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Income Variations Due to Yields on *Dryland Cotton Farms* on the *High Plains of Texas*

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SUMMARY AND CONCLUSIONS

Much variation in cotton yields exists on typical dryland farms on fine sandy loam on the High Plains of Texas. These yield variations lead to variations in reinvestment income — income left after cash farm costs and family living expenses are taken from gross income. This reinvestment income is what the farmer must use for replacement of farm equipment, reduction of debt or increases in his living level. Reinvestment income for typical small, medium and large dryland farms on fine sandy loam were computed over a 41-year period using the actual yields obtained at the Big Spring Field Station at Big Spring.

Land use practices, farm equipment, major improvements and production requirements for dryland cotton and grain sorghum were based on data collected in Dawson, Martin, Lynn, Lamb and Bailey counties. This information shows the typical organization and practices for cotton and grain sorghum on dryland farms in the area.

Farm size has a definite effect on the average reinvestment income. The average reinvestment income increased as the farm size increased from small to large for both the tenant-operated and owner-operated farms. For all farm sizes, average reinvestment income was higher for the owner-operator than for the tenant-operator.

The absolute variability — the range between the highest and lowest years and the range containing approximately two-thirds of the years — was the greatest for the larger farms. However, the larger units did not have the greater variability relative to the size of the average reinvestment income. Relative to its extremely low average, -$47, the 240-acre tenant-operator had the greatest relative variability, 4711 percent. The 240-acre owner-operator had the next highest variability, 183 percent. There was not a great deal of difference in relative variability on the 480-acre owner-operated farm, 108 percent, and the 640-acre owner-operated farm, 105 percent. There also was a slight difference between the 480-acre tenant-operated farm, 157 percent, and the 640-acre tenant-operated farm, 161 percent.

Considering the historical variations in yields and the present age of equipment, chances of equipment replacement were computed. Most major equipment items on dryland farms on the High Plains will have to be replaced by 1962. Results of the study indicate that the chances for equipment replacement is better on the 480 and 640-acre farms than on the 240-acre farms. The 480-acre owner-operator has about the same chance of equipment replacement as the 640-acre owner-operator. Chances that the 480-acre tenant-operator will replace his equipment are greater than the chances of equipment replacement for the 640-acre tenant-operator.

The low probability that the 240-acre tenant-operator will be able to replace his equipment, along with the negative average income, gives very definite indication that the 240-acre tenant-operator is farming an uneconomical (too small) unit. While the 240-acre owner-operator has a fair chance of being able to replace his equipment, the low average income and the relatively high variability also tend to indicate this may be an uneconomical unit. It is doubtful that the 240-acre owner-operator would be able to do much more than replace his equipment. He would not have much funds available for expansion or land payment. By using his capital to rent a larger farm he could enjoy a higher income, have a higher probability of equipment replacement and lower his variation of reinvestment income.

This study has implication for the present small irrigated farm where the water supply is variable. If the farmer is forced to abandon his irrigated farm and go to dryland, he will be in serious trouble unless he can increase his dryland acreage over the irrigated acres. With declining water for irrigation in this portion of the High Plains, a real adjustment problem may exist for these farmers.

CONTENTS

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THE HIGH PLAINS OF TEXAS at present are devoted primarily to crop production. The soil types and topography of the area are ideally suited to multirow, labor-saving equipment. Cotton and grain sorghum can be produced on dryland farms at a minimum cost for the control of weeds, insects and plant diseases. The extreme fluctuations in yields on dryland farms on the High Plains is a familiar phenomenon. This variation is due largely to variations in moisture conditions. On the High Plains the average precipitation is close to the critical limits for crop requirements, thus variations from this average take on unusual significance. Over a 39-year period, the average annual rainfall at Big Spring was 18.3 inches; however, half of the years were above 16.2 inches and half below. Precipitation conditions such as these approach the lower limit for successful dryland farming. A high percentage of the rainfall comes in the form of local showers. These showers frequently are of the torrential type.

