NOTE

P. D. 97 has now been released jointly by South Carolina Agricultural Experiment Station and USDA as S. C. 58.

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Measured crop performance

TOBACCO

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GUY L. JONES, *Associate Professor*

W. K. COLLINS, *Research Instructor*

Department of Field Crops
N. C. State College
Raleigh, N. C.

INTRODUCTION

Quality is probably the most important characteristic of United States flue-cured tobacco. Foreign and domestic trades for United States leaf have been built on quality. Quality is affected by factors such as cultural practices; various agricultural chemicals; fertilization; climatic conditions and varieties. Varieties play an important role in determining the usability of United States tobacco in the world market.

In an evaluation program it is a relatively simple matter to determine the comparative yield of varieties. However, it is more difficult for the breeder to develop a variety with a high yield potential that is resistant to the major diseases, easy to handle by the grower and has an acceptable quality for the manufacturer. In recent years the emphasis by the producer has been on yield. With a fixed land area all practices that have a potential for increasing yield are utilized, sometimes to the detriment of quality. The high correlation between yield and dollar return has forced the grower in this direction.

If the domestic and export markets are to be maintained and expanded, practices that will improve quality must be fully utilized by the grower. Varieties differ in quality. Some varieties tend to produce a more desirable domestic type tobacco while the tobacco from others is more suited to the export trade and still others may not be acceptable for either. Care should be exercised in choosing varieties if the quality of the crop is to be maintained and improved. In general, higher yielding varieties in recent years have not produced the best quality tobacco. Many potentially good quality varieties have not been planted because of their moderate to low yield.

The Tobacco Variety Evaluation Program in North Carolina is an effort to fulfill the need for information on varietal performance under diverse soil and climate conditions. Experiments are conducted to determine agronomic, pathological, and chemical characteristics as well as acceptability, from both the growers' and manufacturers' viewpoint. Included are disease resistant and non-resistant varieties, as well as advanced breeding lines.

The evaluation program is composed of two phases. The first phase consists of testing of varieties by the utilization of small replicated plots located on five research stations. In this program are included experimental

lines and varieties developed both by public and private agencies. Measurements are made on yield, value, agronomic characteristics, disease resistance, chemical characteristics and over-all quality. The second phase of the program involves a more extensive study of fewer varieties and advanced lines under farm conditions with approximately one-half acre plots. Two varieties and three advanced lines were tested in 1958. Twelve locations were involved, three in each of the Border, Eastern, Middle and Old Belts. This evaluation program is a cooperative effort between the Experiment Station, tobacco companies, and growers. Representatives from both domestic and foreign buyers obtain samples of the cured leaf for study in their leaf departments, laboratories and manufacturing plants. The participating companies in 1958 were the American Tobacco Company, Brown & Williamson Tobacco Corporation, the Imperial Tobacco Company, Liggett & Myers Tobacco Company, Philip Morris, Inc., R. J. Reynolds Tobacco Company and P. Lorrilard.

This report presents data from the 1958 Tobacco Vareity Tests and Cooperative Variety Evaluation Tests. In addition to the 1958 results, a summary of tobacco variety tests during the last six years with respect to acre yield, acre value and value per hundred weight is presented in Table I.

Similar reports which record previous years' data have been issued. It should be recognized that a single year's data may not portray the true performance of a variety over a wide range of seasonal conditions, and that testing over a period of years is needed to evaluate the performance of any variety.

EXPERIMENTAL PROCEDURE

What May Be Tested

Both private breeders and those with federal or state agencies may submit entries. 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 or line to qualify for the test. The personnel of the testing program may include entries whose performance records indicate that they may contribute to more effective crop production. There may also be included certain entries from seeds of lots offered for sale within the state, or from seed lots furnished by testing agencies of other states.

Early in December of each year rules governing the tests for the ensuing year are distributed to all previous participants and to those who make inquiry.

Agencies Sponsoring Entries

Bell Seed Farm, Rocky Mount, N. C.

Coker's Pedigreed Seed Company, Hartsville, S. C.

McNair's Yield-Tested Seed Company, Laurinburg, N. C.

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

Robert M. Reams, Apex, N. C.

S. C. Agricultural Experiment Station, Florence, S. C.

Virginia Agricultural Experiment Station, Chatham, Va.

Test Locations

Five locations were used to represent the different soil and climatic conditions of the State. At least one test was included in each of the flue-cured belts. The locations were as follows:

TV 92 Border Belt Tobacco Research Station, Whiteville, N. C. representing the Border Belt.

TV 93 Upper Coastal Plain Research Station, Rocky Mount, N. C. representing the Eastern Belt.

TV 94 Central Crops Research Station, Clayton, N. C. representing the Eastern Belt.

TV 95 Oxford Tobacco Research Station, Oxford, N. C. representing the Middle Belt.

TV 96 Upper Piedmont Tobacco Research Station, Rural Hall, N. C. representing the Old Belt.

The map in Figure I shows the locations of these tests and also the locations of the cooperative grower tests.

METHODS

The Official Variety Tests were conducted on disease-free soil, in so far as possible and the same entries occurred at every location. All entries were coded in the plant bed and in the field. A total of 30 varieties and advanced lines were included.

Four replications of a randomized block design were used at each location. The plants were banded and individually selected for transplanting so as to get uniformity within plots. Each two row plot consisted of 40 guarded plants. The rows were 3.5 feet apart with the plants spaced 22 inches in the row.

Farm practices of plant bed preparation, liming, fertilization, planting date, cultivation, and insect and disease control were in accordance with those normally accepted as good for the production of tobacco. Fertilizer was applied in accordance with soil test recommendation. TV 92 received 1100 pounds of 3-9-9 plus 16 pounds of nitrogen as top-dress. One thousand pounds of 4-8-10 was applied on TV 93; 875 pounds of 6-12-12 on TV 94; 935 pounds of 4-8-10 on TV 95 and 900 pounds of 4-8-10 on TV 96.

All varieties were hand topped and suckered. Individual plots were harvested according to the degree of maturity, tagged and kept separate throughout curing, sorting and grading. Data on agronomic characters were taken in the field, and chemical determinations were made on the cured leaf of the whole plant.[1/] Disease reaction was noted in separate tests under severe disease conditions.[2/]

The methods of taking the data were the same as those used in previous years and are as follows:

Ground Suckers: Whenever ground suckers developed, they were removed prior to topping and the number of the total plot recorded. An average number per plant was calculated for each plot.

Days to Flower: Starting when approximately 10% of the plants in the most advanced plots had flowered, the tops were broken when the first flower showed pink, at one leaf below where the stalk commenced a sharp taper towards the flower head. Flowering plants were topped approximately every three days until all topping was complete. An average flowering date, when 50% of the plants had flowered, was calculated.

Number of suckers: The number of leaf axil suckers removed from plants in the entire plot during the growing season was recorded and an average number of suckers per plant was calculated for each plot. Suckers were removed weekly.

Number of harvestable leaves: The number of leaves that could be harvested during the season was recorded from 5 competitive plants of each plot. An average number of leaves per plant was calculated.

Plant height at maturity: At the time of making the leaf count, the height in inches of the same five plants was measured. An average height per plant was calculated.

Internode length: This was calculated from the leaf number and height of each of the five plants.

Leaf length and width: The length and width, at the widest place, of the 5th, 10th, and 15th leaves from the top were measured on five plants in each plot and averages calculated. The 5th leaf measurements were made approximately two weeks after the other measurements.

1/ Chemical analyses were made in the Tobacco Chemistry Laboratory under the supervision of J. A. Weybrew and John L. Hall.

2/ The Plant Pathology Faculty including E. L. Moore and N. T. Powell cooperated on the tests for disease reaction.

Angle of leaf projection from the stalk: The angle of projection from the stalk of the same three leaves used in the leaf length and width measurements was taken.

Yield per acre in pounds: When the harvest was completed, the tobacco was sorted and graded and the weight of the cured leaves harvested from each plot was recorded. Yields per acre in pounds were calculated.

Value per acre: Under the supervision of a government grader the tobacco from each plot was graded into appropriate government grades. The value per acre was calculated by multiplying the pounds of each grade by the average price paid for that grade during the 1956 to 1958 seasons.

Value per 100 pounds: An average value per hundred pounds was calculated for each plot by dividing the value per acre by the yield per acre.

Quality index: Each grade was evaluated for physical traits by rating the leaf for color, size, body, texture, maturity, physical intactness, and cutting quality. Each of these characteristics was further divided into several categories and a value assigned to each according to its contribution to quality. A value was calculated for each plot using a score of 0 to 100 with 100 as best.

Chemical analyses: A sample of the cured leaf from each plot was submitted to the tobacco biochemistry laboratory in the Department of Chemistry for chemical analysis. The per cent of the following chemical constituents was determined on a dry weight basis.

(a) nicotine
(b) nornicotine
(c) total alkaloids
(d) reducing sugars
(e) total nitrogen

In spite of efforts to obtain perfect stands it was occasionally necessary to make an adjustment for missing plants. If less than one-twentieth of the plants were missing from a given plot, no adjustment was considered necessary. If more than one-twentieth of the plants were missing, the following adjustment was made for those characters which might be influenced by stands. If end or guard plants were missing, each missing plant was considered as one missing plant. Within the row, it was assumed that if adjacent plants were present, their increased growth would compensate for one-half of the missing plants. Thus, each guarded missing plant within a row was considered one-half a plant in adjusting for stand.

