



United States
Department of
Agriculture

Economics and
Statistics
Service

Agricultural
Economic
Report
Number 470

Trends in Flue-Cured Tobacco Farming

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Trends in Flue-Cured Tobacco Farming. By Verner N. Grise. National Economics Division, Economics and Statistics Service, U.S. Department of Agriculture. Agricultural Economic Report No.470 .

Abstract

Mechanical harvesting, bulk barn curing, and acres of flue-cured tobacco produced per farm increased substantially during 1972-79, while labor used to harvest tobacco dropped by 35 percent, from 72 million to 47 million hours. Only 16 percent of the tobacco producers owned all the quota they produced in 1979; 63 percent rented some land with quota and 43 percent leased some quota. This study identifies trends in flue-cured tobacco farming in four Southeastern States. The amount of labor used to harvest flue-cured tobacco in the next few years will likely drop as mechanical harvesting and acres per farm increase.

Keywords: Flue-cured tobacco, farm operators, tobacco acreage, mechanical harvesters, bulk barns, labor use.

Preface

A number of studies within the U.S. Department of Agriculture (USDA) and at State universities were conducted in the early seventies on changes within the flue-cured tobacco industry and their effect on people and communities. The work was jointly undertaken by USDA and the U.S. Department of Labor (USDL). The USDL portion of the work was conducted through a contract with North Carolina State University. The USDA studies examined the state of technology in the flue-cured tobacco industry, the likely effects of future technological changes on the demand for labor within the industry, and economic conditions in the flue-cured tobacco region and their influence on human resource adjustments. The USDL studies examined labor supply and household earnings of tobacco harvest workers. Findings of these studies, which are summarized in the references at the end of this report (see items 2, 3, 4, and 6), are the basis for the trends analyzed here.

Acknowledgments

The author acknowledges the contribution of Gail Garst, who provided input throughout the development of the survey questionnaire, data collection, and computer programming. Bob Graham and Dennis Findley helped develop the survey questionnaire and overall survey plans. Matthew Wyneken did the computer programming, and Linda Ferrell and others did the typing. The contributions of the Crop and Livestock Reporting Service offices and the enumerators who collected the data for this survey are acknowledged. Special recognition goes to the more than 1,000 flue-cured tobacco farmers who took the time to answer the questions that made this study possible.

Summary

Total labor used to harvest flue-cured tobacco dropped 35 percent during 1972-79, from 72 million to 47 million hours, as farmers adopted labor-saving bulk barns and mechanical harvesters. Nineteen percent of the acreage was harvested by mechanical harvesters and 61 percent was cured in bulk barns in 1979, compared with 1 and 8 percent, respectively, in 1972.

This study examines these and other trends in flue-cured tobacco farming in the four regions of Georgia, North Carolina, South Carolina, and Virginia that grow 75 percent of all U.S. flue-cured tobacco. Impact of these trends is projected to 1985.

Flue-cured tobacco management units in the study area averaged 13.8 acres of tobacco in 1979, up from 9.5 acres in 1972. The average size of units ranged from 10.8 acres in the Virginia-North Carolina Piedmont to 18.8 acres in the North Carolina Coastal Plain in 1979.

Only 23 percent of the tobacco producers owned all the land they farmed in 1979. Sixteen percent owned all the tobacco quota they grew. Sixty-three percent rented some land with quota and 43 percent leased some quota.

Many flue-cured tobacco farms in the study area have farm enterprises other than tobacco (primarily corn and beef cattle), although gross farm family income from tobacco in 1979 averaged 79 percent of total gross farm income.

About 27 percent of all flue-cured tobacco farmers worked off the farm in 1979, ranging from 17 percent in the North Carolina Coastal Plain and Georgia to 40 percent in the Virginia-North Carolina Piedmont. About 52 percent of the operator households had one or more members working off the farm.

Flue-cured tobacco farms are likely to continue to increase in size, as adoption of mechanical harvesters and bulk barns continues. An estimated 35 percent of the flue-cured acreage will be mechanically harvested by 1985, and essentially all the tobacco will be cured in bulk barns.

