Making Changes Feasible on Small Farms

By D. B. Ibach

There is growing interest in the problem of low-income farmers on under-productive farms. This interest has been heightened by the need for full production in connection with the defense effort. This paper presents a research analysis of the problem that this poses as exemplified by the situation of small farmers in the Southern Piedmont of North Carolina. It describes a representative small farm in such terms as capital investment and organization; outlines what such a farm would require to make it as efficient as possible under the limits defined; and outlines a programmatic approach that would make it feasible to bring about the needed changes.

SMALL FARMS GENERALLY have not been reached adequately by soil conservation and other programs directed toward improvement in farming systems. Relatively few of their operators participate. Those who do can obtain some benefit in the form of increased yields of cash crops. But lack of necessary capital resources would prevent many of them from making desirable changes in farming even if they took advantage of assistance offered in the way of soil-improvement programs that result in increased production of forage crops and pasture.

Many operators of small farms also lack experience with livestock so that a balanced program involving planning and management counsel and credit for adequate livestock, buildings and fencing, is often needed if they are to make desired changes in farming systems based on soil improvements. Many of these operators do not have alternative opportunities for productive employment. If the other necessary resources can be developed through a well-adapted credit arrangement, a good case can be made for grants or other forms of aid to provide the necessary soil improvement, provided such assistance is not used for lands that are unsuited to farming. If the task is approached through development of a complete farm plan, this situation can be avoided.

An example of the problem and an illustration of how it may be met, may be developed through examination of a study of farming opportunities in the Southern Piedmont area of North Carolina.[1]

A sample of 217 farms in 11 intensive cotton-producing communities was studied in order to learn the characteristics of the farms, and to develop suggestions for improved farming systems. Cotton is the principal source of income, furnishing more than half of the total value of all products sold in 1944. In 1945, 36 percent of the total cotton acreage of the State was located within the 13 counties represented by the sample used in the study. Local conditions make the competitive position of cotton strong even at price relationships that are much less favorable to cotton than those of the present time.

The problem is not to replace cotton, but to obtain more profitable utilization of all farm resources. The combination of enterprises should provide a market for the feed and pasture that can be grown, and for farm labor throughout the year. Present farming systems promote a rapid rate of soil depletion and erosion. This, together with a high degree of dependence on one crop, is conducive to extreme risks.

Data showing the complete farm organization, production, yields, and important crop and livestock practices, were obtained from 22 farms in each of 11 communities. In that study 11 producing neighborhoods were selected within 6 soil associations in 13 counties. Complete neighborhoods were selected as sampling units, with the number of sampling units in each soil association in about the same proportion as the acreage in that association bears to the total acreage in all soil groups. Records from 217 farms (in 11 neighborhoods) were used to find out the more common systems of farming and modal levels of farm resources. These farms were classified by sizes and types within soil associations. Purposive sampling was again used

[1] OPPORTUNITIES FOR ADJUSTMENTS IN FARMING SYSTEMS, SOUTHERN PIEDMONT AREA OF NORTH CAROLINA, by W. W. MCPHERSON, W. H. PIERCE, and R. E. L. GREENE, published as Technical Bulletin, No. 87, of the North Carolina Agricultural Experiment Station, Raleigh, N. C.

TABLE 1.—*Capital investment of the representative small farm by classes and items, 1945*

Real estate		Machinery and equipment		Livestock	
Item	Value	Item	Value	Kind and number	Value
Land	$3,700	Wagon	$ 48	Milk cows (2)	$ 150
		Mowing machine	45	Heifer calf (1)	25
Barn	75	Rake	25	Hens (40)	34
Corn crib	30	Plow	8	Work stock (2)	330
Poultry house	16	Harrow	11		
Smoke house	15	Planter	12	Total	$ 539
Fencing	18	Cultivator	10		
		Fertilizer distributor	12		
Total service buildings	$ 154	Auto	200		
Dwelling	600				
		Total	$ 371		
All buildings	$ 754				

TABLE 2.—*Present and improved organization, income, and expenses—representative small farm*