Standard check varieties were included for comparison. These checks or standards, Dixie Bright 101 and 402, are the same that are used by other stations as recommended by the Regional Tobacco Variety Evaluation Committee of the Tobacco Workers' Conference.

The data from all 30 entries were statistically treated. 3/ This report includes only the data on the 13 released varieties.

There were twelve cooperating farmers in the off-station tests with plots approximately one-half acre in size. Two varieties and three breeding lines were included in these tests. Fertility and other cultural practices were those generally used by the growers and were considered moderate but not extreme. The tobacco from these tests was displayed on a warehouse floor for the participating companies to examine and sample for laboratory analyses. Each company graded the tobacco according to the types they normally use in their manufacturing. In addition, they also rated each lot of tobacco for the physical quality characteristics from which the previously described quality index was determined. Physical intactness and cutting quality were not used in the index by all companies, consequently, the top value in the index was 85 instead of 100. This report includes only the data on the three released varieties in the farmer cooperative tests.

Seasonal Conditions

In general, the 1958 season resulted in the production of thin tobacco (Table 13). Excessive rain during certain periods caused the tobacco to grow very rapidly at some locations. As a result, the nicotine content was generally lower than for the last few years.

The Whiteville test, TV 92, was transplanted May 8 under conditions of low soil moisture. However, due to the use of banded plants a good stand was obtained. About four days after transplanting there was a good rain and rainfall continued favorably throughout most of the remainder of the growing season. In fact, there appeared to be an excess of moisture during the latter part of June which caused the tobacco to be thin and light in body. As a result, there were few cutters produced.

The Rocky Mount test, TV 93, was transplanted May 16. There was adequate soil moisture and a good stand was obtained. The first three weeks in June were deficient in moisture so the tobacco was irrigated once. The remainder of the season was good and the tobacco made excellent growth as is

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3/ Statistical analyses were made in the Statistical Laboratory under the supervision of Dale Matzinger.

indicated by the heavy yields. The potential quality was good, however, the upper 2/3 of the plant was harvested on the immature side.

The Clayton test, TV 94, was transplanted on May 15 under conditions of good soil moisture. Rainfall was heavy through the remainder of the season and the plants grew off to an excellent start with a very uniform over-all test. The excess moisture tended to leach the nitrogen from the root area, consequently, the tobacco, in general, failed to fill out in the top and showed signs of nitrogen deficiency. The low nicotine content is indicative of the season.

At Oxford, TV 95, the tobacco was transplanted May 30 under conditions of high soil moisture. The tobacco grew off with an excellent start. Adequate rainfall during the remainder of the season insured one of the best tests at this location in recent years. The nicotine content was generally low, yet the texture of the leaf was grainy and the color generally desirable. However, in the upper portion of the plant some of the tobacco tended to be "muddy and unclear" in color.

The Rural Hall experiment, TV 96, was transplanted on May 22 under very dry conditions. There was insufficient rain through the month of June for the tobacco to make normal growth. The upper part of the plant failed to fill out and mature properly. Consequently, the upper leaves from the stalk were small. Although the tobacco was not excessively heavy, the nicotine content was generally high.

RESULTS AND DISCUSSION

The data presented in Tables 1, 2, 3, 9, 10, 11 and 12 are summary data for various years and locations. These tables will be discussed, however, the remaining tables are of individual tests and will be discussed only to emphasize specific points.

In Table 1 the data are percentage comparisons with the mean of 402 and Dixie Bright 101 from the period 1953-1958. The varieties with the higher number of comparisons have been included in the tests for a number of years while the varieties with only five comparisons have been in the tests only one year. The information on varieties which have been in the tests at several locations for a number of years gives a more acurate estimate of their general performance.

Value per acre, a quantity reflecting both yield and quality, was calculated for each entry and the data presented in Table 1. If price support and government grade fail to reflect the true demand then a false

estimate may be given on the value of a variety. It is necessary that the factors of price support, grade and demand be understood to properly evaluate a variety. For example, neutral and slick tobaccos are not currently in demand.

Most varieties in Table I maintain their same relative positions for value per acre as they do for yield except Hicks and White Gold which improve their relative ranking in value per acre because of their higher value per pound. Bell 15, PD 97 and Coker 156 moved up in value per 100 pounds which is indicative of their good quality. With Coker 187-Hicks there was a drop in value which is indicative of lower quality, particularly in the upper part of the plant.

In Table 2 the averages of varieties at five locations in 1958 are compared. The data from TV 92, TV 93, TV 94, TV 95 and TV 96 were statistically combined to study average varietal performance over a wide area. Coker 187-Hicks, Vesta 5, Reams 51 and Bell 15 were the higher yielders and generally had the greatest value per acre. Hicks was a moderate yielder but due to its high price per 100 pounds it had one of the higher values per acre. For varieties which have been in the tests only one year the data should be considered with caution. At this time it is not known whether or not these new varieties will produce tobacco desired by the trade.

A quality index, a determination based on physical characteristics, was used for the first time in 1958. This index was developed in cooperation with Federal and State research workers, representatives of foreign and domestic manufacturers and members of the Federal Grading Service. All of texture, maturity, physical intactness and cutting quality are important quality traits. One or a combination of these may render a line of tobacco undesirable, whereas, all must be acceptable for a tobacco to be desirable. This index offers a potentially better method for evaluating quality than does price based on government grades.

According to the quality index as shown in Table 2, Hicks rated highest followed by Bell 15, Coker 187, N.C. 73 and Coker 156. Dixie Bright 101 and Coker 187-Hicks were on the low end of the scale. The upper part of the plant of Coker 187-Hicks and Dixie Bright 101 was most noticeable as being undesirable.

Coker 187-Hicks produced more leaves than Dixie Bright 101 while no variety was as tall growing as Dixie Bright 101. Hicks and Bell 15 were considered low growing varieties. Internode length, a direct reflection of

leaf number and height, is also given in this table. Dixie Bright 101, Vesta 5 and N.C. 73 tended to have wider spaced leaves than the other varieties.

Most varieties were intermediate in maturity, however, a few such as Hicks and Bell 15 were early flowering and others such as Dixie Bright 101, Reams 51 and Coker 187-Hicks were later maturing.

Dixie Bright 101, Hicks, Bell 15 and Coker 187-Hicks produced the most and Coker 187 and N.C. 73 the least suckers per plant. Dixie Bright 101, Reams 51 and Coker 187-Hicks produced the most ground suckers.

Varieties differ in the angle of leaf projection from the stalk. Coker 187 and Coker 187-Hicks grow with their leaves more upright than most varieties while Dixie Bright 101, Vesta 5 and N.C. 73 have a wider angle of projection of the leaves from the stalk. Hicks, Bell 15 and Coker 156 have slightly narrower leaves than most of the other varieties in these tests.

Although quality per se cannot be measured precisely at present, certain chemical constituents clearly related to quality can be determined. Three of these constituents, alkaloids, sugar, and nitrogen, and certain ratios from them are presented in Table 2.

In general a nicotine content of about 1.75 to 2.50 per cent has been found to be satisfactory to the trade. However, nicotine is definitely influenced by environment. A wet season tends to produce tobacco low in nicotine, as indicated by the Oxford and Clayton locations, while a dry season has the opposite effect, as shown at Rural Hall. Coker 156 had the highest nicotine content, ranging above 3.3 per cent, while Coker 187-Hicks had the lowest. None of the varieties in this table were below the normally acceptable range. All varieties appeared to be in the acceptable range of nornicotine, sugar and nitrogen.

The ratio of nitrogen to nicotine may give some indication of the chemical balance within the plant. An improper balance of the chemical constituents is probably more serious to the tobacco manufacturers than the specific amount of any one constituent, such as nicotine. It is believed that, within limits, the higher the ratio the less desirable the tobacco. Since nitrogen varies with the environment far less than does nicotine, a ratio of the two should give a better index for comparison. In Table 2, ratios of nitrogen to nicotine are presented for a number of varieties from the official variety tests in 1958. There were differences between varieties, however, all appeared to fall with the acceptable range. Dixie Bright 101 had the highest ratio.

Generally the varieties with a low nicotine content have been considered as neutral in flavor and aroma. Although there is no known analytical measure for aroma, nicotine, nitrogen, and certain other chemical constituents can be measured precisely. These have a bearing on the quality of the cigarette smoke.

In Figure 2 the relationship of nicotine percentage, yield and variety is shown for 13 varieties in the 1958 tests at five locations. In general, the lower yielding varieties such as Coker 156 and PD 97 are higher in per cent nicotine. In fact, they are on the high side of what has been considered the acceptable range. Coker 187-Hicks had the highest yield and lowest percent nicotine. A correlation of -0.85 existed between nicotine and yield. This represented a decrease of .33% nicotine for each increase of 100 pounds in yield between 1700 and 2200 pounds per acre. Nicotine and yield are both variety traits, that is, each is controlled genetically, however, both are influenced by the environment.

