ORGANIZATION OF IRRIGATED FARMS IN OTERO COUNTY, COLORADO

1921 to 1925

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A report dealing with the organization of irrigated farms with special reference to the factors of success on these farms.

COLORADO AGRICULTURAL COLLEGE
EXTENSION SERVICE
FORT COLLINS, COLORADO

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CO-OPERATIVE EXTENSION WORK IN
AGRICULTURE AND HOME ECONOMICS, COLORADO AGRICULTURAL COLLEGE
AND U. S. DEPARTMENT OF AGRICULTURE CO-OPERATING
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ORGANIZATION OF IRRIGATED FARMS IN OTERO COUNTY, COLORADO

Business methods, when applied to farming, have proved to be successful. Such methods involve the maintenance of systematic records, including complete inventory, farm expenses and farm receipts in detail, and an analysis of the results so that profitable adjustments may be made from time to time.

Relatively few farm operators take the time or trouble to study the business features of their farm organization, farm operation, labor or other problems. Consequently, they are never sure of the outcome at the end of the year and they are seldom in a position to take advantage of changes which might be made with profit if records were available.

This bulletin contains a brief statement of the business experiences of a number of Otero County farmers. Some of these men were eminently successful from the standpoint of their business ventures during a period when agriculture was passing thru a serious depression. A review of their methods and results should be beneficial and helpful to men who are engaged in farming in the Arkansas Valley, and particularly to the men who are located in Otero County.

Source of Data

In 1920 the County Extension Agent and Extension Specialist in Farm Management made a survey of the farm-business situation in the county and outlined a plan to carry on an annual farm business survey on a number of farms. Twenty-five farmers were secured as cooperators in this work and these men were supplied with farm account books furnished by the Extension Service in which to keep their farm business records. An annual survey was made during the month of April each year when each farmer was visited and the items taken from his account book. These records were then analyzed and a summary report returned to the farmer.

During the first three years the number was kept at twenty-five, but in 1923 thru additional help furnished by the Department of Economics and Sociology of the Colorado Agricultural College, new farms were added so that there has been an average of forty-one since that time.

In selecting these farms an effort was made to include representatives of the more important types of farming systems generally practiced in this section under different irrigation ditches and in various parts of the county.

The figures used in this discussion were taken from the annual

TABLE 1—MONTHLY DISTRIBUTION OF RAINFALL AT ROCKY FORD, 1899-1925.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1899	.98	.55	.32	.28	.99	.78	7.0	2.22	1.43	.63	2.40	.98	18.56
1900	.0	.52	.37	7.16	2.28	1.47	1.78	1.05	.08	.60	.06	.24	15.61
1901	.20	.10	1.0	2.36	1.34	.23	1.48	.74	.48	.25	.0	.50	8.68
1902	.18	.57	1.78	.18	4.02	.60	.72	2.72	.46	.80	.41	.33	12.77
1903	.0	1.05	.18	.56	.28	3.94	.42	.87	.0	1.02	.26	.22	8.80
1904	.0	.0	.77	.81	2.03	2.20	1.75	.33	2.34	.50	.0	.31	11.04
1905	.0	.11	2.11	4.67	2.13	1.56	1.30	.45	1.48	.10	.41	.0	14.32
1906	.23	.10	.92	5.59	.59	.54	2.05	1.21	1.64	1.57	.22	.0	14.66
1907	.0	.0	.0	1.84	1.85	.65	4.96	.78	.33	.88	.02	.26	11.57
1908	.18	.35	.0	.14	.89	1.16	2.65	2.89	.0	1.96	.86	.0	11.08
1909	.15	.15	.65	.98	.75	1.21	.65	2.52	1.72	.90	1.07	.14	10.89
1910	.0	.27	.35	2.70	1.93	.27	3.58	1.20	.0	.0	.43	.0	10.73
1911	.0	.65	.05	.60	.65	.67	1.51	.69	.12	1.25	.20	1.16	7.55
1912	.16	.70	.16	.65	1.70	1.57	1.22	.82	1.77	.40	.0	.0	9.15
1913	.17	.62	.0	1.65	.42	2.87	2.82	.0	.54	.77	.67	2.32	12.85
1914	.0	.14	.35	2.90	3.38	2.68	3.09	.87	1.18	1.60	.0	.30	16.49
1915	.10	.91	.51	3.64	4.55	1.10	3.36	3.22	.69	.22	.15	.30	18.75
1916	.0	.0	.32	1.78	.80	.88	.45	4.52	.0	.28	.10	.31	9.44
1917	.17	.22	.35	.89	1.52	.25	1.60	1.18	2.45	.12	.0	.0	8.75
1918	.56	.0	.35	.57	.35	2.70	1.79	1.10	1.54	.21	.20	1.14	10.51
1919	.06	.46	1.20	3.10	1.93	2.68	3.66	.25	.15	2.51	.80	.20	17.00
1920	.10	.21	.0	1.60	1.35	.82	3.07	.85	.65	1.75	.0	.05	10.45
1921	.65	.12	.55	1.03	.69	2.35	3.39	1.44	.0	.62	.12	.40	11.36
1922	.0	.12	.21	1.46	1.63	.55	1.28	.33	.0	.0	.97	.0	6.55
1923	.0	.30	.20	.32	6.27	4.16	2.39	3.99	.85	3.18	.16	.0	21.82
1924	.15	.05	1.11	1.29	.93	.27	.79	.0	.20	.47	.0	.60	5.86
1925	.34	.0	.0	.47	4.41	1.21	5.98	1.23					
Av.	.16	.31	.51	1.82	1.84	1.46	2.40	1.39	.77	.87	.37	.38	12.12

summaries of these farm records and are, for the most part, actual figures carefully kept by the farmer.

Location

Otero County, located in the Arkansas River Valley, is in the southeast part of the state. It has an area of 850,760 acres of which 76,492 acres are under irrigation. The unirrigated part of the county, comprising over 90 percent of its area, is extremely dry, occupying about the center of the most arid part of the eastern-slope plains. The rainfall in this section is less than twelve inches and farming without irrigation has not proved to be successful. The unirrigated portion is used mostly for grazing purposes.

The irrigated land in Otero County is highly productive and, where the water supply is sufficient, lends itself well to intensive farming, special crops, such as cantaloupes, cucumbers for seed, and other vine crops being grown extensively. Sugar beets and canning crops such as tomatoes, beans, table beets, gooseberries, cherries, etc., are also grown in certain sections. The success of producing these special crops has in many cases led to the abuse of growing the same types of crops on the same fields too many years in succession. In some instances it has resulted in reduced yields to such an extent that farming has become unprofitable. By the proper rotation of crops and liberal use of barnyard manure such fields are usually brought back in a few years to a normal state of productivity.

Table 1 shows the monthly distribution of rainfall at Rocky Ford from 1899 to 1925.

History

Otero County shares in the very early history of Colorado. In 1832 Colonel William Bent built a fort on the banks of the Arkansas, a few miles east of the present town of La Junta. This was for several years a bustling trading post. La Junta became a trading post in 1842. At that time agriculture was already being carried on by some survivors of the early Spaniards who had settled on the Purgatoire River, twenty miles south of La Junta, now known as Higbee. These farmers sold some of their produce to the traders at Fort Bent and later at La Junta. Twelve miles up the river from La Junta is a rock-bottom crossing which is said to have been named Rocky Ford by the famous Indian scout, Kit Carson. In 1870 Swink and Russell built a trading post at the Rocky Ford crossing. These men were followed by other settlers and soon the country began to develop. The present city of Rocky Ford was later established on a line of the Santa Fe railroad a few miles south of the Rocky Ford crossing.