The climatic conditions of the area are responsible largely for the high risks faced by the dryland farmers. These risks may be reduced somewhat through the development of drouth-resistant crop variety which may be able to sustain a profitable yield even when moisture conditions are extremely low. However, the farmer also must make better plans to cope with the risks he faces. If the farmer knows what yield and income variability to expect, he can organize his farm to withstand a series of years with low yields.

It has been stated frequently that a crop failure can be made cheaper on the Plains than anywhere else. There is a great deal of truth in this statement if operation costs only are considered and not overhead cost. However, sometime during the life of his equipment, the farmer must not only cover operating costs and provide for the family living expense, but he also must obtain enough additional income for equipment replacement. With the reduced cotton acreage facing the farmer of this area, coupled with the prolonged drouth, there is some doubt as to whether the profits from many of the High Plains dryland cotton farms on fine sandy loam will be sufficient for equipment replacement within the remaining life expectancy of the present equipment.

PURPOSE OF THE STUDY

The purpose of this study is (1) to describe the reinvestment income variability due to variation in yields on the typical small (240 acres), medium (480 acres) and large (640 acres) High Plains dryland farms on fine sandy loam as operated by owner-operators and tenants; and (2) to determine the probability that the reinvestment income from the typical small, medium and large dryland cotton farm will be sufficient for equipment replacement within the remaining estimated life expectancy of the present equipment.

The term, reinvestment income, refers to the profits derived from the sale of farm products (cotton and grain sorghum in this case) after all firm-household expenses have been deducted. The reinvestment income, if any, then could be used for equipment replacement, farm expansion, debt repayment, savings or enabling the family to enjoy a higher level of living.

PROCEDURE

Reinvestment income was computed annually over a 41-year period using historical yields of cotton and grain sorghum and 1955 prices, costs and land use. The yields used in the budgeting procedure are actual yields of cotton and grain sorghum experienced on the Big Spring Field Station at Big Spring. This procedure was followed to determine the variability in reinvestment income due to the varation in yields alone. The procedure for each year is described in the following outline form:

1. Computation of gross income on the basis of 1955 land use and prices and historical yields of cotton and grain sorghum.
2. Cash or "out-of-pocket" crop production expenses and income and self-employment taxes were deducted from gross income to determine net farm income.
3. Family living expenses were deducted from net farm income, the residual being the reinvestment income for the farm firm-household unit for a given year.

Data indicating land use, equipment items, major improvements and production requirements for dryland cotton and grain sorghum for 1955 were obtained during the summer of 1956 from approximately 60 dryland farmers in Dawson, Martin, Lynn, Lamb and Bailey counties. This information was used to determine the typical organization and practices of the area for the 1955 crop year.

The typical dryland cotton farms in the area had 41 percent of the farm devoted to cotton production and 53 percent designated to the production of grain sorghum. The tenure status of the farm operator did not appear to be related to crop organization; therefore, owner-operated and tenant-operated farm units are assumed to have the same crop organization.

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Yield data (Table 1) for cotton and grain sorghum over a 41-year period from the Big Spring Field Station were used to represent typical yield fluctuations of cotton and grain sorghum on dryland farms on fine sandy loam of the High Plains. The Big Spring yield data are more desirable to estimate fluctuations than are county average yields. County data, being an average of many farm units, smooth out extreme variations and do not represent the variation experienced on an individual farm unit. These extreme variations in yields are important when describing income variability. The average yields on any dryland farm means little or nothing to the farm operators, for the average is seldom, if ever, experienced.

