Tobacco.

ECONOMICS
RESEARCH
REPORT

THE EFFECTS OF TOBACCO PRICE AND ALLOTMENT VARIATIONS ON FARM ORGANIZATIONS AND INCOMES, NORTHERN PIEDMONT AREA, NORTH CAROLINA

J. GWYN SUTHERLAND

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PREFACE

The study upon which this publication is based is part of Regional
Project S-42 entitled "An Economic Appraisal of Farming Adjustment
Opportunities in the Southern Region to Meet Changing Conditions."
The regional project is financed in part from Research and Marketing
Funds. It is a cooperative effort of the Farm Production Economics
Division, Economic Research Service, and Cooperative State Experiment
Station Service, United States Department of Agriculture, and the
departments of economics or agricultural economics of the following
State agricultural experiment stations: Alabama, Arkansas, Georgia,
Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South
Carolina, Tennessee, Texas, and Virginia. Dr. John W. White, Vice-
President for Agriculture, University of Arkansas, is the administra-
tive advisor for the project. Dr. James White, University of Arkansas,
is chairman of the project regional committee.

The Southern Farm Management Research Committee, sponsored by the
Farm Foundation and the southern agricultural experiment stations, was
helpful in the development of the regional project.

The overall purpose of this project is to provide guides (1) to
farmers choosing among alternative production opportunities, especially
as those opportunities are affected by changes in prices and technology,
in order that they may make the most profitable decisions, and (2) to
farmers and other persons engaged in developing and administering public
agricultural programs.

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THE EFFECTS OF TOBACCO PRICE AND ALLOTMENT VARIATIONS ON FARM ORGANIZATIONS AND INCOMES, NORTHERN PIEDMONT AREA, NORTH CAROLINA

J. Gwyn Sutherland[1]

INTRODUCTION

North Carolina ranks first among the States in flue-cured and
total tobacco production. Tobacco accounted for 46 percent of all cash
receipts from farm marketings in this State in 1963. By 1967, this
figure had dropped to 41 percent, owing to a decline in the value of
tobacco and an increase in the value of livestock and livestock products
sold. Nevertheless, cash receipts from tobacco continue to exceed
those from livestock and livestock products, and are almost twice the
cash receipts obtained from all other field crops.

In the Northern Piedmont, the area of this study, the value of the
flue-cured tobacco crop amounted to over $105 million, or 86 percent
of the value of the eleven principal crops produced in 1963. Involved
in this production was a tobacco allotment for the area of 108,361
acres, or 23 percent of the State's flue-cured crop. In 1965, Public
Law 89-12 authorized an acreage-poundage program for flue-cured tobacco
which has continued to the present. In 1967, the allotment for the
Northern Piedmont was 92,698 acres, down 14.5 percent from 1963, but
still 23 percent of the acreage in the State. The poundage quota was
155,217,897 pounds, or 20.8 percent of the total for the State. The
average price received for the flue-cured tobacco from 1963 through

1966 was 56.8 cents per pound. Variations in the quantity produced or
in the price obtained for flue-cured tobacco can have a significant
influence on the amount of farm income received by the tobacco farm
operators in the Northern Piedmont and greatly affect the economic
development of the area.

The purpose of this study is to analyze the effects of a wide
range of product prices and allotments for flue-cured tobacco on
resource use, farm organizations, production of major commodities, and
farm incomes of operators of small, medium and large tobacco farms in
the Northern Piedmont Area of North Carolina.

ASSUMPTIONS

As this analysis is a contributing project to Regional Project
S-42, dealing with adjustment opportunities in a changing economy, a
number of assumptions applicable to all projects so contributing were
specified by the technical committee for the regional project. These
assumptions are given in the following sections.

The Farm Operator

It was assumed that the farms in this study would be owner-operated,
and that the operators would make the adjustments in farm organizations
and operations that appear to be most profitable. The operators each
would supply a full man-equivalent year of their own "unpaid" labor as
needed in the management and operation of their farms (Appendix Table 10).

Other Resident and Seasonal Labor

Labor required in addition to that supplied by the operator would
be supplied by resident hired labor in whole units at a specified annual
cost, or by seasonal hired labor at a specified hourly wage rate,
depending on their relative profitability in particular farming systems.
Seasonal hired labor was assumed to be available as needed, at an
average wage rate of 90 cents per hour.

Prices

The major product and factor prices used in this study were based
on the U. S. prices of farm products sold and items used in production
as shown in "Agricultural Price and Cost Projections for Use in Making
Benefit and Cost Analyses of Land and Water Resource Projects Analyzing
the Repayment Capacity of Water Users," Agricultural Research Service
and Agricultural Marketing Service, U. S. Department of Agriculture,
Washington, D. C., 1957. These prices were adjusted to North Carolina
conditions to reflect regional differences. As tobacco was the
commodity of primary consideration in the analysis, tobacco prices

were varied from 80 to 140 percent of a base price of 44 cents per pound. Prices of all other commodities and production inputs were held constant at a projected level specified in the budgets, organizational tables, or in the narrative.

Capital

Capital was not considered a limiting factor in the analysis. Operating capital was charged to the farming system for the estimated time used at an annual rate of 6 percent. Thus it was assumed that operating capital usually would have to be borrowed.

Level of Technology

The level of technology assumed in the development of the budgets for this study was an advanced level incorporating "recommended" practices. The better farmers already are operating at this level. Thus, good management, capable of operating a farm at a relatively high level of efficiency, also was assumed.

Time Period

In evaluating production practices and techniques sufficient time was assumed for the full effect on yields to materialize. In evaluating adjustments in enterprise sizes and combinations, sufficient time was assumed for intermediate term capital investments in items such as farm machinery and pasture improvement to be considered as variables. Enough time also was assumed to permit farm operators to make adjustments considered to be profitable. Where specific dates were necessary, 1963 was the base year and 1975, the target date.

Allotment Levels

Acreage allotments were assumed to be in effect for tobacco. To permit an analysis of the effects of variations in tobacco allotments on farm organizations and incomes, tobacco allotments were varied from 55 to 115 percent of the levels in effect during the base year 1963. Although acreage-poundage was not analyzed, yields were set to reflect those obtained under acreage-poundage.

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Wheat acreages were restricted to no more than 15 acres, as any farm could grow that amount or less in 1963.

Buying Feed

Feed for some enterprises requires a considerable amount of processing, such as grinding and mixing, while other enterprises can utilize homegrown feeds with a minimum of processing. In general, the type of grain-consuming animal and the size of the enterprise largely determine whether it is more economical to produce or purchase the feed needed in livestock production. Because of the possible opportunity to exploit external economics by purchasing feed for some enterprises, limited purchase of feed is permissible. Livestock enterprises considered in this analysis, therefore, are those for which only supplementary feeds are purchased.

THE STUDY AREA

The Northern Piedmont (Figure 1) is located in the "Old Tobacco
Belt" and is comprised of 13 counties. Based on a sample of Agricul-
tural Stabilization and Conservation Service farm records and the ASCS
1963 Annual Report, there were approximately 3.3 million acres in farms,
including 1.1 million acres of cropland, in the area in 1963, the base
year of this study. Important crops grown in the area are tobacco,
corn, wheat, oats, soybeans, and hay. Livestock enterprises are
dairying, hogs, beef cattle, and poultry.

Although the total population of the area has been increasing over
the years, rural farm population has been declining. The total popula-
tion increased from 808,000 to 951,000, or 17.7 percent, from 1950 to
1960. The rural farm population declined during the same period from
194,000 to 131,000, or 32.5 percent.[2] This decline in the rural farm
population is indicative of the increasing industrialization and
nonfarm job opportunities in the area.