Figure 1.—The Daughters of the American Revolution have erected a monument on the site of Fort Bent.

Type of People

The people who first settled this part of the Arkansas Valley were mostly enterprising Americans coming largely from the middle western states. After the year 1900 when the sugar-beet industry was established there came many Germans, Russians and Danes. Later there was an influx of Japanese and Mexicans who were employed to do the hand labor in the sugar-beet fields. At present the population is still largely American with a sprinkling of Germans, Danes, Russians and Japanese, while the hand labor in the beet fields at present is being done almost entirely by Mexicans.

Steps in Development of Farming

The first settlers engaged for the most part in cattle raising. In 1874 the Rocky Ford Irrigation Ditch was built bringing some land under irrigation upon which crops were grown. At first mostly grain, hay and other forage crops were produced in order to provide feed for the cattle during the winter. In 1884 the cantaloupe industry had its inception at Rocky Ford which soon became known thruout the country as the famous cantaloupe town. The early history of the cantaloupe industry reveals that the crop was frequently unprofitable to the grower, but that there were occasional seasons that brought high returns per acre, creating an incentive for a greater acreage to be planted in succeeding years.

As cantaloupes and other vines became established there came a demand for more and better seed of these crops, and thus the vine-seed industry had its inception. At present a very large percentage of all the vine seeds grown for the entire United States is produced in the Rocky Ford district. This is one of the important industries of the region.

In 1900 the American Beet Sugar Company built a sugar factory at Rocky Ford and in 1905 another factory was built at Swink by the Holly Sugar Corporation. Since that time the sugar-beet crop has been one of the most important cash crops. Sugar-beet by-products figured largely in the development of cattle and sheep feeding and dairying. Cattle and sheep feeding have been largely carried on by specialized feeders or by commission firms who contracted for the beet by-products. During the past the average farmer did not realize the necessity of feeding the beet by-products on his own farm in order to maintain the fertility of his land, but in recent years there has been a tendency toward more feeding and dairying on the farms.

Irrigation Systems

As irrigation in this country is the chief factor involved in crop production, the water supply for irrigation ditches must be reckoned with. There are seven major irrigation ditches in Otero County besides a number of minor systems and numerous pumping plants.

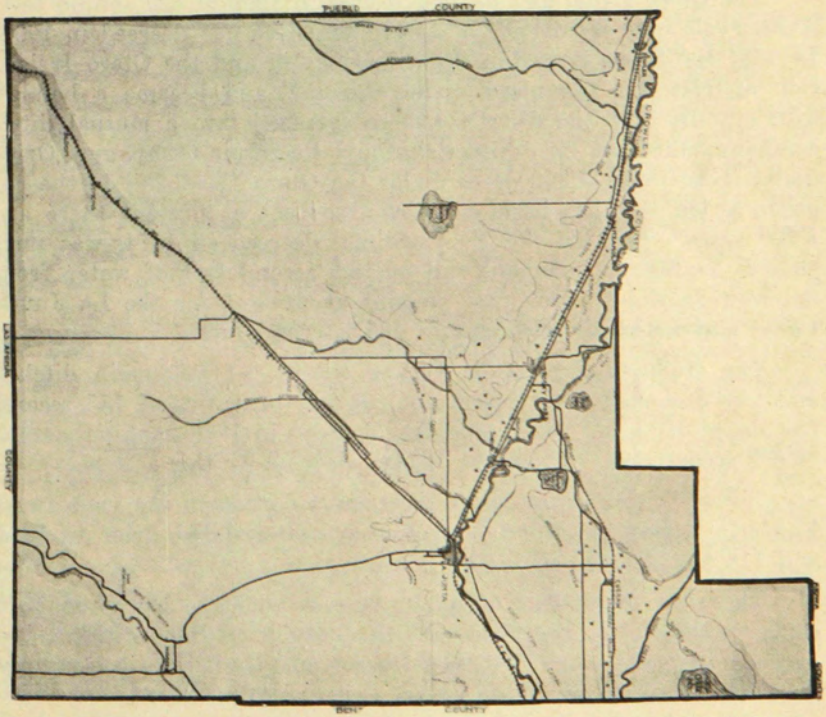

Figure 2.—Otero County farmers obtain their irrigation water from a number of sources. (Map by Ruth C. Abell.)

The Rocky Ford ditch, one of the earliest decrees in the valley, has priorities of 111.74 second feet dating back to 1874. On account of these priorities this ditch is the most reliable in the county and covers an area of 10,000 acres.

The Catlin Canal was decreed in 1884 with priority rights of 248 second feet of early water and 97 feet decreed in 1887, making a total of 345 second feet. This ditch irrigates 19,600 acres.

The Fort Lyon Canal was also decreed in 1884 with 164.64 second feet. In 1887 an additional priority of 597.16 second feet was secured and in 1893 another addition of 171.2 second feet. This is the most extensive irrigation system in the Arkansas Valley but only about 1000 acres under it are located in Otero County.

The High Line Canal is the longest irrigation ditch in Otero County. Its source is in Pueblo County near where the Huerfano empties into the Arkansas. It is ninety miles long and irrigates 28,000 acres. It has 88 second feet dated prior to 1886 and 380.5 feet decreed in 1890, making a total of 468.5 second feet.

The Otero Canal had its first decree in 1902 of 327 second feet. A reservoir with a capacity of 11,425 acre feet was decreed in 1902. In 1901 the State Irrigation Law was passed and the Otero Irrigation district was organized under this law and became a bonded district. In 1923 the district was reorganized into a mutual ditch company called the La Junta Canal and Reservoir Company. Originally there were 19,200 acres under the Otero Canal but in the reorganization this has been cut down, so that at present there are 8,620 acres. In 1926 the Ewing ditch, decreed in 1874, was purchased, having a continuous run of 18.5 second feet of water from the western slope. The total amount at present for the La Junta Canal and Reservoir Company is 465.5 second feet.

The Holbrook Irrigation System consists of two main ditches and two exchange-water reservoirs. It has priorities of 155 second feet dated 1889 and 445 second feet decreed in 1893, making a total of 600 second feet. There are 19,000 acres under this system.

The Oxford Farmers ditch irrigates a section in the vicinity of Fowler. It has 14 second feet of early water dated prior to 1884 and 116 feet decreed in 1887.

There are a number of minor systems such as the Nine Mile ditch on the Purgatoire river, the Omer ditch on the Apishipa, the Jackson Lateral in the Holbrook district and the Fort Lyon supply canal at Horse Creek.

The reliability of these irrigation ditches varies. Under some ditches there is at all times sufficient water to produce any kind of

crop adapted to the soil and climate. Under other ditches there are times when there is a shortage of water and it is best to depend upon those crops which can withstand a certain amount of drouth. The early priorities, of course, have an advantage over the later ones when there is a low water supply in the river's watershed.