Until recently, the trend in variety development has been toward milder, lower nicotine varieties that have a high yield. The fact that recent high yielding varieties are generally low in nicotine does not preclude the possibility of the development of higher yielding varieties with desirable levels of nicotine. However, there does appear to be a dilution effect of nicotine as the yield is increased. In breeding programs selection pressure is being exerted toward improved quality, moderate nicotine, disease resistance and as high yields as can be obtained consistent with quality. With relation to quality, selection pressure is also exerted to retain color, body, texture and other quality factors. However, as the number of selection criteria increases so does the difficulty of keeping them in proper balance likewise increase. With many of the agronomic and pathologic characteristics within an acceptable range, breeders are shifting more and more emphasis on quality.

Information on disease resistance for 1957 and 1958 is presented in Table 3. The level of resistance of varieties such as Dixie Bright 101 to black shank has been classified as low. With new varieties carrying much higher levels of resistance, this represents a definite improvement in germ plasm carrying resistance to black shank. Dixie Bright 101 has a high level of resistance to both Granville and Fusarium wilts. Coker 187 has a high level of resistance to black shank and Granville wilt and a low level of resistance to Fusarium wilt. Bell 15 was susceptible to black shank and Granville wilt and had low resistance to Fusarium wilt. This represents a shift from 1957 which, according to the breeder, Bell Seed Farm, is primarily

due to selection pressure for type instead of resistance. Material must continually be evaluated under disease and other conditions if selection is to be effective. McNair 121 was highly resistant to all three diseases. Coker 187-Hicks was highly resistant to black shank and bacterial wilt and moderately resistant to Fusarium wilt. N.C. 73 was highly resistant to black shank, susceptible to bacterial wilt and moderately resistant to Fusarium wilt.

In Table 9 data on yield and value are shown for the 1958 cooperative tests with tobacco farmers and manufacturers. N.C. 73 had the lowest yield and value and Coker 187-Hicks the highest yield. However, there was no statistical difference in value for Hicks and Coker 187-Hicks. The high value per hundred pounds for Hicks is indicative of its acceptable quality.

In general the cooperating growers in this program rated N.C. 73 good for handling characteristics, curability and quality. Quality appraisal forms were used in evaluating these farmer grown tobaccos. As shown in Table 10, Hicks was rated first by five companies and second by two companies. N.C. 73 was rated first by two companies, second by three, and third by two. Coker 187-Hicks was rated second by two and third by five companies.

The per cent that each company could grade from these farmer test plots into grades is shown in Table 11. Companies differ in their demands for different types of tobacco. These varieties differ in the type tobacco they produce as indicated by the per cent graded.

An index for the amount graded by the six participating companies was calculated and is shown in Table 12. The index ranged from 0 to 6 with six showing that all tobacco was graded by all of the participating companies With the wide range of types in demand by the different companies it would not be expected that any variety would receive an index of 6 indicating that all companies could grade all of a particular variety. The index for varieties in decreasing order was: Hicks 1.84, N.C. 73 1.53, and Coker 187-Hicks 1.16. This grade index is indicative of the acceptability and desirability of these tobaccos.

It is important for the grower to study and consider all available data in choosing a variety of tobacco. The variety should be resistant to prevalent soil-borne diseases, easy to handle in the field and in curing, and produce a profitable yield of leaf possessing physical and chemical properties desired by the trade.

LOCATION OF TESTS — 1958

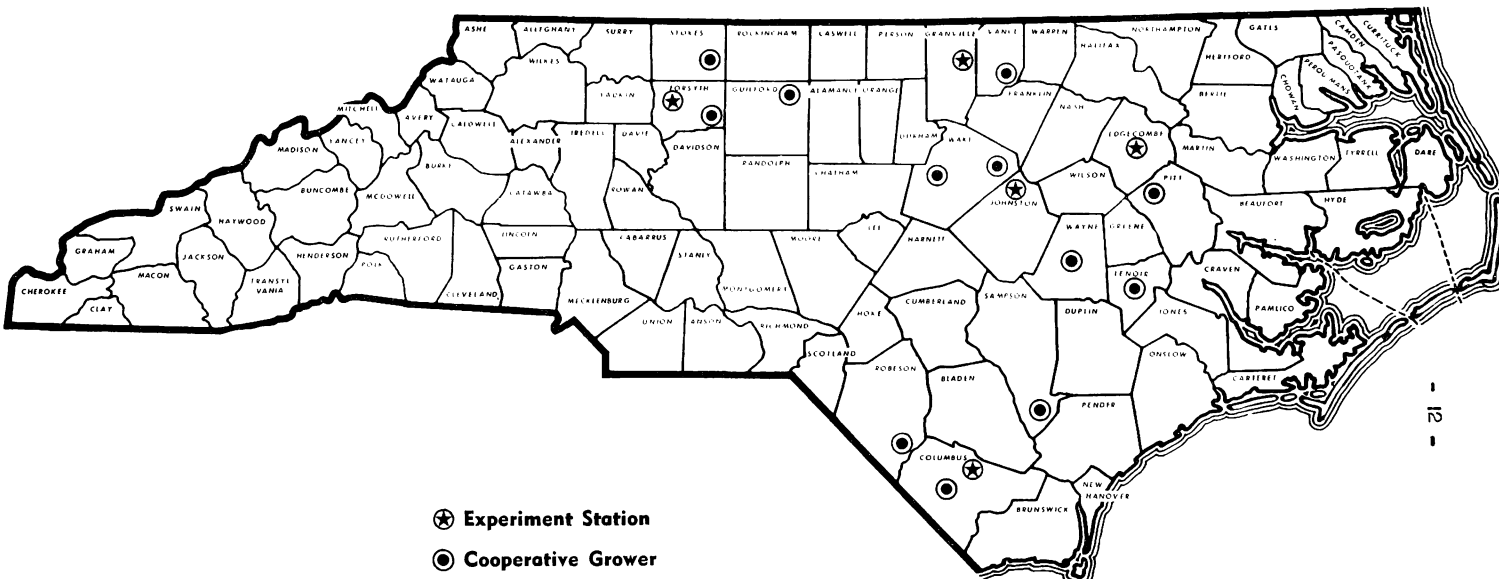

Figure 1

Table 1. Percentage Comparison With the Mean of 402 and D.B. of Certain Flue-Cured Tobacco Varieties. Official Tobacco Variety Tests. 1953-1958.

Standard $\frac{402 + D.B.\ 101}{2}$	Acre Yield 1790		Acre Value $957		Value per 100 lbs. $53.25	
No. Comparisons*						
10	Coker 187-Hicks	(117)	Coker 187-Hicks	(117)	Hicks Broadleaf	(107)
13	Speight 42	(110)	McNair VG 2	(112)	White Gold	(105)
13	McNair VG 2	(109)	Hicks Broadleaf	(109)	Bell 15	(103)
6	D. B. 28	(107)	Va. 21	(109)	P. D. 97	(103)
18	Va. 21	(106)	Speight 42	(109)	Coker 156	(103)
10	Vesta 5	(105)	Vesta 5	(107)	Va. 21	(102)
10	McNair 121	(104)	Bell 15	(106)	McNair VG 2	(102)
15	Bell 15	(103)	McNair 121	(103)	N. C. 73	(102)
10	Buyers Choice	(103)	N. C. 73	(103)	402	(101)
26	Hicks Broadleaf	(101)	White Gold	(102)	Yel. Sp. A	(101)
10	N. C. 73	(101)	402	(101)	Vesta 5	(101)
26	D. B. 101	(100)	Buyers Choice	(101)	D. B. 101	(99)
26	402	(100)	D. B. 101	(99)	Oxford 1-181	(99)
15	Coker 187	(100)	Coker 187	(99)	McNair 121	(99)
6	Golden Cure	(99)	D. B. 28	(99)	Coker 187-Hicks	(99)
11	Yel. Sp. A	(98)	Yel. Sp. A	(98)	Coker 187	(98)
11	White Gold	(97)	Golden Cure	(98)	Speight 42	(98)
10	P. D. 97	(94)	P. D. 97	(96)	Buyers Choice	(98)
5	Coker 156	(93)	Coker 156	(96)	Golden Cure	(98)
16	Oxford 1-181	(86)	Oxford 1-181	(86)	D. B. 28	(94)

* Number of times appeared in tests with D.B. 101 and 402. Same applies for acre value and value per 100 lbs. as for yield.

Table 2. Comparison of varieties in 1958 for certain characteristics. Combined for all locations. TV 92 - Whiteville, TV 93 - Rocky Mount, TV 94 - Clayton, TV 95 - Oxford, TV 96 - Rural Hall

Varieties	Yield Lbs./A	Value Index 1/ Dol./A	Value Index 1/ Dol./Cwt.	Quality 2/ Index	No. of leaves per plant	Height of plant (in.)	Ave. length of internode (in.)	Days to Flower
D. B. 101	1916	1026	53.25	66.0	19.4	53.9	2.8	56
402	1877	1003	53.15	68.1	17.3	44.3	2.6	50
Hicks Broadleaf	1929	1108	57.24	74.3	17.3	40.2	2.4	47
Coker 187	1929	1039	53.23	72.5	18.8	45.8	2.5	55
Bell 15	1973	1149	57.87	72.6	17.4	39.9	2.3	48
Vesta 5	1980	1073	53.79	69.1	17.9	48.9	2.8	52
McNair 121	1922	1010	52.11	69.3	18.1	43.9	2.5	55
Coker 187-Hicks	2182	1161	52.77	66.1	20.5	45.8	2.3	57
Coker 156	1768	974	54.79	71.2	18.3	45.7	2.5	51
Reams 51	1986	1086	54.22	70.4	19.5	47.7	2.5	56
P. D. 97	1760	972	54.81	69.8	18.3	46.2	2.6	52
Bell 16	1910	1015	52.97	66.1	17.6	45.5	2.6	50
N. C. 73	1902	1015	53.00	71.3	17.1	46.7	2.8	50
L. S. D. (.05)	71	52	1.47	4.3	1.2	2.6	.1	3
(.01)	93	69	1.94	5.7	1.6	3.5	.1	4
C. V. (%)	6	8	4	6	5	5	4	4

1/ Based on 3 yr. ave. all belts 1956-57-58 auction price on gov't. grade basis. 1958 prices through Sept. 25.