The agriculture of the area is characterized by a preponderance
of small farms incapable, in many cases, of providing an acceptable
level of living.[3] Over 81 percent of all commercial farms had gross
sales of less than $10,000, and almost half the farms sold less than
$5,000 worth of products in 1964 (Table 1). As net farm income seldom
exceeds 50 percent of the value of gross sales, a high proportion of

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[2]U. S. Department of Commerce, Bureau of the Census. A change in
definition of a farm in the 1960 census may account for a part of the
decline in the rural farm population during the decade.

[3]"The People Left Behind," a report by the President's National
Advisory Commission on Rural Poverty, defines the poverty line as
"... the minimum level of income needed to provide the kind of living
that our society considers a basic human right," and uses $3,000 as a
rough indicator of the level of income required to provide an average
family with an acceptable level of living. The income required to
provide an acceptable level of living will vary with the price level,
size of family, location, and what the family and society consider
acceptable.
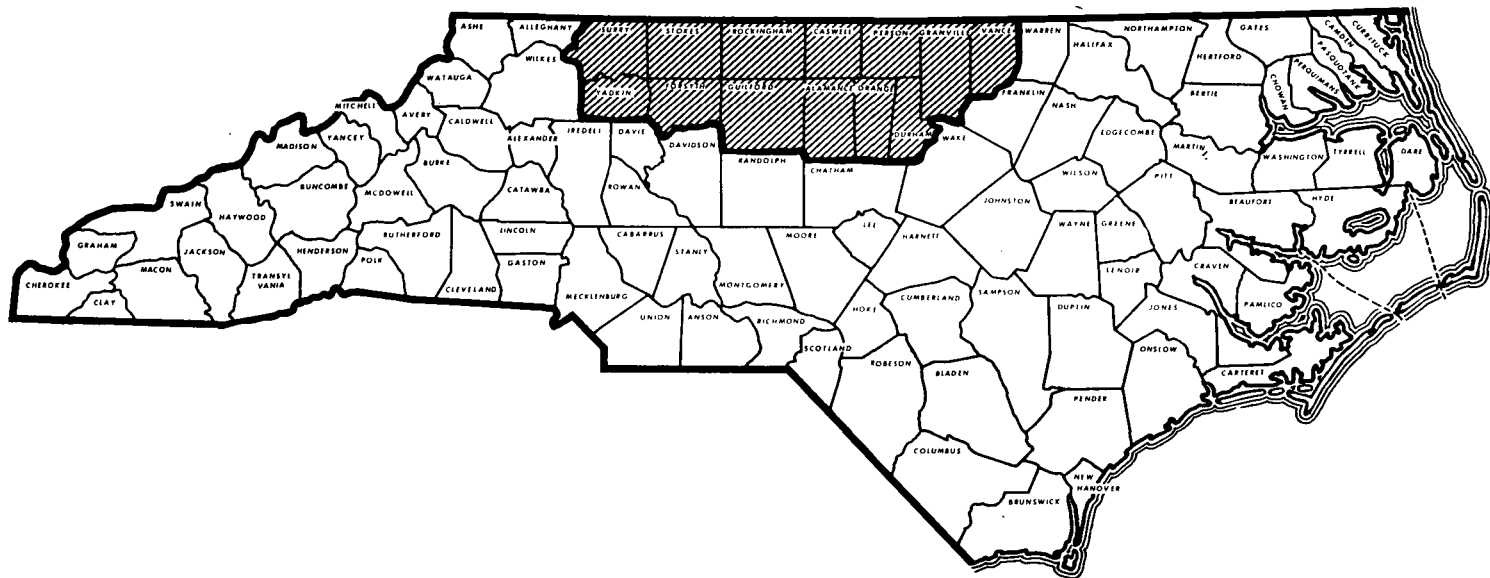
Figure 1. Northern Piedmont Area of North Carolina

Table 1. Number of commercial farms, by economic class, Northern
         Piedmont, North Carolina, 1964[a]

Economic class	Farms		Value of products sold (dollars)
	Number	Percent	
I	263	1.3	40,000 or more
II	697	3.6	20,000 to 39,999
III	2,672	13.8	10,000 to 19,999
IV	6,415	33.1	5,000 to 9,999
V	6,548	33.8	2,500 to 4,999
VI	2,799	14.4	50 to 2,499
Total	19,394	100.0	x x x x

[a]U. S. Census of Agriculture. Does not include part-time and
part-retirement farms.

the farm operators in the area would fall into the poverty category,
as currently defined by recognized authorities, if farming were the
only source of income. The number of small farms, however, is declining
while the number of relatively large farms is increasing. During the
period 1959 to 1964, the number of census farms in the area with less
than 100 acres of cropland harvested declined from 21,386 to 16,939
or almost 21 percent. During the same period, the number of farms with
260 or more acres of cropland harvested increased about 15 percent.

       According to the ASCS Annual Report, there were 24,783 farms with
tobacco allotments and 9,208 farms without tobacco allotments in the
Northern Piedmont area in 1963.[4] There also were 1,854 cotton allot-
ments, averaging 2.4 acres. Cotton production is disappearing from the
area.

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[4]The number of farms reported by the census and ASCS are not in
agreement, owing to differences in the definitions of what constitutes
a farm and a variety of enumeration problems that preclude the acquisi-
tion of an accurate census by either the Bureau of the Census or ASCS.

Typical farms in the area were ascertained from ASCS farm record data. A sample of ASCS farm records of each of the 13 counties in the Northern Piedmont for 1963 was used to determine the size of allotments and land resources available on the typical farms. The sampling procedure was developed in consultation with the Department of Experimental Statistics, North Carolina State University.[5]

The average farm resource situations resulting from an analysis of the sample data are shown in Table 2. Tobacco prices and allotments were varied to ascertain the effects on farm organization, production, and income. This was accomplished by developing optimal enterprise organizations for these farms, employing linear programming procedures, with tobacco prices and allotments as specified in Table 3.

Enterprises considered in the analyses were tobacco, corn, soybeans, wheat, barley, grain sorghum, hogs, and beef cattle. These enterprises already are well adapted to the area. Poultry and dairy enterprises were not considered. Farms with large poultry and dairy enterprises presumably have already made significant adjustments toward higher levels of productivity, as these enterprises are considered profitable for those farm operators with the requisite managerial ability. Enterprise budgets were developed by personnel of the North Carolina Agricultural Extension Service and representatives of the Economic Research Service.[6]

It was estimated that each operator could work a maximum of 2,818 hours each year (Appendix Table 10). Other family labor was considered hired labor, requiring the payment of wages at the same rate as for seasonal hired labor, 90 cents per hour.

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[5]See Appendix for an additional comment concerning sampling procedure.

[6]See Appendix Tables 1-9 for budgets of enterprises in the optimal farm organizations.

Table 2. Number of ASCS farms, Northern Piedmont, North Carolina, 1963[a]

| Item | Size of farm[b] | | | | | |
| | Small | | Medium | | Large | |
	Tobacco	Nontobacco	Tobacco	Nontobacco	Tobacco	Nontobacco
Number of farms	14,874	6,745	8,312	2,187	1,597	276
Total land per farm (acres)	53.5	46.5	134.7	119.1	416.8	379.4
Cropland per farm (acres)	15.6	14.3	48.3	45.9	143.4	148.6
Tobacco allotment per farm (acres)	2.6	xx	5.6	xx	15.0	xx

[a]Based on a sample of ASCS farm records from each county.

[b]Small, 0-29 acres of cropland; medium, 30-79 acres; large, 80 acres or more.