Farm organization			Financial summary [1]				
Item	Present organization	Improved organization	Sales	Present organization		Improved organization	
	Acres	*Acres*		*Quantity*	*Dollars*	*Quantity*	*Dollars*
Land use			Cotton (cwt.)	42	521	45	558
Cotton	8.5	8.5	Cotton seed (ton)	3.35	129	3.5	134
Corn	7.9	5.0	Wheat (bu.)	40	46	72	82
Wheat	6.1	7.4	Lespedeza seed (cwt.)	---	---	60	402
Oats	4.1	2.8	Milk (cwt.)	20	58	56	162
Barley	---	2.0	Cow or heifer (no.)	---	---	1	80
1st yr. lespedeza	(10.2)	(12.2)	Veal (cwt.)	.75	9	1	12
2nd yr. lespedeza	3.5	7.0	Chickens (cwt.)	.55	13	3.34	80
Alfalfa	---	3.1	Cull hens (cwt.)	---	---	2	42
Garden	1.7	1.0	Eggs (doz.)	180	50	2,400	672
Idle	5.0	0.0	Total sales	XX	826	XX	2,224
Total crop land	36.8	36.8	Expenses				
Per open pasture	6.1	7.0	Ginning (bales)	8.5	42	8.9	44
Other	13.1	12.2	Combining (acres)	6.1	21	12.2	43
Total land	56.0	56.0	Comb. & Cl. lesp. seed	---	---	---	219
Livestock	Number	Number	Seeds and plants	---	51	---	80
Milk cows	2	2	Fertilizer 4-10-6 (ton)	5.6	157	---	---
Heifers, 2 yrs. old	0	1	6-8-6 (ton)	---	---	5.1	143
Heifers, 1 yr. old	0	1	16-0-0 (ton)	1.4	55	2.52	98
Heifers, calf	1	1	Lime and phosphate	---	---	---	50
Hens	40	200	Feed	---	74	---	204
Work stock	2	2	Livestock purchases	---	16	---	46
			Other livestock exp.	---	15	---	20
			Hired labor	---	22	---	---
			Machy. exp.	---	84	---	84
			Bldg. and fence repair	---	51	---	59
			Ins. and taxes	---	34	---	61
			Total expenses		622		1,151
			Net cash income		204		1,073

[1] The prices used in developing this analysis are not forecasts. They represent lower levels than would probably be estimated by many informed price specialists. But for purposes of farm budgets as a basis for credit, it seemed preferable to stay on the conservative side. The prices used recognize that the general agricultural and business economy could be moderately prosperous if balance were achieved with lower prices. No controls are assumed.

North Carolina State Report to Improve Farming Opportunities in the South, June 30, 1946, supplied the prices used which are: Cotton $0.124 per lb.; cottonseed $38.38 per ton; lespedeza seed $6.70 per cwt.; eggs $0.28 per doz.; and milk $2.90 per cwt. Unit costs used for principal items are combining $3.50 per acre; ginning $4.90 per bale; fertilizer $31 to $39 per ton depending on grade; dairy and poultry feeds $2.50 and $3.25 per cwt., respectively.

for the selection of one farm from each group for special study.

This paper deals with the small farms for which the problem is most difficult. These comprise 47 percent of the number included in the sample.

In terms of efficient farming, the first step should consist of farm enlargement. But the owners of many small farms would not find it possible, or feasible, to make this change even though general assistance were available. Some may not be located near other suitable crop land, or land that can be improved. Others may prefer their small farms. The typical small farm now carries 2 cows, whereas 10 cows are suggested for farms of medium size. Such a herd would demand a marked change in the work habits of the farm family. Many will want to continue part-time farming along with other employment; about two-fifths of the small farmers had off-farm work in 1945. If farm prices became less favorable, more would probably supplement their farm income through other work.

A Representative Small Farm

Table 1 shows details of the capital investment for a representative small farm. Both the present and the improved organization, and a summary of income and expenses for this representative small farm are given in table 2. The combination of enterprises may vary with differences in land resources, operator's preference, and the local market situation. For example, a few hogs or a larger dairy enterprise might be substituted for the poultry enterprise.

