Cotton-Potato Farms

costs, returns, and relationships to scale of operation in Kern County

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The following article is a condensation of the Giannini Foundation of Agricultural Economics Mimeographed Report No. 143 on a study conducted co-operatively by the University of California, and the Bureau of Agricultural Economics, which is available without charge from the Giannini Foundation, University of California, Berkeley 4.

The scale of operations on cotton-potato farms in northern Kern County directly affects the use of resources, production costs and returns to the operator.

Changes in enterprise organization also result in shifts in utilization, costs, and returns. The small operator's need for sufficient income for himself and family usually necessitates a strict adherence to the two primary cash crops—cotton and potatoes. But, greater flexibility in organization appears to accompany increasing scale of operation.

A study of farm organization and administrative aspects of cotton-potato farming in northern Kern County was based on data taken from Production and Marketing Administration farm worksheets for 405 farms in the area and on a field survey of 40 cotton-potato farms in the county. Nine farm organizations were synthesized from the collected data to represent three farm sizes in each of three kinds of organization typical of those found in the area during the 1949–50 period covered by the study.

In Type I the acreage of the three farms—75, 150, and 300 crop acres—was divided equally among cotton, potatoes and alfalfa. The acreage of the three farms in Type II was planted two-thirds to cotton, and one-sixth each to potatoes and alfalfa. Only cotton and potatoes are included in Type III, the crop acreage in all three sizes being devoted two-thirds to cotton and one-third to potatoes.

During the 1949–50 crop year the two enterprises, cotton and potatoes, occupied over 75% of the cropland on farms of all sizes in the area. On farms of less than 80 acres of cropland, these two crops utilized over 90% of the land.

Minor differences in production practices and available resources were found on farms of different sizes in 1949. In terms of total investment per crop acre—in land, improvements, and equipment—the 80-acre farm with cotton, potatoes, and alfalfa represented an investment of $553, the 160-acre farm $511, and the 320-acre farm $484.

These observed reductions in per crop acre investment with increasing farm size reflect the fact that some required, yet expensive, resources such as farm equipment can service a range of farm sizes.

Utilization of resources can thus be viewed as a function of size, though the influence of organization must also be recognized. To illustrate, the cost per hour of operation for a 20 to 27 horsepower wheeled tractor on a 50-acre farm with equal acreages of cotton, potatoes, and alfalfa in the organization is $2.03 using 1949 data. On a 120-acre farm with identical organization, the cost is $1.17 per hour. Annual use varies from 294 hours on the 50-acre farm to 706 hours on the 120-acre farm. With two organizations in an 80-acre farm the tractor costs $1.54 per hour to operate where it is used 441 hours and only $1.38 per hour with 525 hours of annual use.

Equipment costs and costs for pumping water exhibit the same relationships. For example, an increase in farm size from 80 to 320 acres with an organization of one-third each of cotton, potatoes, and alfalfa decreases water cost per acre foot from $7.41 to $6.35.

Production costs of specific crops on a per unit of output basis vary with both size and organization. Depending on which of three organizations is selected for analysis, the cost per bale for producing cotton varies between $112.32 and $110.47 on the 80-acre farm. For comparable organizations on 160-acre farms the cost varies between $106.51 and $105.76, and on the 320-acre farm the limits are $104.78 and $104.32. These are based on a yield of 2.1 bales per acre, 1949 costs and production practices. Both potato and alfalfa production costs decline with increasing size of farm. The influence of organization on costs is less pronounced within the range of alternative enterprise organizations.

Changes in scale and organization provide means of reducing costs on individual farms but the impact of these changes on the net farm income must be evaluated before any alteration is undertaken. The analysis of the earnings of the nine synthetic farms of three sizes reveals that total farm earnings are significantly greater on larger farms. Organization also exerts strong influence on the net farm income because of its impact on gross receipts.

An individual farm operator can vary his net income over a significant range with no change in size of farm. It was found that if a farm organization with equal acreages of cotton, potatoes, and alfalfa is of 80 acres in size, a management income of $63 per acre could be expected at 1949 cost and price levels. The same organization on 320 acres would yield a management income of $92.50 per acre. But, by transferring the alfalfa acreage to cotton on the 80-acre farm, the same increase in per acre management income can be obtained with no increase in size of farm.

An organizational change on the 320-acre farm to cotton and potatoes only would increase management income to a new level on that size also, which precludes the chance for the small farm operator to equate his net returns to those of the large operator if organizations are comparable.

The findings of this study are particularly relevant to the operators of small farms—those of 160 acres and less. Those operators with limited capital resources who desire to expand their incomes may also benefit from the data presented in this report. Additional study of employment of small farm operators at other than field tasks must be made before the costs accruing to small farms—because of underemployed resources—can be quantified, though the upper and lower limits of these costs are established.

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