Table 3. Combination of tobacco prices and allotments programmed[a]

Size of farm	Tobacco price		Allotment levels (percent of 1963 acreage)				
	Cents per pound	Percent of base price	55	70	85	100	115
					Acres		
Small:	35.2	80				2.6	3.0
	44.0	100			2.2	2.6	3.0
	52.8	120		1.8	2.2	2.6	3.0
	61.6	140	1.4	1.8	2.2		
Medium:	35.2	80				5.6	6.4
	44.0	100			4.8	5.6	6.4
	52.8	120		3.9	4.8	5.6	6.4
	61.6	140	3.1	3.9	4.8		
Large:	35.2	80				15.0	17.3
	44.0	100			12.8	15.0	17.3
	52.8	120		10.5	12.8	15.0	17.3
	61.6	140	8.3	10.5	12.8		

[a]The combinations of tobacco prices and allotments to be programmed were specified by the S-42 technical committee. A price of 44.0 cents and the 1963 allotment levels were specified as bases.

EFFECTS OF TOBACCO PRICE AND ALLOTMENT VARIATIONS

Tobacco provides a high proportion of the total farm income of
tobacco farms. Government price support programs place "floors" under
tobacco prices that tend to become minimum prices with supply and
demand determining actual prices above the minimum levels. Allotments
are related to the history of production of individual farms and,
generally, vary with the size of farm. Analyses of the effects of
different tobacco prices and allotments show the relative importance
of these factors in determining incomes of tobacco farmers.

Small Farms

The Northern Piedmont is characterized by a high proportion of
small farms--small in terms of the acreage of cropland, and too small
to mechanize economically, except on a custom basis. They also are
too small, in most instances, to efficiently utilize the labor of
full-time operators. Although the number of small farms is declining
rather rapidly, they still provide the major means of employment for
thousands of operators and as a secondary source of income for other
thousands.

Small farms in the Northern Piedmont, based on the survey of ASCS
farm records, averaged 53.5 acres of total land, of which only 15.6
acres was cropland (Table 2). The average small farm had a tobacco
allotment of 2.6 acres in 1963. These land and allotment quantities
are used in this analysis to represent the small farm population of
the area.

Optimal farm organizations for the representative small farm are
shown in Table 4. The six optimal organizations (columns 2-7) result
from assumed variations in the tobacco allotment (55 to 115 percent of
the 1963 allotment of 2.6 acres), and the assumed changes in the price
of tobacco (35.2 to 61.6 cents per pound).

With an assumed tobacco price of only 35.2 cents per pound, it
would be profitable for the representative small farm operator to grow

Table 4. Optimal organizations and incomes of a representative small farm when tobacco allotments and prices are at specified levels, Northern Piedmont Area, North Carolina

Item (1)	Tobacco allotment (percent of 1963 acreage)					
	55 (2)	70 (3)	85 (4)	100,115 (5)	100 (6)	115 (7)
	Acres					
Land use						
Tobacco[a]	1.4	1.8	2.2	2.1	2.6	3.0
Corn	6.0	6.0	4.0	4.0	4.0	4.0
Wheat	1.8	2.3	2.8	2.6	3.3	3.8
Barley	5.6	4.6	5.8	6.0	4.8	3.8
Pasture	.4	.4	.3	.3	.3	.3
Total open land	15.6	15.6	15.6	15.6	15.6	15.6
Other land	37.9	37.9	37.9	37.9	37.9	37.9
Total land	53.5	53.5	53.5	53.5	53.5	53.5
	Numbers					
Livestock						
Brood sows	3	3	2	2	2	2
Hogs finished	45	45	30	30	30	30
	Hours					
Labor[b]						
Operator	768	931	1,043	1,023	1,066	1,088
Hired	0	0	21	0	161	302
Total labor	768	931	1,064	1,023	1,227	1,390
	Dollars					
Capital investment[c]						
Land[d]	10,914	10,914	10,914	10,914	10,914	10,914
Other	4,034	4,254	4,012	3,951	4,255	4,499
Total investment	14,948	15,168	14,926	14,865	15,169	15,413
Gross farm income with tobacco price per pound at:						
35.2 cents	xxxx	xxxx	xxxx	2,695	xxxx	xxxx
44.0 cents	xxxx	xxxx	3,115	xxxx	3,415	3,716
52.8 cents	xxxx	3,459	3,474	xxxx	3,839	4,205
61.6 cents	3,322	3,753	3,833	xxxx	xxxx	xxxx

Table 4 (continued)

Item	Tobacco allotment (percent of 1963 acreage)					
	55	70	85	100,115	100	115
(1)	(2)	(3)	(4)	(5)	(6)	(7)

<div align="center">Dollars</div>

Item						
Gross farm expenses with tobacco price per pound at:[e]						
35.2 cents	xxxx	xxxx	xxxx	2,216	xxxx	xxxx
44.0 cents	xxxx	xxxx	2,279	xxxx	2,532	2,727
52.8 cents	xxxx	2,375	2,290	xxxx	2,545	2,741
61.6 cents	2,253	2,384	2,301	xxxx	xxxx	xxxx
Net income to land, operator labor and management with tobacco price per pound at:						
35.2 cents	xxxx	xxxx	xxxx	479	xxxx	xxxx
44.0 cents	xxxx	xxxx	836	xxxx	883	989
52.8 cents	xxxx	1,084	1,184	xxxx	1,294	1,464
61.6 cents	1,069	1,369	1,532	xxxx	xxxx	xxxx

[a]Each acre of tobacco uses 1.25 acres of cropland.

[b]Labor used exclusive of that for maintenance.

[c]Does not include tractor and other tillage equipment. Operations requiring tractor power are assumed to be available on a custom basis and are charged to the farm at custom rates.

[d]Valued at $204 per acre of total land, based on data furnished by the Farmers Home Administration.

[e]Expenses vary with tobacco prices as warehouse charges are computed at 3 percent of the gross income from tobacco.

no more than 2.1 acres of tobacco (Table 4, column 5), although the assumed allotment levels for this price of tobacco were 100 and 115 percent of the 1963 allotment of 2.6 acres, as indicated in Tables 3 and 4. With tobacco prices of 44.0 cents and over, it would be profitable to grow the maximum of the assumed tobacco allotments.

Other enterprises included in the representative small farm organizations, in addition to tobacco, are corn, wheat, barley, and

hogs. The small size of the total farm operations precludes efficient use of the operator's labor. Except for general maintenance, no more than about 1,100 hours, or less than 40 percent of the operator's labor assumed to be available, would be required for any of the optimal organizations. Total capital investment would be about $15,000, a large investment for the relatively small net income to land, operator labor, and management of $1,500 or less. With a tobacco price of 44 cents or less per pound, the small farm operator would have little incentive to grow tobacco or do general farming, as the return to his land, labor, and management would be less than he probably could obtain in alternative employment.[7]

Medium Farms

Medium farms make up the second largest number of farms in the Northern Piedmont, being slightly less than half as numerous as the small farms. Medium-sized tobacco farms averaged 134.7 acres of total land, including 48.3 acres of cropland in 1963. Tobacco allotments on these farms averaged 5.6 acres, slightly more than twice as large as the average for the small farms. Although the medium tobacco farms have more than three times the cropland acreage of the small farms, they generally do not efficiently utilize the labor of the full-time operators. Incomes from the farms also are considerably higher than for the small farms, but they still are inadequate for an acceptable level of living in many instances. Consequently, the number of medium farms in the area also is declining.

The optimal organizations for the representative medium farm with different tobacco price and allotment combinations are shown in Table 5. As with the small farms, variations in the tobacco prices and allotments over the ranges specified for this study resulted in the development of six different optimal organizations. The tobacco allotment was varied from 3.1 to 6.4 acres, and it would be profitable to grow the

[7]North Carolina farm wage rates without board and room in 1963, according to the Statistical Reporting Service, averaged about 78 cents per hour. To do as well as this, assuming a 5 percent return to land and no return to management, per se, the small farm operator would have to have a net farm income in excess of $1,300.