The 1955 average price received for cotton and grain sorghum was used to compute income from cotton and grain sorghum. These prices were 28 cents per pound for cotton lint and 2 cents per pound for grain sorghum. The joint production of cottonseed with lint cotton means the amount and value of the cottonseed must be considered when computing the income from cotton. On the average, approximately 1.6 pounds of cottonseed are produced with 1 pound of cotton lint. The average 1955 price received for cottonseed was approximately $50 per ton, or 2.5 cents per pound. Therefore, 1.6 pounds of cottonseed valued at 2.5 cents per pound were added to the value of 1 pound of cotton lint to compute the income from cotton.

TABLE 1. COTTON AND GRAIN SORGHUM YIELDS USED TO REPRESENT TYPICAL YIELDS ON DRYLAND COTTON FARMS ON FINE SANDY LOAM ON THE HIGH PLAINS[1]

Year	Cotton yield, pounds lint per acre	Grain sorghum yield, bushels per acre
1916	103	16.4
1917	8	0.3
1918	53	0
1919	365	35.0
1920	578	38.3
1921	110	15.5
1922	243	33.4
1923	300	29.7
1924	133	1.6
1925	224	9.1
1926	175	5.7
1927	95	10.2
1928	251	4.3
1929	110	2.2
1930	163	1.6
1931	194	17.2
1932	290	20.2
1933	300	21.2
1934	188	7.9
1935	337	10.3
1936	92	0.9
1937	280	10.9
1938	213	24.8
1939	212	6.9
1940	174	3.6
1941	430	43.6
1942	180	20.3
1943	144	10.9
1944	154	3.4
1945	240	24.1
1946	110	12.8
1947	180	6.9
1948	181	1.0
1949	204	7.6
1950	210	11.7
1951	57	0.5
1952	0	0
1953	20	1.9
1954	113	3.3
1955	110	15.2

[1]Source: Moldenhauer, W. C. and Keating, F. E., A Study of Relationships Between Climatic Factors and Yields of Cotton, Milo and Kafir at Big Spring Texas, SWCRD, ARS, Research Report 295, 1956.

Seventy-five percent of the cotton yield and 66.7 percent of the grain sorghum yield were used as the tenant's share of production. On tenant-operated farms, one-fourth of the cotton lint and seed and one-third of the grain sorghum yield usually are paid as rent, with the cotton ginning and grain sorghum harvesting expense shared in the same ratio.

The total farm firm-household costs, other than cotton harvesting and ginning and grain sorghum hauling, which are incurred in the production of cotton and grain sorghum are presented in Table 2. Detailed information as to the data used in determining these costs is available on request to the Agricultural Information Office, College Station, Texas. These annual farm firm-household costs are assumed to be constant over the 41 years for which reinvestment income was computed. Thus, the variations in reinvestment income are due to fluctuations in yields alone. The one exception to constant cost occurs when the yield of grain sorghum is zero or so small that its value would not pay the harvesting expense. This was the case in 10 of the 41 years. No adjustment was necessary for low cotton yields since the cotton harvesting, ginning, and associated costs were deducted from the price of cotton when computing gross profits.

LIMITATIONS OF STUDY

Certain assumptions made in this study should be considered when applying the findings to any particular farm or the farms in general, or both, throughout the High Plains. Perhaps the most important assumption is the continuance of past yield variation, present land use (acreage controls), prices received and production costs. Therefore, the results presented in this study are valid only to the extent that yields at Big Spring for the past 41 years will be experienced in the future on dryland farms on fine sandy loam on the High Plains and that 1955 land use, prices received and costs prevail. It may be assumed that land use and prices received will prevail for some time near their present situation because of government participation in the form of acreage controls and support prices for cotton. Innovations could appear in the form of cotton and grain sorghum varieties that are better yielding and more drouth resistant that would tend to change present yield expectations.

It is assumed that the managerial ability, age and health of farm operators is such that yields used can be obtained with each tenure situation and farm size considered.

