target spot. During some seasons Hood may have purple stain.

Hood has grey pubescence, purple flowers, and produces large yellow seed with a light brown hilum. It grows about 36 inches tall.

Lee - This is one of the first varieties adapted to a wide range of growing conditions, in this and other southern states, which has excellent shatter resistance and resistance to bacterial pustule, wildfire, frogeye and purple seed stain.

Lee has brown pubescence, purple flowers, and produces relatively small yellow seed with a black hilum. It grows about 36 inches tall and reaches combine maturity about October 31.

Jackson - The maturity range of Jackson is almost as late as North Carolina farmers can use. It usually cannot be combined until after November 1. Even though it generally grows 40-44 inches tall, it has excellent resistance to lodging.

Jackson has grey pubescence, white flowers, and holds its seed well after maturity. The seeds are large, yellow, and have a distinctive brown hilum. Jackson may have purple seed stain.

Hampton - This variety matures from 2-6 days later than Jackson. It is slightly shorter but tends to lodge more than Jackson in early plantings.

Hampton holds its seed better than Jackson. It may be considered in those areas of North Carolina where Jackson maturity is acceptable. Hampton has grey pubescence on a brown pod and purple flowers.

Bragg - A high yielding, disease and shatter resistant variety that matures 5 days earlier than Jackson and 6 days later than Lee. The plants are about one inch taller than Jackson and 10 inches taller than Lee. It has white flowers and brown pubescence and a brown pod wall. The plants are resistant to bacterial pustule, wildfire, and target spot, and appear to have a high degree of resistance to the root-knot nematode. It is equal to Lee in seed holding ability. Seeds have yellow coats and black hila. Seed size is similar to Jackson.

RESULTS

Varietal performance varied between locations, depending upon the seasonal conditions. Table 10 shows data on yield from each location as well as the mean for the four locations.

In the Beaufort County test yields ranged from 43.1 bushels for Hill to 35.7 bushels for Hood in the commercial varieties. Two of the experimentals exceeded the 43.1 bushels per acre in this test.

A yield of 53 bushels per acre was recorded in Duplin County for Hampton 266. The yields were very good in this test, with Hood, Lee and Jackson near or above 50 bushels per acre.

Lee was the top yielder in Perquimans County with 47 bushels per acre Hood with a yield of 34.2 was on top in Rowan County in the commercial class.

The overall means shows Lee with a yield of 41.5 bushels as the top commercial variety with several others very close. Three experimentals are above this yield, however.

The maturity group in which each entry belongs is listed in Table 10, also. The approximate date of maturity for these groups has been presented earlier.

Information on lodging, plant height and moisture are shown in Table 11. Although some varieties such as Hill and Lee showed some lodging, the combine picked most of the beans and there was very little loss. Bragg and Jackson appeared to be the taller growing varieties.

The data should be considered not only for yield but for maturity group and other characters which might influence the selection of a variety All available data should be studied to aid in selecting a variety that best fits the management practices of the producer.

Table 10. Performance of Soybeans (bu./acre)

Entries	Beaufort	Duplin	Perquimans	Rowan	Ave.	Maturity Group
			Commercial Varieties			
Hill	43.1	43.4	32.7	31.1	37.6	V
Hood	37.0	51.6	36.4	34.2	39.8	VI
Lee	41.2	48.3	47.0	29.7	41.5	VI
Bragg	39.7	46.4	45.1	27.4	39.6	VII
Jackson	35.7	48.9	40.2	28.7	38.4	VII
Hampton 266	38.4	53.0	40.5	32.0	41.0	VII
			Experimentals			
Co58-240	32.5	42.5	40.3	24.3	34.9	VIII
N59-6821	36.1	47.6	39.1	27.5	37.6	VI
N59-6825	42.5	47.7	40.1	30.2	40.1	VI
N59-6913	46.1	49.7	40.9	30.0	41.7	VI
N59-6921	43.0	47.4	37.7	32.4	40.1	VI
N59-6926	42.1	48.5	39.9	30.4	40.2	VI
N59-6937	38.2	49.9	46.0	32.3	41.6	VII
N59-6955	40.4	49.2	37.9	31.5	39.7	VI
N59-6958	40.3	49.6	32.2	31.3	38.4	VII
N59-6972	46.4	50.3	36.7	34.7	42.0	VI
Mean of Test	40.2	48.4	39.5	30.5	39.6	
L.S.D. (.05)	5.8	3.7	NS	4.8	3.5	
(.01)	7.7	4.9	NS	6.5	4.7	
C. V. (%)	10	5	16	11	11	

Table 11. Lodging, height and moisture of soybean varieties.

Entries	Lodging		Plant Height (inches)		Moisture (%)	
	Duplin	Perquimans	Duplin	Perquimans	Duplin	Perquimans
Hill	4	3	38	37	14.52	12.00
Hood	3	2	36	35	13.70	12.40
Lee	3	3	35	39	13.58	12.84
Bragg	2	2	46	49	13.20	12.84
Jackson	1	1	46	47	13.79	13.28
Hampton 266	3	1	44	42	13.60	12.93
Co58-240	2	2	41	43	13.12	12.95
N59-6821	3	2	38	38	13.71	11.96
N59-6825	3	2	38	40	13.56	12.55
N59-6913	2	2	33	31	13.47	11.56
N59-6921	3	2	38	39	13.44	12.04
N59-6926	2	2	38	37	13.37	11.81
N59-6937	3	1	39	41	14.08	12.89
N59-6955	3	2	41	37	14.75	12.48
N59-6958	3	2	39	34	13.83	12.21
N59-6972	3	2	41	37	14.33	12.55
Mean of Test	3	2	39	39	13.75	12.45
L.S.D. (.05)	1	1	3	2	.92	NS
(.01)	1	1	3	3	NS	NS
C. V. (%)	21	25	5	4	5	4