As irrigation has now been carried on for quite a long term of years the underground soil strata have gradually filled up. The water table has risen in many places so that it is now possible to put in pumps and make use of the underground flow. There are at present approximately 300 pumping plants in the county, varying in size from supplying water to a few acres up to large units where good-sized farms are entirely watered by pumps.

Kind of Crops Grown

The elevation of the irrigated section of Otero County ranges from 4000 to 4500 feet. The weather records show there is an average growing season of 161 days between killing frosts. The climate is such that under adequate irrigation a large variety of crops can be grown.

The following list shows the important crops grown, in order according to acreage: (1) Alfalfa, (2) corn, (3) sugar beets, (4) cantaloupes, (5) cucumbers, (6) wheat, (7) oats, (8) barley, (9) honey dews, (10) beans, (11) red clover, (12) tomatoes, (13) watermelons, (14) onions, (15) celery, and (16) zinnias. Approximately one-third of the irrigated land is in alfalfa, the acreage remaining fairly constant. This crop is grown both as a feed crop for local consumption and as a cash crop. Several alfalfa mills grind and ship considerable quantities of alfalfa meal. The greater percentage of alfalfa, however, is fed within the county.

The corn acreage has been variable from year to year. During the past ten years it has ranged from 5000 to 15,000 acres. Corn is grown entirely for home feeding. Large quantities must be shipped in each year in order to supply the local needs.

The sugar-beet acreage has also varied somewhat from year to year but the average acreage grown in the county for the past ten years has been approximately 10,000 acres. The by-products from sugar beets are beet tops, beet pulp and molasses. These feeds, together with alfalfa and corn constitute good rations for beef feeding, sheep feeding and dairying.

The cantaloupe industry, which originated here, is still one of the leading crop industries in the county. The acreage range is from 3,000 to 6,000 acres with a ten-year average of approximately 4,000 acres. This includes from 800 to 1,000 acres grown annually for seed.

Figure 3.—Some cantaloupes are grown for seed, care being exercised to select only the best for this purpose.

There are approximately 1000 acres of honey dews, 500 acres of watermelons and from 300 to 400 acres of miscellaneous melons grown annually for seed and market.

The cucumber-seed industry has, during the past decade, been the most important vine-seed crop grown in the county. Approximately 3000 acres are grown annually. In recent years, in order to permit better rotation of crops, the cucumber-seed acreage has a tendency to spread more up and down the valley.

The wheat acreage has been holding around 4500 acres annually. Winter wheat fits quite well into many of the farming systems. It is a crop to which water may be applied at a time when it is not needed for other crops and which requires labor when other things are not rushing, thus permitting better distribution of water and labor thruout the season. Oats and barley are grown as feed crops and fed on the farm, and serve as nurse crops for seeding alfalfa and red clover.

Ten years ago beans were an important crop in the county but in recent years the bean acreage has been greatly reduced. This has been due to the comparatively low market price of beans and also to a number of bean diseases that gave considerable trouble.

The acreage of truck crops has been on a steady increase during the past five years. Tomatoes, green beans and garden beets are grown rather extensively for canning factories. These factories also contract cherries and gooseberries. During the past year there were approximately 1500 acres of truck crops contracted by the canning factories. Some twenty years ago there were a large number of extensive fruit orchards but in recent years this industry has been unprofitable so that at present there are but a few orchards

left. The tendency now is to increase the general truck-crop acreage such as onions, sweet potatoes, celery and other vegetables which can be readily marketed. The Spanish Valencia onion has proved to be a very profitable crop, the prospects being for a large expansion in acreage.

Figure 4.—Farmers, on small tracts that are capitalized at a high rate per acre, find it necessary to include some truck crops in their cropping systems.

Red clover has come into favor during the past few years and has proved to be a highly profitable crop for seed. A perceptible increase in acreage of red clover is expected to take place in the very near future. Zinnias, grown for seed, are also of some importance as they seem to be exceptionally well adapted to soil and climatic conditions in this part of the valley. A considerable acreage of these flowers is grown each year and the tendency seems toward expansion of the industry.

The variety of crops that can be successfully grown in Otero County makes it possible for farmers to adopt a cropping system for any part of the irrigated section. While there is a wide range of conditions there is also a wide range of crops from which to select to meet these conditions.

Kind of Livestock Kept

It is a foregone conclusion that livestock is essential to good farming on these valley farms. During the past a great many farmers in Otero County have not kept sufficient livestock on the farms to keep up soil fertility.

The early settlers, as in most western frontiers, engaged in the production of range cattle. These people were especially adapted to this enterprise. Those who came in later to settle on the small

irrigated farms were primarily interested in the growing of crops. The rich virgin soils when first irrigated produced bumper crops and farmers, at that time, were generally successful. It was even possible to grow the same kind of crop on the same fields year after year, a practice which was followed too long by many farmers. As time went on these fields began to show the detrimental effects of this abuse and many farms were very much run down in fertility. In recent years the farmers have realized that more livestock must be kept in order to build up and keep up the productivity of the soil, so that there is now a tendency toward more feeding and dairying on the average farm.

All classes of livestock can be economically produced and fed in this section. Alfalfa, corn, oats and barley, together with sugar-beet by-products, constitute feeds that can be made into rations for practically every class of livestock. The 1925 records show the following numbers of livestock in the county:

Horses	8000	Sheep	17000
Mules	1300	Hogs	4000
Range cattle	12000	Poultry (dozen)	7700
Dairy cattle	3500		

In total numbers there has been a decrease in livestock during the past five years. This is due to the fact that during the war there was considerably more sheep and cattle feeding carried on. Dairying was then at its peak, a condensary furnishing a good market for the milk. Hogs fluctuated in numbers on account of changing prices.

At the close of the war cattle and sheep feeders lost heavily.

Figure 5.—A patch of corn near the poultry house provides excellent shade for the farm flock or commercial flock.

The milk condensary was closed and hog prices fell. These conditions caused a decided decline in the livestock industries of the county. At present, however, there is a steady increase in all classes of livestock, this increase taking place on the average farm.

The poultry industry did not seem to be affected materially by the deflation, experiencing almost a phenomenal growth during the past ten years. The small farms where intensive farming must be resorted to lend themselves to intensive poultry production.

Extent of the Study

At the outset, the plan was to select a few farms in different parts of the county that would more nearly represent the various types of farming. Accordingly, several districts were selected. These were Fowler, Manzanola, Rocky Ford, La Junta and Cheraw.

In 1925, five farms were at Fowler, three at Manzanola, thirteen at Rocky Ford, five at La Junta and fourteen at Cheraw.

When the work was initiated, very few records were kept by the 25 demonstrators. Each year, however, a few more farmers took an account book and kept farm records. At the end of each year the farm records were secured on an analysis sheet and the results worked out. This year 90 percent of these demonstrators kept farm records which were used in summarizing the farm business for the year. For this reason, the figures are more than mere estimates and are based on actual records.

As is indicated in Table 2, farms of different tenure were selected so that some comparisons could be made between the returns received by those who farmed their own farms and those who rented either a part or all of their land.

TABLE 2.—FARM TENURE.

Year	No. of owners	No. of owners additional	No. of tenants	Total
1921	18	5	2	25
1922	17	6	2	25
1923	26	11	5	42
1924	23	10	8	41
1925	16	13	11	40

Figures were secured on these farms to show the inventory at the beginning and the end of the year; a record of the production of crops as well as livestock and livestock products was also included. Receipts and expenses were set down and the summary of the entire business was worked out.