Table 5. Optimal organizations and incomes of a representative medium
         farm when tobacco allotments and prices are at specified
         levels, Northern Piedmont Area, North Carolina

Item (1)	Tobacco allotment (percent of 1963 acreage)					
	55 (2)	70 (3)	85 (4)	100,115 (5)	100 (6)	115 (7)

<table>
<tr><td colspan="7" align="center"><u>Acres</u></td></tr>
<tr><td>Land use</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Tobacco[a]</td><td>3.1</td><td>3.9</td><td>4.8</td><td>2.0</td><td>5.6</td><td>6.4</td></tr>
<tr><td>Corn</td><td>19.9</td><td>19.9</td><td>17.9</td><td>21.9</td><td>17.9</td><td>17.9</td></tr>
<tr><td>Wheat</td><td>3.9</td><td>4.9</td><td>6.0</td><td>2.5</td><td>7.0</td><td>8.0</td></tr>
<tr><td>Barley</td><td>19.1</td><td>17.0</td><td>17.1</td><td>19.8</td><td>15.1</td><td>13.1</td></tr>
<tr><td>Pasture</td><td>1.5</td><td>1.6</td><td>1.3</td><td>1.6</td><td>1.3</td><td>1.3</td></tr>
<tr><td>Total open land</td><td>48.3</td><td>48.3</td><td>48.3</td><td>48.3</td><td>48.3</td><td>48.3</td></tr>
<tr><td>Other land</td><td>86.4</td><td>86.4</td><td>86.4</td><td>86.4</td><td>86.4</td><td>86.4</td></tr>
<tr><td>Total land</td><td>134.7</td><td>134.7</td><td>134.7</td><td>134.7</td><td>134.7</td><td>134.7</td></tr>
<tr><td colspan="7" align="center"><u>Numbers</u></td></tr>
<tr><td>Livestock</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Brood sows</td><td>10</td><td>10</td><td>9</td><td>11</td><td>9</td><td>9</td></tr>
<tr><td>Hogs finished</td><td>150</td><td>150</td><td>135</td><td>165</td><td>135</td><td>135</td></tr>
<tr><td colspan="7" align="center"><u>Hours</u></td></tr>
<tr><td>Labor[b]</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Operator</td><td>1,486</td><td>1,529</td><td>1,556</td><td>1,450</td><td>1,538</td><td>1,645</td></tr>
<tr><td>Hired</td><td>410</td><td>692</td><td>1,004</td><td>28</td><td>1,286</td><td>1,567</td></tr>
<tr><td>Total labor</td><td>1,896</td><td>2,221</td><td>2,560</td><td>1,478</td><td>2,824</td><td>3,212</td></tr>
<tr><td colspan="7" align="center"><u>Dollars</u></td></tr>
<tr><td>Capital investment</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Land[c]</td><td>27,479</td><td>27,479</td><td>27,479</td><td>27,479</td><td>27,479</td><td>27,479</td></tr>
<tr><td>Other</td><td>13,725</td><td>14,116</td><td>14,177</td><td>13,446</td><td>14,490</td><td>15,214</td></tr>
<tr><td>Total investment</td><td>41,204</td><td>41,595</td><td>41,656</td><td>40,925</td><td>41,969</td><td>42,693</td></tr>
<tr><td>Gross farm income
with tobacco price
per pound at:</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>35.2 cents</td><td>xxxx</td><td>xxxx</td><td>xxxx</td><td>7,410</td><td>xxxx</td><td>xxxx</td></tr>
<tr><td>44.0 cents</td><td>xxxx</td><td>xxxx</td><td>9,133</td><td>xxxx</td><td>9,733</td><td>10,335</td></tr>
<tr><td>52.8 cents</td><td>xxxx</td><td>9,436</td><td>9,916</td><td>xxxx</td><td>10,647</td><td>11,378</td></tr>
<tr><td>61.6 cents</td><td>9,216</td><td>10,073</td><td>10,700</td><td>xxxx</td><td>xxxx</td><td>xxxx</td></tr>
</table>

Table 5 (continued)

Item	Tobacco allotment (percent of 1963 acreage)					
	55	70	85	100,115	100	115
(1)	(2)	(3)	(4)	(5)	(6)	(7)

<p align="center">Dollars</p>

Gross farm expenses with tobacco price per pound at:[d]						
35.2 cents	xxxx	xxxx	xxxx	5,762	xxxx	xxxx
44.0 cents	xxxx	xxxx	7,013	xxxx	7,501	7,988
52.8 cents	xxxx	6,710	7,036	xxxx	7,528	8,020
61.6 cents	6,235	6,729	7,060	xxxx	xxxx	xxxx
Net income to land, operator labor and management with tobacco price per pound at:						
35.2 cents	xxxx	xxxx	xxxx	1,648	xxxx	xxxx
44.0 cents	xxxx	xxxx	2,120	xxxx	2,232	2,347
52.8 cents	xxxx	2,726	2,880	xxxx	3,119	3,358
61.6 cents	2,981	3,344	3,640	xxxx	xxxx	xxxx

[a]Each acre of tobacco uses 1.25 acres of cropland.

[b]Labor used exclusive of that for maintenance.

[c]Valued at $204 per acre of total land, based on data furnished by the Farmers Home Administration.

[d]Expenses vary with tobacco prices as warehouse charges are computed at 3 percent of the gross income from tobacco.

maximum of the allotments except at a price of 35.2 cents per pound of tobacco (Table 5, column 5). At that price, it would be profitable to grow only 2.0 acres of tobacco. The hog enterprise, however, would be expanded to a maximum of 11 brood sows and would off-set, to some extent, the loss of income from tobacco. Net income to land, operator labor and management would drop to a low of only $1,648. Only at a tobacco price of 52.8 cents and above would the net income approach or go above the poverty income level of $3,000. The capital investment required to obtain these relatively low levels of income would exceed

$40,000. Less than 60 percent of the operator labor assumed to be available would be employed in any of these optimal organizations.

Large Farms

Large farms comprise only about 6 percent of all farms and 6 percent of all tobacco farms in the Northern Piedmont. Large tobacco farms averaged 143.4 acres of cropland and 416.8 acres of total land in 1963. Thus large tobacco farms, in terms of cropland, were about three times as large as the medium farms. The tobacco allotments on the large farms averaged 15.0 acres, or about 2.7 times the average allotment for medium farms. These farms are large enough to provide relatively full employment for a full-time operator.

When optimally organized with the various tobacco price-allotment combinations specified for this study, a total of six farm organizations were developed (Table 6). Tobacco allotments were varied from 8.3 to 17.3 acres. With a tobacco price of 44.0 cents per pound and below, however, only 1.6 acres of tobacco would be profitable (Table 6, column 5). At 52.8 cents and over, the maximum of the tobacco allotments would be profitable. A large hog enterprise would be profitable in all the optimal organizations, but varying inversely in size with the acreage of tobacco. Net incomes vary with both acreage and price of tobacco from about $4,700 to $9,500, and capital investment from $113,000 to $118,000. Up to 91 percent of the operator labor and 2.2 man-equivalents of hired labor would be required.

Utilization of Labor on Tobacco Farms

The relatively large and uneven seasonal distribution of labor requirements in tobacco production is well known. Although development of an economical, labor-saving method of mechanically harvesting tobacco appears imminent, no such method has been developed, and a great deal of hand labor still is required on most tobacco farms during the harvesting season. Thus a large reserve of labor must be available in the tobacco-growing areas during the harvesting season to meet the large labor requirements for harvesting. Much of this labor will not be employed on the tobacco farms during the rest of the year. Nonfarm employment during these months is available for some of the people involved.

