

Photo by Billy Barnes

Changes in the Structure of the Flue-Cured Tobacco Farm — A Compilation of Available Data Sources

by Robert Dalton

In the past decade, flue-cured tobacco farms have changed dramatically. They have become larger and more mechanized, requiring fewer and fewer farmers and relying on more and more leased quota.¹ These four factors — mechanization, farm unit size, the lease and transfer system, and labor displacement — are all closely interrelated and interdependent. As mech-

Bulk curing barns on a mechanized tobacco farm in eastern North Carolina.

Robert Dalton, a former staff member at the N.C. Center for Public Policy Research, is completing graduate work in political science at the University of North Carolina at Chapel Hill.

anization increases, farms get bigger, more tobacco is leased, and fewer people grow it. Each factor allows and encourages the next, operating in a circular system (see diagram on this page). This article summarizes the currently available data on the four variables shown in the figure; all of them play a vital role in determining the structure of the flue-cured tobacco farm.

The most wide-ranging and thorough data on this subject has been collected by the U.S. Department of Agriculture (USDA) through surveys of the flue-cured area in 1972 and 1979. The USDA published reports on this data in 1975, 1977, and 1981, documenting a rapid increase in the use of mechanical harvesters and bulk barn curing and a shift towards larger farm units with decreased overall labor requirements.² Other organizations and individuals have also collected this kind of data with similar results.

Size of Farm Management Unit

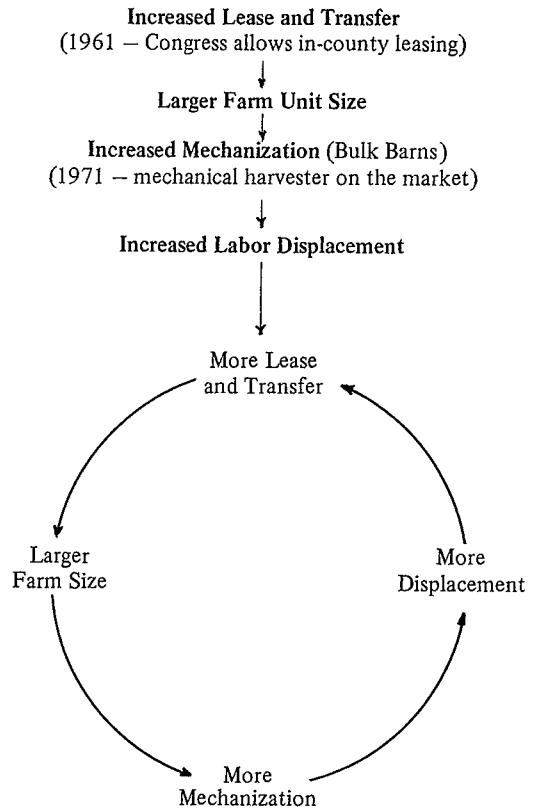
The size of the flue-cured tobacco management unit, according to the U.S. Census of Agriculture, increased from about five acres in 1964 to 8.7 acres in 1969. The USDA studies found the average at 9.5 acres in 1972 and 13.8 acres in 1979 (see table on page 16). In North Carolina the average number of acres harvested per flue-cured farm steadily increased from 5.2 in 1964 to 12.2 in 1978 (see table on page 16).

Mechanization

In both North Carolina and all flue-cured areas, the trend is towards greater mechanization of harvest and increased use of bulk barn curing. (These two aspects of tobacco harvesting go hand-in-hand). The USDA survey results show a dramatic jump in the use of both. In 1972 (one year after the mechanical harvester reached the open market), only one percent of the flue-cured crop was harvested mechanically and eight percent was cured in bulk barns. Just seven years later, from 19-33 percent of the crop was harvested mechanically and 61 percent was bulk cured. Projections for 1985 are 35 percent and 100 percent, respectively.