Contents

	Page
Summary	vii
Introduction	1
Farm Numbers and Tobacco Acreages	2
Cropland Acreages and Enterprises	3
Methods of Holding Land and Tobacco Quotas	4
Land Tenure	7
Quota Ownership and Control	7
Characteristics of Operator Households	7
Age	7
Education	7
Farm Income	9
Off-Farm Work and Nonfarm Earnings	9
Production Input Use	10
Curing Fuel Use	12
Fertilizer Use	12
Changes in Labor Use	12
Preharvest Labor	12
Preharvest Labor Use	13
Family Labor Contribution	13
Tobacco Harvest Method Characteristics	13
Tobacco Harvest Stages	13
Reasons for Harvest System Variation	17
Characteristics of Tobacco Farm Harvest Labor	18
Labor Use Per Farm	18
Hired Labor	20
Family Labor	21
Wage Rates	22
Total Labor Used to Harvest Flue-Cured Tobacco	22
Projected Harvest Labor Changes to 1985	25
References	26

Trends in Flue-Cured Tobacco Farming

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Introduction

Flue-cured tobacco farming changed considerably during the seventies, as farms became larger and more mechanized. This trend is expected to continue during the eighties.

This report updates information about structural and technological changes on flue-cured tobacco farms from 1972-79, evaluates their ramifications, and provides some insight into potential changes in the eighties. Specifically, it looks at trends in the number of farms producing tobacco; changes in enterprise combinations, tenure of operators, and the age and education of operators; and changes in the methods of harvesting flue-cured tobacco. Particular attention is given to the effect of changes in the methods of harvesting flue-cured tobacco on the type and quantity of labor used. Farms in four agricultural regions containing about three-fourths of the U.S. flue-cured production were surveyed in 1972 (fig. 1). Another survey of the same four agricultural regions was conducted in 1979.

Questionnaires were completed for 955 tobacco farm operators in the latest survey.¹ Information was collected on the size and organization of flue-cured tobacco management units, the methods of acquiring tobacco quota and other resources, the current tobacco harvesting systems, the type and quantity of labor used, and the dependence of farm operators on income from farm and nonfarm sources. The 1979 survey was designed to collect data that would be useful for estimating the costs of producing flue-cured tobacco. As a result, the structural data is not as detailed as the data in the 1972 study (2).²

¹The term "farm" in this report is synonymous with management unit and operator unit. This definition of a farm is not consistent with the one specified in the census of agriculture. For census purposes, each sharecropper is a separate farm unit. In this study, all land farmed by sharecroppers is included with the operator's acreage and classified as a single management unit. This procedure results in fewer farms in the study regions than does the census definition.

²Italicized numbers in parentheses refer to items in the References section.

The specific objectives of this report are to:

- Evaluate the structure of flue-cured tobacco production units and compare changes during 1972-79.
- Determine the type and amount of labor-saving technology that has been adopted on flue-cured tobacco farms and appraise its effects on labor use.
- Evaluate future structural and technological changes in flue-cured tobacco production and harvest.

The geographic study area consists of four agricultural regions (called subregions by the census of agriculture) in four Southeastern States (fig. 1).

Pee Dee-Lumber River, North Carolina and South Carolina Census Subregion 16

This area is located in the drainage basin of the lower Pee Dee River and its tributary, the Lumber River. Most of the subregion lies in the Coastal Plain, but a few tobacco-producing counties of the North Carolina Sand Hills are also included. Farmland is interspersed with large acreages of swamp or other poorly drained land. In the Sand Hills portion, much of the land is suitable only for forestry or nonagricultural uses. At one time, cotton predominated in the Pee Dee-Lumber River area, but little cotton is now grown and tobacco is the leading cash crop.

Coastal Plain, North Carolina Census Subregion 17

The Coastal Plain of North Carolina is the most concentrated area of flue-cured tobacco production in the United States. It has ideal soil and climatic conditions. The sandy clay subsoils warm early and can be easily worked. Commercial cultivation of

Farm Numbers and Tobacco Acreages

tobacco began in the 1890's. Once established, tobacco supplanted cotton as a principal source of farm income, and now accounts for a large percentage of all farm sales.

Piedmont of North Carolina and Virginia Census Subregion 18

The Piedmont of North Carolina and Virginia is the Nation's oldest area for growing flue-cured tobacco. It ranks second to the Coastal Plain of North Carolina as the most important producer of tobacco, and is the center of the cigarette manufacturing industry. Tobacco is grown mostly on the light-textured soils of fine sand loam. The fields are often small and irregularly shaped and lie on uneven terrain, which varies from undulating to hilly, with mountainous portions in the Western Piedmont. Half the farmland remains in woods, mostly unpastured.