The farm firm-household unit goes through phases of a life cycle. During the first stage, that of establishing the farm firm-household unit, there is a shortage of capital, and it is difficult to combine capital and labor in the proper proportion. The farm begins slowly to reach its peak in the subsequent stages as the children furnish some resources in the form of labor to the firm. The firm is probably at its highest stage, in terms of available capital and owner equity, as the children leave the household unit, and the cash outlays needed for family living decrease. In the latter stages of the cycle, development declines as the farm operator ages and labor becomes less productive. The life cycle of the firm-household unit has two important effects on the organization or resource efficiency of a farm. First, is the way in which the farm and household compete for the use of capital. In the early stages of the life cycle, capital must be taken away from the farm unit and used in the household unit for the rearing of children. The second effect lies in the fact that the household unit may offer resources in the form of labor to the farm unit during certain stages of the life cycle. The assumption is made that the operators are somewhere in the middle stages where capital and labor are combined in a fairly favorable manner.

REINVESTMENT INCOME VARIATIONS

Variations in reinvestment income experienced by dryland farm owners and tenants on the High Plains are shown in this section. The reinvestment income for a 41-year period, 1916 - 56, for each size of farm and tenure status considered is presented in Figure 1.

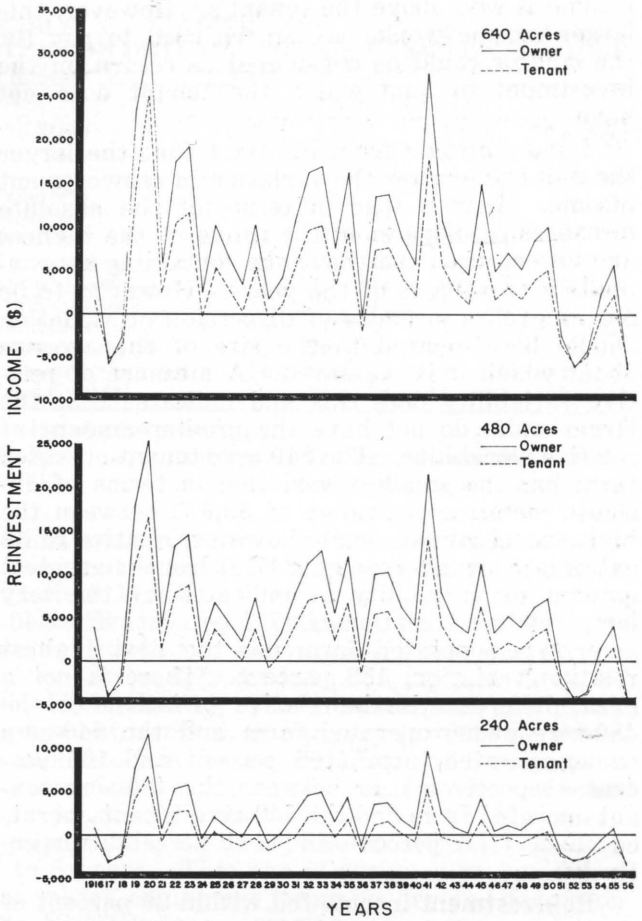

Figure 1. Reinvestment income on dryland cotton farms on the High Plains of Texas, 1916-56.

A summary of the distributions of reinvestment income for the various farm sizes is presented in Table 3. The first item in description of the distributions is the average. The variablity of the distributions is brought out by three measures: the range in terms of the highest and lowest years; the upper and lower limits which contain approximately ⅔ of the years; and a measure of relative variability. The relative variability shows the standard deviation as a percentage of the average. This measure can be compared between situations since the influence of the average enters into its determination.