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Table 6. Optimal organizations and incomes of a representative large farm when tobacco allotments and prices are at specified levels, Northern Piedmont Area, North Carolina

	Tobacco allotment (percent of 1963 acreage)					
Item	55	70	85	85,100,115	100	115
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Acres

Land use						
Tobacco[a]	8.3	10.5	12.8	1.6	15.0	17.3
Corn	61.7	57.8	55.8	69.7	53.8	49.8
Wheat	10.4	13.1	15.0	2.0	15.0	15.0
Barley	56.4	55.1	52.5	64.6	51.9	53.3
Pasture	4.5	4.3	4.1	5.1	3.9	3.7
Total open land	143.4	143.4	143.4	143.4	143.4	143.4
Other land	273.4	273.4	273.4	273.4	273.4	273.4
Total land	416.8	416.8	416.8	416.8	416.8	416.8

Numbers

Livestock						
Brood sows	31	29	28	35	27	25
Hogs finished	465	435	420	525	405	375

Hours

Labor[b]						
Operator	2,394	2,357	2,434	2,248	2,561	2,575
Hired	2,908	3,742	4,620	443	5,379	6,263
Total labor	5,302	6,099	7,054	2,691	7,940	8,838

Dollars

Capital investment						
Land[c]	85,027	85,027	85,027	85,027	85,027	85,027
Other	30,395	30,762	31,650	28,263	32,347	33,022
Total investment	115,422	115,789	116,677	113,290	117,374	118,049
Gross farm income with tobacco price per pound at:						
35.2 cents	xxxx	xxxx	xxxx	20,280	xxxx	xxxx
44.0 cents	xxxx	xxxx	xxxx	20,541	xxxx	xxxx
52.8 cents	xxxx	26,810	28,561	xxxx	30,225	31,639
61.6 cents	26,865	28,524	30,651	xxxx	xxxx	xxxx

Table 6 (continued)

Item	Tobacco allotment (percent of 1963 acreage)					
	55	70	85	85,100,115	100	115
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Dollars

Gross farm expenses with tobacco price per pound at:[d]						
35.2 cents	xxxx	xxxx	xxxx	15,560	xxxx	xxxx
44.0 cents	xxxx	xxxx	xxxx	15,568	xxxx	xxxx
52.8 cents	xxxx	19,842	21,099	xxxx	22,302	23,422
61.6 cents	18,915	19,893	21,162	xxxx	xxxx	xxxx
Net income to land, operator labor and management with tobacco price per pound at:						
35.2 cents	xxxx	xxxx	xxxx	4,720	xxxx	xxxx
44.0 cents	xxxx	xxxx	xxxx	4,973	xxxx	xxxx
52.8 cents	xxxx	6,968	7,462	xxxx	7,923	8,217
61.6 cents	7,950	8,631	9.489	xxxx	xxxx	xxxx

[a]Each acre of tobacco uses 1.25 acres of cropland.

[b]Labor used exclusive of that for maintenance.

[c]Valued at $204 per acre of total land, based on data furnished by the Farmers Home Administration.

[d]Expenses vary with tobacco prices as warehouse charges are computed at 3 percent of the gross income from tobacco.

Even the farm operators themselves, as indicated in the above sections, frequently are not fully utilizing their labor in farming during much of the year. Figure 2 shows the seasonal distribution of the supply of operator labor available compared with the labor require-ments on the representative small, medium, and large Northern Piedmont farms with tobacco allotments restricted to the 1963 acreage level. Only during the 3-month harvesting season are the small and medium farm operators fully utilizing their labor in farming. Even the large farm fails to provide full utilization of the operator's labor from November through February. The large farm operators' income may be sufficiently
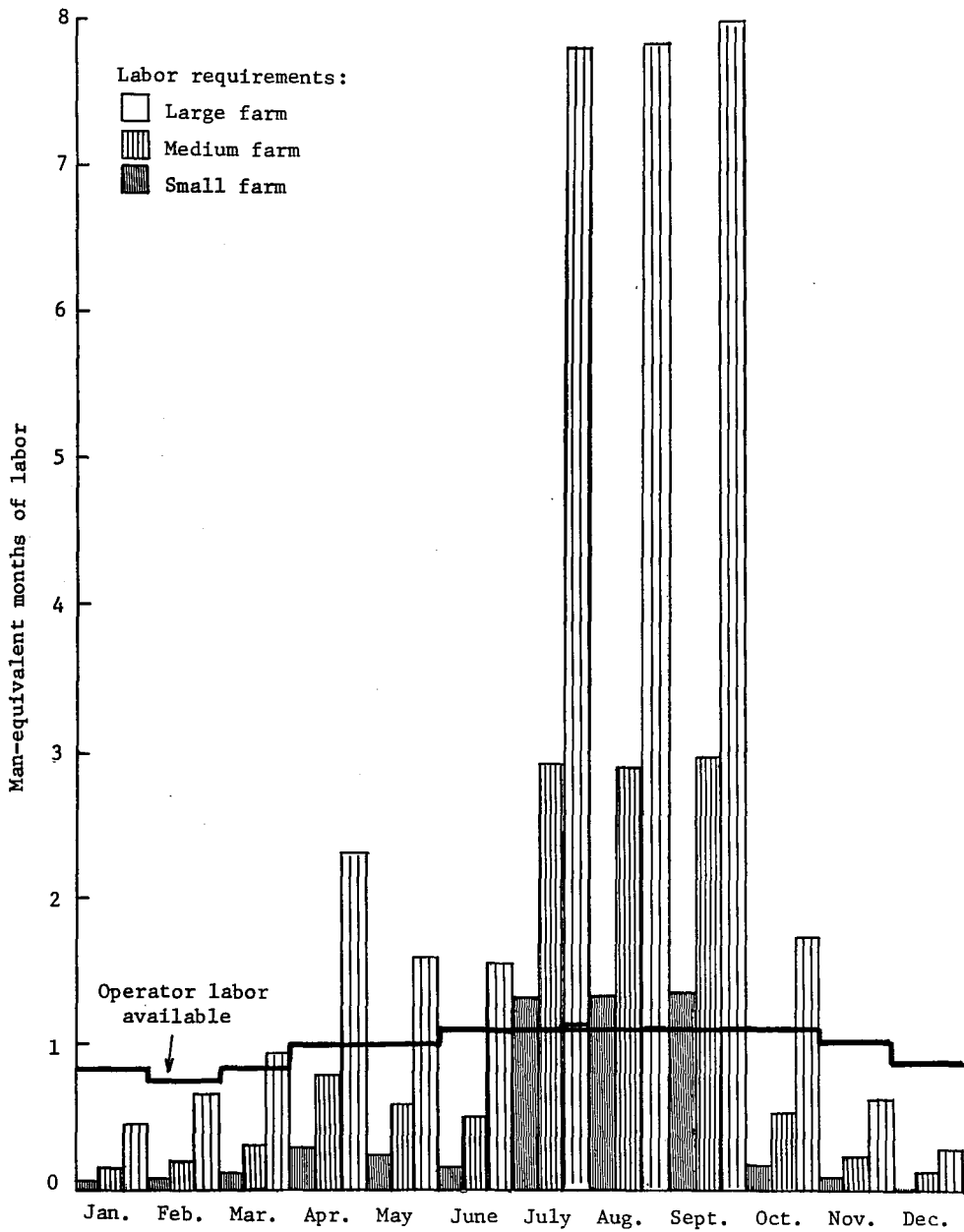
Figure 2. Seasonal distribution of operator labor available and labor required on small, medium and large representative farms with tobacco allotments restricted to the 1963 acreage level, Northern Piedmont Area, North Carolina

large even with less than full use of operator labor on the farm during these months, but the small and medium farm operators can scarcely afford less than full utilization of their labor during any month of the year. Many small and medium farm operators resort to off-farm work to supplement incomes during the months when little labor is required in farming.