Two other sources, widely recognized among tobacco analysts, make yearly estimates of this data: Rupert Watkins of the North Carolina Agricultural Extension Service and the Tobacco Association of the United States (TAUS). Both Watkins and TAUS estimate that mechanization has proceeded faster than the USDA survey reports. The three sources agree on the degree to which bulk barns are being used for curing. Watkins derives his annual estimates by updating the number of mechanical harvesters used in North

LINEAR TRENDS HAVE EVOLVED INTO CIRCULAR SYSTEM



Carolina with sales figures from the manufacturers. He then multiplies that number by 50 acres per harvester. Watkins selects 50 acres because, as he puts it, it is a "happy medium" among the estimates other researchers use for the capacity per harvester. His methodology for bulk barn estimates is similar, except he multiplies the number of bulk barns by six acres per barn.³ TAUS derives its percentage of the acreage mechanically harvested and bulk-cured by a survey of equipment manufacturers, extension agents, agricultural engineers, and tobacco specialists.⁴

Lease and Transfer

In 1961, Congress voted to allow lease and transfer of tobacco quota within counties, and in 1967 it removed the limit of five acres that could be leased to any one farm. Lease and transfer is still only permitted within county lines. Both the North Carolina state office of the Agricultural Stabilization and Conservation Service and the USDA Economics, Statistics, and Cooperatives Service maintain careful records on quota levels and lease and transfer arrangements because they

are integral to the operation of the tobacco program.

Since 1966, lease and transfer has been growing in North Carolina, both in raw numbers (pounds of quota and acreage of allotment are assigned to each farm) and in percentage calculations. From 1966 to 1979, the amount of quota and acreage leased each increased 250 percent, from 80 to 280 million pounds and from 42,200 to 147,600 acres, respectively.⁵ The portion of quota poundage that was leased increased from 12 percent in 1966 to 40 percent in 1980; the portion of allotment acreage that was leased rose from 12 percent to 42 percent over the same 15-year period. Similar trends took place throughout the flue-cured belts.

The portion of North Carolina's flue-cured farms leasing in or out grew from 32 percent in 1965 to 85 percent in 1979. The number leasing out increased much more rapidly than those leasing in, which indicates that farms still producing flue-cured tobacco are becoming larger in acreage and fewer in number. By 1979, 60 percent of the flue-cured farms in the state leased out but only 24 percent leased in.⁶

The trends belt-wide are similar. Verner Grise of the USDA, reporting on the 1979 survey results, indicated that a higher percentage of farmers are dependent on leased quota in order to have an economical farm management unit. "Only 16 percent of the farm operators owned the entire tobacco quota that they produced in 1979. The figure was 19 percent in 1972....About 27 percent rented in all their quota in 1979. The remain-

ing 57 percent used some combination of owning, renting, and leasing....Ownership of the entire quota was much more prevalent among operators of the smallest tobacco acreages."⁷

Finally, Grise reported that an average farm in 1979 produced four quotas, compared to 3.2 quotas in 1972. In other words, three out of four quota holders did not grow their allotment in 1979. For many years allotment holders have rented their quota to a local farmer, but this practice has accelerated with the increase in leasing.

Labor Requirements

The amount of labor needed to produce an acre of tobacco has declined dramatically in the last 25 years, the period during which labor saving devices — from weed control chemicals to the mechanical harvester — have been introduced. Comparing a 1956 study by Dr. Charles Pugh at North Carolina State University with a 1977 report issued by the North Carolina Agricultural Extension Service shows the trend among the various stages of tobacco farming and for different farm sizes (see table on page 17).⁸ The North Carolina Agricultural Extension service periodically publishes pamphlets that enable farmers to estimate costs and returns for growing tobacco in North Carolina.

The USDA report of the 1979 survey estimates that the number of flue-cured harvest workers (including family and exchange workers) declined

SIZE OF FLUE-CURED TOBACCO FARMS

REGION WIDE

	Pee Dee-Lumber River N.C. - S.C.	Coastal Plain N.C.	Piedmont N.C. - Va.	Georgia	All
1979	13.2	18.8	10.8	11.5	13.8
1972	10.9	11.2	7.7	8.7	9.5

Source: USDA, "Flue-cured Tobacco Farming: Structural Characteristics, Labor Use, and Mechanization," by Verner Grise. See Footnote 2.

NORTH CAROLINA

Year	Acres Produced (1000's)	Farm Producing (1000's)	Average/Farm
1964	399.3	76.6	5.2
1969	364.8	54.6	6.7
1974	359.5	37.8	9.5
1978	413.3	33.9	12.2

Source: U.S. Census of Agriculture for 1964, 1969, 1974, and 1978. The 1964 census provided this data directly, separating flue-cured from burley farms. For later years, the figures were derived by subtracting from the state totals the number of farms and acres in burley belt counties.

