AN INDEX OF GENERAL QUALITY OF BURLEY TOBACCO

By

Dana G. Card and Willard H. Minton

RESEARCH REPORT 19 : April 1974

University of Kentucky :: College of Agriculture
Agricultural Experiment Station :: Department of Agricultural Economics
Lexington

CONTENTS

LIST OF TABLES

SUMMARY

Average quality of burley tobacco has varied from year to year, but no standard measure of quality has been used to compare one crop with another over a period of years. An index number of general quality, based upon the distribution of tobacco among standard federal grades is presented here.

Some 25 measures of quality were considered for use in an index number, but no one of them was entirely satisfactory. A combination of the following five measures appears to reflect thickness of leaf, color, extent of damage and other characteristics of quality: (1) the proportion of the crop made up of lugs and flyings, (2) the proportion of the crop in the choice, fine and good quality classifications, (3) the proportion of the crop in the buff, tan and tannish red colors, (4) the proportion of the crop in selected high-quality grades, by groups, and (5) the proportion of tan color within the leaf group. The sum of these five percentages divided by the 1949-70 average of the sums constitutes the index presented in Table 1.

For years 1912 to 1938, prior to extensive use of federal grades for burley tobacco, the quality of crops is presented as scores ranging from 1 to 5 in Table 7. The scores are based on various types of information available for those years.

ACKNOWLEDGMENTS

Without the data gathered and published by the Tobacco Division of the USDA Agricultural Marketing Service, this index of burley tobacco quality would not be possible. Robert T. Gaitskill and Aubrey R. Waits of the Tobacco Division; Ira Massie, Extension Specialist in Tobacco; and Garnett L. Bradford, Associate Professor of Agricultural Economics, encouraged us to develop an index of quality. Our associates, Harry H. Hall and Loys L. Mather, reviewed the manuscript and offered helpful suggestions. Ruth E. Wagner and Carol H. Holbrook carefully typed the tables and manuscript through its revisions, and Dana R. Ritchie prepared the final format and typing. We are grateful for all of these services.

AN INDEX OF GENERAL QUALITY OF BURLEY TOBACCO

by

Dana G. Card and Willard H. Minton*

Introduction

"Quality" is a term used frequently when discussing the merits of a crop of burley tobacco, yet just what is meant by "quality" is not easy to describe. In the system of federal grades for burley tobacco, relative quality is a characteristic considered within a group and color in determining a particular grade of burley. More frequently, however, the term quality is used in a general sense such as "the 1967 crop was of better quality than the 1966 crop" or a statement to the effect that tobacco grown in one area is of better quality than that grown in another area during the same year.

Such statements usually mean that the better quality tobacco has more desirable characteristics such as brighter color, thinner body, better burning qualities, etc. Year-to-year quality comparisons are often made but no system now in effect assigns a numerical quality score to burley tobacco grown each year.

Data on the distribution of tobacco among the various standard grades are used here to compute a numerical index which reflects differences in average quality between crop years, or between periods in the marketing season. Inasmuch as all burley tobacco is graded before it is sold, the proportion of tobacco falling in the better grades should provide an index of general quality [9].[1] No one measure appears adequate, however, because grade designations do not completely reflect the difference between heavy-bodied and thin-bodied crops. A combination of measures seems more accurate.

Since 1938, the Tobacco Market News Service[2] has issued, at the close of each marketing season, a brief comment on the general quality of the crop, usually compared with that of the previous year. Thus, there is available a year-to-year comparison of burley quality but no comparison except between succeeding years, and then only in general terms. (See the Appendix for these statements.) The statements are not consistent in their use of terms. There are some references to the proportion of lugs and flyings, some to the predominance of low grades or to dark red and green colors. This suggests that no single characteristic adequately reflects general quality but indicates some measures that are important.

In this report, a numerical index of the general or overall quality of burley tobacco

*Professor Emeritus and Assistant Professor, respectively, of Agricultural Economics. This report results from work on Experiment Station Hatch projects 72 and 78, which deal with tobacco marketing and prices.

[1] Figures in brackets refer to literature listed on page

[2] U.S. Department of Agriculture and Departments of Agriculture in southern tobacco growing states, cooperating.

grown each year is presented. Measures of quality which did not agree fairly well in the direction of change with the market news statements were considered inadequate. Some 25 different measures were considered, but only five are used in the numerical index.

It is hoped that this index of burley tobacco quality may be of interest and of value to people in the tobacco industry, to agronomists who study tobacco production and ways to improve its quality, and to economists who work on marketing and policy aspects of the crop.

The Federal System of Standard Grades

The system of standard grades now used for burley tobacco was developed in the U.S. Department of Agriculture during the 1920's. It is part of a general system for all types of tobacco grown in the United States and has been in use since about 1930 [10].

Even with federal grades in use, each tobacco company places its private grade on the tobacco it buys. Private grades vary between companies, and descriptions of the grades are not available to others. The Burley Tobacco Growers Cooperative Marketing Association (1921-26) used a set of grades which included all qualities of burley tobacco, but those grades were replaced by official government grades.

The 107 grades listed in Table 2 are the ones now used by official government graders of burley tobacco.

Subjective evaluation of a product into so many grades would be practically impossible were it not for the fact that burley tobacco can be sorted on the basis of three distinguishable characteristics: group, quality and color. The grade symbols have three characters: first, a letter indiciating the group; second, a number indicating the quality within the group; and third, a letter or letters signifying color [10 and 14].

Group

The tobacco plant does not ripen uniformly. Often a few of the bottommost leaves deteriorate and slough off while the topmost leaves still are growing actively. The oldest leaves at the bottom of the plant tend to be light in color, thin in body and so tissuey that they often shatter when handled. These leaves are called "Flyings" and are given the group designation X.

Farther up the stalk are longer leaves, a little heavier than flyings but still thin enough to have good burning qualities. These are called "Lugs" and are given the group designation C. They usually are the most valuable part of the burley plant.

The next series of leaves, called "Leaf" are given the group designation B. They form later than lugs and, therefore, are not quite as mature, and thus tend to be medium-to-heavy in body and darker in color than either lugs or flyings. This leaf group makes up some 45% of the crop and varies in color and body with general quality of the entire crop.

The fourth regular group is made up of the topmost leaves harvested. These leaves are shorter and heavier in body and darker in color than those of the leaf group. Quite logically, this group of leaves is called "Tips" and is given the group designation T. Still other small leaves, at the top of the plant, are cut off and discarded before burley tobacco is harvested.

Three other group designations also are used: "Mixed" (M) for tobacco containing two or more of the above-mentioned groups in mixed amounts; "Nondescript" (N) for

damaged tobacco or tobacco which does not meet the minimum specifications of the lowest grades in other groups; and "Scrap" (S) for broken pieces of tobacco leaves and stems.

Quality

The second character in the grade symbol is a number (1 to 5) which relates to quality within the group and color. The five degrees of quality are based on elements in tobacco such as: smoothness, maturity, body, texture, injury, finish and uniformity. They are Choice (1), Fine (2), Good (3), Fair (4) and Low (5). No choice or fine qualities occur in the tip group.