Georgia Census Subregion 29

The Southern Georgia Coastal Plain was traditionally a cotton area. Today, major crops are

tobacco (introduced in the twenties), soybeans, and peanuts. This predominantly rural subregion is a diversified farming area. Many farms have livestock. Considerable land is devoted to pulpwood forests.

Farm Numbers and Tobacco Acreages

As flue-cured tobacco farming has become more mechanized through the use of mechanical harvesters and bulk barns, the number of tobacco farms has declined and the tobacco acreage per farm has increased. Larger acreages of tobacco per farm are necessary to justify investment in labor-saving technology. While some producers have expanded, others have discontinued growing tobacco and retired, shifted to off-farm work, or shifted to alternative farm enterprises.

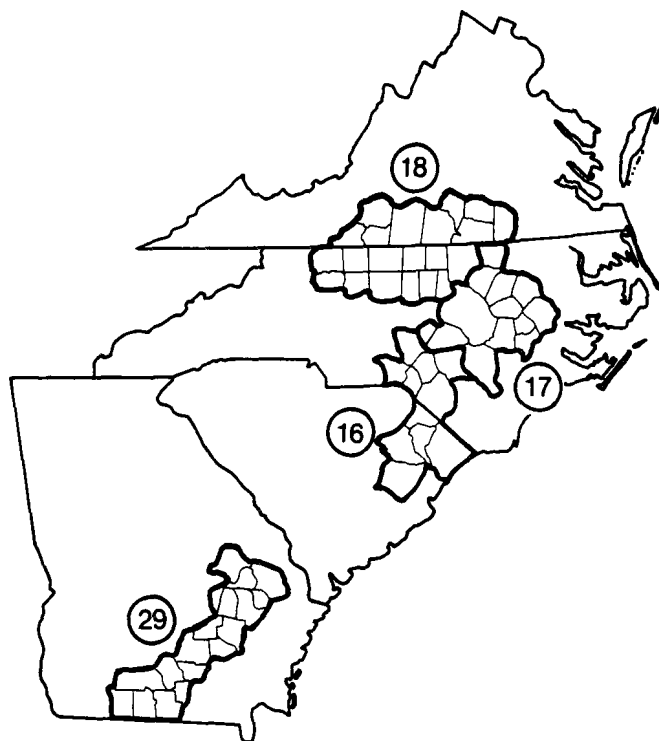
Flue-cured tobacco quotas are assigned to specific farms. Quotas can be leased and transferred to other farms that have flue-cured tobacco quota if the farms are in the same county.

Figure 1

Flue-cured tobacco production regions

- ①⑥ Pee Dee-
Lumber River,
North Carolina-South Carolina
- ①⑦ Coastal Plain, North Carolina
- ①⑧ Piedmont, Virginia-North Carolina
- ②⑨ Georgia

Numbers refer to
designated census of
agriculture subregions



Quota values have been bid up with rising Federal price support levels as a result of the demand for quota to increase operating unit size. About 43 percent of the farmers leased-in quota in 1979 at an average cost of 39 cents per pound. The average lease cost ranged from 34 cents a pound in region 18 to 45 cents a pound in region 29.³ Many tobacco allotment owners with alternative uses for their labor and land resources can earn more from leasing quota out than from growing tobacco themselves.

An average of 13.8 acres of tobacco was produced on 28,906 management units in the four study areas in 1979 (table 1), a 45-percent increase in acres of tobacco per unit from 1972. There has been a 30-percent decline in the number of farms during this period. The average tobacco acreage per farm unit ranged from 10.8 acres in the Piedmont to 18.8 acres in the Coastal Plain. Each management unit was comprised of an average of four individual tobacco quotas in 1979, reflecting considerable quota consolidation. Quota was most consolidated in the Coastal Plain and the least consolidated in the Piedmont.

³Rates cited are for leases for production. Marketing season leases averaged 44 cents per pound in 1979.

The Piedmont has the most management units—39 percent of the area total. However, because of the smaller size of operations, lower quota pounds per acre, and lower yields, the Piedmont accounted for only 29 percent of the total tobacco production in 1979. The Coastal Plain had 30 percent of the operator units, but produced 41 percent of the tobacco.

Slightly over half the growers produced 9 acres of tobacco or more in 1979, compared with less than 40 percent with at least this much acreage in 1972 (table 2). The proportion growing 9.0 to 19.9 acres was slightly higher in 1979. The largest increase was in the proportion of growers producing 20 or more acres of tobacco, which more than doubled over the 7-year period. Please note that averages for all following tables are weighted based on the total number of farms or units reported in each region.