The principal changes suggested in land use are a reduction in intertilled crops and an increase in the acreage of legumes that occupy the land during the entire season. Acreages of cropland and cotton would remain unchanged. There would be a reduction in cropland used for intertilled crops, and an increase in acreage of legumes grown alone. The slight increase in permanent pasture would be drawn from land now in woods. These minor changes, accompanied by use of more fertilizer and lime, particularly for hay and pasture, would result in more feed grain, better quality of roughage and pasture, and more months of good pasture during the year. The quantity of grain in terms of corn equivalent would be increased from about 300 to a little less than 600 bushels. Animal-unit months of pasture would be increased from 14 to 37.

TABLE 3.—*Estimated cost and value of new investments needed on representative small farm*

Type of investment and item	Cost	
Soil improvement	*Dollars*	
Establish 3.1 acres of alfalfa		
Lime	25	
Fertilizer; 2-12-12	43	
Seed	30	
Establish 7.0 acres permanent pasture		
Lime	28	
Fertilizer; 0-14-7	41	
Seed	35	
Lime other cropland	54	
Terrace half of cropland	116	
		372
Buildings and fences		
Brooder house	50	
Laying house	224	
Granary	65	
Poultry fence	100	
		439
Livestock		
2 heifer calves	70	70
Total cash cost		881
Value of farm-produced materials and farm labor included in buildings		610
Estimated total value of new investments		1,491

New investments would include those for soil improvements, a poultry house for 200 hens, a brooder house, a granary, some additional fencing, and two dairy heifer calves of high-production ancestry (table 3). The soil improvements consist of liming all, and of terracing half, of the cropland; establishing a stand of alfalfa; and developing 7 acres of pasture through use of lime, fertilizer, and seeding. The initial investment for soil improvements is calculated to be $372.

Total cash outlay for new investments is estimated at $372 for the soil improvements, $70 for livestock, and $439 for buildings and fences. The value of the buildings when completed would be $1,049, the difference being accounted for by the contribution of farm-produced lumber and unpaid labor. The two cows now on the farm would be replaced by the two heifer calves when they come into production.

Problems in Making the Change

Even the conservatively estimated cash outlay of $881 for new investments presents a difficult problem. The net cash income of $204 (table 2) estimated under the present organization will not permit this undertaking, even assuming there is no present indebtedness. Furthermore, this $204

TABLE 4.—*Calculated repayments on principal of new investment loans, other than for soil improvement, small farms*

Item	Cash farm income, expenses and calculated repayment schedule by years					
	0	1	2	3	4	5
Cash receipts:	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Crops	696	1,078	1,122	1,112	1,171	1,176
Livestock and produce	130	299	526	787	935	1,048
Total sales	826	1,377	1,648	1,899	2,106	2,224
Cash farm expenses	622	969	1,089	1,119	1,135	1,151
Net cash farm income	204	408	559	780	971	1,073
Available for repayment[1]	0	0	0	180	371	473
Increase over base year	0	0	0	180	371	473
Cumulative increase	0	0	0	180	551	1,024
Percent (5th year = 100)[2]	0	0	0	18	54	100
Cumulative repayments[3]	0	0	0	134	401	[4]742
Annual repayments	0	0	0	134	267	341
Available for other purposes[5]	0	0	0	46	104	132

[1] After deducting $600 for family living expenses from net cash farm income. This would be —$192 and —$41 for the first and second years respectively, but for purposes of this table these deficits are not recorded as they are covered in the original loan of $742.

[2] Percent cumulative increase each year is of cumulative increase the fifth year.

[3] Percentage on preceding line multiplied by the total loan advance.

[4] Total loan advance if all of soil-improvement investment were handled as a grant.

[5] Amounts available for repayment, minus annual repayments.

must be applied on family living expenses. With only this net cash farm income, it must be assumed that there are off-farm wages to make up at least a reasonable minimum for family living. This minimum is, of course, a variable sum. Within the framework of prices used in this analysis, and for purposes of illustration here, it is assumed to be $600. Thus the net cash farm income of $204 falls $396 short of reaching this minimum.