Color

The third character in the grade symbol is a letter, or letters, representing color. The colors and the letters assigned to them from light to dark are: Buff (L), Tan (F), Tannish Red (FR), Red (R) and Dark Red (D). Other color designations are: Variegated (K), Mixed (M), Greenish (V), Greenish Tan (VF), Greenish Red (VR), Green (G), Green Tan (GF) and Green Red (GR). The buff color occurs only in flyings and lugs, while red and tannish red occur mainly in leaf and tips.

Thus a grade symbol of C4F represents tobacco belonging in the lugs group, of fair quality and tan in color.

Measures of Quality Used in the Index

Five indicators of quality are combined in the quality index (Table 3).

1. *The Proportion of the Crop made up of Lugs and Flyings*—The thinner-bodied lighter-colored and better burning leaves of a burley crop usually are the lugs and flyings. If one year's crop has lighter thinner leaves than that of another year, it is probable that a higher proportion of the leaves will be classified as "lugs". The proportions of lugs and flyings do not always increase or decrease together, but when lugs and flyings are combined, this seems to be a good indicator of overall quality of burley tobacco.

In recent years, differences in the prices of lugs, flyings and the better grades of leaf have been so small that some farmers have not taken the trouble to separate these groups. As a result, the amount of burley classified as Mixed (M) has increased (Table 8). "In Mixed Group grades: F indicates light general color and medium-to-tissuey body," [11, p. 10]. Most of this tobacco, therefore, would have appeared as lugs or flyings had it been sorted into groups more carefully. When calculating the index of general quality of burley tobacco, mixed tobacco which carried the "F" designation was considered to be flyings and lugs.

In the 22 years, 1949-70, the flyings group (X) made up about 19% of the crop, the lugs group (C) about 21%, and the F part of the mixed group (MF) a little over 2%. Thus, these three components averaged over 42% of the burley tobacco marketed. It varied from 31% in 1962 to 53% in 1955 (Table 3).

2. *The Proportion of the Crop Made up of Choice, Fine and Good Quality Grades*—The sum of the first two or three quality designations should give a satisfactory indicator of overall quality. Two limitations arise, however. The first two qualities constitute 10% or less of the entire crop and the percentage varies erratically from year to year. The 3rd quality "Good", includes, a

fairly large amount of relatively low-grade tobacco. The key to standard grades (Table 2) shows that a number of grades of red, variegated and green tobacco carry the good or 3rd quality designation, as does the tip group.

Looked at another way, the choice, fine and good quality tobacco is better than the fair, low, nondescript and miscellaneous, so using the proportion falling in the first three qualities should reflect changes in overall quality. In the 22 years, 1949-70, nearly 29% of the crop fell in the first three qualities (choice, fine and good) and varied from 17% in 1959 to 48% in 1968 (Table 3).

3. *The Proportion of the Crop in the Dark-Colored, Nondescript and Miscellaneous Classifications*—In some years a lower quality crop is indicated by a larger-than-usual proportion of off-colored tobacco. More dark, variegated and green tobacco shows up in the crop. Table 10 shows the percentage of red, dark red, variegated, Mixed,[3] greenish, green, nondescript and miscellaneous tobacco. The key to standard grades (Table 2) shows that most of such tobacco is in the lower grades. A sum of the eight columns gives a negative indicator of quality. That is, the larger the total, the poorer the general quality of the crop. This percentage can be changed to a positive indicator by adding the percentages in the first three columns, those for buff, tan and tannish red colors. Inasmuch as tannish red (FR) grades were not used in the leaf group prior to 1943, and in the tip group prior to 1949, some allowance was made for this.

During the 22 years, 1949-70, this positive indicator of quality included, on the average, 71% of the crop and varied from 54% in 1959 to 89% in 1955 (Table 3).

4. *The Proportion of the Crop in 19 Selected Grades, by Groups*—A large proportion of tobacco in the better grades of each group should reflect a high quality crop. The grades selected to be "high-grade" or "low-grade", within groups, doubtless would depend on the person making the selection. For this index of quality, 19 grades were selected. An average of 14.8% of all burley was in these 19 grades during the years 1949-70. The percentage varied from a low of 6.44 in 1959 and in 1960, to a high of 30.76 in 1968 (Table 3). Table 4 lists the grades used, the average percent of the crop represented by each group and the ranges in percentages. Neither the high percentages nor the low percentages for all groups came in the same year. Data for this indicator of quality were not published prior to 1949.

5. *The Proportion of Tan Color Within the Leaf Group*—Although color by itself may not be an important determinant of quality, it is associated with other physical characteristics which are important [14, p. 15]. So color is a consideration in assigning grades.

The amount of light-colored tobacco in a crop is reflected to some extent by the proportion of lugs and flyings. On the other hand, variations in color in the leaf group may not be reflected. Leaf makes up about 45%, by weight, of burley tobacco so the quality of leaf is important in affecting the overall quality of the crop. As an indicator of quality, the proportion of leaf which was graded tan in color is used in calculating the index. From 1949 to 1970, an average of 50% of leaf was tan in color, but ranged from 29% in 1949 to 71% in 1955 (Table 3). Here too some allowance was made for the absence of FR grades in leaf prior to 1943 and in tips prior to 1949.

[3] "Mixed" here refers chiefly to mixed colors in contrast to mixed groups in Table 8.

Calculating The Index Of General Quality

To calculate the index of quality presented here, the following five percentages were added together for each year: (1) the percentage of the crop in flyings, lugs, and the thin side of the mixed group; (2) the percentage of the crop in the three top qualities (choice, fine and good); (3) the percentage in the three brighter colors (buff, tan and tannish red); (4) the percentage of leaf which was classed as tan in color; and (5) the percentage of the tobacco which was included in 19 selected high-quality grades (Table 3).

Table 5 gives the 22-year average of these indicators, together with the highest and lowest value for each. Even though the indicators differ considerably in average value, their ranges are less variable. An index based on the sum of the five indicators should give each indicator roughly the same importance in determining changes from year to year.

Index numbers usually are expressed in percent of some base number. For a time series, some relatively normal or recent period often is selected for the base value of 100. The 22 years, 1949-70 inclusive, are used as a base for this index of burley quality. Data were more complete for these years than for earlier ones. The sum of the five percentages averaged 207.1 in the 22-year period. The figure 207.1 is taken as the base and yearly totals are expressed as percentages of it. The method of calculation for the year 1971 is illustrated in Table 6. Indexes for other years are given in Tables 1 and 3.

Evaluation Of The Index

Some may question the need for five measures of quality in the index rather than just one. If each is a good measure of quality, why use more than one? One answer to this can be found by comparing the year-to-year changes in the five measures used in the index. Only about half of the time did all five indicators move in the same direction from year to year. In other words, one indicator may show an improvement in quality at the same time that another shows a decline. An average of the five indicators seems preferable to any one.

Using several indicators helps maintain comparability over a period of years. The indicators used show different trends. The proportion of burley graded as lugs and flyings tended to decrease during the 22-year base period. The amount of burley graded choice, fine and good, however, tended to increase and about offset the decline in lugs and flyings. The proportion of low grades and the proportion in the selected 19 high grades showed very slight but opposite trends. The proportion of tan color in the leaf group declined slightly. These offsetting changes improve the merits of the index over one based on a single measure of quality.