Cropland Acreages and Enterprises

Tobacco farms averaged 114 acres of cropland in 1979, ranging from 47 acres in the Piedmont to 221 acres in Georgia (table 3). Average cropland per

Table 1—Flue-cured tobacco management units, quotas, and tobacco production, by region

Item	Unit	Region				Total/average, four regions
		Pee Dee- Lumber River, N.C.-S.C. 16	Coastal Plain, N.C. 17	Piedmont, N.C.-Va. 18	Georgia 29	
Farms:						
1979	Number	5,877	8,577	11,266	3,186	28,906
1972	do.	6,752	13,571	15,967	4,255	40,545
Acreage per farm:						
1979	Acres	13.2	18.8	10.8	11.5	13.8
1972	do.	10.9	11.2	7.7	8.7	9.5
Quota per farm:						
1979	Pounds	27,526	38,647	20,752	24,191	27,818
1972	do.	23,111	22,898	14,333	17,856	19,071
Individual quotas per farm:						
1979	Number	4.1	4.5	3.3	4.3	4.0
1972	do.	3.4	2.6	2.5	3.5	3.2
Total tobacco produced:						
1979	1,000 lb.	156,374	303,104	216,944	71,815	748,237
1972	do.	154,498	312,763	209,138	76,711	753,110

Source: From surveys by Economics, Statistics, and Cooperatives Service, USDA and data computed by Price Support and Loan Division, Agricultural Stabilization and Conservation Service, USDA.

Holding Land and Tobacco Quotas

farm increased by 50 percent during 1972-79, as farmers expanded both tobacco and other crop acreages.

Because of the uneven topography in the Piedmont, large acreages of cropland are difficult to consolidate under one management unit. Tobacco farms in the Pee Dee-Lumber River region and the Coastal Plain contain more cropland acreage than farms in the Piedmont. The greater acreage of cropland per management unit in Georgia permits diversity in the region's agriculture.

A variety of crops in addition to tobacco were grown on the study area farms in 1979. Nearly 70 percent produced corn, over half grew soybeans, and over one-fourth produced small grains (table 3). Few farms produced cotton in 1979, and peanuts were an important enterprise only in Georgia. Soybeans were produced by over two-thirds of the farms in the Pee Dee-Lumber River and the Coastal Plain.

Comparing production of other crops on tobacco farms between 1972 and 1979, the number of farms growing soybeans rose from 43 to 55 percent. Acreage of soybeans per farm doubled. Even though corn acreage per farm increased by 70 percent, the proportion of farms growing corn fell from 77 to 69 percent. The importance of peanuts remained

relatively unchanged, while that of cotton declined significantly. Apparently it became more profitable to substitute corn and soybeans for cotton.

Slightly over half the farms reported livestock on hand at the time of the 1979 survey. Forty percent reported swine and one-fourth had cattle (table 3). Beef cattle were more prevalent in 1979 on the larger operations. The proportion reporting swine, however, varied little among size groups. A larger percentage of farmers in Georgia reported livestock, and in larger numbers, than in any other region in 1979. The proportion of farms producing livestock dropped from 68 to 53 percent during 1972-79.

Methods of Holding Land and Tobacco Quotas

The method of land and quota control reflects the permanency of control and the types of negotiations needed to accumulate flue-cured tobacco production rights. Assurance of continued control through ownership tends to lengthen the planning period over which an investment might be amortized. Renting tends to limit this period.

Table 2—Proportion of flue-cured tobacco farms in various acreage size groups, by region

Acres of tobacco grown and year	Region				
	Pee Dee-Lumber River, N.C.-S.C. 16	Coastal Plain, N.C. 17	Piedmont, N.C.-Va. 18	Georgia 29	Average, four regions
	Percent				
Less than 9.0:					
1979	53	28	59	59	49
1972	60	51	71	62	62
9.0-19.9:					
1979	25	40	28	22	30
1972	24	36	23	30	28
20.0-34.9:					
1979	13	17	8	13	12
1972	10	10	5	7	7
35.0 and over:					
1979	9	15	5	6	9
1972	6	3	1	1	3

Table 3—Percentage of flue-cured tobacco farms reporting various crop and livestock enterprises,
plus crop area and livestock numbers, by region