2/ Based on quality appraisal for color, size, body, texture, maturity, physical intactness and cutting quality.

Table 2. Continued. Combined Analyses of All Locations - 1958.

Variety	Suckers per Plant		Analyses of Cured Leaf						Ratio
	Ground	Leaf Axil	Nic. %	Nornic. %	Tot. Alk. %	Ratio Nic x 100 / Tot. Alk.	Red. Sug. %	Tot. N %	N/Nic.
D. B. 101	5.1	17.5	2.25	.16	2.42	92.81	22.82	1.53	.68
402	2.3	16.2	2.81	.24	3.07	91.71	17.52	1.45	.55
Hicks Broadleaf	1.7	19.4	2.78	.17	2.98	93.70	20.33	1.47	.55
Coker 187	.8	13.5	2.55	.16	2.77	92.55	19.28	1.49	.62
Bell 15	1.5	19.5	2.58	.15	2.79	93.02	20.92	1.38	.57
Vesta 5	2.6	17.1	2.77	.17	2.98	93.17	19.60	1.36	.52
McNair 121	2.0	15.3	2.44	.21	2.67	91.34	18.36	1.36	.60
Coker 187-Hicks	3.8	17.7	2.22	.16	2.40	92.55	20.33	1.35	.64
Coker 156	.6	14.5	3.34	.21	3.57	93.51	18.20	1.53	.52
Reams 51	4.1	15.7	2.35	.17	2.53	92.90	20.35	1.32	.60
P. D. 97	.6	14.5	3.53	.25	3.81	92.87	17.93	1.74	.51
Bell 16	1.4	15.1	2.47	.17	2.65	93.14	18.31	1.37	.62
N. C. 73	1.3	13.8	2.71	.18	2.91	93.11	17.77	1.46	.59
L. S. D. (.05)	.7	3.1	.16	.04	.17	1.95	1.07	.19	.09
(.01)	1.0	4.2	.21	.06	.22	2.57	1.40	.26	.13
C. V. (%)	38	15	11	44	11	3	9	16	15

Table 2. Continued. Combined Analyses of All Locations - 1958

Variety	Angle of leaf proj. from stalk			Width of leaves in inches			Length of leaves in inches		
	5th 2/	10th 2/	15th 2/	5th 2/	10th 2/	15th 2/	5th 2/	10th 2/	15th 2/
D. B. 101	49.5	34.9	48.3	10.5	11.8	12.7	19.0	20.2	19.4
402	35.4	31.1	43.9	11.1	12.9	13.5	21.1	22.1	20.3
Hicks Broadleaf	35.1	32.2	41.7	10.0	11.4	12.0	22.5	22.6	20.4
Coker 187	31.4	27.3	35.8	10.5	12.3	13.3	19.4	21.1	19.7
Bell 15	35.5	32.4	39.8	9.9	11.4	12.1	22.1	22.3	20.0
Vesta 5	45.9	31.4	46.4	10.3	12.2	12.7	20.2	22.3	20.5
McNair 121	30.6	27.1	37.9	10.8	12.1	13.2	19.3	20.8	20.2
Coker 187-Hicks	34.4	28.5	34.2	10.5	11.9	13.4	19.4	21.3	21.0
Coker 156	35.7	28.2	38.8	9.4	10.7	11.5	21.0	21.8	19.8
Reams 51	44.8	32.4	42.1	10.0	11.7	13.5	19.3	21.0	20.9
P. D. 97	34.0	28.0	37.8	9.6	10.6	11.9	21.4	22.0	20.3
Bell 16	39.9	33.3	43.8	10.8	12.3	13.2	21.8	22.9	20.9
N. C. 73	41.4	30.1	45.6	10.7	13.2	13.8	20.4	21.8	20.1
L. S. D. (.05)	5.8	3.5	4.7	.7	.7	.7	1.0	.9	1.0
(.01)	7.7	4.7	6.2	.9	.9	1.0	1.3	1.3	1.3
C. V. (%)	14	11	11	7	6	6	5	5	5

2/ No. of leaves from top of plant.

Table 3. Summary Information on Disease Resistance 1957-58.

Variety	Black Shank % Diseased 1957	Black Shank % Diseased 1958	Level of Resistance 2/	Bacterial Wilt Green House Wilt Index 1/ 1957	Bacterial Wilt Field % Diseased 1958	Level of Resistance 2/	Fusarium Wilt % Diseased 1957	Fusarium Wilt % Diseased 1958	Level of Resistance 2/
D. B. 101	81	53	Low	16	17	High	0	4	High
402	--	--	Susc.	91	85	Susc.	83	-	Susc.
Hicks Broadleaf	98	99	Susc.	89	--	Susc.	67	25	Low
Coker 187	12	1	High	13	26	High	45	50	Low
Bell 15	44	99	Susc.	40	86	Susc.	11	29	Low
Vesta 5	67	41	Low	96	100	Susc.	89	--	Susc.
McNair 121	19	11	High	16	20	High	6	13	High
Coker 187-Hicks	14	20	High	21	25	High	0	29	Mod.
Coker 156		16	High 3/		43	Susc. 3/		88	Susc. 3/
Reams 51		56	Low 3/		14	High 3/		13	High 3/
P. D. 97	23	11	High	35	66	Susc.	94	83	Susc.
Bell 16		32	Mod. 3/		32	Low 3/		17	Mod. 3/
N. C. 73	10	7	High	65	69	Susc.	6	29	Mod.

1/ Wilt index - 0 = no wilt; 100 = maximum wilt development.
2/ A relative rating based on 1957-58 data plus information from other disease tests.
3/ Rating based on one year's data.

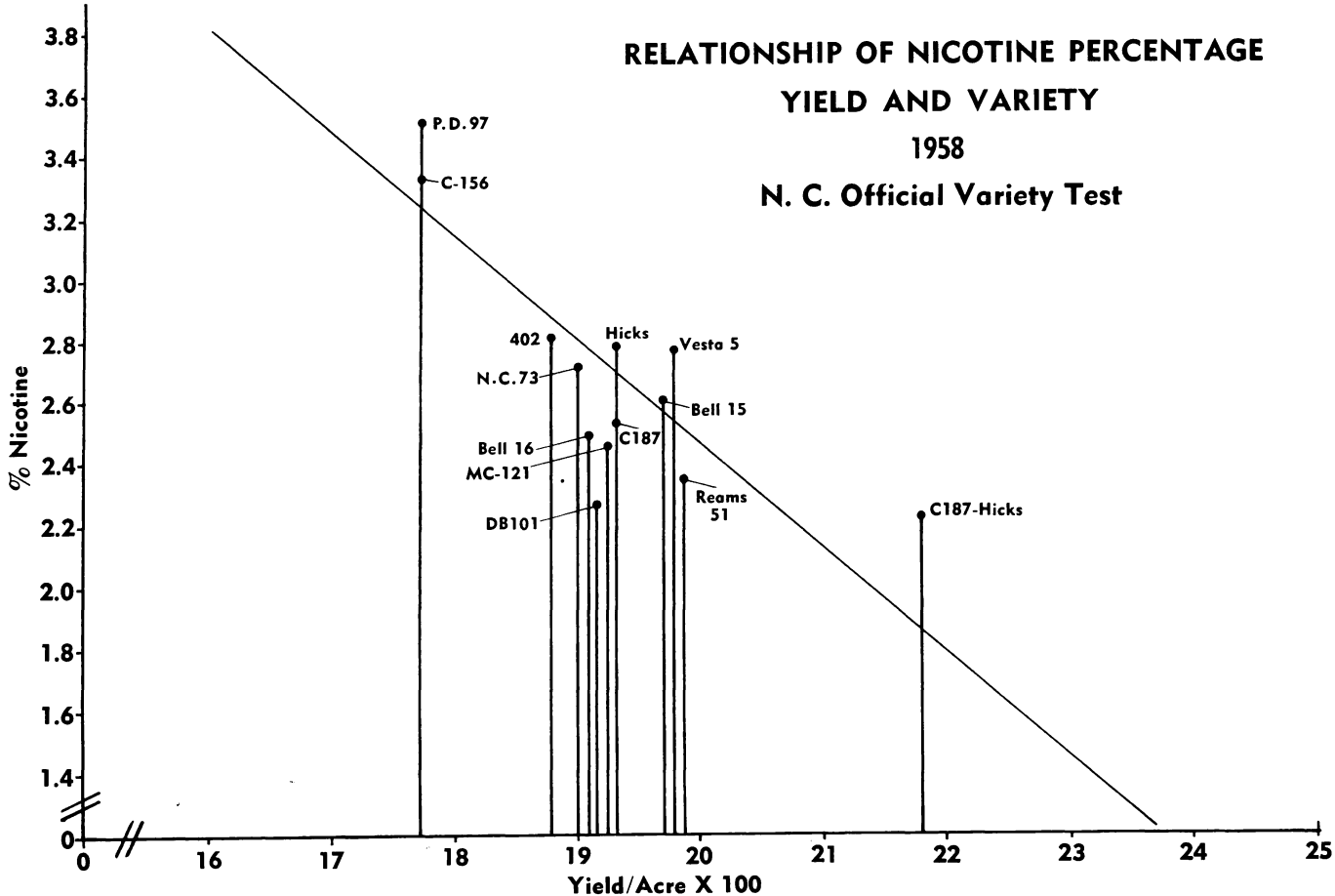
RELATIONSHIP OF NICOTINE PERCENTAGE
YIELD AND VARIETY
1958
N. C. Official Variety Test
% Nicotine
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
0
P.D.97
C-156
402
N.C.73
Bell 16
MC-121
DB101
Hicks
C187
Vesta 5
Bell 15
Reams 51
C187-Hicks
0
16
17
18
19
20
21
22
23
24
25
Yield/Acre X 100

