THE EFFECT OF YIELD UPON TENANT AND LANDLORD COSTS

OF PRODUCING IRRIGATED CROPS

By

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It is frequently assumed that the cost of producing a crop is more or less constant. As a matter of fact, costs vary widely. They are influenced by many factors. By no means is the yield of the crop the least of these factors. Many items of cost vary entirely with yield as, for example, the threshing rate per bushel, the potato contract picking cost per sack or the sugar beet topping rate per ton. These rates are on a uniform basis because average yields of crops are anticipated. If extremely low yields were customary the contract rates undoubtedly would be higher per unit of the crop or they would be on an acre basis, thus removing them from the list of variable items.

Other items of cost are independent of yield and would remain the same if the crop were never harvested. Examples of these costs are the cost of preparation of seedbed, and the cost of seed, irrigation, and cultivation.

Both tenant and landlord bear some of these fixed costs in the production of crops. Tenants bear the major portion of the costs which vary with production. The landlord's costs are usually fixed. He pays taxes, water, and repairs to buildings regardless of production. Some landlords pay their share of sacks and twine which are variable expenses.

In connection with a study of tenant and landlord relationships (See Colo. Sta. Bul. 451) detailed cost records for irrigated farms in northern Colorado were analyzed to discover the fixed and variable expenses of tenants and landlords for four major crops, namely, alfalfa, barley, potatoes, and sugar beets.

The hours of man, horse, equipment, truck and tractor operation for the years 1922 to 1932 inclusive, on all farms regardless of method of operation, were separated into "fixed" and "variable," the latter being those which vary directly with yield. Such items as landlord's depreciation on buildings, water tax, and real estate tax, as shown by representative records, were distributed uniformly on a crop-acre basis for ease of contrast. The tenant's labor charges were separated into "cash", which included machinery depreciation and horse feed, and "total", which included the estimated value of the operator's and family labor, and 6 percent interest on his investment. Total costs for the landlords included a flat $8-per-acre "land use" charge in addition to cash and depreciation charges.

These costs were based upon studies made prior to the introduction of general-purpose tractors and some of the labor-saving equipment used with these tractors. Consequently, the results should not be used as applying to production where a tractor is the chief source of power.

The details of cost for these four crops were not included in Colorado Station Bulletin 451. The following tables have therefore been prepared in order to make them available to those interested and to show the effect of yield per acre upon tenant and landlord costs for these four crops.

Cost rates used.-Two columns of "cost" are shown for the tenant and two for the landlord. The labor on these crops was calculated at a "cash rate" which was the actual out-of-pocket cash or contract labor expense as shown by a representative tenant-farm record. Depreciation on the tenant's machinery and

the value of horse feed were also included, being closely related to cash. Contract labor was charged as shown by the 11-year average, with one exception. The 1938 contract rates on sugar beets were used in place of the 1922-32 averages. These cash rates per hour of work were as follows: Man, 16.48¢; horse, 8.70¢; overhead, 7.16¢; equipment, 6.96¢, truck, 73.2¢; and tractor, 72.5¢.

The "total rate" was the one reported for each kind of work on these farms in Colorado Station Bulletin 353. These rates were: Man, 32.8¢; horse, 14.05¢; overhead, 10.11¢; equipment, 6.22¢;, truck, 64¢; and tractor, $1.00. The cost per acre for the tenant as shown in these tables would not change much if the share division of the crop were changed, unless, at the same time, the tenant and landlord changed the manner of sharing expenses.

There are many other variables which deserve consideration. The more important of these are rates per hour, hours per acre, cost of seed, charge for contract work, quality and shrinkage of the crop in storage, presence of insect pests and plant disease, the weather, fertility of the soil, size and shape of fields, size of machine used, kind of power used, speed of travel while at work in the field, and the farmer's ability to plan ahead for his work. These are some of the more commonly recognized variables which affect the cost of producing crops. Consequently, these average costs might properly be used as a starting point rather than being considered the final word as to cost. The purpose of presenting them is to stress the importance of yield, under customary conditions, in changing the cost per acre. Total costs are the safest guide. Cash costs show no pay for the operator's own time and no allowance for interest on his investment. The differences in cost as shown in the tables are due to the increased cost of the increased yield.

Table 1, alfalfa. The shares assumed are 1/2 of the crop to each. Note that yields of 3.5 tons per acre are needed in order to have approximately equal costs.

Table 2, barley. This crop was divided 2/3 to the tenant and 1/3 to the landlord. Note that the relative expenses are not at this ratio at any point within the yields used, although at yields above those in table 2 such a relationship would be reached.

Table 3, potatoes. The effect of shrinkage during storage is a complicating problem here. As an average 81.58 percent of the crop was used and 18.42 percent was shrinkage. Note that the tenant receives 2/3 of the crop and the landlord furnishes 1/3 of the sacks. The tenant, however, has more than 2/3 of the costs.

Table 4, sugar beets. The landlord's share (1/4) is larger than his share of the expenses for this crop.