It is obvious from the above analyses that both the small and medium tobacco farms in the Northern Piedmont of North Carolina are inadequate to provide a satisfactory level of living for most full-time operator families. Consequently, the current trend is toward consolidation of these farms into larger units that can provide more acceptable levels of living. As consolidation and reorganization of Northern Piedmont farms is proceeding at a rather rapid rate, the question arises as to the long-run effects on total production of major crops and livestock, and on total farm incomes. There is no infallible method by which these effects can be determined. However, a projection of recent trends in farm consolidation, an estimate of the acreage of cropland available in some future time period, and the assumption that the resulting farm organizations will be approximately as indicated for the optimal organizations presented in the previous sections would provide an estimate of the effects that might be expected. Aggregation of the results, however, involves a bias that limits the value of the estimates since "typical" or "representative" farms are necessarily employed in the analysis.[8]

During the period 1959-1964, the numbers of census farms grouped to approximate the ASCS size of farm groups as presented in this report changed at the following annual rates:

>   Small farms   - 4.182 percent
>   Medium farms - 3.174 percent
>   Large farms   + 2.960 percent

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[8]Frick and Andrews define aggregation bias "... as the difference between the area supply function as developed from the summation of linear programming solutions for each individual farm in the area, and summations for a smaller number of 'typical' or 'benchmark' farms." For a detailed discussion of aggregation bias, see George E. Frick and Richard A. Andrews, "Aggregation Bias and Four Methods of Summing Farm Supply Functions," and Randolph Barker and Bernard F. Stanton, "Estimation and Aggregation of Firm Supply Functions," Journal of Farm Economics, Vol. 47, August 1965.

Assuming that the small, medium, and large farms as presented in this report would still be representative of these groups in 1975, and assuming a continued rate of decline in small and medium farm numbers as in the 1959 to 1964 period, the numbers of small, medium and large farms in the Northern Piedmont Area in 1975 would be as shown in Table 7. Using the 1975 projected farm numbers as weights, the approximate aggregative effects of adoption of the optimal organization for the small, medium, and large farms as presented in the above sections of this report may be estimated. The results are shown in Table 8.

Table 7. Estimated number of tobacco farms, by size groups, Northern Piedmont, North Carolina, 1963 and 1975 projected

Size group of farms	1963	1975 projected[a]
Small	14,874	7,410
Medium	8,312	5,146
Large	1,597	2,164

[a]Based on a projection of the trend in the number of farms, by size groups, 1959 and 1964 U. S. Census of Agriculture.

With tobacco allotments varying from 55 to 115 percent of the 1963 allotments and tobacco prices from 35.2 to 61.6 cents, total acreage of tobacco in the Northern Piedmont would vary from about 29,000 to 93,000 acres. Total production of tobacco would vary from 54 to 172 million pounds. These figures compare with an allotted acreage of 108,000 acres and a production of 189 million pounds in the area in 1963, and an allotment of 93 thousand acres and a quota of 159 thousand pounds in 1967.

The acreage of corn would vary from 230,000 to 293,000 acres depending on the demand for grain for hog production. The acreage of wheat would range from 36,000 to 102,000 acres, and the acreage of barley from 211,000 to 286,000 acres.

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Hog production would tend to vary inversely with acreage and production of tobacco. Thus income from hogs would tend to offset the income effects of low tobacco prices and production. The number of finished hogs produced is estimated to range from 1.8 to 2.2 million head.

The man-year-equivalents of labor employed on farms in the area would range from 8,000 to 16,000, of which 400 to 8,500 would be hired seasonal labor. The quantity of labor used would vary directly with acreage and production of tobacco.

Total capital investment also would vary with the acreage of tobacco from about $566 to $589 million. Net farm income is heavily influenced by both price and production of tobacco, and would vary from about $22 million to more than twice that amount.

Table 8. Estimated aggregative effects of adopting optimal organizations, tobacco farms, Northern Piedmont Area, North Carolina, 1975 projected

Item (1)	Unit (2)	Tobacco allotment (percent of 1963 acreage)								
		55 (3)	70 (4)	85 (5)	(6)	100 (7)	(8)	115 (9)	(10)	100,115 (11)
Crops										
Tobacco	1,000 acres	44.3	56.2	44.5	68.7	51.5	80.5	58.6	92.6	29.3
	1,000,000 pounds	82.1	104.2	82.4	127.4	95.6	149.3	108.7	171.7	54.4
Corn	1,000 acres	280.4	271.9	272.6	242.5	272.6	238.2	272.6	229.5	293.2
	1,000,000 bushels	25.2	24.5	24.5	21.8	24.5	21.4	24.5	20.7	26.4
Wheat	1,000 acres	55.9	70.6	56.0	84.1	64.8	92.9	73.7	101.8	36.5
	1,000,000 bushels	2.0	2.5	2.0	2.9	2.3	3.3	4.1	3.6	1.3
Barley	1,000 acres	261.8	240.8	270.8	244.6	253.1	225.6	235.4	210.9	286.1
	1,000,000 bushels	15.7	14.4	16.2	14.7	15.2	13.5	14.1	12.7	17.2
Livestock										
Brood sows	1,000 head	140.8	136.4	136.9	121.7	136.9	119.6	136.9	115.2	147.2
Hogs finished	1,000,000 head	2.1	2.0	2.1	1.8	2.1	1.8	2.1	1.7	2.2
Labor used	1,000 m.e.[a]	9.6	11.2	9.5	12.9	10.4	14.5	11.6	16.3	7.5
Operator	1,000 m.e.[a]	6.6	7.1	7.3	7.5	7.3	7.6	7.6	7.8	7.1
Hired	1,000 m.e.[a]	3.0	4.1	2.2	5.4	3.1	6.9	4.0	8.5	.4
Capital investment	1,000,000 dollars	572.6	577.0	570.1	577.5	573.6	582.4	579.1	589.4	565.9
Land	1,000,000 dollars	406.3	406.3	406.3	406.3	406.3	406.3	406.3	406.3	406.3
Other	1,000,000 dollars	166.3	170.7	163.8	171.2	167.3	176.1	172.8	183.1	159.6
Gross farm income with tobacco price at:										
35.2¢	1,000,000 dollars	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	102.0
44.0¢	1,000,000 dollars	xxx	xxx	114.5	xxx	119.8	xxx	125.2	xxx	xxx
52.8¢	1,000,000 dollars	xxx	132.2	xxx	138.6	xxx	148.6	xxx	158.2	xxx
61.6¢	1,000,000 dollars	130.2	141.4	xxx	149.8	xxx	xxx	xxx	xxx	xxx

Gross farm expenses													
with tobacco prices at:													
35.2¢	1,000,000 dollars	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	79.7
44.0¢	1,000,000 dollars	xxx	xxx	86.7	xxx	91.1	xxx	95.0	xxx	xxx
52.8¢	1,000,000 dollars	xxx	95.1	xxx	98.8	xxx	105.9	xxx	112.3	xxx
61.6¢	1,000,000 dollars	89.7	95.3	xxx	99.2	xxx	xxx	xxx	xxx	xxx

Net farm income													
with tobacco price at:													
35.2¢	1,000,000 dollars	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	22.3
44.0¢	1,000,000 dollars	xxx	xxx	27.8	xxx	28.7	xxx	30.2	xxx	xxx
52.8¢	1,000,000 dollars	xxx	37.1	xxx	39.8	xxx	42.7	xxx	45.9	xxx
61.6¢	1,000,000 dollars	40.5	46.1	xxx	50.6	xxx	xxx	xxx	xxx	xxx

[a]Man-equivalents.