The characteristics and uses of burley tobacco have changed materially in the past 50-60 years [6]. Because of this, an index of quality may not be applicable over an extended period. Our index is judged to be reasonably satisfactory in this respect, however.

Tobacco grown in different parts of the burley producing area differs in average quality [4]. Prior to 1940, the collection of grade information, upon which the index of quality is based, was much less complete and consistent than for the years since 1940. The markets on which Federal grading was done, and for some years the amount of tobacco graded, is shown below. The location of markets on which grade information was

gathered undoubtedly affects its comparability from year to year [14, pp. 16-25].

1931 crop—Gallatin, Tenn. 5,470,265 pounds
1932 crop—No grading
1933 crop—Horse Cave, Carrollton, Maysville, Lexington, Ky. and Knoxville, Tenn. 63,318,898 pounds
1934 crop—Knoxville, Tenn. 3,966,674 pounds
1935 crop—Lexington, Shelbyville, Ky. and Knoxville, Tenn.
1936 crop—Bowling Green, Cynthiana, Horse Cave, Mt. Sterling, Ky. 157,383 lots (probably 20-25 million pounds)
1937 crop—Bowling Green, Cynthiana, Danville, Horse Cave, Mt. Sterling, Ky.
1938 crop—Same as 1937 plus Maysville, Paris, Springfield, Ky.; Ripley, Ohio; Abingdon, Va.; Huntington, W. Va.; and Knoxville, Tenn. (12 markets) 105,715,613 pounds
1939 crop—14 markets
1940 crop—16 markets
1941 crop—All 43 markets

When selecting indicators of quality for use in the index, comparisons were made with the comments in the market news summaries. If too many discrepancies were found the proposed indicator was discarded. No one of the five indicators used, however, agreed with the market news comments in all of the 35 possible year-to-year comparisons (1937-72).

Comparison of the composite index with the market news comments shows agreement whenever a marked change in quality took place. With moderate changes in quality the agreement is less consistent. For instance, the 1945 crop was considered to be of quite low quality but our index shows it slightly better than the 1944 crop. This is due to an unusually low percentage of tan colored leaf in 1944 and a sharp rebound in 1945. Other years with small discrepancies were 1950, 1951, 1952 and 1964. In each of these years, either the amount of tan tobacco in the leaf group or the proportion in the 19 selected grades, moved in divergence to the market news report. In only one case, however, did the index show a change of as much as four points in the opposite direction from the news report. Changes of four points or less in the index probably are not important in reflecting quality differences.

Among the 36 years for which tobacco market news comments are available, eight changes in the index were four points or less while 18 were 12 points or more. Changes ranged from a decrease of 28 points from 1958 to 1959 to an increase of 33 points between 1966 and 1967, and averaged 12 points for the 34 year-to-year changes.

Quality Scores For Crops Prior To 1939

In 1939, when information by federal grades was not available, quality scores were assigned to crops of burley tobacco for the years 1912 to 1938 [2]. The best crops were scored 1 and the poorest were scored 5. These scores reflect variability in quality of crops even though the burley tobacco of those days was quite a different product from that of today.

The numerical scores were based on receipts by the Burley Tobacco Growers Cooperative Marketing Association from 1921 to 1926, sales records of buyer's grades, opinions of reputable tobacco dealers, buyers

and warehousemen and upon personal observation.

Table 7 shows the scores assigned to each crop. For a few years, both an index number and a score are available. They agree reasonably well, but no attempt is made here to link the two together.

Conclusions

The average quality of burley tobacco has varied considerably from year to year, but no recognized measure of quality has been available. Because quality is important in determining the value and use of burley tobacco, there is need for an index of general quality which can be used to compare one crop with another over a period of years. Such an index should be of value to people in the tobacco industry, to farmers and to educators. It may also be useful for analyzing the relation of weather conditions during the growing and curing seasons to tobacco quality.

The index of quality presented here appears to reflect changing characteristics of burley tobacco. There is some upward trend in the index during the 42-year period, but this would be expected from changes which have taken place in the burley tobacco plant as a result of new varieties and cultural practices. On the other hand, the index reflects short-time fluctuations in quality as well.

One limitation in using the index is a time lag in availability of federal grade data for inclusion in the index. A considerable portion of the year's crop must be sold before a reliable index number for that crop can be calculated. The index could be used, however, to show changes in average quality from week to week during the marketing season.

TABLE 1

AN INDEX OF GENERAL QUALITY OF BURLEY TOBACCO
(1949-70 average = 100)

Crop Year	Index Number	Crop Year	Index Number
1930		1950	90
1931	80	1951	92
1932*	90	1952	93
1933	80	1953	118
1934	96	1954	102
1935*	104	1955	128
1936	100	1956	109
1937	85	1957	102
1938	99	1958	101
1939	98	1959	73
1940	83	1960	88
1941	84	1961	102
1942	96	1962	80
1943	101	1963	85
1944	88	1964	89
1945	91	1965	101
1946	82	1966	94
1947	109	1967	127
1948	96	1968	131
1949	87	1969	107
		1970	101
		1971	113
		1972	125

Source: The basic data on federal grades came from U.S.D.A. Light Air-Cured Tobacco Market Reviews.

*Estimated from unofficial data.

TABLE 2

KEY TO STANDARD GRADE MARKS FOR BURLEY TOBACCO

Group	Quality	Color	
B - Leaf	1 - Choice	L - Buff	V - Greenish
T - Tips	2 - Fine	F - Tan	VF - Greenish tan
C - Lugs or Cutters	3 - Good	FR - Tannish red	VR - Greenish red
X - Flyings	4 - Fair	R - Red	G - Green
M - Mixed Group	5 - Low	D - Dark red	GF - Green tan
N - Nondescript		K - Variegated	GR - Green red
S - Scrap			

SUMMARY OF STANDARD GRADES

35 Grades of Leaf

B1F	B1FR	B1R							
B2F	B2FR	B2R							
B3F	B3FR	B3R		B3K	B3M	B3VF	B3VR	B3GF	B3GR
B4F	B4FR	B4R	B4D	B4K	B4M	B4VF	B4VR	B4GF	B4GR
B5F	B5FR	B5R	B5D	B5K	B5M	B5VF	B5VR	B5GF	B5GR

21 Grades of Tips

T3F	T3FR	T3R						
T4F	T4FR	T4R	T4D	T4K	T4VF	T4VR	T4GF	T4GR
T5F	T5FR	T5R	T5D	T5K	T5VF	T5VR	T5GF	T5GR

21 Grades of Lugs or Cutters

C1L	C1F				
C2L	C2F				
C3L	C3F	C3K	C3M	C3V	
C4L	C4F	C4K	C4M	C4V	C4G
C5L	C5F	C5K	C5M	C5V	C5G

14 Grades of Flyings

X1L	X1F		
X2L	X2F		
X3L	X3F		
X4L	X4F	X4M	X4G
X5L	X5F	X5M	X5G

8 Grades of Mixed Group

M1F	
M2F	
M3F	M3FR
M4F	M4FR
M5F	M5FR

7 Grades of Nondescript

N1L	N1F	N1R	N1G
N2L		N2R	N2G

1 Grade of Scrap

S

Special factors "W" 1/ and "U" 2/ may be applied to all grades. Tobacco not covered by the standard grades is designated as No-G (no grade).