Crop or livestock and year	Farms reporting in region					Acres or number per farm reporting in region					Average, four regions
	Pee Dee- Lumber River, N.C.-S.C. 16	Coastal Plain, N.C. 17	Piedmont, N.C.-Va. 18	Georgia 29	Average, four regions	Pee Dee- Lumber River, N.C.-S.C. 16	Coastal Plain, N.C. 17	Piedmont, N.C.-Va. 18	Georgia 29		
----- Percent -----											
----- Acres -----											
Tobacco:											
1979	100	100	100	100	100	13.2	18.8	10.8	11.5	13.8	
1972	100	100	100	100	100	10.9	11.2	7.7	8.7	9.5	
Corn:											
1979	73	80	53	94	69	40	69	16	105	53	
1972	78	86	63	98	77	22	32	8	92	31	
Soybeans:											
1979	67	80	30	50	55	111	63	30	156	77	
1972	72	61	20	27	43	62	26	20	73	38	
Peanuts:											
1979	2	7	0	48	8	22	67	0	22	34	
1972	3	10	0	45	9	34	22	0	22	22	
Cotton:											
1979	1	1	0	2	1	261	75	0	146	129	
1972	22	6	1	17	8	65	14	13	40	44	
Small grains:											
1979	12	24	43	12	28	44	28	19	31	24	
1972	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	
Cropland available:											
1979	—	—	—	—	—	129	153	47	221	114	
1972	—	—	—	—	—	107	78	34	183	76	
Beef:											
Cows—2 years old or older											
1979	13	19	18	48	20	13	17	17	25	18	
1972	12	16	30	56	25	N.A.	N.A.	N.A.	N.A.	N.A.	
Slaughter or fat cattle											
1979	2	4	3	4	3	6	7	11	20	10	
1972	5	4	7	13	6	N.A.	N.A.	N.A.	N.A.	N.A.	
Cattle, all types											
1979	14	25	20	49	24	22	21	25	43	27	
1972	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	

See notes at end of table.

Continued—

**Table 3—Percentage of flue-cured tobacco farms reporting various crop and livestock enterprises,
plus crop area and livestock numbers, by region—continued**

Crop or livestock and year	Farms reporting in region					Acres or number reporting in region					Average, four regions
	Pee Dee- Lumber River, N.C.-S.C. 16	Coastal Plain, N.C. 17	Piedmont, N.C.-Va. 18	Georgia 29	Average, four regions	Pee Dee- Lumber River, N.C.-S.C. 16	Coastal Plain, N.C. 17	Piedmont, N.C.-Va. 18	Georgia 29		
	Percent					Number on hand					
Swine:											
Brood sows and boars											
1979	28	29	12	63	26	15	15	13	20	16	
1972	40	42	14	68	33	N.A.	N.A.	N.A.	N.A.	N.A.	
Feeder pigs											
1979	38	29	11	56	27	35	52	29	71	48	
1972	22	41	18	31	28	N.A.	N.A.	N.A.	N.A.	N.A.	
Market hogs											
1979	21	27	28	31	26	52	39	10	95	36	
1972	32	34	27	58	33	N.A.	N.A.	N.A.	N.A.	N.A.	
Hogs, all types											
1979	45	38	35	67	41	63	79	22	121	64	
1972	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	
Livestock, all types											
1979	52	53	47	79	53	N.A.	N.A.	N.A.	N.A.	N.A.	
1972	61	68	66	83	68	N.A.	N.A.	N.A.	N.A.	N.A.	

N.A. = Not available.

— = Not applicable.

¹Number on hand the day the survey was completed.

Land Tenure

The method of holding or controlling land and quota varies among regions and changed dramatically during 1972-79. Three categories used to designate land control were: full owners who own the land they operate, part owners (who both own and rent), and full renters who rent all their land. The proportion of both full owners and full renters declined, while the proportion of operators who both owned and rented land increased substantially (table 4). Former full owners probably rented land to expand their farming operation. This shift is consistent with strategies for increased mechanization. The assurance of control of some land through ownership tends to lengthen the planning period over which investments in barns and harvesters can be amortized. However, capital requirements preclude most tobacco growers from owning all the land resources needed for a large mechanized tobacco operation.

The Piedmont and Pee Dee-Lumber River regions had the highest percentage of full owners and the lowest share of part owners in 1979. The Coastal Plain and Pee Dee-Lumber River regions accounted for the highest percentage of operators who were full renters, and the Coastal Plain had the lowest share of full owners. In Georgia, which had more cropland per farm, three-fourths of the operators were part owners.