SUMMARY AND CONCLUSIONS

The purpose of this study is to determine the effects of a range
of flue-cured tobacco prices and allotments on resource use, farm
organizations, and farm incomes of operators of tobacco farms in the
Northern Piedmont Area of North Carolina. Linear programming procedures
were employed to this end. Tobacco prices used in the analysis were
35.2, 44.0, 52.8, and 61.6 cents per pound. Tobacco allotments were
varied from 55 to 115 percent of the 1963 acreage level.

Tobacco prices and allotments strongly influence the organizations
and incomes of all sizes of tobacco farms. Little tobacco would be
grown on any size of farm with a tobacco price of only 35.2 cents per
pound. At this price, none of the farms would find it profitable to
grow tobacco to the maximum of any of the specified allotment levels.
At a price of 44.0 cents and above, small and medium farms would grow
their entire allotments. Large farms, however, would grow very little
at this price, but would grow their entire allotments at a price of
52.8 cents and over.

The small and medium farms are relatively inefficient employers
of the farm operator's labor. Only about 40 percent of the operator's
labor can be productively employed on the small tobacco farm and only
about 60 percent on the medium farm. Net farm incomes are cor-
respondingly inadequate, reaching the $3,000 level on the medium farm
only at the highest tobacco price considered in the analysis, 61.6
cents per pound. Only on the large tobacco farms are net farm incomes
adequate for a reasonable level of living for the full-time operator
family. The inadequacy of incomes on the small and medium farms
explains to a considerable extent the current downward trend in the
number of both sizes of farms and the increasing number of larger farms
in the Northern Piedmont Area.

The 1964 U. S. Census of Agriculture provides data on the number
of farms by size groups, approximating those employed in this analysis,
which show that the number of small farms in the Northern Piedmont

declined at an annual rate of over 4 percent and medium farms at more
than 3 percent, and that the number of large farms increased at an
annual rate of about 3 percent during the 1959 to 1964 period. Assuming
that this decline in small and medium farm numbers continues, the number
of small farms will decrease about 50 percent, the number of medium
farms about 38 percent, and the number of large farms will increase
about 36 percent by 1975.

Assuming these changes in the numbers of small, medium, and large
farms, and the adoption of the optimal organizations presented in this
report, total production of tobacco in the Northern Piedmont Area would
vary from about 29,000 acres and 54 million pounds with a tobacco price
of 35.2 cents to about 93,000 acres and 172 million pounds with a
tobacco price of 52.8 cents and an allotment of 115 percent of the 1963
acreage level. Total net farm income on tobacco farms would vary with
the acreage and price of tobacco from about $22 to $51 million.

APPENDIX

Sampling Procedure

The farms in the Northern Piedmont Area were stratified into three size groups: small, 0-29 acres of cropland; medium, 30-79 acres; and large, 80 acres and over. Small and medium farms were selected by random numbers. Every large farm was taken into the sample. Total land and total cropland acreages were obtained for each sample farm. Data relating to acreage of allotted crops were recorded for every small and medium sample farm and for every fifth large farm. Total cropland for the Northern Piedmont, based on the sample data, was 1,054,016 acres, or 4 percent below the 1,100,151 acres of total cropland reported for the area by ASCS. Total acreage of tobacco allotment computed from the sample exceeded the acreage allotted to the area by less than one percent.

Appendix Table 1. Tobacco, flue-cured: Estimated variable expenses,
partially mechanized production, per acre, Northern
Piedmont, North Carolina[a]

Item	Description	Unit	Quantity	Price	Amount
Income	Flue-cured	lb.	1,854[b]	44.0¢[c]	$815.76
Variable expenses:[d]					
Plant bed					
Fumigant					$ 5.40
Fertilizer	4 – 9 – 3	cwt.	2	$ 2.15	4.30
Tobacco seed		oz.	1/4	10.00	2.50
Bluemold treatment					4.40
Insecticide					.30
Plant bed cloth		sq. yd.	100	.10	10.00
Gas-light cover		sq. yd.	34	.15	5.10
Field					
Cover crop seed		bu.	2	1.00	2.00
Soil fumigation					12.50
Insect control					10.00
Fertilizer	4 – 8 – 12	cwt.	11	2.82	31.02
Top dressing	8 – 0 – 24	cwt.	1.6	3.65	5.84
Sucker control	MH-30	pt.	5	2.00	10.00
Twine	Cotton	lb.	5	.70	3.50
Fuel oil	No. 2	gal.	300	.15	45.00
Insurance, tobacco	Hail, fire, ext. cov.	$100	5	6.13	30.65
Insurance, barn		$100	5	3.10	15.50
Marketing	Warehouse charges	$	816	.03	24.48
Tractor		hr.	35.5	.45	15.98
Truck		hr.	5.9	1.53	9.03
Interest	On operating capital				8.00
Total					$255.47
Net income over variable expenses					$560.29

[a]Mechanized except for hand harvest and conventional curing.
Adapted from budget prepared by J. G. Allgood, Extension Economist,
Farm Management, and R. R. Bennett and S. N. Hawks, Extension Agronomy
Specialists (tobacco).

[b]National average yield goal under acreage-poundage program.

[c]Base price.

[d]Exclusive of seasonal hired labor cost as it is determined by
the programming procedure.

Appendix Table 2. Investment required and annual cost of investment
for three acres of flue-cured tobacco

Item		Cost (dollars)
Investment:		
Tobacco curing barn	20-year life	750
Curer-oil type	20-year life	211
Fuel tank - 250 gal.	15-year life	38
Stringing shed	15-year life	175
Tobacco trucks	10-year life	90
Stringing horses	10-year life	4
Transplanter	20-year life	350
Fumigant applicator	12-year life	140
Tobacco sticks	10-year life	68
Total		1826
Annual cost		
Repairs		39
Depreciation		111
Interest		60
Taxes		33
Total		243

Appendix Table 3. Corn: Estimated variable expenses and net income
                   over variable expenses, per acre, mechanized
                   production, North Carolina[a]

Item	Description	Unit	Quantity	Price	Amount
Total income	Shelled corn	bu.	90	1.10	$99.00
Variable expenses:[b]					
Fertilizer	5 - 10 - 10	cwt.	6	2.28	$13.68
Side dressing	Pounds of N	lb.	120	.12	14.40
Seed	Hybrid	lb.	12.2	.22	2.68
Weed control	Atrazine (pre-emerg.)	lb.	2.5	2.85	7.12
	2, 4-D (acid equiv.)	lb.	.5	1.06	.53
Tractor	Operating	hr.	5.4	.45	2.43
Harvesting	Custom	acre	1.0	13.50	13.50
Truck	Operating	hr.	1.8	1.53	2.75
Total					$57.09
Net income over variable expenses					$41.91

[a]Adapted from budget prepared by William L. Holtiwanger, Extension
Agronomy Specialist (Crop Science), and Clyde R. Weathers, Extension
Economist, Farm Management.

[b]Exclusive of seasonal hired labor cost as it is determined by the
programming procedure.

Appendix Table 4. Wheat: Estimated variable expenses and net income over variable expenses, per acre, mechanized production, North Carolina[a]

Item	Description	Unit	Quantity	Price	Amount
Total income	Grain	bu.	35	1.29	$45.15
Variable expenses:[b]					
Seed	Adapted variety	bu.	1.25	3.00	$ 3.75
Fertilizer	5 - 10 - 10	cwt.	5	2.28	11.40
	Ammonium nitrate	cwt.	1.4	3.90	5.46
Weed control[c]	2, 4-D	lb.	1	1.06	1.06
Tractor	Operating	hr.	4.1	.45	1.84
Harvesting	Custom	acre	1	7.00	7.00
Truck	Operating	hr.	1.5	1.53	2.30
Interest	Operating capital				.50
Total					$33.31
Net income over variable expenses					$11.84

[a]Adapted from budget prepared by H. G. Small, Extension Agronomy Specialist, and D. G. Harwood, Jr., Extension Economist, Farm Management.