The farms were divided into three groups according to tenure. The first group includes those who own their land; the second, those who own a part of the land they farm and rent additional acreage; and third, those who do not own the land but farm as tenants. For

this study these groups are named owners, owners additional and tenants.

Some change in the selection of farms occurred from year to year. Not all of the original 25 farms are included in the 40 which were studied in 1925. However, 15 men of the original number are included in the five-year study, 7 continued the work for two years, 4 for three years and 3 for four years.

As men dropped out others took their places and additional farms were added to bring the total to around 40 farms. The changes in the number of farms for each group are due to the additional farms included and not so much to a change of the individual farm from one group to another.

When it comes to the matter of size, however, a different story is revealed. Some farms during the period have been increased in size while others have been reduced. This will be discussed under a later heading.

Farm Size

The farm sizes vary from 3.75 acres to 320 acres. The smallest farm is a highly specialized type while the largest unit is devoted to general farming on a fairly large scale.

By groups, the average of the owners is 92.8 acres, for the owners additional 119.3 acres per farm and for the tenants 121.47 acres per farm.

This variation can be explained. The majority of the small tracts are operated by the owners. The owners additional were able to farm more land with the same equipment and were so situated that this additional land was available for their use. The tenants exceeded these two groups. Table 3 shows the average size each year for the three groups.

TABLE 3.—SIZE OF FARMS (Acres).

Tenure	1921	1922	1923	1924	1925	Average
Owners	91	101	82	86.21	103.61	92.8
Owners additional	65	99	131.61	157.0	144.0	119.3
Tenants	154	122	117	113.13	101.23	121.47

Some farms were increased in size during the five-year period, others decreased. The increases were made usually to allow more efficient use of labor and equipment. The decreases applied very largely to farms where too much land was being operated inefficiently, the reduction allowing for better work on a smaller acreage.

Livestock

Good farming is associated with livestock production on most farms. This is due not only to the supplying of manure to keep up

the soil fertility but also to the fact that more sources of income are added to the farm business thereby reducing the risk.

In addition to the work stock, some dairy cows are being kept on these farms. Not only is enough milk, cream and butter produced for the farm family, but usually there is some for sale in the form of cream, whole milk and butter. Several farms make dairying a major part of the farm business. One man operates a dairy and buys all the feed which is fed the cows.

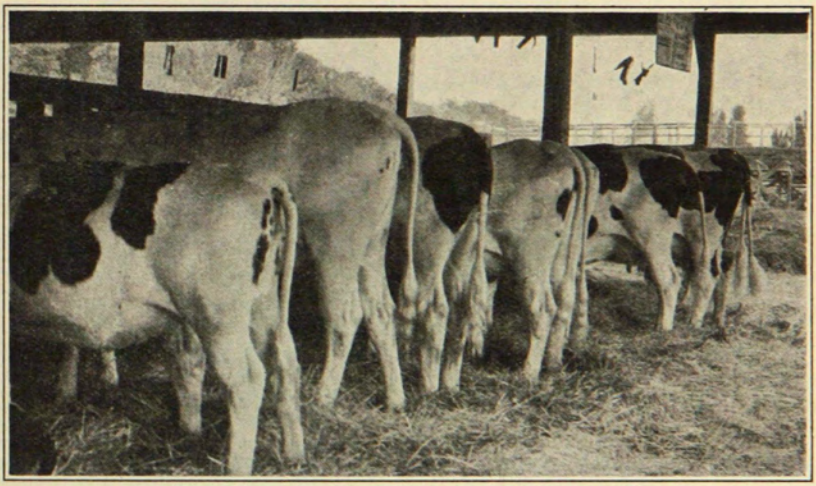

Figure 6.—Good cows are essential if milk is produced at a profit.

Likewise with poultry. Usually enough hens are kept to furnish the family with eggs and chickens. Besides there is generally a surplus to sell. Several farmers have added the production of baby chicks to their business, so that in this industry there are all sizes of flocks and several degrees of intensity.

The same thing can be said regarding hog production. It more frequently happens, however, that no hogs are raised on the place, especially on small tracts. It is necessary then for the family to buy pork for home consumption.

Table 4 indicates the amount of livestock kept.

TABLE 4.—NUMBERS OF LIVESTOCK ON FARMS, 1925 (ANIMAL UNITS). [1]

Tenure	Horses	Cows	Hogs	Sheep	Poultry	Total
Owners	7.2	13.1	1.1	.6	1.4	23.4
Owners additional	7.5	13.6	1.8	6.2	1.7	30.8
Tenants	5.7	8.7	2.5	...	1.9	18.8

[1] An animal unit equals one cow, one horse, five hogs, seven sheep, or one hundred chickens. This is used so that the different classes of livestock can be compared one with another.

The figures for 1925 will indicate the relationship between the farm tenure and the number of livestock on the farm. The relationship holds for the other four years.

Referring to Table 4 it will be observed that altho the tenants farm larger farms on the average than the owners, the amount of livestock kept by the tenants is less than that kept by the owners. This difference is seen in the horses, cows and hogs. No sheep are kept on the tenant farms in this study.

The Operator's Returns

In considering the returns to the operator, it must be remembered that some of the years over which the study extends, were very unfavorable to the farmer, while several years were more favorable.

The years 1921 and 1922 were periods of low prices for agricultural products. The slump in farm prices was still very much in evidence. In 1923 an excess of moisture, 21.82 inches, the highest precipitation in 25 years, cut down crop yields on these farms.

In 1924 a good crop year was experienced, probably due to the carry-over of moisture from the previous year, since the precipitation was only 5.86 inches. In addition, some recovery of prices occurred, making 1924 the banner year of the five.

The year 1925 was also a favorable year due to yields and prices, altho not as good as 1924.

These facts show that the results obtained on these farms were perhaps below normal, due to prices and rainfall for the period.

The operator's returns were computed in two different ways. First, six percent was figured on the total capital invested and subtracted from the farm income. The balance represented what the operator received for his own work. This is called the labor income or return to the operator for his own labor. The labor income for the owners for the five-year period averaged $—146. For the owners additional the average was $239 and for the tenants $1,034.

In other words, on the average, the owners did not get anything for their own work and lacked $146 of making 6 percent on the capital invested in the farm business. The owners additional, on the average, made 6 percent on their investment and received $239 for their own labor. The tenants received 6 percent on their invested capital and $1,034 for their labor during the year.

Table 5 shows what the operators received.

TABLE 5.—RETURNS TO THE OPERATOR FOR HIS OWN LABOR.