The extreme variations in reinvestment income that a dryland farmer of the High Plains faces is indicated in Figure 1. Farm size has a definite effect on the average reinvestment income over the 41-year period. The average increases with an increase in farm size. For each size of farm considered, the owner's reinvestment

TABLE 2. FARM FIRM-HOUSEHOLD COSTS, OTHER THAN COTTON HARVESTING AND GINNING AND GRAIN SORGHUM HAULING, REQUIRED TO PRODUCE COTTON AND GRAIN SORGHUM, HIGH PLAINS, 1955[1]

Item	240-acre farm		480-acre farm		640-acre farm	
	Owner	Tenant	Owner	Tenant	Owner	Tenant
	Dollars					
Cotton						
Preharvest	539.98	539.98	1085.47	1085.47	1443.62	1443.62
Grain sorghum						
Preharvest	123.19	123.19	246.38	246.38	329.00	329.00
Harvest[2]	317.50	211.67	635.00	423.54	71.00	47.33
Hired labor					600.00	600.00
Annual repairs						
Improvements	289.00	289.00	289.00	289.00	289.00	289.00
Equipment	671.00	671.00	913.00	913.00	1642.00	1642.00
Property taxes						
Real estate	94.97		104.10		272.06	
Personal	10.78	10.78	21.50	21.50	28.47	28.47
Total	2046.42	1845.62	3394.45	2978.68	4675.42	4379.69
Family living expense	1678.00	1678.00	1678.00	1678.00	1678.00	1678.00

[1]Cotton and grain sorghum costs are based on per-acre cost information which is available in mimeograph form.
[2]If the grain sorghum yield is not enough to pay for harvesting, this cost is deducted from the total.

income is well above the tenant's. However, this larger income would have to be used to pay for the land or could be considered as return on the investment in land which the tenant does not have.

It may appear from Figure 1 that the larger the unit the greater the variation in reinvestment income. This is true in terms of the absolute measures of dispersion, the range of the highest and lowest year, and the range containing approximately two-thirds of the years. However, to be meaningful, a measure of dispersion or variation should be compared to the size of the average about which it is measured. A measure of relative variability does this and indicates that the larger units do not have the greater amount of relative variability. The 240-acre tenant-operated farm has the smallest variation in terms of absolute measures (a range of $9,975 between the highest and lowest year); however, relative to its extremely low average of -$47, it has the greatest amount of variability as indicated by the very large relative variation of 4711 percent. The 240-acre owner-operated farm has the next highest relative variation, 183 percent. There is not a great difference in the relative variations on the 480-acre owner-operated farm and the 640-acre owner-operated farm (108 percent and 105 percent, respectively), or between the 480-acre tenant-operated farm and the 640-acre tenant-operated farm (155 percent and 161 percent, respectively).

Reinvestment income fell within 25 percent of the average, between $1,261 and $2,102, only 3 out of the 41 years on the 240-acre owner-operated farm. Only in 9 out of the 41 years did reinvestment income fall within 50 percent of the average, between $841 and $2,522, and only twice were these years consecutive on the 240-acre owner-operated farm. This shows that a dryland farmer on the High Plains cannot base his reinvestment income expectations on a long-time average reinvestment income and obtain any degree of accuracy. Reinvestment income fell within 25 percent of the average only two times, and these years were not consecutive, on the 240-acre tenant-operated farm. The reinvestment income fell within 50 percent of the average only four times, and no cases were consecutive. On the 480 and 640-acre owner-operated farms, the reinvestment income fell within 25 percent of the average eight times and in two cases the years were consecutive. On the same farms, the reinvestment income fell within 50 percent of the average 19 out of the 41 years, and only in nine cases were the years consecutive. On the 480 and 640-acre tenant-operated farms, the reinvestment income fell within 25 percent of the average only four times and none of the years were consecutive. On the 480-acre tenant-operated farm, the reinvestment income fell within 50 percent of the average 16 times and in six cases the years were consecutive. On the 640-acre tenant-operated farm, the reinvestment income fell within 50 percent of the average 15 times and in only four cases were the years consecutive.