ESTIMATED LABOR INPUTS PER ACRE OF FLUE-CURED TOBACCO (Man-hours)

Operation	1956	1977		
		Small*	Medium**	Large***
Plant Bed	11.0	3.74	2.32	5.87
Land Preparation	11.8	5.56	2.86	1.75
Pulling/Transplanting	35.0	22.00	16.10	16.20
Growing after Transplanting	46.2	13.13	2.87	3.38
Harvesting and Curing	145.0	125.00	88.00	59.06
Preparation for Market	140.0	30.00	15.60	15.60
Total Assumed Yield Per Acre	1600 lbs.	2100 lbs.		

*Small Farms – using hand-priming, typing machines, conventional barns and small tractor and tillage equipment, with 10 acres or less.

**Medium Farms – using larger tillage equipment, harvesting via racking on priming aid, and bulk barns, with around 25 acres.

***Large Farms -- Using large tillage equipment, 4-row transplanters, automatic harvester, and bulk barns, with 40 acres or more.

Source: See Footnote 8 in article.

from 325,000 in 1972 to 211,000 in 1979, an average drop of over 16,000 workers per year. "The decline occurred because of the adoption of labor-saving harvest technology," Grise reported. "Between 1972 and 1979 the greatest harvest labor reduction occurred in the Coastal Plain of North Carolina – the most concentrated production region. Harvest labor use declined by 46 percent in this region from 30.8 million to 16.7 million hours . . . The number of harvest workers may have declined from 139,000 to 75,000.

"The smallest drop in harvest labor use between 1972 and 1979 was in the Piedmont of North Carolina and Virginia where labor use declined by 16 percent . . . Because of the rougher topography, operator units have expanded less rapidly and mechanical harvesters have been adopted at a slower rate in this region."⁹ □

¹ Various systems for harvesting, preparing for curing, and curing flue-cured tobacco exist. The USDA reports cited in footnote 2 list ten different combinations, including several that could be called partially mechanized systems. This article focuses on mechanical harvesters and bulk barns because that combination has the most long range impact on the tobacco farm structure in terms of size of farm unit and labor requirements.

² The three USDA reports listed below are based on survey data in a four-region area which produces about three-quarters of the nation's flue-cured tobacco. All figures cited from these studies are based on surveys in this region, not on the entire flue-cured growing area. The studies are:

Vernon N. Grise *et al.*, *Structural Characteristics of Flue-Cured Tobacco Farms and Prospects for Mechanization*, Economic Research Service, U.S. Department of Agriculture, Agricultural Economic Report No. 277, January 1975.

Frederic L. Hoff, *et al.*, *Flue-Cured Tobacco Mechanization and Labor: Impacts of Alternative Production Levels*, Economic Research Service, U.S. Department of Agriculture, Agricultural Economic Report No. 368, April 1977.

Vernon N. Grise, "Flue-Cured Tobacco Farming: Structural Characteristics, Labor Use, and Mechanization," presented at the 29th Tobacco Workers Conference, Lexington, Ky., January 21, 1981, Economics and Statistics Service, USDA. The full report on the 1979 survey data will be published in 1981.

³ Rupert Watkins, Extension Specialist, North Carolina Agricultural Extension Service, North Carolina State University at Raleigh, N.C. Telephone interviews, September 15 and 22, 1980.

⁴ Letter from Hugh C. Kiger, executive vice-president, Tobacco Association of the United States, October 8, 1980.

⁵ The figures for acreage allotment leased refer to acres leased in. The number of acres leased out tends to be larger than the number of acres leased in because of differing yields per acre. I chose to use the figures for leasing in to err on the side of caution.

⁶ 1965-1979 *Annual Reports/North Carolina*, Agricultural Stabilization and Conservation Service, U.S. Department of Agriculture.

⁷ Grise, "Flue-Cured Tobacco Farming," *op. cit.* pp. 3-4.

⁸ *Cost of Producing Farm Products in North Carolina*, Department of Agricultural Economics, North Carolina State College, A.E. Information Series No. 52, December 1956.

Planning for Profit-Field Crops. North Carolina Agricultural Extension Service, Circular 519 (Revised), November 1977.

⁹ Grise, "Flue-Cured Tobacco Farming," *op. cit.* p.7.