Owners

Year	No. of farms	Farm area	Total capital	Crop receipts	Livestock receipts	Misc. receipts	Total receipts	Expenses	Farm income	Interest (6%)	Labor income
1921	18	91	$22,587	$1,805	$1,652	$125	$3,582	$2,598	$ 984	$1,355	$—371
1922	17	101	23,170	1,408	1,639	250	3,297	2,785	512	1,390	—878
1923	26	82	16,739	1,028	1,568	321	2,917	2,565	352	1,004	—652
1924	23	86.21	17,896	2,376	2,085	132	4,593	2,718	1,875	1,074	801
1925	16	103.61	18,345	2,555	1,731	110	4,396	2,926	1,470	1,101	369
5-yr. av.	20	92.8	19,747	1,834	1,735	188	3,757	2,718	1,039	1,185	—146

Owners Additional

1921	5	65	13,535	1,761	1,485	120	3,366	1,947	1,419	812	607
1922	6	99	14,237	2,105	903	316	3,324	2,156	1,168	854	314
1923	11	131.3	18,027	1,786	412	94	2,292	2,240	52	1,082	—1030
1924	10	157	16,533	3,439	984	107	4,530	2,423	2,107	992	1115
1925	13	144	14,717	2,585	1,515	101	4,201	3,127	1,074	883	191
5-yr. av.	9	119.3	15,410	2,335	1,060	148	3,543	2,399	1,164	925	239

Tenants

1921	2	154	2,562	2,408	985	17	3,410	2,494	916	154	762
1922	2	122	3,521	3,768	922	76	4,766	3,531	1,235	211	1024
1923	5	117	1,969	1,877	777	174	2,828	1,899	929	118	811
1924	8	113.13	2,191	2,413	1,115	125	3,653	2,121	1,532	132	1400
1925	11	101.23	2,238	2,050	1,104	148	3,302	1,992	1,310	134	1176
5-yr. av.	6	121.47	2,496	2,503	981	108	3,592	2,407	1,185	150	1034

The second method used in computing the operator's returns is that of allowing a cash wage of $600 per year for the work of each operator and figuring what remains in terms of interest on the investment. This can all be considered as a return for the use of capital or a portion of it allowed for supervision of the operator.

TABLE 6.—OPERATOR'S RETURNS ON HIS INVESTMENT.

Year	Farm income	Wages	Balance	Investment	Perct. return
Owners					
1921	$ 984	$ 600	$ 384	$22,587	1.7
1922	512	600	—98	23,170	—.42
1923	352	600	—248	16,739	—1.5
1924	1,875	600	1,275	17,896	7.1
1925	1,470	600	870	18,345	4.7
5-yr. av.	1,039	600	437	19,747	2.2
Owners additional					
1921	1,419	600	819	13,535	6.7
1922	1,169	600	569	14,237	4.0
1923	52	600	—548	18,027	—3.04
1924	2,107	600	1,507	16,533	9.1
1925	1,074	600	474	14,717	3.2
5.-yr. av.	1,164	600	564	15,410	3.66
Tenants					
1921	916	600	316	2,562	12.3
1922	1,235	600	635	3,521	18.04
1923	929	600	329	1,969	16.7
1924	1,532	600	932	2,191	42.6
1925	1,310	600	710	2,238	31.7
5-yr. av	1,184	600	584	2,496	23.4

In order to compare the returns to the tenant with the returns to his landlord, the 1925 tenant records were used. The total value of the share given to the landlord was divided by the total number of acres in the tenant farms. This showed a gross return of $14.10 per acre. After subtracting the taxes, water assessment, insurance and repairs on buildings which amounted to $4.86 per acre there was a balance of $9.24 per acre to pay for the investment in land and improvements. This was 6.4 percent on a valuation of $145 per acre.

Now compare this with what the owner operator received for the use of his land. After subtracting from the farm income a wage of $600 for the manual labor performed by the owner, there was left only 2.2 percent on the capital invested in the business.

It cannot be inferred that because the tenant realizes a higher return on his investment that he is better off than the owner. In 1925 the amount of money invested by the tenant was $2,238 while that invested by the owner was $18,345.

The owner is able to operate his farm longer under adverse conditions than is the tenant. Altho his rate of interest is greatly reduced some years, he is able to hold out until the good years come without increasing his indebtedness.

Food for the Farm Family

The production of food for the farm family is an important item in connection with the business of farming. The production of this food belongs to a great extent to the farm chores which have to be done whether stock products or crops are raised for the consumption of the farm family. In other words, this work does not seem to interfere materially with the ordinary farm work, but helps considerably when figured in money values. On these farms the value of the food furnished the farm family by the farm has been set out in addition to the other farm income for the purpose of emphasing its importance.

Figure 7.—The farm garden provides profitable employment, furnishing food for the farm family as well as producing some products for sale.

The food was divided into five sources; orchard and garden, meat, dairy products, eggs and honey. Table 7 gives the relative value of these groups of items.

The owners produced an average of $310 worth of food for the family; the owners additional, $332 per farm and the tenants, $289, over the five-year period. The decrease in the case of the tenants can be explained by the absence of livestock on these farms. Notice the comparison of meat. Owners, $85; owners additional,

TABLE 7.—VALUE OF PRODUCTS FOR FAMILY USE.

Owners

Year	No. of farms	Orchard and garden	Meat				Dairy			Eggs	Honey	Total
			Beef	Pork	Chicken	Total	Butter	Milk	Total			
1921	18	$62	$ 9	$39	$45	$ 93	$35	$106	$141	$48	$....	$344
1922	17	58	11	35	51	97	32	95	127	49	1	332
1923	26	31	6	31	29	66	40	90	130	45	3	275
1924	23	38	8	41	37	86	42	96	138	45	1	308
1925	16	39	9	38	33	80	52	75	127	43	2	291
5-yr. av.	20	45	9	37	39	85	40	93	133	46	1	310

Owners Additional

1921	5	57	5	43	47	95	58	125	183	48	1	384
1922	6	67	20	62	79	161	56	91	147	49	1	425
1923	11	32	8	36	31	75	50	69	119	34	....	260
1924	10	33	10	52	35	97	47	70	117	44	2	293
1925	13	40	11	30	34	75	40	98	138	43	1	297
5-yr. av.	9	46	11	45	45	101	50	91	141	43	1	332

Tenants

1921	2	5	8	25	28	61	55	105	160	19	....	245
1922	2	55	....	74	39	113	23	118	141	33	....	342
1923	5	16	....	28	18	46	34	116	150	46	....	258
1924	8	36	....	37	29	66	73	90	163	42	1	308
1925	11	44	3	23	36	62	69	75	144	39	3	292
5-yr. av.	6	31	2	37	30	69	51	101	152	36	1	289

$101; and tenants, only $69. This difference evidently occurs in the case of meat animals and poultry since the value of dairy products is greater for the tenants than for either the owners or owners additional.

On the average the value of the food furnished the family by the farm amounts to $25 per month. Should the farmer have to pay out this amount and more, since the farm values have been figured in every case, it would mean a considerable burden.

Farmers are prone to compare their lot with the wage earner in town. In this comparison, very little consideration is given the lack of opportunity on the part of the city wage earner to reduce his living expenses by producing food for the family. As a matter of fact practically all of these items that have been considered must be purchased by the city wage earner at higher prices than those values figured in this study.

Food for the farm family could easily be increased by giving more attention to the farm garden and the production of meat, eggs and milk. The storage of vegetables for winter use is sometimes neglected, with the result that proper foods, if they are used in the winter months, must be purchased. Too often, however, these foods are excluded from the farm table.

Farm Receipts

The sources of income on many farms are in a measure indicative of the success or failure of the farm business. In analyzing the receipts of these farms, three divisions were made; receipts from crops, receipts from livestock and livestock products, and miscellaneous receipts.

Total receipts for the three groups did not vary greatly. The five-year average for the owners was $3,757, for the owners additional, $3,543, and for the tenants, $3,592.