EQUIPMENT REPLACEMENT

The full effect of the extreme variations in reinvestment income is not shown by coefficients of variations or other measures of dispersions. The variations in reinvestment income, while important, do not in themselves present a complete picture of the risks incurred on dryland farms on the High Plains. The present prolonged drouth is evidence that extremely low reinvestment incomes can occur in periods of several consecutive years. The pertinent question is what are the chances of the owners and tenants of the various sizes of dryland farms remaining solvent in the face of the extreme variations in reinvestment income. A great deal of information would be needed to answer this question specifically. The chances of success undoubtedly depend on such factors as a farmer's equity or net worth, his capital accumulation and his access to credit. The farmer who has several small children and expensive medical bills is certainly more vulnerable than one whose children are grown and healthy. The chances of success also would depend to a great extent on the time when a farming enterprise is started. If extreme economic reversals attack a farmer immediately after he has started his business enterprise, the chances of success are small; for he has had no time for capital accumulation. All these factors are beyond the scope of this study.

The chances of success can be estimated, however, if the assumption is made that the variations in reinvestment income over the past 41

TABLE 3. AVERAGE AND VARIABILITY OF REINVESTMENT INCOME FOR 240, 480 AND 640-ACRE FARMS, OWNER AND TENANT OPERATED

Type farm	Average	Range		Range containing approximately ⅔ of years		Relative variability (standard deviation as a percent of average)
		Highest year	Lowest year	Upper limit	Lower limit	
	Dollars					Percent
240 acres						
Owner	1,681	11,671	−3,407	4,752	−1,390	183
Tenant	−47	6,663	−3,312	2,167	−2,261	4711
480 acres						
Owner	6,081	25,381	−4,437	12,630	−468	108
Tenant	2,898	16,561	−4,233	7,436	−1,640	157
640 acres						
Owner	8,168	32,154	−6,282	16,752	−416	105
Tenant	3,939	24,968	−6,010	10,272	−2,394	161

years will be experienced in the future. The chances of equipment replacement are estimated in light of the recent prolonged drouth in this area. It is assumed that the drouth has drained the dryland farmer in this area of any capital accumulation which they might have had for equipment replacement, but that he has no debt obligation. The present equipment situation for the dryland farms of the High Plains is established in terms of the typical equipment inventory necessary for successful crop production on the various sizes of farms, the typical equipment age and its estimated life expectancy. The remaining period of time for which the present equipment may be used for the necessary crop production requirements is estimated. It is assumed that the farm operator must acquire at 1955 prices the same type and amount of equipment at the end of this period in order to remain solvent. The chances of equipment replacement can be estimated by relating these data to the reinvestment income for the owners and tenants of the various sizes of farms.

Equipment Inventory

The typical equipment inventory necessary for successful crop production on the various sizes of dryland farms on the High Plains and the 1955 price for these equipment items are presented in Table 4. Typical equipment inventories were derived for the three sizes of farms considered from the schedules taken in the area; however, after studying the inventories with agricultural workers familiar with the High Plains, it was felt that on the 480 and 640-acre farms the typical equipment inventory was too large in terms of equipment necessary for the typical crop production requirements in the area. It is assumed that the operators of the various sizes of farms would, if financial conditions necessitated, acquire only the minimum amount of equipment necessary to continue farming and remain solvent. Considering this, the equipment inventory for each size of farm was set up on the basis of the minimum amount of equipment necessary to conduct typical dryland crop production requirements for that particular size of farm. The 1955 new prices for the equipment items were obtained from a reputable, well-established farm machinery dealer on the High Plains.

TABLE 4. NECESSARY EQUIPMENT ITEMS AND THEIR COST NEW FOR DRYLAND COTTON FARMS ON THE HIGH PLAINS, 1956

Equipment item	Number of items			Cost per item when new, dollars
	240-acre farm	480-acre farm	640-acre farm	
Tractors[1]	1	1	2	4500.00
Pickups	—	1	1	1800.00
Trailers	3	3	4	200.00
Knifing sleds				
4 row	1	1	1	150.00
3 row	—	1	2	100.00
Rotary hoes	1	1	2	50.00
Stalk cutters	1	1	2	200.00
Combines	—	—	1	1700.00
Cotton strippers	—	1	1	975.00
Sprayers	1	1	1	250.00
Sand fighters	—	1	1	125.00

[1]Four row tractor which includes lister, cultivator, and tractor mounted attachments.