Summary.—These tables show that the costs of landlord and tenant are not uniformly in the same proportion as the commonly accepted shares used in dividing the crop. However, one should consider rather carefully before making any shift in shares based on these tables. With customary cropping systems, gains on one crop may be largely offset by losses on another so that the income from the farm as a whole is reasonably fair to both tenant and landlord. The production and costs of crops, other than these four, also deserve consideration. Likewise, it is important to remember that these costs have been calculated on the assumption that yield was the only factor which varied and affected cost. Actually there are many other factors which should be considered.

It is hoped that this brief summary may aid in a public recognition of the fact that costs are extremely variable. The conditions under which crops are produced will determine individual costs.

Table 1.- The effect of yield per acre upon tenant and landlord costs, with customary shares of crop and expense.

Alfalfa

Yield (tons)	Tenant's share 1/2	Landlord's share 1/2	Tenant's costs per acre		Landlord's costs per acre	
			Cash	Total	Cash	Total
	tons	tons				
1.	.5	.5	$5.49	$9.56	$9.34	$17.34
1.5	.75	.75	6.20	11.07	9.34	17.34
2.	1.	1.	6.90	12.57	9.34	17.34
2.2 (a)	1.1	1.1	7.18	13.17	9.34	17.34
2.35	1.175	1.175	7.39	13.62	9.34	17.34
2.5	1.25	1.25	7.60	14.07	9.34	17.34
3.	1.5	1.5	8.31	15.58	9.34	17.34
3.5	1.75	1.75	9.02	17.09	9.34	17.34
4.	2.	2.	9.72	18.59	9.34	17.34

(a) 14-year average on all farms studied.

Table 2.-The effect of yield per acre upon tenant and landlord costs, with customary shares of crop and expense.

Barley

Yield	Tenant's share 2/3	Landlord's share 1/3	Tenant's costs per acre		Landlord's costs per acre	
			Cash	Total	Cash	Total
Pounds	Pounds	Pounds				
1000	667	333	$9.34	$14.00	$8.50	$16.50
1200	800	400	9.84	14.80	8.50	16.50
1500	1000	500	10.58	16.00	8.50	16.50
1800	1200	600	11.32	17.20	8.50	16.50
1848	1232	616	11.44	17.39	8.50	16.50
2000	1333	667	11.82	18.00	8.50	16.50
2296(a)	1531	765	12.56	19.18	8.50	16.50
2372	1581	791	12.74	19.49	8.50	16.50
2500	1667	833	13.06	20.00	8.50	16.50
3000	2000	1000	14.30	22.00	8.50	16.50
3600	2400	1200	15.79	24.40	8.50	16.50

(a) 14-year average on all farms studied.

Table 3.—The effect of yield per acre upon tenant and landlord costs, with customary shares of crop and expense.

Potatoes

Yield		Tenant's share 2/3	Landlord's share 1/3	Tenant's costs per acre		Landlord's costs per acre	
Total	Acct. for 81.58% of total production			Cash	Total	Cash	Total
Pounds	Pounds	Pounds	Pounds				
2452	2000	1333	667	$34.21	$45.25	$ 9.00	$17.00
4903	4000	2667	1333	38.11	50.49	9.50	17.50
7355	6000	4000	2000	42.01	55.73	10.00	18.00
9806	8000	5333	2667	45.90	60.97	10.50	18.50
10837	8841(a)	5894	2947	47.54	63.17	10.71	18.71
12258	10000	6667	3333	49.80	66.21	11.00	19.00
14709	12000	8000	4000	53.70	71.45	11.50	19.50
17161	14000	9333	4667	57.60	76.69	12.00	20.00
19613	16000	10667	5333	61.50	81.93	12.50	20.50
22064	18000	12000	6000	65.40	87.17	13.00	21.00
24516	20000	13333	6667	69.30	92.41	13.50	21.50

(a) 14-year average on all farms studied.

Table 4.—The effect of yield per acre upon tenant and landlord costs, with customary shares of crop and expense.

Sugar beets

Yield	Tenant's share 3/4	Landlord's share 1/4	Tenant's costs per acre		Landlord's costs per acre	
tons	tons	tons	Cash	Total	Cash	Total
5	3.75	1.25	$38.49	$49.99	$8.50	$16.50
10	7.5	2.5	46.27	60.90	8.50	16.50
12	9.	3.	49.38	65.27	8.50	16.50
13.5	10.125	3.375	51.56	68.40	8.50	16.50
14	10.5	3.5	52.29	69.44	8.50	16.50
14.61(a)	10.96	3.65	53.18	70.72	8.50	16.50
15	11.25	3.75	53.76	71.53	8.50	16.50
15.3	11.475	3.825	54.18	72.15	8.50	16.50
16	12.00	4.00	55.20	73.61	8.50	16.50
18	13.5	4.5	58.11	77.78	8.50	16.50
18.6	13.95	4.65	58.98	79.03	8.50	16.50
20	15	5.	61.02	81.95	8.50	16.50
25	18.75	6.25	68.30	92.38	8.50	16.50

(a) 14-year average on all farms studied.