In balancing up the figures on the farm business, increases in the inventories were figured as receipts, while decreases in the inventories were computed as expenses. For instance, if the value of all livestock is greater at the end of the year than at the beginning, the amount is added to the livestock receipts and appears in that column. The same is true for the inventory of feed crops or cash crops on hand.

In connection with the study of the distribution of receipts, it is interesting to note the division of the total receipts between livestock and crops.

It will be noticed that approximately 50 percent of the farm receipts of the owners came from crops and about 45 percent from livestock, the balance from miscellaneous sources.

TABLE 8.—DISTRIBUTION OF FARM RECEIPTS.

Owners

Year	Total receipts	Percent from Crops	Livestock	Misc.
1921	$3,582	50	46	4
1922	3,297	42	50	8
1923	2,917	35	54	11
1924	4,593	52	45	3
1925	4,396	58	39	3
5-yr. av.	3,757	49	46	5

Owners additional

1921	3,366	52	44	4
1922	3,324	63	27	10
1923	2,292	78	18	4
1924	4,530	76	22	2
1925	4,201	62	36	2
5-yr. av.	3,543	66	30	4

Tenants

1921	3,410	70	29	1
1922	4,767	79	19	2
1923	2,828	67	27	6
1924	3,653	66	31	3
1925	3,302	62	34	4
5-yr. av.	3,592	70	27	3

The owners additional, however, received two-thirds of their receipts from crops, 30 percent from livestock and 4 percent from miscellaneous. On the other hand, the tenants got 70 percent of their receipts from crops and only 27 percent from the sale of livestock and livestock products.

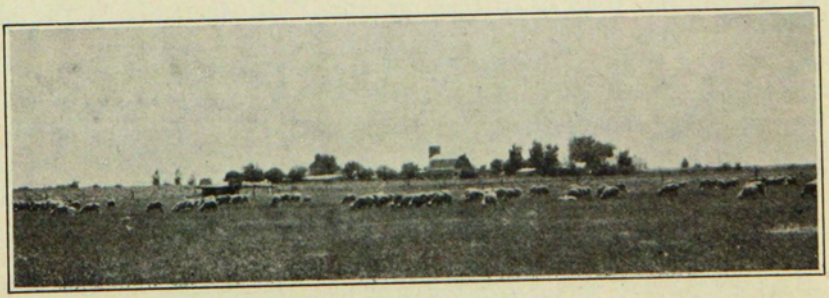

Figure 8.—The establishment of farm flocks of sheep is increasing on the general farm in Otero County.

Additional land rented by the owner was evidently devoted to cash crops and feed crops since some increase in the number of livestock on the farm was noticed. A larger percentage was also received from crops. The figures for the tenants indicated that less attention was paid to livestock and more attention devoted to cash crops.

This checks up with the general observation of tenant farms and owner farms in many sections.

Farm Expenses

Much has been said concerning farm expenses during this period of agricultural adjustment. Economy on the farm has been emphasized as one of the necessities if farming is to be profitable. Economy on the farm also necessitates a very close scrutiny of the expenditure of the farm income. The first thing to do is to find out what constitutes these expenses. Table 9 gives an itemized list of the current expenses incurred in connection with the operation of these farms.

The average total expenses for the five years ranged from $1,912 for the owners additional to $2,205 for the owners. The tenants came between these two figures, $2,116.

A closer examination of the table shows some items that stand out on account of their being so much greater than others. Labor, feed and taxes occur in this list.

In the owner group 27 percent of the current expenses was paid for labor, 36 percent of the current expenses was paid for labor by the owners additional, while 51 percent of the expenses of the tenants was paid for labor.

Grain, hay and pasture is the next largest group and represents the amount expended for feed. Twenty-eight percent of the expense on owner farms went for purchased feed, 15 percent of the expense in the owners additional and 19 percent in the case of the tenants. These figures are of greater significance when it is remembered that the total current expenses of the tenants was almost as great as the owners, but the amount of livestock kept on the tenant farms was much less than in the case of the owners.

The next item of importance is taxes. This expense comprises 22 percent of the current expenses on the owner farms, 20 percent in the case of the owners additional and only about 1 percent for the tenants. The item of taxes, however, is more than offset by the value of the crop share given by the tenant to the land owner.

This division of the expenses has been made to emphasize the items that lend themselves to an economy program. Small items usually lend themselves less readily to reduction. Taxes are more

TABLE 9.—DISTRIBUTION OF CURRENT EXPENSES.

Owners

Year	No. of farms	Labor			Repairs		Feed		Pas. ture	Vet. H.shoe Br. fees	Seeds and plants	Sacks and twine	Thr- esh- ing	Fuel and oil	Phone	Truck and auto	Mach. work hired	In- sur- ance	Taxes	Misc.	Total
		Month day	Con- tract	Board	Mach.	Bldg. fence	Hay	Grain													
1921	18	$341	$175	$50	$51	$32	$64	$373	$22	$51	$74	$21	$48	$46	$11	$113	$69	$33	$534	$29	$2137
1922	17	380	86	34	36	30	184	431	20	54	60	28	32	11	14	180	37	20	438	170	2245
1923	26	279	95	45	20	23	64	544	20	36	55	50	22	18	16	122	3	39	470	40	1961
1924	23	326	257	40	37	9	98	623	29	36	58	9	23	16	16	110	3	24	474	114	2302
1925	16	431	254	30	48	17	54	496	31	16	83	76	37	18	16	125	5	18	469	156	2380
5-yr. av.		352	173	40	38	22	93	493	24	39	66	37	32	22	15	130	23	27	477	102	2205

Owners Additional

1921	5	238	174	58	45	33	102	107	7	34	55	9	39	46	7	94	67	27	282	78	1502
1922	6	227	269	52	62	18	29	136	23	20	72	109	28	13	12	129	19	26	332	90	1656
1923	11	223	193	33	37	8	40	139	15	33	65	16	21	17	17	162	1	38	535	118	1711
1924	10	473	276	59	47	40	108	136	10	15	93	33	25	11	15	152	1	50	358	65	1967
1925	13	469	500	83	67	19	239	311	73	21	109	27	31	9	14	140	2	21	373	216	2724
5-yr. av.		326	282	57	49	24	104	166	26	25	79	39	29	19	13	135	18	32	376	113	1912

Tenants

1921	2	1075	581	....	57	....	32	115	77	37	149	9	82	23	12	71	88	14	30	6	2458
1922	2	703	686	20	116	15	105	315	40	30	175	235	73	50	13	144	29	139	37	....	2925
1923	5	341	333	40	14	....	44	299	18	15	66	19	42	15	13	114	5	18	23	....	1419
1924	8	496	342	32	79	6	146	294	31	16	51	9	43	14	18	104	2	53	22	220	1978
1925	11	350	258	58	39	3	206	238	5	20	56	32	35	12	18	114	....	45	17	294	1800
5-yr. av.		593	440	30	61	5	106	252	34	24	99	61	55	23	15	109	25	54	26	104	2116

or less out of the question for immediate relief. Reductions in taxes are seldom made and in the majority of cases are being raised as improvements are made in the county.