[b]Exclusive of seasonal hired labor cost as it is determined by the programming procedure.

[c]Use 1 to 2 pounds dinitro for henbit and chickweed. Use 2 to 4 ounces of dicamba ("Bauvel D") for German knotweed or knowel control.

Appendix Table 5. Barley: Estimated variable expenses and net income over variable expenses, per acre, mechanized production, North Carolina[a]

Item	Description	Unit	Quantity	Price	Amount
Total income	Grain	bu.	60	.81	$48.60
Variable expenses:[b]					
Seed	Adapted variety	bu.	2	2.25	$ 4.50
Fertilizer	5 – 10 – 10	cwt.	5	2.28	11.40
	Ammonium nitrate	cwt.	1.4	3.90	5.46
Weed control[c]	2, 4-D	lb.	1	1.06	1.06
Tractor	Operating	hr.	4.1	.45	1.84
Harvesting	Custom	acre	1	7.00	7.00
Truck	Operating	hr.	1.5	1.53	2.30
Interest	Operating capital				.51
Total					$34.07
Net income over variable expenses					$14.53

[a]Adapted from budget prepared by H. G. Small, Extension Agronomy Specialist, and D. G. Harwood, Jr., Extension Economist, Farm Management.

[b]Exclusive of seasonal hired labor cost as it is determined by the programming procedure.

[c]Use 1 to 2 pounds dinitro for henbit and chickweed. Use 2 to 4 ounces of dicamba ("Bauvel D") for German knotweed or knowel control.

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Appendix Table 6. Hogs: Estimated variable expenses and net income over variable expenses for finishing
hogs on concrete, 24 sows and 2 boars, 2 litters per year, 8 pigs per litter[a]

Item	Description	Unit	Quantity	Price	Amount
Total income					
Hogs	360@ 200 lbs.	cwt.	720	$14.50	$10,440.00
Sows	12 @ 425 lbs.	cwt.	51	10.50	535.50
Total					$10,975.50
Variable expenses:[b]					
Corn	46 bu./sow, 20 bu./boar 8.5 bu./hog	acre	47.8	57.09	$ 2,728.90
Protein supplement	425 lb./sow (40% protein)	cwt.	102	5.50	561.00
	365 lb./boar (40% protein)	cwt.	7.3	5.50	40.15
	78 lb./hog (40 % protein)	cwt.	290.2	5.30	1,538.06
Feed grinding	Electric grinder-blender[c]	kwh.	700	.03	21.00
Creep ration	50 lb./litter (18% protein)	cwt.	24	5.90	141.60
Pasture	Grass and clover	acre	3.5	31.00	108.50
Boar cost	Difference between sale and purchase price	each	2	30.00	60.00
Medical	Veterinary and drugs	each	372	1.00	372.00
Vaccination program for sows		each	12	1.00	12.00
Vaccination for gilts		each	12	1.00	12.00

Miscellaneous	Hauling and other	150.00
Marketing	If sold at auction add 3% of rev.	
Interest	Operating capital	81.86
Total		$ 5,827.07
Net income over variable expenses		$ 5,148.43

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[a]Adapted from budget prepared by David Spruill, Animal Husbandry Specialist, and Hugh L. Liner, Extension Economist, Production Economics.

[b]Exclusive of seasonal hired labor cost as it is determined by the programming procedure.

[c]Five kwh. per ton for grinding, mixing and distributing feed to feeders.

Appendix Table 7. Hogs: Initial investment and annual fixed cost for finishing hogs on concrete, 24 sows

Item	Life	Initial cost	Depreciation[a]	Taxes[b]	Insurance[c]	Interest[d]	Repairs[e]	Annual total fixed cost
	(years)				(dollars)			
Buildings:								
Farrowing house, concrete block	20	3,000[f]	150.00	4.88	5.70	90.00	60.00	310.58
Finishing house, poletype 50' x 45' – 12' per hog[g]	20	1,800[f]	90.00	2.93	3.42	54.00	36.00	186.35
Pasture sheds (3)	10	225	22.50	.37	–	6.75	4.50	34.12
Grain bin (4,800 bu.)	20	1,350	67.50	2.19	2.57	40.50	27.00	139.76
Supplement bin	20	400	20.00	.65	.76	12.00	8.00	41.41
Building for feed mill	15	400	26.67	.65	.76	12.00	8.00	48.08
Equipment:								
Feed mill and equipment	7	2,500	357.14	4.06	4.75	75.00	50.00	490.95
Water system-shallow well (pump, pipes, house, etc.)	20	400	20.00	.65	–	12.00	8.00	40.65
Pasture waterers (3)	5	24	4.80	–	–	.72	.48	6.00
Pasture fencing	10	275	27.50	.45	.52	8.25	5.50	42.22

Livestock:								
24 sows and 2 boars	–	1,300	–	–	–	78.00	–	78.00
Total	–	11,674	786.11	16.83	18.48	389.22	207.48	1,418.12

[a]Cost divided by length of life.

[b]Half of initial cost times .325 percent.

[c]Half of initial cost times .380 percent.

[d]Half of initial cost times 6 percent, except for livestock computed at 6 percent of total initial cost.

[e]Cost times 2 percent.

[f]Contract price with all materials purchased, including waterers and feeders.

[g]Allow for overlap of litters in finishing house.

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Appendix Table 8. Labor requirements for enterprises appearing in the optimal organizations

Months	Tobacco 1-acre[a]	Corn 1-acre	Wheat 1-acre	Barley 1-acre	Hogs 24-sows
January	4.0	-	-	-	46.5
February	4.0	-	.7	.3	59.9
March	8.1	-	.3	.7	52.5
April	20.8	3.2	-	-	198.0
May	19.3	.4	-	-	81.6
June	3.0	.9	3.0	3.0	98.2
July	119.0	-	-	-	46.5
August	118.0	-	-	-	66.5
September	116.7	-	.8	1.1	53.9
October	2.9	3.6	1.4	1.5	218.6
November	-	.7	.8	.4	93.0
December	-	-	-	-	54.0
Total	415.8	8.8	7.0	7.0	1,069.2

[a]Hand harvest and conventional curing.

Appendix Table 9. Equipment for the operation of the medium and large farms presented in this study

Item	Number Medium farm	Number Large farm	Size	Cost per item	Annual repairs per item	Annual depreciation per item
Tractor	1	2	31 DHP	$2,715	$217	$163
Plows, moldboard	1	2	2, 12"	295	14	18
Harrow, section	1	2	9'	102	2	7
Stalk cutter	1	1	2-row	173	5	14
Trailer	1	1	1-ton	223	8	15
Grain drill	1	1	7'	495	7	22
Disk, tandem	1	1	7'	340	8	23
Sprayer	1	1	6-row	195	6	20
Planters, w/fert. attach.	1	1	2-row	365	5	18
Cultivator	1	2	2-row	275	9	23
Trucks, used	1	1	1 1/2-ton	1,500	50	150
Small tools	xxx	xxx	xxx	200[a]	4	20

[a]Total cost for all small tools.

Appendix Table 10. Man-equivalent hours of operator labor available, by months, Eastern Piedmont and Upper Coastal Plain of North Carolina[a]

Month	Number of work days	Number of hours per day	Total hours per month
January	26	8	208
February	24	8	192
March	26	8	208
April	26	9	234
May	26	9	234
June	26	10	260
July	26	10	260
August	26	10	260
September	26	10	260
October	26	10	260
November	26	9	234
December	26	8	208
Year	310	xx	2,818

[a]The man-equivalent hours of labor available were estimated by the Piedmont and Coastal Plain Subcommittee of the Technical Committee for Regional Project S-42.

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