TABLE 5. NUMBER AND AGE OF EQUIPMENT ITEMS ON DRYLAND COTTON FARMS ON THE HIGH PLAINS, 1956

Item	Age in years							
	1 to 3		4 to 6		7 to 9		10 & over	
	No.	%	No.	%[1]	No.	%	No.	%
Tractors[2]	19	15	52	41	23	18	34	26
Pickups	21	41	22	43	8	16	—	—
Trailers	26	14	71	39	14	24	39	23
Knifing sleds	28	24	49	42	15	13	25	21
Rotary-hoes	28	38	33	44	2	3	11	15
Stalk cutters	9	15	27	44	10	16	15	25
Combines	6	9	11	34	5	16	10	31
Cotton strippers	3	7	22	50	12	27	7	16
Sprayers	6	14	26	59	8	18	4	9
Sand fighters	10	21	25	52	10	21	3	6

[1]Indicates most usual age.

[2]Includes lister, cultivator and tractor-mounted attachments.

The age of all equipment on farms in the sample was studied to determine if there was a typical age for equipment items on dryland farms of the High Plains. The number and age of all equipment items as of January 1, 1956, were tabulated into four class intervals: 1 to 3 years, 4 to 6 years, 7 to 9 years and 10 years of age and over. The results are shown in Table 5. For every equipment item shown, the most usual age was 4 to 6 years. This age is assumed to be typical for major equipment items on dryland farms on the High Plains.

The estimated life expectancy of all major equipment items was determined. The estimated

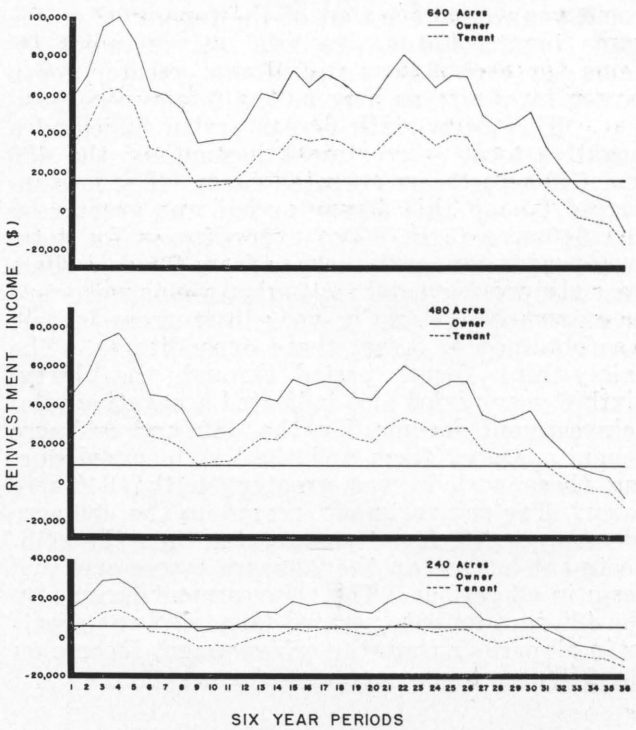

Figure 2. Reinvestment income by 6-year periods on dryland cotton farms on the High Plains of Texas, 1916-56.

life expectancy varies from farm to farm; however, the typical life expectancy of major equipment items was 10 to 12 years. Coordinating the typical age of equipment items, 4 to 6 years, with the typical life expectancy, 10 to 12 years, it is assumed that the typical dryland farmer has approximately 6 years to replace his major equipment items in order to continue his farming enterprise.