Labor can be economized in a number of cases thru more efficient methods of production and better equipment such as better horses and labor-saving machinery. This must be given careful consideration before any change is made. In some cases an increase in the labor bill has been the means of increasing the product per acre as in the case of some of the cash crops such as truck crops. Labor efficiency, however, that is cutting down the number of hours it takes to do a certain operation or increasing the number of hours worked per man and horse, has some possibilities in the county.

Figure 9.—Some farmers are looking ahead to the time when their work stock must be replaced. Those who are not raising colts will have to purchase them.

The large feed bill in a number of cases can be reduced materially. It frequently happens that a man will under estimate at harvest time his feed requirements for the year. He sells short of alfalfa and finds it necessary to buy back a considerable quantity in the spring to see him thru. The price of this alfalfa is also much higher than what he received for his hay when he sold it. Then too, it frequently happens that some feed crops are sold and bought back in another form at a very much higher price. A feed grinder in some cases would pay for itself in a very short time.

Sufficient feed crops to take care of the livestock on the farm is usually a good plan to follow, especially on the larger farms with relatively low capitalization.

The importance of small items of expense are not minimized by the foregoing statements. Better care of machinery not only cuts down the repair bill, but at the same time reduces depreciation. An increase in the insurance, especially that which covers hail damages, has been the means of averting an almost total loss. However, the excessively high rates for hail insurance at the present time make this procedure questionable. Most farmers are receiving hail protection by including in their cropping systems some crops that no not suffer so much from hail or that make a rapid recovery from hail injury.

From $109 to $135 per year on the average was figured for truck and auto expense. This covers only the expense that can be charged against the farm business. It would be extremely difficult for many farmers to farm without these essential equipments.

Personal and household expenses were not included in the farm expenses. These are items that occur regardless of one's vocation. From a strictly business standpoint they cannot be charged to the farm business. Items that come under this heading are food, clothing, education, etc. Only a part of the auto and telephone expense is figured since these are used for personal purposes as well as for business. Farm papers and farm organization memberships, however, are figured as farm expenses.

Capital Investment

The invested capital in the farm business varies considerably, not only from farm to farm, but also between the three groups. The owners on the average had a capitalization of $19,747 per farm. The owners additional had $15,410 invested and the tenants only $2,496 per farm. Table 10 shows the total capital invested and the distribution of this capital in the farm business.

The investment in working capital, which includes livestock, machinery, feed and supplies and cash to run the farm, amounts to about 20 percent of the total capital for the owners and owners additional. All of the capital investment on the tenant farms comes in this same classification.

An analysis of the working capital, however, shows very little variation in the distribution when measured in percentage. However, it will be seen that the working capital of the owners is $3,809 per farm; of the owners additional, $3,211 per farm; and of the tenants, only $2,496 per farm. In other words, the owners had 50 percent more invested in livestock than did the tenants and 20 cent more than the owners additional. This comparison further emphasizes the fact that the additional land rented by the owners additional was mostly devoted to cash crops with approximately the

TABLE 10.—DISTRIBUTION OF OPERATOR'S CAPITAL.

Owners

Year	No. of farms	Dwellings	Other buildings	Land	Total real estate	Livestock	Machinery	Feed and supplies	Cash to run farm	Working capital	Total capital
1921	18	$2,267	$1,242	$14,434	$17,943	$2,347	$1,331	$273	$693	$4,644	$22,587
1922	17	2,422	1,303	14,536	18,261	2,644	1,288	244	733	4,909	23,170
1923	26	1,970	1,050	10,574	13,594	1,660	697	164	624	3,145	16,739
1924	23	2,152	1,099	11,583	14,834	1,477	674	157	754	3,062	17,896
1925	16	2,546	1,018	11,494	15,058	1,563	581	349	793	3,286	18,344
5-yr. av.	20	2,271	1,143	12,524	15,938	1,938	914	237	720	3,809	19,747

Owners Additional

1921	5	2,660	620	7,020	10,300	1,853	718	114	550	3,235	13,535
1922	6	2,456	569	7,808	10,833	1,988	628	104	684	3,404	14,237
1923	11	3,019	667	11,177	14,863	1,606	764	176	557	3,163	18,026
1924	10	2,515	798	10,627	13,940	1,142	644	151	656	2,593	16,533
1925	13	1,423	707	8,928	11,058	1,152	1,409	191	908	3,660	14,718
5-yr. av.	9	2,415	672	9,112	12,199	1,560	833	147	671	3,211	15,410

Tenants

1921	2					1,621	360	69	512	2,562	2,562
1922	2					1,848	639	61	973	3,521	3,521
1923	5					1,041	304	45	579	1,969	1,969
1924	8					1,059	349	124	659	2,191	2,191
1925	11					1,054	376	208	600	2,238	2,238
5-yr. av.	6					1,324	406	101	665	2,496	2,496

same amount invested in livestock. It also explains in a measure why the tenants produced a larger acreage of cash crops per farm than did either of the other classes.

The first two groups evidently had better equipment than did the tenants since the tenants devoted only 16 percent to equipment while the other groups had 25 percent of their working capital in farm machinery.

Capitalization of land is an important problem in the county. Some land carries a very high valuation in the records. While the small farms usually carry the highest valuation per acre, some large farms have changed hands at relatively high figures and must pay on a heavy indebtedness. Also, most small farms are devoted to the production of highly specialized crops that bring a high gross return per acre. In some cases, however, an attempt is being made to produce the staple crops on small farms with a high capitalization. The result is just what should be expected. The gross returns from the staple crops is not large enough to carry this high capitalization. Large-scale production as a means of reducing costs per unit is not possible on the small farms. Consequently a different choice of crops will be necessary to pay out.

Crop Rotations

Crop rotations have played a very important part on some farms in this study. Other farms have been conspicuous for the lack of any definite cropping system.

Good crop rotations are not common in the county. Cropping systems have varied from year to year due to such influences as prices, costs of production and certain plans that have been incorporated in the farm organization.

However, certain general principles underlie crop rotations and result in a number of direct benefits to the farmer. These have been listed by Van Slike in "Fertilizers and Crops" as follows:

1. Rotation changes location of feeding range of plants;
2. Changes the demand for individual plant-food constituents;
3. Makes most advantageous use of remains of preceding crop;
4. Provides economical supplies of nitrogen;
5. Maintains supply of organic matter in soil;
6. Keeps soil in good physical condition;
7. Provides advantageous means of utilizing both farm manure and commercial plant-food;

8. Keeps the soil advantageously occupied with crops most of the time;
9. Prevents or reduces injury caused by poisonous substances in soils;
10. Aids in controlling injuries done by insects, weeds and fungi;
11. Prevents mixing of varieties, thus keeping the seed pure;
12. Often saves labor;
13. Systematizes farming.

Systems that will accomplish the results set forth in the foregoing list are to be recommended. Sometimes, however, it is not practical to follow a set system without some slight variations. Take the case where an unusually good contract can be entered into for the production of such crops as beets, tomatoes, cucumber and canteloupe seed. Who would not favor these crops to some extent if they did not materially interfere with the soil fertility or the plans of operating the farm? Just so long as the returns to the farmer are greater over a period of years, he is justified in making these fluctuations in his cropping plans. It is only the natural thing to do under the circumstances.

SOME FACTORS THAT DETERMINE THE SUCCESS OF FARMING ON IRRIGATED FARMS IN OTERO COUNTY

It cannot be denied that the human factor is the most important in the success of farming. However, this does not always mean ability on the part of the farmers to do those things which mean success on the farm.