Figure 2

Table 4. Comparison of varieties in 1958 for certain characteristics. TV 92 - Whiteville

Varieties	Yield Lbs./A	Value Index 1/ Dol.A	Value Index 1/ Dol./Cwt.	Quality Index 2/	No. of leaves per plant	Height of plant (in.)	Ave. length of internode (in.)	Days to Flower
D. B. 101	2091	1130	54.08	67.8	18.2	53.6	2.9	50
402	2059	1121	54.37	73.0	16.4	44.9	2.7	47
Hicks Broadleaf	2253	1317	58.40	76.4	16.6	40.8	2.5	44
Coker 187	2188	1208	55.13	78.5	17.6	50.3	2.9	51
Bell 15	2347	1409	60.05	82.5	16.9	40.8	2.4	44
Vesta 5	2167	1198	55.29	74.6	17.3	49.1	2.9	50
McNair 121	2108	1085	51.43	75.4	18.1	46.8	2.6	51
Coker 187-Hicks	2365	1321	55.86	74.9	19.7	50.9	2.6	54
Coker 156	1924	1048	54.47	79.5	17.9	46.6	2.6	49
Reams 51	2110	1178	55.60	78.3	19.0	50.9	2.7	53
P. D. 97	1928	1093	56.65	73.0	18.3	49.3	2.7	50
Bell 16	2181	1159	53.12	67.3	18.7	48.8	2.6	48
N. C. 73	2173	1188	54.65	79.5	16.9	47.2	2.8	47
L. S. D. (.05)	116	109	3.51	N.S.	1.3	3.0	.2	2
(.01)	154	144	4.65	N.S.	1.7	4.0	.2	3
C. V. (%)	4	6	5	7	5	4	5	3

1/ Based on 3 yr. ave. all belts 1956-57-58 auction price on gov't. grade basis. 1958 prices through Sept. 25.

2/ Based on quality appraisal for color, size, body, texture, maturity, physical intactness and cutting quality.

Table 4. Continued. TV 92 Whiteville - 1958

Variety	Suckers per Plant		Analyses of Cured Leaf						Ratio
	Ground	Leaf Axil	Nic. %	Nornic. %	Tot. Alk. %	Ratio Nic x 100 / Tot. Alk.	Red. Sug. %	Tot. N %	N/Nic.
D. B. 101	5.8	17.2	2.14	.14	2.28	93.57	19.83	1.36	.63
402	2.2	12.9	2.47	.19	2.68	92.21	13.60	1.44	.58
Hicks Broadleaf	.9	16.2	2.29	.20	2.44	93.58	16.49	1.21	.52
Coker 187	.5	12.7	2.33	.16	2.50	92.89	15.96	1.45	.64
Bell 15	1.7	18.0	2.14	.17	2.32	92.26	17.99	1.26	.60
Vesta 5	2.7	12.9	2.48	.16	2.65	93.52	15.22	1.28	.54
McNair 121	2.2	12.5	2.17	.17	2.35	92.01	13.39	1.53	.75
Coker 187-Hicks	3.9	14.9	2.14	.15	2.31	92.74	16.26	1.37	.66
Coker 156	.2	13.0	3.08	.24	3.34	91.92	12.95	1.56	.58
Reams 51	4.4	13.1	2.04	.16	2.21	92.22	15.80	1.17	.57
P. D. 97	.2	11.6	2.93	.26	3.21	91.42	14.79	1.68	.58
Bell 16	.8	13.2	2.14	.19	2.35	91.10	13.90	1.19	.62
N. C. 73	.5	10.6	2.23	.16	2.40	92.95	15.92	1.09	.54
L. S. D. (.05)	1.2	2.8	.26	.07	.27	.32	2.78	.31	.14
(.01)	1.5	3.7	.34	.09	.36	.42	3.68	N.S.	.19
C. V. (%)	46	15	9	32	9	2	13	11	9

Table 4. Continued. TV 92 Whiteville - 1958

Variety	Angle of leaf proj. from stalk			Width of leaves in inches			Length of leaves in inches		
	5th 2/	10th 2/	15th 2/	5th 2/	10th 2/	15th 2/	5th 2/	10th 2/	15th 2/
D. B. 101	34.9	32.2	56.7	12.0	12.7	13.5	21.5	21.3	20.1
402	30.2	29.2	45.3	12.4	14.7	15.6	23.9	24.2	22.7
Hicks Broadleaf	28.0	30.6	40.4	11.3	12.3	13.5	25.4	24.5	21.9
Coker 187	22.1	22.8	33.7	12.1	13.4	14.7	21.6	22.1	20.7
Bell 15	28.8	32.4	41.8	11.0	12.6	13.5	25.0	24.3	21.9
Vesta 5	33.1	25.1	48.1	12.1	13.5	14.1	24.1	24.5	22.3
McNair 121	26.3	22.9	33.4	11.7	12.5	14.8	21.2	22.1	22.4
Coker 187-Hicks	25.9	24.8	29.1	12.2	12.8	14.8	21.9	23.6	23.0
Coker 156	26.4	23.4	39.8	11.0	10.9	12.4	23.6	23.2	21.0
Reams 51	33.9	29.2	41.1	11.6	12.7	14.4	21.6	22.1	21.7
P. D. 97	24.9	25.1	38.2	10.5	11.2	12.8	23.2	23.5	22.0
Bell 16	29.1	25.4	40.0	11.9	12.9	14.6	24.3	24.3	23.0
N. C. 73	28.6	25.0	44.0	11.7	14.1	14.6	22.9	23.7	21.1
L. S. D. (.05)	5.2	3.4	5.7	1.0	1.1	1.1	1.1	1.2	1.3
(.01)	6.9	4.5	7.5	1.2	1.4	1.5	1.5	1.6	1.8
C. V. (%)	13	9	11	6	6	6	4	4	4

2/ No. of leaves from top of plant.

Table 5. Comparison of varieties in 1958 for certain characteristics. TV 93 - Rocky Mount

Varieties	Yield Lbs./A	Value Index 1/ Dol./A	Value Index 1/ Dol./Cwt.	Quality 2/ Index	No. of leaves per plant	Height of plant (in.)	Ave. length of internode (in.)	Days to Flower
D. B. 101	2400	1367	56.96	75.8	20.1	60.0	3.0	56
402	2263	1270	56.10	66.3	17.0	47.6	2.8	50
Hicks Broadleaf	2351	1378	58.58	72.6	16.7	44.3	2.7	47
Coker 187	2373	1359	57.26	71.8	19.0	49.8	2.6	53
Bell 15	2397	1461	60.98	74.1	16.2	42.2	2.6	48
Vesta 5	2454	1411	57.50	67.6	18.6	55.1	3.0	53
McNair 121	2454	1392	56.70	68.3	17.7	46.8	2.7	52
Coker 187-Hicks	2870	1583	55.11	63.7	21.2	50.3	2.4	56
Coker 156	2171	1266	58.32	69.8	17.6	48.3	2.8	50
Reams 51	2604	1487	57.07	71.7	19.3	50.8	2.6	56
P. D. 97	2145	1247	58.11	72.9	17.6	49.0	2.8	51
Bell 16	2358	1294	54.93	65.5	16.8	46.4	2.8	48
N. C. 73	2271	1275	56.11	70.1	17.2	50.6	3.0	50
L. S. D. (.05)	106	91	2.52	7.3	1.7	3.5	.2	2
(.01)	141	120	3.34	N.S.	2.2	4.6	.2	3
C. V. (%)	3	4	3	5	6	5	4	3

1/ Based on 3 yr. ave. all belts 1956-57-58 auction price on gov't. grade basis. 1958 prices through Sept. 25.

2/ Based on quality appraisal for color, size, body, texture, maturity, physical intactness and cutting quality.