Quota Ownership and Control

Flue-cured tobacco quotas are assigned to specific farms. Besides owning and renting land with tobacco quota, operators can lease tobacco quota to their owned or rented land. The lessor can transfer the quota from the leasee's farm to his/her owned or rented farm.

Only 16 percent of the farm operators owned the entire tobacco quota that they produced in 1979, compared with 19 percent in 1972 (table 5). The proportion owning all quota fell in the Coastal Plain and Piedmont regions but rose in the Pee Dee-Lumber River and Georgia regions. About 27 percent rented all their quota in 1979. The remaining 57 percent used a combination of owning, renting, and leasing and transferring. The practice of renting or leasing was most prevalent in the Coastal Plain region.

Ownership of the entire quota was most prevalent among operators of the smallest tobacco acreages (table 6). Owning and renting, and owning, renting and leasing increased proportionately with larger tobacco acreages.

Unlike control of the land resource, control of tobacco quota (proportion using different combinations of owning, renting, and leasing) changed little from 1972-79. However, the amount of quota leased and rented per farm increased substantially.

Characteristics of Operator Households

This section describes the flue-cured tobacco operators and their households in terms of age, education, farm income, and off-farm work and nonfarm earnings.

Age

Operator age may affect decisions about expanding or contracting the size of the farm operation. An older operator may be less likely than a younger operator to expand the operation, invest in equipment, or both. Older operators, nearing retirement, would not expect to use the equipment long enough to recover the investment.

Thirty-seven percent of all operators in 1979 were 55 years of age or older (table 7). Forty-four percent of the operators were between the ages of 35 and 54, and 19 percent were not yet 35 years old. Operators were youngest in Georgia and oldest in the Pee Dee-Lumber River region. A larger proportion of operators were under 35 years old in 1979 than in 1972.

Older operators tended to produce smaller acreages of tobacco. Those 55 and over were also more likely to be full owners.

Education

Nearly two-thirds of the operators of the largest acreages in 1979 had finished at least 12 years of school (table 8). In contrast, those with less than 8 years of formal schooling tended to operate smaller farms, particularly farms of less than 9 acres of tobacco. Seventy percent of the small operators in 1979 had less than 12 years of formal education. The

Table 4—Proportion of flue-cured tobacco farms operated under various tenure arrangements, by region

Tenure and year	Region				
	Pee Dee-Lumber River, N.C.-S.C. 16	Coastal Plain, N.C. 17	Piedmont, N.C.-Va. 18	Georgia 29	Average, four regions
	Percent				
Full owners:					
1979	30	11	30	15	23
1972	30	20	39	32	30
Full renters:					
1979	19	21	15	9	17
1972	26	41	32	17	32
Part owners:					
1979	50	68	55	76	60
1972	43	37	27	48	35
Other: ¹					
1979	N.A.	N.A.	N.A.	N.A.	N.A.
1972	2	3	3	2	2

N.A. = Not available.

¹Any arrangement that consists of some managed land. Managed land was included with owned or rented land in 1979.**Table 5—Distribution of flue-cured tobacco farms operated under various quota arrangements, by region**

Quota arrangement and year	Region				
	Pee Dee-Lumber River, N.C.-S.C. 16	Coastal Plain, N.C. 17	Piedmont, N.C.-Va. 18	Georgia 29	Average, four regions
	Percent				
Own:					
1979	34	5	12	27	16
1972	21	16	20	21	19
Rent:					
1979	26	30	28	18	27
1972	21	31	23	18	27
Own and rent:					
1979	16	18	9	15	14
1972	15	10	10	22	12
Own and lease:					
1979	10	15	30	23	21
1972	19	11	22	26	18
Rent and lease:					
1979	3	10	7	6	7
1972	8	14	11	2	11
Own, rent, lease:					
1979	10	22	14	11	15
1972	16	16	10	7	13
Other ¹ :					
1979	N.A.	N.A.	N.A.	N.A.	N.A.
1972	1	2	3	2	2

N.A. = Not applicable.

¹Any arrangement that consists of some managed allotment. Managed allotment was included with owned or rented allotment in 1979.

average level of education rose during 1972-79 (table 8).

Age and education are correlated. The younger farmers attended school longer than older ones (table 9). As older operators retire, the proportion of operators with at least a high school education increases.

Farm Income

The farmers surveyed reported an average of 79 percent of gross family farm sales from tobacco in 1979 (table 10). The proportion of farm receipts from tobacco varied considerably by region. Tobacco was expected to account for 47 percent of farm sales in Georgia, compared with 93 percent in the Piedmont. The proportion of the sales attributed to tobacco varied little by size of farm.