Assuming that the reinvestment income for the past 41-year period previously presented will be experienced in the future, an estimation as to the chances of equipment replacement can be made for the owners and tenants of the three sizes of farms considered. The total reinvestment income for each 6-year period in the 41 years is calculated. The first 6-year period includes the years 1916-21, the second includes the years 1917-22; thus there are thirty-six 6-year periods within the 41 years of data. The chances of equipment replacement is then estimated by considering the number of 6-year periods that the total reinvestment income was equal to or greater than the new cost of equipment items that must be replaced.

Chances of Equipment Replacement

The total reinvestment income for each 6-year period within the 41 years of data is presented for the owners and operators of the three sizes of farms in Figure 2. The horizontal lines represent the expenditure necessary for equipment replacement. The periods which are above this line were 6-year periods in which equipment replacement was possible.

In every period for each particular size of farm, the owner-operator's total reinvestment income was well above that of the tenant. For the same tenure status, the total reinvestment income for each 6-year period was greater for a larger farm size as long as the totals were positive. The thirty-sixth 6-year period indicated a negative total reinvestment income for the 480 and 640-acre owner-operated farm. The loss incurred during this 6-year period was greater on the 640-acre farm. The expenditures for total crop production on the larger farm for any given year also were greater; and when yields were zero or extremely low, no or very little gross income was obtained to offset these expenditures. The thirty-third, 6-year period through the thirty-sixth 6-year period also indicated a negative total reinvestment income for the 480 and 640-acre tenant-operated farm and the loss incurred during these periods was greater on the 640-acre farm. The reinvestment income on the 480-acre owner-operated farm was greater than the reinvestment income on the 240-acre owner-operated farm in all periods. The reinvestment income on the 480-acre tenant-operated farm also was greater in all periods than the reinvestment income on the 240-acre tenant-operated farm.

TABLE 6. PROBABILITY OF REINVESTMENT INCOME BEING SUFFICIENT FOR EQUIPMENT REPLACEMENT ON DRYLAND COTTON FARMS ON THE HIGH PLAINS

240-acre farm		480-acre farm		640-acre farm	
Owner	Tenant	Owner	Tenant	Owner	Tenant
27/36 or 75%	5/36 or 14%	32/36 or 89%	31/36 or 86%	32/36 or 89%	27/36 or 75%

The severe effect of the recent drouth can be seen easily in Figure 2. The total reinvestment income over each 6-year period declined almost steadily since the thirtieth period which was the total reinvestment income during 1945-50. The total reinvestment income for these last 6-year periods extend well below the horizontal lines which represent the expenditure necessary for equipment replacement. The thirty-sixth period, which is the total reinvestment income during 1951-56, extends well below zero for each size of farm and tenure status considered.

The chances for equipment replacement are summarized in Table 6. They are much better on the 480 and 640-acre farms than on the 240-acre farms. The 480-acre owner-operators have the same chances (89 percent) of equipment replacement as the 640-acre owner-operators (89 percent). The chances that the 480-acre tenant-operators (86 percent) will replace their equipment is greater than the chances of equipment replacement for the 640-acre tenant-operators (75 percent). This is due to the much larger expenditures necessary for equipment replacement on the 640-acre farms. The increase in farm size does not compensate for the increase in expenditures necessary for equipment replacement. This indicates that the increased amount of machinery may not be utilized fully on the 640-acre farms.

The 240-acre owner-operator has the same chance (75 percent) of equipment replacement as the 640-acre tenant-operator. However, the 240-acre tenant-operator only has a 14 percent chance of replacing his equipment.

ACKNOWLEDGMENTS

Acknowledgment is made to L. D. Smith, acting state director, Farmers Home Administration, U. S. Department of Agriculture, for data on family living costs. Acknowledgment also is made to the farmers who cooperated with the study.

MORE DETAILS AVAILABLE

Detailed data from which the narrative and tabular matter in this publication were drawn are available in a separate mimeographed report. A copy may be obtained from the Agricultural Information Office, College Station, Texas.