If the investment of $372 for soil-improvement and conservation practices were handled as a grant, contingent upon carrying out a sound farm plan, this would leave a balance of $509 for the other investments for which a loan would be needed. But if there were no off-farm work, or income from other sources, and if $600 were a necessary minimum for family living, there would be operating deficits of $192 and $41 for the first and second years, respectively (table 4). Therefore the total loan advance is assumed to be $742. It is commonly recognized that some minimum requirement for family living has the first claim on net farm income. A prudent lender will want to be assured that at least this reasonable minimum is taken into account. In this illustration it is assumed that the loan fund is the only source.

Table 4 shows how the principal sum may be retired during the last 3 years of a 5-year period. The repayments are based on the cumulative increases in available net income, after allowing for $600 estimated family living expenses. As the net cash income is below this minimum for the first 2 years, no cash is available for interest payments during that time. The last line of table shows the amounts available for interest on unpaid balances, and for other purposes during the 5-year period.

Table 5 shows the farmer's estimated final cash position after paying his interest. Because no interest could be paid the first 2 years, a small unpaid balance is left to be met in the sixth year. In actual practice, this may be met earlier, as table 4 indicates small balances after the principal payments are made during each of the 3 years in which payments are made. But these balances, in reality, are too small to allow an adequate cushion for contingencies. This illustrates the severity of the problem on many small farms.

A Desirable Approach

In this kind of situation there is opportunity for joint efforts on the part of public agencies that offer programs to assist farmers in making needed changes. On many small farms other desirable changes cannot be made except as they are based on soil improvements. At the same time, soil im-

TABLE 5.—*Loan advances, other than for soil improvement, repayments of principal, and interest payments as related to net cash available, small farms*

Year	Loans for new investments[1] (1)	Net cash income available[2] (2)	Total loan advances (3)	Principal payments (4)	Unpaid balance [3] (5)	Interest paid at 5 Percent (6)	Total principal & interest payments (7)	Available for other purposes (8)
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1	509	−192	701	0	701	0	0	0
2	0	− 41	41	0	[4]777	0	0	0
3	0	180	0	134	[4]816	41	175	5
4	0	371	0	267	682	34	301	70
5	0	473	0	341	415	21	362	111
6	0	473	0	74	74	4	78	395
7	0	473	0	0	0	0	0	473

[1] $439 for poultry house, brooder house, granary and fencing, and $70 for two heifer calves.
[2] After deducting $600 for family living. Minus signs the first 2 years indicate loans for this purpose.
[3] Beginning of year.
[4] Includes $35 and $39 unpaid interest from first and second years, respectively.

provements are likely to be wasted if they are not accompanied by the other investments. A combined program, in which careful planning and management counsel are provided, and conservation and soil-improvement measures are supported by credit for other needed capital investments, offers a desirable approach.

Many Farms Involved

Table 6 provides some indication of the number of farms in the southern Piedmont area of North Carolina which have adjustment problems similar to those presented here. The small farms in the sample had from 10 to 44 acres of cropland so the first two groups in table 6 consist of farms that were not represented. Group 1 represents rural residences of occupants who have full-time nonfarm employment, or are retired or otherwise unemployed. A large proportion of the occupants of units in group 2 probably have similar tenure status. But all of the farms in groups 3 and 4, and possibly three-fourths of those in group 5, would be classed as "small," as defined in the study. This would make approximately 18,000 small farms, out of the 33,401 farms in the area. On many of these, the problem would be more difficult than on the representative small farm here used as an illustration.

The Southern Piedmont area of North Carolina appears to offer good possibilities for demonstrating what can be done under difficulties through a joint approach involving the ACP and FHA programs, backed up by closely coordinated educational and technical assistance from other sources such as the Agricultural Extension and the Soil Conservation Services.

TABLE 6.—*Number of farms by size groups, Southern Piedmont area, North Carolina, 1945*[1]

Group	Acres harvested	Number of farms
1	none	1,078
2	1 to 9	6,206
3	10 to 19	6,582
4	20 to 29	6,207
5	30 to 49	7,485
6	50 to 99	4,308
7	100 to 199	1,255
8	200 and over	280
	Total	33,401

[1] U. S. CENSUS OF AGRICULTURE, 1945, SPECIAL REPORT OF MULTIPLE-UNIT OPERATIONS IN SELECTED AREAS OF SOUTHERN STATES.