Off-Farm Work and Nonfarm Earnings

For the four regions combined, 52 percent of the farm households reported one or more family members with off-farm employment in 1979 (table 11). About 27 percent of the operators and 29 percent of the operators' spouses worked off the farm. The proportion of farms reporting any off-farm work dropped by 4 percentage points between 1972 and 1979 (2). More spouses than operators worked off the farm in the Coastal Plain region and Georgia. It is likely that operators in these areas have less time to work off the farm, since tobacco acreages per farm are largest in the Coastal Plain and Georgia has the largest total farm acreage.

A smaller percentage of operator household members living on farms with the largest tobacco

Table 6—Distribution of flue-cured tobacco farms operated under various quota arrangements, by acres of tobacco grown, study area

Quota arrangement and year	Acres of tobacco grown				Average, four regions
	Less than 9.0	9.0-19.9	20.0-34.9	35.0 and over	
Percent					
Own:					
1979	30	3	1	2	16
1972	27	6	2	16	19
Rent:					
1979	29	30	20	17	27
1972	27	26	20	4	25
Own and rent:					
1979	8	18	18	25	14
1972	10	15	12	21	12
Own and lease:					
1979	23	20	18	16	21
1972	21	17	7	4	19
Rent and lease:					
1979	4	9	14	6	7
1972	9	13	16	7	10
Own, rent, lease:					
1979	6	20	29	34	15
1972	5	21	36	48	13
Other: ¹					
1979	N.A.	N.A.	N.A.	N.A.	N.A.
1972	2	3	7	0	2

N.A. = Not available.

¹Any arrangement that consists of some managed allotment. Managed allotment was included with owned or rented allotment in 1979.

Production Input Use

Table 7—Distribution of flue-cured tobacco farmers, by age and acres of tobacco grown, study area

Acres of tobacco grown and year	Age (years)			
	Under 35	35-54	55-64	65 and over
	Percent			
Less than 9.0:				
1979	17	34	30	19
1972	11	44	29	16
9.0-19.9:				
1979	25	45	23	7
1972	17	55	24	4
20.0-34.9:				
1979	15	59	23	3
1972	10	66	20	4
35.0 and over:				
1979	17	66	15	2
1972	16	57	15	12
Average, all size groups:				
1979	19	44	25	12
1972	12	48	28	12

Table 8—Distribution of flue-cured tobacco farmers, by educational level and acres of tobacco grown, study area

Acres of tobacco grown and year	Years of education		
	Less than 8	8-11	12 and over
	Percent		
Less than 9.0:			
1979	39	31	30
1972	45	36	19
9.0-19.9:			
1979	18	32	50
1972	29	39	32
20.0-34.9:			
1979	13	31	56
1972	29	36	35
35.0 and over:			
1979	6	30	64
1972	8	36	56
Average, all size groups:			
1979	27	31	42
1972	39	37	24

Table 9—Distribution of flue-cured tobacco farmers, by educational level and age, study area, 1979

Age of operator (years)	Years of education		
	Less than 8	8-11	12 and over
	Percent		
Under 35	1	18	81
35-54	27	34	39
55-64	57	36	7
65 and over	63	28	9
Average, all operators	27	31	42

acres work off the farm (table 12). The proportion of operators working off the farm declined directly with increased tobacco acreage. However, the proportion of households with spouses and other family members working off the farm was greater on farms growing 9 to 20 acres of tobacco than on those growing less than 9 acres of tobacco. This may result from a larger proportion of other family members on farms with 9 to 20 acres of tobacco being younger and better educated than those living on farms growing less than 9 acres of tobacco.

Only about 27 percent of farm operators and their spouses reported the equivalent of full-time off-farm employment (2,000 hours or more annually). About half the farm households reported off-farm employment for all family members combined that equaled full-time off-farm employment for one person.

Half the flue-cured tobacco farm families received less than \$2,500 in 1979 from nonfarm sources (table 13). Only a fifth had \$10,000 or more in nonfarm income. Nonfarm earnings were higher on farms with smaller tobacco acreages.

Production Input Use

Curing fuel, fertilizer, and labor are three major inputs used in the production of flue-cured tobacco. Comparable data for curing fuel and fertilizer are not available for 1972.