1/ "W" - Unsafe order - Sound but containing excessive moisture which is likely to damage unless unusual precaution is taken.

2/ "U" - Unsound - Damaged under 20 percent.

Source: Light Air-Cured Tobacco Market Review, Part I, (Burley) U. S. Department of Agriculture, Agricultural Marketing Service, Tobacco Division (1970 Crop).

TABLE 3

COMPONENTS OF THE INDEX OF GENERAL QUALITY OF BURLEY TOBACCO
(1949-70 average = 100)

Crop Year	Components of the Index[1]					Composite	
	Flyings, Lugs and Mixed "F"	Qualities 1,2 and 3	Buff, Tan and Tannish Red	Nineteen Top Grades in Groups	Tan Color in Leaf	Total	Index
	----------percent of sales----------				(percent)		
1930							
1931	38.0	27.0	50.2		38.0	153.2	79.7
1932							
1933	41.6	31.4	45.4		36.4	154.8	80.5
1934	42.6	38.5	62.6		41.5	185.2	96.3
1935							
1936	48.6	38.9	61.0		43.3	191.8	99.7
1937	45.0	22.5	60.6		36.1	164.2	85.4
1938	49.8	28.5	71.3		41.3	190.9	99.3
1939	46.2	30.3	70.1		41.6	188.2	97.9
1940	36.3	24.0	59.3		39.5	159.1	82.7
1941	42.3	21.3	59.7		39.0	162.3	84.4
1942	47.4	31.2	67.0		39.7	185.3	96.4
1943	48.3	38.8	65.6		40.6	193.3	100.6
1944	47.0	32.6	59.4		31.0	170.0	88.4
1945	46.3	25.8	63.5		38.7	174.3	90.6
1946	41.7	20.8	60.6		35.2	158.3	82.3
1947	55.0	30.6	75.7		48.9	210.2	109.3
1948	50.7	25.7	67.4		41.4	185.2	96.3
1949	51.2	20.9	64.7	13.3	28.9	179.1	86.6
1950	50.7	20.9	64.2	12.1	39.1	187.0	90.3
1951	45.5	19.5	65.1	9.3	50.3	189.7	91.6
1952	42.9	23.3	66.7	14.2	45.4	192.5	92.9
1953	52.7	31.7	79.0	24.1	57.4	244.9	118.3
1954	43.6	22.5	76.4	10.0	58.9	211.4	102.1
1955	53.3	30.2	88.7	22.2	70.7	265.0	128.0
1956	48.7	25.7	81.0	15.8	54.2	225.3	108.8
1957	39.6	24.2	73.0	13.7	60.5	211.1	101.9
1958	46.5	22.7	74.2	13.5	53.1	210.0	101.4
1959	33.7	17.2	53.6	6.4	39.8	150.8	72.8

TABLE 3.--Continued

COMPONENTS OF THE INDEX OF GENERAL QUALITY OF BURLEY TOBACCO
(1949-70 average = 100)

Crop Year	Components of the Index[1]					Composite	
	Flyings Lugs and Mixed "F"	Qualities 1, 2 and 3	Buff, Tan and Tannish Red	Nineteen Top Grades in Groups	Tan Color in Leaf	Total	Index
	----------percent of sales----------				(percent)		
1960	35.1	22.1	67.2	6.4	51.2	182.1	87.9
1961	38.9	32.0	72.3	14.5	54.0	211.6	102.2
1962	30.9	24.4	58.0	9.7	42.9	165.9	80.1
1963	33.0	28.3	60.3	7.1	47.9	176.7	85.3
1964	37.0	26.6	62.5	12.2	46.0	184.3	89.0
1965	39.9	34.0	70.7	17.1	47.3	209.0	100.9
1966	35.2	34.6	66.6	13.0	44.1	193.6	93.5
1967	43.5	46.7	86.2	28.5	58.3	263.2	127.1
1968	52.6	47.9	87.2	30.8	53.8	272.3	131.4
1969	43.2	37.3	77.1	17.3	47.1	222.1	107.3
1970	36.5	37.3	69.7	14.3	50.6	208.5	100.7
1971	47.0	43.9	77.7	19.2	46.2	234.0	113.0
1972	47.0	50.6	81.6	22.7	56.5	258.4	124.8

Source: Light Air-Cured Tobacco Market Review, published by the United States Department of Agriculture.

[1] See accompanying text for description of components of the index.

TABLE 4

AVERAGE AND RANGE IN PERCENTAGE OF BURLEY TOBACCO CLASSIFIED IN 19 HIGH-QUALITY GRADES, BY GROUPS

Groups and Grades	Percent of the Crop Represented	
	1949-70 Average	Range
Flyings; X1L, X2L, X3L, X1F, X2F, X3F	6.13	1.20 - 15.00
Lugs; C1L, C2L, C3L, C1F, C2F, C3F	3,76	1.14 - 11.49
Leaf; B1F, B2F, B1FR, B2FR	4.31	0.53 - 12.57
Tip; T3F, T4F, T3FR	0.60	0.10 - 1.88
Total 19 grades	14.80	6.44 - 30.76

TABLE 5

TWENTY-TWO YEAR AVERAGE VALUE OF FIVE INDICATORS OF QUALITY AND THEIR RANGE OF VARIATION

Indicator of Quality	1949-70 Average	Lowest	Highest
	Percent	Percent	
Lugs, flyings and the thin side of the mixed group	42.5	31	53
Qualities 1, 2 and 3 (choice, fine and good)	28.6	17	48
Buff plus tan plus tannish red	71.1	54	89
Tan color in leaf	50.1	29	71
Nineteen high grades, by groups	14.8	6.4	30.8
Total	207.1		

TABLE 6

CALCULATION OF THE INDEX OF QUALITY
(1971 CROP OF BURLEY TOBACCO)[1]

Indicator of Quality	Percent of the Crop	Components of the Index
Flyings (X)	13.2	
Lugs (C)	20.3	
Mixed group (M), thin or "F" side only	13.5	47.0
Choice quality (1)	2.4	
Fine " (2)	10.8	
Good " (3)	30.7	43.9
Buff color (L)	1.5	
Tan color (F)	63.1	
Tannish red (FR)	13.1	77.7[2]
Proportion of leaf, graded tan (19.802 ÷ 42.895 x 100)		46.2
Sum of 19 grades		
X1L, X2L, X3L	0.400	
X1F, X2F, X3F	4.565	
C1L, C2L, C3L	0.215	
C1F, C2F, C3F	5.005	
B1F, B2F	8.163	
B1FR, B2FR	0.725	
T3F, T4F, T3FR	0.105	19.2
Total		234.0

Index of quality, 234.0 ÷ 207.1 x 100 - 113.0

The 1949-70, 22-year average total is 207.1, i.e., 1949-70 average = 100

[1]Source of Data: Tables 14 and 16 on pages 29 and 32 of Tobacco Market Review - type 31 - 1971 crop.

[2]Used to reflect changes in the amount of low-grade tobacco.