Table 5. Continued. TV 93 Rocky Mount - 1958

Variety	Suckers per plant		Analyses of Cured Leaf						Ratio
	Ground	Leaf Axil	Nic. %	Nornic. %	Tot. Alk. %	Ratio Nic x 100 / Tot. Alk.	Red. Sug. %	Tot. N %	N/Nic.
D. B. 101	5.1	22.5	2.59	.19	2.80	92.68	23.29	1.69	.64
402	2.1	21.4	2.94	.21	3.16	92.86	17.06	1.40	.44
Hicks Broadleaf	1.7	24.1	3.07	.16	3.24	94.76	20.54	1.58	.50
Coker 187	.8	18.9	2.87	.21	3.11	92.19	19.18	1.38	.50
Bell 15	1.1	23.4	2.61	.18	2.81	92.71	21.52	1.28	.50
Vesta 5	2.6	20.2	2.47	.11	2.68	92.29	19.52	1.14	.48
McNair 121	2.7	22.5	2.54	.25	2.82	90.38	19.60	1.42	.54
Coker 187-Hicks	4.0	25.3	2.35	.23	2.60	90.34	20.65	1.29	.56
Coker 156	.7	17.1	3.52	.24	3.78	93.19	17.54	1.42	.42
Reams 51	4.1	21.4	2.56	.17	2.75	93.26	19.56	1.38	.54
P. D. 97	.8	18.0	3.51	.30	3.82	91.78	17.70	1.52	.43
Bell 16	1.8	23.0	2.77	.16	2.95	93.98	17.98	1.66	.57
N. C. 73	2.0	19.3	2.79	.22	3.03	92.09	17.29	1.53	.58
L. S. D. (.05)	.7	3.2	.29	.09	.30	.35	2.09	.35	.18
(.01)	1.0	4.3	.38	.12	.40	.47	2.77	N.S.	.24
C. V. (%)	26	11	8	35	8	3	8	12	14

Table 5. Continued. TV 93 Rocky Mount - 1958

Variety	Angle of leaf proj. from stalk			Width of leaves in inches			Length of leaves in inches		
	5th 2/	10th 2/	15th 2/	5th 2/	10th 2/	15th 2/	5th 2/	10th 2/	15th 2/
D. B. 101	42.9	33.1	43.0	10.2	12.7	14.0	18.7	21.4	21.4
402	26.2	32.3	52.4	12.5	14.3	13.6	22.6	24.7	20.1
Hicks Broadleaf	29.9	32.3	45.9	11.5	13.1	11.9	25.3	25.8	21.1
Coker 187	29.3	27.8	34.7	11.2	13.1	14.0	20.4	22.8	21.8
Bell 15	28.9	31.0	40.1	11.4	12.8	12.2	24.6	24.6	20.0
Vesta 5	36.4	28.6	38.4	10.7	13.3	13.9	20.9	25.1	23.2
McNair 121	26.9	25.8	38.3	12.1	14.0	14.4	21.5	24.1	22.7
Coker 187-Hicks	28.0	27.3	32.7	10.7	13.0	13.8	20.0	22.9	22.7
Coker 156	27.9	27.9	42.3	10.3	12.1	12.2	22.4	24.5	21.6
Reams 51	37.9	30.8	38.4	10.1	12.9	14.6	19.7	22.6	23.2
P. D. 97	24.8	28.3	35.0	11.2	12.2	13.1	23.3	24.3	22.1
Bell 16	33.1	38.0	50.3	12.7	14.1	13.5	24.5	25.4	21.3
N. C. 73	33.2	30.7	57.1	12.2	15.0	13.8	22.4	24.1	19.5
L. S. D. (.05)	4.6	3.4	5.7	1.2	.8	.8	1.4	1.3	1.6
(.01)	6.1	4.5	7.6	1.6	1.1	1.1	1.8	1.7	2.1
C. V. (%)	11	9	11	8	4	4	5	4	5

2/ No. of leaves from top of plant.

Table 6. Comparison of varieties in 1958 for certain characteristics. TV 94 - Clayton

Varieties	Yield Lbs./A	Value Index 1/ Dol./A	Value Index 1/ Dol./Cwt.	Quality 2/ Index	No. of leaves per plant	Height of plant (in.)	Ave. length of internode (in.)	Days to Flower
D. B. 101	1740	898	51.56	64.0	17.4	50.5	2.9	55
402	1678	878	52.36	69.0	15.7	42.3	2.7	47
Hicks Broadleaf	1712	958	55.98	77.8	15.2	39.1	2.6	44
Coker 187	1697	921	54.32	71.9	16.8	44.6	2.7	50
Bell 15	1719	943	54.83	67.9	16.0	39.8	2.5	43
Vesta 5	1892	975	51.61	68.5	15.5	47.3	3.1	48
McNair 121	1661	849	51.12	67.8	15.6	42.0	2.7	51
Coker 187-Hicks	1936	1031	53.26	68.1	18.7	45.0	2.4	52
Coker 156	1613	856	53.11	69.7	16.8	45.5	2.7	46
Reams 51	1679	933	55.57	69.2	17.2	47.5	2.8	51
P. D. 97	1634	883	54.15	66.1	16.8	44.4	2.7	47
Bell 16	1722	926	53.88	72.9	16.1	44.4	2.8	46
N. C. 73	1699	871	51.31	67.7	15.4	47.2	3.1	47
L. S. D. (.05)	144	90	2.82	N.S.	1.2	3.7	.2	2
(.01)	190	120	3.74	N.S.	1.6	4.9	.3	3
C. V. (%)	6	7	4	8	5	6	5	3

1/ Based on 3 yr. ave. all belts 1956-57-58 auction price on gov't. grade basis. 1958 prices through Sept. 25.

2/ Based on quality appraisal for color, size, body, texture, maturity, physical intactness and cutting quality.

Table 6. Continued. TV 94 Clayton - 1958

Variety	Suckers per Plant: Ground	Suckers per Plant: Leaf Axil	Analyses of Cured Leaf: Nic. %	Nornic. %	Tot. Alk. %	Ratio Nic x 100 / Tot. Alk.	Red. Sug. %	Tot. N %	Ratio N/Nic.
D. B. 101	6.3	14.2	1.74	.13	1.88	92.01	27.42	1.32	.74
402	4.3	12.9	1.94	.15	2.10	92.43	23.71	1.24	.66
Hicks Broadleaf	4.6	15.5	2.26	.15	2.42	93.40	24.10	1.31	.59
Coker 187	2.3	11.5	2.18	.14	2.32	93.74	24.41	1.54	.70
Bell 15	3.9	15.6	1.97	.11	2.08	94.35	25.54	1.40	.69
Vesta 5	5.2	12.7	1.98	.12	2.10	94.00	24.45	1.18	.59
McNair 121	4.3	12.1	2.12	.14	2.27	93.18	24.55	1.25	.58
Coker 187-Hicks	5.0	15.4	1.83	.14	1.98	92.27	25.52	1.04	.62
Coker 156	1.8	11.7	2.43	.14	2.58	94.45	23.35	1.16	.58
Reams 51	5.5	13.7	1.79	.12	1.92	93.41	25.05	1.12	.62
P. D. 97	1.9	13.9	2.89	.16	3.06	94.46	21.71	1.67	.58
Bell 16	3.3	12.3	1.86	.10	1.96	94.42	22.94	1.22	.75
N. C. 73	3.5	10.8	2.22	.14	2.37	93.60	20.58	1.44	.66
L. S. D. (.05)	1.3	2.5	.32	N.S.	.34	5.81	2.44	.36	.24
(.01)	1.7	3.4	.42	N.S.	.45	N.S.	3.23	N.S.	.32
C. V. (%)	24	14	13	86	12	4	7	14	15

Table 6. Continued. TV 94 Clayton - 1958

Variety	Angle of leaf proj. from stalk			Width of leaves in inches			Length of leaves in inches		
	5th 2/	10th 2/	15th 2/	5th 2/	10th 2/	15th 2/	5th 2/	10th 2/	15th 2/
D. B. 101	62.4	33.3	46.4	11.1	12.3	12.5	19.5	19.9	17.5
402	41.4	28.7	41.7	10.9	12.9	12.9	19.9	19.7	17.9
Hicks Broadleaf	35.0	30.0	43.1	10.2	11.8	12.5	21.3	21.1	18.8
Coker 187	44.4	24.1	35.0	9.8	12.8	14.2	18.8	20.5	17.8
Bell 15	40.8	30.9	42.9	10.0	11.9	12.6	20.8	21.1	18.6
Vesta 5	56.2	27.3	50.0	10.7	13.1	13.4	20.3	21.6	18.2
McNair 121	31.8	25.6	47.3	10.6	12.3	13.0	18.8	20.1	17.9
Coker 187-Hicks	53.0	24.3	30.6	10.4	12.2	13.7	18.8	19.9	18.9
Coker 156	45.5	23.4	39.2	9.8	11.6	11.9	21.2	21.8	18.1
Reams 51	58.5	31.3	44.0	10.3	11.9	14.0	19.7	20.9	19.4
P. D. 97	40.2	24.1	41.7	9.9	10.5	12.2	21.4	21.4	17.7
Bell 16	49.9	28.5	45.1	10.8	13.0	13.5	21.4	22.1	19.3
N. C. 73	56.7	27.3	44.7	11.2	13.9	14.9	20.3	21.6	19.1
L. S. D. (.05)	8.6	4.8	5.0	.8	1.0	1.0	1.2	1.4	1.4
(.01)	11.4	6.3	6.6	1.1	1.3	1.3	1.5	1.9	1.9
C. V. (%)	14	13	9	6	6	5	4	5	5

2/ No. of leaves from top of plant.