Table 10—Distribution of sales from various enterprises on flue-cured tobacco farms, by region, 1979¹

Enterprise	Region				
	Pee Dee- Lumber River, N.C.-S.C. 16	Coastal Plain, N.C. 17	Piedmont, N.C.-Va. 18	Georgia 29	Average, four regions
	Percent				
Flue-cured tobacco	74	75	93	47	79
Other crops	24	20	4	36	16
Livestock	2	5	3	17	5

¹Farm operators' estimates of sales.**Table 11—Off-farm employment of flue-cured tobacco farm operators and family members, by region, 1979**

Family member	Region				
	Pee Dee- Lumber River, N.C.-S.C. 16	Coastal Plain, N.C. 17	Piedmont, N.C.-Va. 18	Georgia 29	Average, four regions
	Percent				
Operator	24	17	40	17	27
Spouse	21	36	32	20	29
Other family ¹	10	12	12	6	11
All family members	42	50	62	35	52

¹Includes children, parents, and other relatives living in the household.**Table 12—Off-farm employment of flue-cured tobacco farm operators and family members, by acres of tobacco grown, 1979**

Family member	Acres of tobacco grown				
	Less than 9.0	9.0- 19.9	20.0- 34.9	35.0 and over	Average, four regions
	Percent				
Operator	34	24	17	12	27
Spouse	26	35	30	27	29
Other family ¹	10	14	10	5	11
All family members	53	56	46	37	52

¹Includes children, parents, and other relatives living in the household.

Curing Fuel Use

More than 80 percent of the fuel directly used in flue-cured tobacco production is for curing. Farmers spent an average of \$162 per acre on fuel to cure flue-cured tobacco in 1979. Three-fourths of the bulk barns and 59 percent of the conventional barns used liquefied petroleum gas for curing. Fuel oil was used in 21 percent of the bulk barns and 33 percent of the conventional barns. Diesel, kerosene, natural gas, and wood were used to cure the remainder of the flue-cured tobacco in 1979.

Fertilizer Use

Flue-cured tobacco farmers applied an average of 92 pounds of nitrogen (N), 144 pounds of phosphorous (P₂O₅), and 207 pounds of potassium (K₂O) per acre. Nitrogen and potassium applications were similar by region but phosphorous applications varied from 133 pounds per acre in the Piedmont to 180 pounds in Georgia.

Changes in Labor Use

Over two-thirds of the labor used to produce flue-cured tobacco in 1979 was for harvesting and preparing the tobacco for market. The amount of harvest labor used per acre varied considerably.

The amount of labor used per acre was substantially reduced because of mechanization in preharvest, harvest, and postharvest operations. Changes in preharvest operations included greater mechanization of land preparation and cultivation, widespread use of mechanical transplanters, substantial use of sucker control chemicals, and use

of mechanical toppers. In combination, the above changes caused preharvest labor use to decline from 129 hours per acre in 1959 to 54 hours in 1979 (2).

Harvest labor use, including market preparation, declined from 187 hours per acre in 1972 to 118 hours per acre in 1979 because of a greater use of labor-saving bulk barns and mechanical harvesters. A changeover from tied to untied sales of flue-cured tobacco resulted in a drop of 75 hours per acre in post-harvest labor use in the late sixties.

In combination, these various changes caused labor used to produce flue-cured tobacco to drop from 425 hours per acre in 1965 to 172 hours per acre in 1979 (2). Increased use of bulk barns and mechanical harvesters will mean further reductions in labor used to produce flue-cured tobacco.

Labor reductions in flue-cured tobacco harvest generally affect part-time workers. The tobacco harvest season only lasts 6 to 8 weeks. As a result, the average hired worker had less than 260 hours of harvest work in 1972 and earned about \$340. More than half the hired work force were less than 18 years of age, more than two-thirds were black, and over half were female (4).

Preharvest Labor

Labor use varies by job, size of farm, and region. Characteristics of people performing the jobs also differ.

Table 13—Proportion of flue-cured tobacco farmers reporting nonfarm income, by acres of tobacco grown, study area, 1979

Nonfarm income class	Acres of tobacco grown				Average, four regions
	Less than 9.0	9.0-19.9	20.0-34.9	35.0 and over	
	Percent				
Less than \$100	36	38	40	47	38
\$100-\$999	3	4	7	6	4
\$1,000-\$2,499	8	10	7	9	8
\$2,500-\$4,999	11	9	11	10	10
\$5,000-\$9,999	21	22	14	13	20
\$10,000-\$19,999	14	9	11	9	12
\$20,000 and over	7	8	10	6	8