TABLE 7

QUALITY SCORES FOR CROPS OF BURLEY TOBACCO, 1912-38*

Crop Year	Score	Crop Year	Score
1912	1	1925	(2.5) 3
1913	3	1926	4
1914	4	1927	3
		1928	1
1915	(2.5) 3	1929	3
1916	1.5		
1917	(2) 2.5	1930	3.5
1918	2	1931	4
1919	2	1932	2
		1933	3
1920	5	1934	(2.5) 3
1921	3		
1922	1.5	1935	(2) 2.5
1923	4	1936	1
1924	3	1937	3
		1938	2.5

Score - 1 best, 5 poorest. Revised scores are in parentheses.

*Source: [2]

Table 8. Percentage of Sales by Group for Crops of Burley Tobacco

Crop Year	B Leaf	T Tips	C Lugs	X Flyings	M Mixed Group	N Nondescript	Miscellaneous
1930							
1931	51.1	9.8	23.2	14.8		1.1	
1932							
1933	46.5	9.5	26.9	14.7		2.4	
1934	41.0	15.9	22.0	20.6		0.5	
1935							
1936	34.5	14.9	26.4	22.2		2.0	
1937	38.5	14.8	23.8	21.2		1.7	
1938	33.9	14.7	29.7	20.1		1.6	
1939	36.8	15.6	26.6	19.6		1.4	
1940	45.6	16.4	18.0	18.3		1.7	
1941	35.1	17.6	21.5	20.8		5.0	
1942	36.8	12.8	26.5	20.9		3.0	
1943	34.2	14.8	24.0	24.3		2.7	
1944	45.1	5.7	26.5	20.5		2.2	
1945	33.6	14.8	22.1	24.2		3.7	1.6
1946	34.7	15.7	20.7	21.0		5.4	2.5
1947	31.5	10.6	30.4	24.6		2.9	
1948	34.3	11.2	26.0	24.7		3.7	0.1
1949	30.7	12.0	22.7	26.2	3.0	4.2	1.2
1950	29.8	10.8	29.4	19.0	3.0	5.6	2.4
1951	31.1	13.4	24.0	19.2	3.0	6.5	2.8
1952	35.8	12.1	18.9	23.6	0.4	5.6	3.6
1953	29.6	12.2	24.1	27.8	0.8	4.6	0.9
1954	40.5	9.4	28.9	14.3	0.6	3.6	2.7
1955	30.9	12.8	27.9	25.0	0.3	2.5	0.6
1956	34.4	10.9	25.2	23.0	0.5	4.9	1.1
1957	37.0	15.2	18.7	20.0	1.1	6.5	1.5
1958	34.1	12.1	24.8	21.1	0.7	6.5	0.7
1959	40.1	8.9	15.9	16.3	1.6	14.1	3.1
1960	44.5	9.2	19.3	12.8	3.2	8.7	2.3
1961	45.8	7.2	18.1	19.6	1.2	6.4	1.7
1962	43.6	10.5	10.6	17.6	3.0	11.7	3.0
1963	50.7	6.1	17.9	14.1	1.1	6.7	3.4
1964	41.7	9.9	13.4	21.7	1.9	7.0	4.4
1965	45.4	8.0	18.3	20.4	1.3	4.4	2.2
1966	50.2	2.2	19.1	14.6	1.5	2.5	9.9
1967	47.3	5.1	24.7	16.5	2.3	1.5	2.6
1968	38.7	4.2	27.7	19.5	5.5	1.8	2.6
1969	44.5	4.6	17.8	17.7	8.0	2.4	5.0
1970	48.9	3.3	17.2	12.0	7.8	2.3	8.5
1971	42.9	2.3	20.3	13.2	14.2	1.9	5.2
1972	42.2	3.2	19.6	11.3	16.7	1.1	5.9

Table 9. Percentage of Sales by Quality for Crops of Burley Tobacco

Crop Year	1 Choice	2 Fine	3 Good	4 Fair	5 Low	N Nondescript	Miscel-laneous
1930							
1931	--	1.6	24.3	51.3	21.7	1.1	
1932							
1933	0.4	4.2	26.8	48.9	17.3	2.4	
1934	0.8	5.6	32.1	51.1	9.9	.5	
1935							
1936	1.3	7.4	30.2	44.4	14.7	2.0	
1937	--	1.7	20.8	52.0	23.8	1.7	
1938	0.3	4.0	24.2	48.0	21.9	1.6	
1939	0.4	4.0	25.9	49.5	18.8	1.4	
1940	0.2	2.0	21.8	51.9	22.4	1.7	
1941	0.3	2.7	18.3	47.1	26.6	5.0	
1942	0.8	4.1	26.3	46.8	19.0	3.0	
1943	1.9	7.3	29.6	44.0	14.5	2.7	
1944	0.5	3.2	28.9	45.5	19.7	2.2	
1945	0.8	3.8	21.2	44.3	24.6	3.7	1.6
1946	0.2	2.5	18.1	43.1	28.2	5.4	2.5
1947	0.4	4.6	25.6	45.4	21.1	2.9	--
1948	0.4	3.7	21.6	47.0	23.5	3.7	0.1
1949	0.3	2.4	18.2	47.5	27.3	4.2	0.1
1950	0.2	2.6	18.1	43.6	27.9	5.7	1.9
1951	0.2	2.2	17.1	47.0	26.4	6.5	0.6
1952	0.2	3.1	20.0	45.9	23.6	5.8	1.4
1953	0.2	6.7	24.8	45.0	18.5	4.6	0.2
1954	0.2	4.1	18.2	48.0	24.7	3.6	1.2
1955	0.4	6.8	23.0	45.9	21.2	2.5	0.2
1956	0.2	4.1	21.4	44.8	24.1	4.9	0.5
1957	0.4	4.9	18.9	43.9	24.6	6.6	0.7
1958	0.2	4.1	18.4	42.2	28.4	6.5	0.2
1959	0.1	2.1	15.0	36.7	29.6	14.2	2.3
1960	0.2	3.6	18.3	38.2	29.5	8.8	1.4
1961	0.7	5.8	25.5	39.2	21.8	6.5	0.5
1962	0.6	4.1	19.7	36.9	24.6	11.8	2.3
1963	0.3	3.5	24.5	37.8	25.2	6.8	1.9
1964	0.5	4.5	21.6	39.3	22.7	7.0	4.4
1965	1.0	6.6	26.4	39.2	20.3	4.4	2.1
1966	0.8	5.8	28.0	37.9	15.1	2.5	9.9
1967	3.0	12.0	31.7	38.1	11.1	1.5	2.6
1968	2.8	9.6	35.5	36.4	11.2	1.8	2.7
1969	2.1	7.8	27.4	42.1	13.2	2.4	5.0
1970	1.8	8.5	27.0	36.4	15.5	2.3	8.5
1971	2.4	10.8	30.7	36.4	12.6	1.9	5.2
1972	4.1	14.5	32.0	32.4	10.0	1.1	5.9