Table 7. Comparison of varieties in 1958 for certain characteristics. TV 95 - Oxford

Varieties	Yield Lbs./A	Value Index 1/ Dol./A	Value Index 1/ Dol./Cwt.	Quality 2/ Index	No. of leaves per plant	Height of plant (in.)	Ave. length of internode (in.)	Days to Flower
D. B. 101	1708	903	52.84	56.3	17.5	50.2	2.9	53
402	1722	958	55.53	64.3	16.6	42.3	2.6	48
Hicks Broadleaf	1724	1012	58.70	70.3	16.7	38.4	2.3	46
Coker 187	1801	987	54.88	67.8	17.5	43.5	2.5	53
Bell 15	1846	1078	58.42	65.9	16.6	39.0	2.4	47
Vesta 5	1836	1040	56.73	65.8	16.2	45.7	2.9	50
McNair 121	1752	988	56.37	65.6	17.3	44.0	2.6	54
Coker 187-Hicks	1872	978	52.30	57.8	19.1	41.8	2.2	54
Coker 156	1634	921	56.35	65.9	17.4	44.2	2.6	49
Reams 51	1874	1024	54.55	62.5	18.5	47.2	2.5	53
P. D. 97	1682	934	55.46	67.1	17.4	44.8	2.6	49
Bell 16	1673	918	54.83	58.7	16.3	41.4	2.6	50
N. C. 73	1779	986	55.41	67.7	15.5	43.1	2.8	49
L. S. D. (.05)	160	108	2.47	6.4	1.1	4.1	.17	2
(.01)	212	143	3.28	8.6	1.4	5.4	.22	3
C. V. (%)	6	8	3	5	4	7	5	3

1/ Based on 3 yr. ave. all belts 1956-57-58 auction price on gov't. grade basis. 1958 prices through Sept. 25.

2/ Based on quality appraisal for color, size, body, texture, maturity, physical intactness and cutting quality.

Table 7. Continued. TV 95 Oxford - 1958

Variety	Suckers per Plant		Analyses of Cured Leaf						Ratio
	Ground	Leaf Axil	Nic. %	Nornic. %	Tot. Alk. %	Ratio Nic x 100 / Tot. Alk.	Red. Sug. %	Tot. N %	N/Nic.
D. B. 101	5.3	11.2	1.43	.10	1.54	92.98	25.98	1.16	.76
402	2.3	10.2	1.98	.19	2.18	90.70	20.46	1.28	.64
Hicks Broadleaf	.7	12.8	2.00	.11	2.12	94.56	23.55	1.22	.64
Coker 187	.2	10.2	1.90	.13	2.04	93.36	22.52	1.14	.58
Bell 15	.6	12.3	1.97	.09	2.07	95.18	21.97	1.28	.62
Vesta 5	2.2	12.0	1.96	.12	2.10	93.33	24.32	1.06	.56
McNair 121	.4	11.0	1.82	.22	2.05	88.32	20.23	1.17	.71
Coker 187-Hicks	4.3	12.4	1.46	.10	1.56	93.21	23.85	1.00	.71
Coker 156	.2	9.3	2.25	.13	2.39	94.20	22.82	1.34	.60
Reams 51	4.8	11.3	1.57	.11	1.69	93.04	24.83	1.08	.68
P. D. 97	.2	9.8	2.54	.16	2.71	93.54	20.82	1.51	.57
Bell 16	.9	8.3	1.72	.11	1.84	93.62	22.56	1.16	.76
N. C. 73	.7	8.4	2.05	.14	2.20	93.41	20.46	1.25	.65
L.S.D. (.05)	1.2	1.8	.24	.07	.26	N.S.	2.20	N.S.	.24
(.01)	1.6	2.4	.31	.10	.34	N.S.	2.91	N.S.	.32
C. V. (%)	55	13	10	49	10	4	7	13	15

Table 7. Continued. TV 95 Oxford - 1958

Variety	Angle of leaf proj. from stalk			Width of leaves in inches			Length of leaves in inches		
	5th 2/	10th 2/	15th 2/	5th 2/	10th 2/	15th 2/	5th 2/	10th 2/	15th 2/
D. B. 101	43.9	35.9	52.8	10.4	11.8	13.0	18.8	20.4	19.3
402	30.4	30.3	41.8	10.8	13.3	14.7	20.1	22.0	21.2
Hicks Broadleaf	38.1	31.5	43.5	9.3	11.2	12.8	21.3	22.0	20.9
Coker 187	28.1	30.0	39.8	10.5	12.5	13.8	19.1	21.0	19.5
Bell 15	35.7	33.5	40.3	9.8	11.2	13.1	21.5	22.3	20.9
Vesta 5	33.	32.9	52.7	10.6	12.3	12.8	20.1	22.1	20.1
McNair 121	27.3	32.1	38.8	10.6	12.5	14.0	18.8	20.8	20.9
Coker 187-Hicks	27.5	33.0	39.2	10.0	11.7	14.0	18.5	21.0	20.4
Coker 156	31.9	30.0	40.5	9.3	11.0	12.1	20.4	21.8	20.1
Reams 51	45.0	33.9	47.8	9.8	12.3	14.7	18.8	21.8	21.6
P. D. 97	34.0	31.7	43.7	9.6	11.3	12.7	20.8	22.6	21.3
Bell 16	37.9	37.6	47.9	10.4	12.2	13.9	20.5	22.4	21.0
N. C. 73	36.1	33.0	48.2	10.6	14.0	14.9	19.5	21.2	21.0
L. S. D. (.05)	6.7	3.5	6.1	.7	.9	1.3	1.2	1.2	1.4
(.01)	8.9	4.6	8.1	.9	1.2	1.7	1.5	1.6	1.8
C. V. (%)	14	8	11	5	6	7	4	4	5

2/ No. of leaves from top of plant.

Table 8. Comparison of varieties in 1958 for certain characteristics. TV 96 - Rural Hall

Varieties	Yield Lbs./A	Value Index 1/ Dol./A	Value Index 1/ Dol./Cwt.	No. of leaves per plant	Height of plant (in.)	Ave. length of internode (in.)	Days to Flower
D. B. 101	1642	833	50.81	23.8	55.7	2.4	66
402	1658	786	47.38	21.0	44.7	2.1	59
Hicks Broadleaf	1606	876	54.52	21.1	38.7	1.8	54
Coker 187	1583	717	44.57	23.1	40.6	1.8	69
Bell 15	1554	854	55.09	21.2	37.6	1.8	56
Vesta 5	1549	741	47.82	21.8	47.6	2.2	61
McNair 121	1633	737	44.93	22.1	40.2	1.8	68
Coker 187-Hicks	1864	890	47.34	23.9	41.1	1.7	69
Coker 156	1499	776	51.70	22.0	43.8	2.0	59
Reams 51	1660	807	48.29	23.3	42.3	1.8	68
P. D. 97	1412	708	49.71	21.4	43.9	2.1	61
Bell 16	1614	778	48.09	20.5	46.5	2.3	61
N. C. 73	1588	756	47.53	20.6	45.5	2.2	61
L. S. D. (.05)	241	174	4.82	1.6	3.6	.2	4
(.01)	320	231	6.38	2.2	4.8	.2	6
C. V. (%)	10	15	7	5	6	6	4

1/ Based on 3 yr. ave. all belts 1956-57-58 auction price on gov't. grade basis. 1958 prices through Sept. 25.

Table 8. Continued. TV 96 Rural Hall - 1958

Variety	Suckers per Plant		Analyses of Cured Leaf						Ratio
	Ground	Leaf Axil	Nic. %	Nornic. %	Tot. Alk. %	Ratio Nic x 100 / Tot. Alk.	Red. Sug. %	Tot. N %	N/Nic.
D. B. 101	2.7	22.3	3.34	.23	3.60	92.80	17.58	2.13	.60
402	.8	23.8	4.75	.47	5.25	90.36	12.78	1.87	.42
Hicks Broadleaf	.7	28.7	4.30	.26	4.67	92.21	16.99	2.05	.48
Coker 187	.0	14.1	3.49	.18	3.88	90.55	14.35	1.90	.71
Bell 15	.2	28.4	4.24	.22	4.67	90.61	17.58	1.68	.44
Vesta 5	.5	27.9	4.96	.36	5.35	92.70	14.47	2.14	.42
McNair 121	.3	18.6	3.57	.25	3.84	92.82	13.84	1.46	.44
Coker 187-Hicks	1.9	20.7	3.34	.21	3.54	94.16	15.34	2.06	.64
Coker 156	.1	21.2	5.44	.32	5.79	93.80	14.33	2.16	.42
Reams 51	1.7	18.8	3.78	.28	4.08	92.56	16.49	1.87	.56
P. D. 97	.0	19.6	5.80	.39	6.23	93.16	14.64	2.32	.40
Bell 16	.2	18.9	3.85	.28	4.16	92.56	14.17	1.62	.40
N. C. 73	.0	19.8	4.28	.27	4.58	93.52	14.59	1.99	.52
L. S. D. (.05)	.8	4.9	.59	.10	.62	4.35	2.49	N.S.	.28
(.01)	1.0	6.5	.78	.13	.82	5.76	3.29	N.S.	.37
C. V. (%)	90	19	12	29	11	3	12	20	23