Table 10. Percentage of Sales by Color for Crops of Burley Tobacco

Crop Year	L	F	FR	R	D	K	M	V	G	N	Misc.
1931	0.9	48.7		36.4	1.6		1.4		9.9	1.1	
1933	2.3	43.1		31.6	5.4				15.2	2.4	
1934	3.0	59.6		33.8	2.4				0.7	0.5	
1936	9.9	51.1		14.4	2.3		0.5	3.6	16.2	2.0	
1937	3.5	47.4		33.6	4.1				9.7	1.7	
1938	7.8	55.9		30.1	2.5				2.1	1.6	
1939	7.4	53.1		32.8	3.2				2.1	1.4	
1940	3.2	42.2		43.0	4.9				5.0	1.7	
1941	5.5	44.6		34.8	3.6				6.5	5.0	
1942	3.7	57.1		29.9	1.6				4.7	3.0	
1943	8.1	47.7	7.8	24.5	0.7				8.5	2.7	
1944	1.8	43.3	13.3	29.9	0.6				8.9	2.2	
1945	5.0	47.4	9.1	26.2	1.1				5.9	3.7	1.6
1946	3.8	44.1	10.7	29.7	1.4				2.4	5.4	2.5
1947	6.4	59.0	8.3	17.4	0.4				5.6	2.9	--
1948	5.6	50.5	9.3	23.8	0.7				6.3	3.7	0.1
1949	5.5	44.3	14.9	26.6	1.4				3.0	4.2	0.1
1950	3.7	47.5	13.0	24.7	2.1				1.4	5.7	1.9
1951	4.8	47.6	12.7	23.5	1.0				3.3	6.5	0.6
1952	3.5	51.5	11.7	17.4	0.7		0.3		7.7	5.8	1.4
1953	11.7	59.2	8.1	7.1	0.2		0.4		8.5	4.6	0.2
1954	3.3	60.0	13.1	14.7	0.6		0.3		3.2	3.6	1.2
1955	7.6	67.9	13.2	6.4	0.1		0.6		1.5	2.5	0.2
1956	4.3	61.7	15.0	10.2	0.4		1.2		1.8	4.9	0.5
1957	2.0	58.2	12.8	13.2	0.5		0.8		5.2	6.6	0.7
1958	3.0	58.1	13.1	9.3	0.7	1.0	3.0	2.3	2.8	6.5	0.2
1959	0.9	42.5	10.2	11.1	0.3	0.3	4.6	8.9	4.7	14.2	2.3
1960	1.3	53.1	12.8	8.7	0.2	0.9	3.1	6.6	3.1	8.8	1.4
1961	2.3	58.1	11.9	7.0	0.1	2.0	3.8	5.7	2.1	6.5	0.5
1962	2.4	44.3	11.3	9.5	0.9	1.0	2.5	9.2	4.8	11.8	2.3
1963	1.5	50.3	8.5	8.9	0.2	7.6	5.8	6.0	2.5	6.8	1.9
1964	2.5	50.8	9.2	8.6	0.5	1.1	3.1	8.3	4.5	7.0	4.4
1965	3.7	54.8	12.2	9.5	0.5	0.5	2.1	7.6	2.6	4.4	2.1
1966	0.6	53.0	13.0	4.7	--	0.6	2.6	9.7	3.4	2.5	9.9
1967	4.3	65.2	16.7	4.0	--	1.6	1.4	2.1	0.6	1.5	2.6
1968	5.0	67.7	14.5	4.0	--	0.2	1.1	2.3	0.7	1.8	2.7
1969	5.8	57.2	14.1	8.4	0.2	0.4	1.7	4.0	0.8	2.4	5.0
1970	1.1	57.5	11.1	8.2	0.2	0.3	3.2	6.0	1.6	2.3	8.5
1971	1.5	63.1	13.1	8.4	0.4	0.1	2.8	2.7	0.8	1.9	5.2
1972	1.4	67.0	13.2	5.4	0.2	0.4	3.2	1.7	0.5	1.1	5.9

L - Buff
F - Tan
FR - Tannish Red
R - Red
D - Dark Red
K - Variegated
M - Mixed
V - Greenish
G - Green
N - Nondescript
Misc. - No-G, W, U, etc.

REFERENCES

[1] Brooks, R. Charles. *Grade-Price Relationships for Flue-Cured Tobacco 1952-1960*, Agricultural Experiment Station, State College, Raleigh, NC, Department of Agricultural Economics, Agricultural Economics Information Series 90, 1962.

[2] Card, Dana G. *The Market Price of Burley Tobacco*, unpublished Ph.D. thesis, Cornell University, Ithaca, NY, 1939.

[3] Card, Dana G. and Carl M. Clark. *Seasonal Movements in Prices and Sales of Burley Tobacco*, Kentucky Agricultural Experiment Station, Lexington, KY, Bul. 409, 1940, pp. 444-467.

[4] Card, Dana G. and James H. Clarke. *Prices of Tobacco in Different Parts of Kentucky*, Kentucky Agricultural Experiment Station, Lexington, KY, Bul. 448, 1943.

[5] Card, Dana G. *Growers. Losses on Burley Tobacco Sold in High Order*, Kentucky Agricultural Experiment Station, Lexington, KY, Bul. 540, 1949.

[6] Card, Dana G. and Carl M. Clark. *Burley--The Adaptable Leaf*, Western Tobacco Journal, Cincinnati, OH, November 1964.

[7] Hyslop, John D. *Quality Relationships in Spring Wheat*, Agricultural Experiment Station, University of Minnesota, St. Paul, MN, Tech. Bul. 267, 1970.

[8] Johnson, Glenn L. *Burley Tobacco Control Programs*, Kentucky Agricultural Experiment Station, Lexington, KY Bul. 580, 1952, pp. 21, 57-71.

[9] Miller, Robert H. *Factors Affecting Leaf Tobacco Prices*, Tobacco Situation, U.S. Department of Agriculture, Economic Research Service, March 1972, pp. 36-38.

[10] U.S. Department of Agriculture. *Official Standard Grades for Burley Tobacco (U.S. Type 31)*, Agricultural Marketing Service, Tobacco Division, Washington, D.C., Mimeo, December 1933; November 1936; May 1938; January 1949; July 1970.

[11] U.S. Department of Agriculture. *Tobacco Inspection, Market News and Demonstration Services*, Agricultural Marketing Service, Tobacco Division, Washington, D.C., July 1960.

[12] U.S. Department of Agriculture. *Tobacco Market News, Season Report*, Consumer and Marketing Service, Tobacco in Kentucky, North Carolina, Tennessee, Virginia and West Virginia, 1971 crop and earlier issues.

[13] U.S. Department of Agriculture. *Light Air-Cured Tobacco Market Review*, Agricultural Marketing Service, Tobacco Division, June 1973 and earlier issues.

[14] Witten, Stoy G. *Price Relationships Between Grades of Burley Tobacco*, unpublished M.S.A. thesis, University of Kentucky, Lexington, KY 1946.

APPENDIX

Notes on Tables

Tables 8, 9 and 10 give the percentage of sales by group, quality and color for crops of burley tobacco, as published in Tobacco Market Reviews. Table 4 and parts of Tables 3 and 5 were compiled from tables in Tobacco Market Reviews which give the "percentage distribution of grades for burley tobacco." These figures are adjusted for "grade standard revisions" and differ somewhat from the summary tables giving percentage of sales (Tables 8, 9 and 10). In calculating the index of quality, the more detailed, adjusted figures were used for data which were readily available there but data on quality and color came from Tables 9 and 10.

Differences in Tables 3 and 8, from 1949 on, are due to revisions in the table giving distributions by grade, which were not included in the source of Tables 8, 9 and 10. In Table 3, totals do not always equal the sum of the parts, as shown. This is due to independent rounding of the figures in each column.

Notes on the Quality of Burley Tobacco Crops 1938-1972

The following quotations are taken from two sources: (1) Season Tobacco Market News reports issued by the Consumer and Marketing Service, U.S. Department of Agriculture, with Departments of Agriculture in the southern tobacco growing states cooperating, and (2) The Tobacco Market Review issued annually for light air-cured tobacco by the U.S. Department of Agriculture.

1938 "The 1938 crop was of better quality than the 1937 crop. Sales contained a larger percentage of fine and good quality grades and also more of the smoking grades."

1939 "The 1939 crop showed improvement in quality as compared with the 1938 crop."

1940 "The crop as a whole was not of as good quality as the 1939 crop. Heavy rains in some sections during the last of the growing season resulted in a large quantity of red and heavy-bodied tobacco being produced. Considerable tobacco was marketed in doubtful keeping order."

1941 "Compared with last season the crop contained a larger proportion of lugs and flyings and a smaller proportion of leaf. The crop also was lighter in body than last season and thus was more desirable for cigarettes."

1942 "The season's sales were composed of 10 percent more choice and good quality grades as compared with the previous year, and correspondingly less lower quality grades and nondescript. ---a considerably larger proportion of tan grades and less red and dark red grades. Generally, the crop was considered highly desirable for smoking manufacture."

"The 1942 burley crop, as a whole, was thinner in body with good color--. There was smaller poundage of the red grades--."

1943 There were "better quality offerings as a whole." "In comparison with last year, there was 7-1/2 percent more good to choice quality grades with most of the corresponding decrease occurring in low quality. Also, there was a larger proportion of buff colored tobacco, but this was partially offset by an increased percentage of green grades. An analysis by areas within the burley belt shows that the general quality of the central Kentucky crop was lower than the previous year. However, improved quality of the leaf grown in Tennessee and other states more than offset the lower quality in Kentucky." (FR grades were introduced with the 1943 crop.)

1944 "A quality analysis shows the crop to be inferior to last season's because of the large decrease in the proportion of choice and fine grades. There was very little change in the percentage of good tobacco but there was considerable increase in the amount of lower

qualities marketed. The proportion of tips was the smallest in several seasons. Too, the color was not as good as that of the 1943 crop due to less buff and tan tobacco and more red colored and green marketings. Summing up, the tobacco was heavier-bodied and did not possess the excellent smoking qualities of that produced the previous year."

"As the leaves of the crop were generally longer than usual, the proportion of tip grades decreased considerably. Although there were relatively more lug grades in this year's crop than in last year's, the crop as a whole was heavier-bodied and was not considered as good for cigarette manufacture."

1945 "The quality of the tobacco was considered the lowest since the 1941 crop." "Although the proportion of choice and fine qualities was practically unchanged from last year, there was much less good tobacco on hand. Large increases were shown in the amount of low grades."

1946 "A large amount of tobacco was delivered to the four Associations." "These deliveries---consisted principally of heavier-bodied leaf grades and tips." "The general quality was lower this year, as the proportion of low grades and nondescript increased. A noticeable difference was in the smaller percentages of good quality lugs and flyings. There was a smaller amount of buff and tan colored offerings and more reddish tan and red marketings. However, the crop was well ripened and the percentage of green tobacco was the smallest since 1939."

1947 "The 1947 burley tobacco crop was comprised of the largest proportion of thin-bodied smoking grades found in any crop produced during the past 10 years--." "The big improvement was the unusually large proportion of buff and tan colored offerings and the increased percentage of lugs and flyings. This combination resulted in the crop being considered the most usable since that of 1936."

1948 Lower quality. "The proportions of good and fine grades were smaller. There were less fair and fine lugs. There was a sharp decrease in the percentage of tan offerings and especially lugs. The difference showed up mostly in larger amounts of red grades." There was a "large amount of tobacco in unsafe keeping order." "A prolonged spell of muggy weather kept a sizeable amount of offerings in 'high case' for several weeks."

1949 "The 1949 burley crop was comprised of exceptionally light-bodied offerings. Thinner composition made it highly usable for cigarette manufacture. The general quality, however, was lower than that of last year. Smaller proportions of good and fine offerings lowered the general quality. More low grades were offered. The percentage of tobacco in tan color was less and more reddish tan and red color was sold."

1950 "General quality of the crop was lower than the previous year. There was a fairly sharp increase in low to good lugs and a slight increase in better quality leaf. However, there

were less flyings and slightly more nondescript. The percentage of tan colored offerings was slightly larger. There was a fairly large amount of 'houseburn' apparent."

1951 "General quality of offerings did not show much change." "The crop contained a larger proportion of fair quality tobacco than the previous one. There was a smaller percentage of good and low offerings. Leaf and tips increased in ratio while lugs declined. Late season offerings consisted of a large percentage of tobacco that had been frozen during cold weather early in November. Color composition was approximately the same."

1952 "--the quality of offerings was below the previous year." "There was a larger percentage of lower quality leaf sold. The proportion of flyings increased but this was more than offset by less lugs. Overall quality was lowered in sections by unusually large amounts of frozen tobacco. Also some areas were hard hit by the severe drought during most of the growing season."

1953 "Quality improved considerably and the crop was one of the best ever produced in the belt, according to available records." "The crop contained the largest proportions of buff and tan lugs and flyings ever marketed--. More than 70 percent of all marketings graded buff and tan color with better than 50 percent flyings and lugs."

1954 "General quality of offerings was good but below last year--." "The 1954 crop contained a larger proportion of heavier-bodied offerings. The shift was principally to fair and good leaf and low and fair lugs. There was a considerably smaller ratio of flyings and slightly less good lugs and tips."

1955 "The crop was one of the best ever produced--even better than the good one of 1954." "The crop graded to the lighter-bodied side with a much larger proportion of buff and tan flyings than last year. The percentage of good to choice offerings increased. However, the ratio of tips was slightly larger."

1956 "General quality of offerings was inferior to that of the 1955 crop which was one of the best ever produced." "Increased percentages of nondescript and low leaf and flyings lowered the quality. The crop was heavier-bodied as proportionally more graded red, reddish tan and dark color. Lugs, good and fine flyings and tips made up a smaller percentage of offerings.

1957 "The crop was produced under abnormally dry growing conditions resulting in quality poorer than last year and not up to average standards." "Offerings contained larger proportions of nondescript, tips and leaf--the increases falling principally in low and fair red and green tips and nondescript. The percentage of nondescript ran the largest on record." "Growers harvested small amounts of suckers in some areas which fell mostly into the nondescript group."

1958 "The quality of the crop improved slightly over the last year but was below average standards particularly of the past few years." "The crop, produced during an abnormally wet growing season, was lighter-bodied than the previous year. It contained a larger proportion of lugs and flyings and a smaller percentage of leaf of fair to fine quality and tips. The color was more on the predominantly tan side with less red and green."