Table 8. Continued. TV 96 Rural Hall - 1958

Variety	Angle of leaf proj. from stalk			Width of leaves in inches			Length of leaves in inches		
	5th 2/	10th 2/	15th 2/	5th 2/	10th 2/	15th 2/	5th 2/	10th 2/	15th 2/
D. B. 101	63.6	39.9	42.6	8.8	9.7	10.4	16.7	18.0	18.6
402	49.1	35.2	38.3	8.9	9.6	10.9	19.0	19.9	19.8
Hicks Broadleaf	44.6	36.5	35.8	7.6	8.7	9.4	19.4	19.9	19.3
Coker 187	33.4	31.8	35.8	8.9	9.8	10.1	17.4	19.1	18.7
Bell 15	43.4	34.3	34.2	7.3	8.5	9.4	18.5	19.2	18.5
Vesta 5	70.9	43.3	42.8	7.5	8.7	9.6	15.9	18.2	18.8
McNair 121	40.9	29.2	31.6	8.9	9.2	9.7	16.4	17.1	17.2
Coker 187-Hicks	37.7	33.5	39.7	9.4	10.1	10.9	17.8	19.4	20.0
Coker 156	46.8	36.5	32.1	6.8	7.8	8.9	17.6	17.8	18.4
Reams 51	48.8	37.0	39.3	8.2	8.8	9.9	16.6	17.6	19.0
P. D. 97	46.3	31.2	30.5	7.1	8.1	8.9	18.4	18.5	18.5
Bell 16	49.6	37.0	35.8	8.2	9.5	10.7	18.6	20.3	20.3
N. C. 73	52.5	34.7	34.0	7.8	9.0	10.9	17.3	18.6	19.8
L. S. D. (.05)	9.0	7.3	6.3	1.0	.9	.8	1.7	1.6	1.7
(.01)	11.9	9.7	8.3	1.3	1.2	1.1	2.2	2.2	2.3
C. V. (%)	15	16	13	9	7	6	7	6	6

2/ No. of leaves from top of plant.

Table 9. Results of Cooperative Evaluation Tests. 1958.
12 locations (3 in each belt)

	Belt				
	Border	Eastern	Middle	Old	Average
	Yield Lbs/A				
Hicks Broadleaf	1730	1815	1456	1614	1654
C 187-Hicks	1721	2164	1788	1570	1810
N. C. 73	1424	1806	1554	1420	1551
L. S. D. (.05)					81
(.01)					110
C. V. (%)					6
	Value Index $/A				
Hicks Broadleaf	1128	1158	959	1026	1068
C 187-Hicks	1053	1294	1103	872	1081
N. C. 73	879	1064	945	807	924
L. S. D. (.05)					50
(.01)					67
C. V. (%)					6
	Value Index $/Cwt.				
Hicks Broadleaf	65.22	63.92	65.72	63.83	64.67
C 187-Hicks	61.39	59.93	61.46	55.42	59.55
N. C. 73	61.81	59.00	60.83	56.79	59.61
L. S. D. (.05)					1.52
(.01)					2.04
C. V. (%)					3

Table 10. Evaluation by Use of Appraisal Sheets for Quality Index on Cooperative Farmer Tests from Eight Locations. 1958. Ratings Made by Tobacco Company Personnel.

	Comp. A	Comp. B	Comp. C*	Comp. D	Comp. E	Comp. F**	Comp. G**
Hicks Broadleaf	53.07 (1)	58.42 (2)	63.91 (1)	58.69 (1)	70.21 (1)	56.13 (1)	64.64 (2)
C 187-Hicks	50.97 (2)	52.78 (3)	56.63 (3)	48.65 (3)	52.73 (3)	54.98 (2)	61.92 (3)
N. C. 73	47.90 (3)	58.65 (1)	62.30 (2)	54.19 (2)	60.24 (2)	52.22 (3)	65.99 (1)

* Based on six locations.

** Based on two locations.

Table 11. Percent Graded by Companies in Their Grades From the Twelve Farmer Tests. 1958.

	Hicks Broadleaf	C 187-Hicks	N. C. 73
Company A	15.77	23.92	15.18
Company B	29.77	30.97	35.12
Company C	38.88	41.00	46.59
Company D	32.02	24.74	29.12
Company E	46.43	3.12	25.92
Company F	17.49	9.75	7.37

Table 12. Index on Amount Graded by Companies From the Twelve Farmer Tests* 1958

Belt	Hicks Broadleaf	C 187-Hicks	N. C. 73
Border Belt Average	2.14	1.77	1.63
Eastern Belt Average	2.26	1.18	2.28
Middle Belt Average	1.29	.95	1.16
Old Belt Average	1.65	.75	1.05
Average	1.84	1.16	1.53

* 0 = none graded; 6 = all graded by all six participating companies.

Table 13. Rainfall Record in Inches
Border Belt Tobacco Research Station, Whiteville, N. C. 1958.

Date	March	April	May	June	July	August
1						
2	.02					.12
3	.09			2.03		
4		.39				
5		.11			.13	
6		.39	.51		.15	
7	T		.01	.60	.66	
8	.11					
9	.70					
10	.02	.21				
11		.15			.50	
12			.55	.01	.46	.45
13	.60					.25
14	.02				.22	
15		.31		.28	.10	
16		1.67				
17						
18					.50	
19	.11					
20			.38	.28		
21		.01	.40		1.11	
22		.50		4.35		
23		.05		.51		
24						
25	.65		.14		.34	1.25
26	.05		.02			6.00
27	.13			1.80		.90
28			.25			.02
29		.55	.14			.02
30		T			.04	
31	2.28					
TOTAL	4.78	4.34	2.40	9.86	4.21	9.01

Table 13. Continued. Rainfall Record in Inches
Upper Coastal Plains Research Station, Rocky Mount, N. C. 1958.

Date	March	April	May	June	July	August
1						
2	T		T	.05		
3				T		.65
4		.04				2.40
5		.03	.12			.03
6		1.04	1.05			
7			1.55		T	
8			.07		T	
9	.42				.52	
10	.05	.42		.35	.03	
11		.46			T	
12			.03		.03	
13	.12		.05		.02	.58
14	.20				.34	.05
15		.04				.35
16		.23		.12	.04	2.39
17						
18	.12					
19	.58			.12		
20			T	.07		
21			.10	.01	.22	
22		.40				
23		.23		.13		.01
24	T		.53		T	.56
25	1.20		.13	1.50*	.56	1.85
26	.10	T	.15	.06		2.15
27	.05			1.30		.15
28	T	.90	.70			.18
29		1.08				
30		.08				
31	.83					
TOTAL	3.67	4.95	4.48	2.21 1.50*	1.76	11.35

* Amount applied as irrigation

Table 13. Continued. Rainfall Record in Inches
Central Crops Research Station, Clayton, N. C. 1958.

Date	March	April	May	June	July	August
1			.04			
2			.04	.20		.09
3			.02			
4		.07				1.73
5			.10		.38	
6		.62	1.75	.55	.02	
7			1.10	.32	.92	
8			.04			
9	.48				.60	
10		.42	.03	.05	.21	
11		.65				
12			.08	.05		.58
13	.32		.19		.10	.36
14	.10			.14	.82	.03
15		.08		1.20	.71	.06
16		.28		.89		.13
17						.05
18	.12					
19	.28					
20			.78	.05	1.43	
21			.04		.07	
22		.50				
23		.11		.12		
24			3.97			.05
25	1.67	.23	T		.90	1.30
26	.13	.07	.14	.22		2.73
27	.04			1.43		.09
28		.57	.39			
29	.01	.93	.46			
30		.47				
31	.46					
TOTAL	3.61	5.00	9.17	5.22	6.16	7.20

Table 13. Continued. Rainfall Record in Inches
Oxford Tobacco Research Station, Oxford, N. C. 1958

Date	March	April	May	June	July	August
1						
2			1.21			.05
3		.07				2.03
4		.26				
5		T			.55	
6		1.83	2.21	T	.13	
7			.73		.23	
8					.25	
9	.47				.06	
10	.09	1.16	.02	2.51	T	
11			.26			
12			.01	.10	.97	T
13	.34				1.67	.91
14						
15		T				
16		.36	T	T		.92
17					.09	
18	.27				.30	
19	.65					
20	.10		T	.08		
21					.54	
22		.56		.85		
23						
24			.23		.70	1.38
25	1.10					.64
26	.20		.49	.77		.50
27		.12		.19	.16	
28		.87	1.76			.13
29		.56				
30						
31	.48				.21	
TOTAL	3.70	5.79	6.92	4.50	5.86	6.56

Table 13. Continued. Rainfall Record in Inches
Upper Piedmont Tobacco Research Station, Rural Hall, N. C. 1958.

Date	May	June	July	August
1	.02	T		.61
2	.15	.81		
3	.27		.12	1.63
4				
5	.01		.09	
6	.56	.47		
7	.65			
8			.13	
9		.28	.07	
10			.03	
11	.04			
12		.47	.32	
13			.11	.79
14			.10	.10
15		.02		
16			.34	2.38
17			T	
18	1.22		T	
19			1.73	
20	.36	.15	T	
21			T	
22		.08	.12	T
23				.05
24	.09			.74
25				.44
26		.49		
27		.08		
28	.22		.05	
29			.01	
30				
31			.17	
TOTAL	3.59	2.85	3.39	6.74