1959 "The crop was one of the lowest in quality ever produced." "The proportion of nondescript offerings was more than double that of the previous year and by far the largest percentage on record. There was a larger ratio of lower quality leaf. Hot humid weather during the curing season resulted in more houseburn than normal. Quality was also lowered by considerable tobacco showing dirt from having been rained on after being cut and left in the field."

1960 "Quality of offerings was noticeably improved over the 1959 crop--." "The crop contained much less nondescript than the previous one, while the proportions of good leaf and fair and low lugs were larger. The percentage of red and green and greenish offerings decreased, with a large increase in the ratio of tan colored tobacco."

1961 "--the quality of marketings improved some." "Larger percentages of good and fine tobacco appeared in this crop compared with the year before. The most significant change was in the increase in good flyings. Less low quality nondescript and tips were offered. Also, more tan and less red and green tobacco was sold." "The average moisture content of marketings was slightly above normal."

1962 "--the quality of marketings was noticeably lower." "A large increase occurred in the percentage of nondescript offerings also the ratio of low quality leaf and tips increased. The proportion of lugs was the smallest on record. A sharp decrease took place in the percentage of tan colored tobacco, while more red and green was sold."

1963 "The general quality was better than the previous crop. There was an increased percentage of fair and low lugs and good leaf on the floors. Less nondescript, tips, and flyings were offered. There was more variegated tan and mixed colored tobacco with less green, greenish, and tannish red noted. The percentage of leaf on the floors was the largest on record."

1964 "The general quality of the 1964 crop showed little change from last year's crop. The percentage of leaf and lugs decreased with more flyings and tips on the floors. The proportion of variegated and mixed colored tobacco declined and green and greenish offerings showed an increase."

1965 "The general quality of the 1965 crop was considerably better than that of the preceding season. Marketings in 1965 consisted of larger percentages of choice, fine and good tobacco, and smaller proportions of nondescript and low quality grades. There was a larger proportion of leaf and lug grades offered and a smaller proportion of tips and flyings. Colorwise, more tan, tannish red, and red and less green, mixed and greenish tobacco was offered."

1966 "The general quality of the 1966 crop was slightly lower than that of the preceding year. More tobacco was graded in the 'no-grade' category, and larger percentages of 'wet' tobacco appeared on the floors. The proportion of flyings and tips decreased and more lugs and leaf grades were marketed. Colorwise, more green and greenish tobacco was graded and less buff and tan."

1967 "The 1967 crop was one of the best on record from a quality standpoint. The proportion of fine and choice offerings was more than twice that of the preceding crop. Tan and buff colored tobacco increased and the percentage of green and greenish declined. Tan colored offerings made up nearly two-thirds of all marketings."

1968 "The quality of the 1968-69 marketings compared favorably with the preceding seasons fine crop; although the marketings contained less fine tobacco, more good quality was sold. More lugs, flyings and mixed group and less leaf was marketed. Colorwise, the proportion of buff and tan tobacco increased slightly with a decrease in the percentage of tannish red."

1969 "The quality of the 1969 offerings was not as good as that of the preceding season's crop as marketings contained larger proportions of lower quality grades. Less fine and good quality and more fair, low and nondescript appeared on the floors. From a color standpoint, less tan and more red and greenish colored tobacco was marketed. Offerings consisted of more leaf and mixed grades and less lugs and flyings."

1970 "The quality of the 1970 offerings was not as good when compared to last year's crop as larger percentages of inferior tobacco lowered the general quality. More leaf and less tips, lugs and flyings were marketed. Colorwise, less buff and tannish red and more greenish and mixed was on the floors."

1971 "From a quality standpoint this was a better crop than last year's. Marketings contained a larger proportion of good to choice grades with less low grades and nondescript. Also, there was a larger percentage of the more desirable colors--buff (L), tan (F), and tannish

red (FR), with less variegated (K), greensih (V), and green (G)." "The 1971 crop should be ranked among the best of the burley crops."

1972 "--this was a better crop than last year's. The 1972 crop contained larger percentages of good to choice grades and less fair and low. Also there was an increase in the proportion of tan color with a corresponding decrease in red, green and greenish." "The 1972 crop of burley tobacco was of excellent quality."

RESEARCH REPORTS

Department of Agricultural Economics

1 Replacement of Dairy Cows: A Multistage Decision-Making Problem by J. C. Redman and L. P. H. Kuo, 1969

2 Changes in the Seasonal Patterns of Marketings, Prices, and Weights of Feeder Pigs in Kentucky by H. R. White, D. M. Shuffett and R. W. Rudd, 1970

3 Effect of Burley Tobacco Prices and Allotment Levels on Profitable Farm Adjustment in Four Areas of Kentucky by V. N. Grise and J. F. Thompson, 1970

4 Developments in the Feeder-Pig Industry and Trends and Cycles in Prices and Receipts of Feeder Pigs in Kentucky by H. R. White, D. M. Shuffett and R. W. Rudd, 1970

5 Educational Posters and Their Effect on Teenagers' Attitudes Toward Milk by J. B. Roberts, 1970

6 Estimating the Comparative Cost of Custom Hiring, Renting, Leasing, or Owning of Selected Farm Machines by G. B. Byers and K. L. Wade, 1970

7 Optimum Tobacco Yield and Marketing Strategies under Poundage Quotas as Compared with Acreage Allotments by G. L. Bradford, 1970

8 An Analysis of the Effect of Selected Economic Variables on the Optimum Location of Burley Tobacco Production within the Burley Belt by V. N. Grise, J. F. Thompson and F. E. Justus, Jr., 1971

9 Minimum Farm Sizes for Given Income Levels in Two Kentucky Bluegrass Areas by C. M. Cuskaden and J. F. Thompson, 1971

10 A Multiperiod Analysis of the Effects of Selected Variables on the Optimum Growth of Two Case Farms in the Mammoth Cave Area of Kentucky by David Raymond Humberd and F. E. Justus, Jr., 1972

11 Perfecting Methods for Predicting the Course of Rural Area Development - Part I: Toward a Definition of Economic Development and A Framework for Evaluating Model Efficacy by B. R. Beattie, T. H. Klindt, and G. L. Bradford, 1972

12 Structural Characteristics and Income Levels of Burley Tobacco Producers in Two Kentucky Counties by Frederic L. Hoff, John G. Stovall, and Garnett L. Bradford, 1972

13 Perfecting Methods for Predicting the Course of Rural Area Development - Part II: Forecasting Income for Selected Rural Areas in Kentucky by Thomas H. Klindt, Garnett L. Bradford, and Bruce R. Beattie, 1972

14 Inter-Area Shifts in Burley Tobacco Allotments, 1950-71 by D. Milton Shuffett, Robert E. Barton, and Patrick M. Henderson, 1973

15 Monetary Conditions and the U.S. Lumber and Wood Products Industry by John C. Redman and Vincent Cusamano, 1973

16 A Survey of Beef Production in Kentucky by Fred E. Justus, Jr., 1973

17 Some Effects of Rural Road Improvement in Appalachia - A Case Study in the Eastern Kentucky Coal Fields by Eldon D. Smith, J. Keith Wilkinson, and Kurt R. Anschel, 1973

18 Economic Costs and Benefits of Rural Road Improvement in the Eastern Kentucky Coal Fields by Eldon D. Smith, J. Keith Wilkinson, and Kurt R. Anschel, 1973