It frequently happens that one is unwilling, for one reason or another, to follow good farming methods. The farms which are discussed in this section are not operated by exceptional farmers, but they are run by men who are willing to profit by the experience of other farmers and to take helpful suggestions in the operation of their farm business.

There are a number of other factors that are responsible for the success or failure of farming that are more or less under the control of the individual farmer. Three that seem to figure prominently in this area are, first, size of business; second, quality of business; and third, efficiency of operation. The last two can be considered as means of increasing the size of the business.

Size of Business

Size of business is not always determined by the area of the farm. Some small farms do more business than large farms. This

fact remains, however, that if the gross returns are $600 or less, there will be little left, after expenses are paid, to compensate the operator for his labor and his managerial ability in running the farm.

There are several ways of increasing the volume of business. One can increase the acreage and produce a greater volume of farm products. A farmer can increase his volume by increasing the quality of his business. This is brought about by practicing methods that will return a greater yield per acre or per animal, as the case may be, without increasing his acreage. Or he can increase his size of business by arranging his farm plans and cropping system to make more efficient use of his labor and equipment. This is brought about by providing a well-balanced cropping system and including some livestock that will furnish profitable employment during the winter months. Farm 1 illustrates all three of these factors.

This operator in 1921 operated 60 acres of land of which he was the owner. In 1922 it was possible for him to rent 20 acres more not far from his own land. By so doing he was able to increase his gross returns and thereby increase the size of his business.

The quality of business is shown by the yields produced on this farm over a five-year period. (Table 11.)

TABLE 11.—CROP YIELDS ON FARM 1.

Crop	Years grown	Av. yield per acre
Corn	5	58 bu.
Wheat	2	33 bu.
Alfalfa	5	4.9 tons
Cantaloupes (seed)	2	377 lbs.
Sugar beets	5	16 tons.
Cucumber seed	4	366 lbs.

TABLE 12.—SOURCES OF RECEIPTS AND LABOR INCOME, FARM 1.

Year	Farm area	Total capital	Receipts			Expenses	Farm income	Labor income
			Crop	Livestock	Total			
1921	60	$14,719	$2,996	$845	$3,841	$1,893	$1,948	$1,065
1922	80	14,714	3,106	1,054	4,160	2,053	2,107	1,224
1923	80	14,907	3,173	981	4,154	2,376	1,778	884
1924	80	14,571	3,908	894	4,802	1,912	2,890	2,016
1925	80	14,541	3,559	1,376	4,935	2,256	2,679	1,807
Av.	76	14,690	3,348	1,030	4,378	2,098	2,280	1,399

Table 12 shows that his organization allows for some returns from livestock and crops, the presence of livestock allowing him to employ his own labor efficiently on his farm.

TABLE 13.—OPERATOR'S RETURN ON INVESTMENT, FARM 1.

Year	Farm income	Value operator's labor	Difference	Total Capital	Percent return on investment
1921	$1,948	$600	$1,348	$14,719	9.15
1922	2,107	600	1,507	14,714	10.2
1923	1,778	600	1,178	14,907	7.90
1924	2,890	600	2,290	14,571	15.7
1925	2,679	600	2,079	14,541	14.3
Av.	2,268	600	1,680	14,690	11.44

Table 13 shows that if the operator allows himself $600 per year for his own manual labor on the farm, there is left enough to pay an average of 11.44 percent on his total invested capital.

TABLE 14.—DISTRIBUTION OF CROP AREA (ACRES), FARM 1.

Year	Farm area	Crop area	Corn	Other grain	Alfalfa	Sugar beets	Cantaloupes	Cucumbers	Wheat	Oats	Cowpeas	Miscellaneous
1921	60	53.5	5	8	9.5	14	7	10	....	....	....	....
1922	80	70.5	5	4.5	17	19	22	....	3	....	....	....
1923	80	71.5	5	....	14	24	....	19	....	5	4	.5
1924	80	75.5	2	....	19	19	....	19	....	5	10	1.5
1925	80	77.0	4	....	13	21	....	18	9.5	5	....	6.5
Av.	76	69.6	4.2	2.5	14.5	19.4	5.8	13.2	2.5	2	4	2.9

The last column shows what he received for his own labor and management, after paying all cash expenses and allowing for interest on his total investment, depreciation on his equipment and pay for the work contributed by the farm family. In addition there was an average over the five-year period of $413 worth of food which the farm furnished towards the family living.

His well-planned cropping system is shown in table 14. Altho there is some fluctuation from year to year the acreage of corn, alfalfa, sugar beets, and vine crops is fairly constant over the five-year period. The fluctuation in crops occurs on a relatively small proportion of his crop area.

Outside Labor

Some men are able to increase their efficiency on the farm by utilizing their teams, equipment and labor off the farm when the farm work is not so urgent. Table 15 shows where this plan has

been followed for the entire period. Thru this plan it was possible for this operator to make an average labor income of $800 over the five-year yeriod. In addition, this farm contributed $385 worth of food for the family living.

TABLE 15.—SOURCES OF RECEIPTS AND LABOR INCOME, FARM 2.

Year	Farm area	Total capital	Receipts				Expenses	Farm income	Labor income (6% on investment) deducted
			Crops	Livestock	Misc.	Total			
1921	75	$11,021	$ 335	$ 917	$1,500	$2,752	$1,279	$1,473	$ 806
1922	75	11,310	124	2,064	1,425	3,613	2,409	1,204	525
1923	75	10,845	166	1,172	1,565	2,903	2,608	295	—356
1924	75	10,154	1,527	1,445	1,457	4,429	2,516	1,913	1,304
1925	155	14,125	5,903	834	163	6,900	4,333	2,567	1,719
Av.	91	11,491	1,612	1,287	1,225	4,119	2,629	1,490	800

Figure 10.—Keeping good horses is just as essential as hiring a good man to work on the farm.

It will be seen that if it had not been for this outside source of income there would not have been enough money during the first three years to pay him a wage and leave anything for the use of his investment.

In 1925 a slight change was made. Instead of doing so much outside work during the year an additional acreage was added to the farm so that the returns were large enough to accomplish a result similar to that under the former plan. After deducting expenses, both cash and computed, including his own labor, this op-

erator was able to make an average of 7.74 percent on his invested capital. (Table 16).

TABLE 16.—OPERATOR'S RETURN ON INVESTMENT, FARM 2.

Year	Farm income	Value operator's labor	Difference	Total capital	Percent return on investment
1921	$1,473	$600	$ 873	$11,021	7.92
1922	1,204	600	604	11,310	5.3
1923	295	600	—305	10,845	—2.81
1924	1,913	600	1,313	10,154	12.9
1925	2,567	600	1,967	14,125	13.92
Av.	1,490	600	890	11,491	7.74

Table 17 shows that this man's cropping system has not been stabilized to the extent to which the system on Farm 1 has been worked out.

TABLE 17.—DISTRIBUTION OF CROP AREA, FARM 2.

Year	Farm area	Corn	Crop area	Oats	Wheat	Other grain	Alfalfa	Beets	Cucumbers	Cantaloupes	Miscellaneous
1921	75	25	49	....	....	12	12	....	....	....	....
1922	75	25	50.5	....	8	12	12	....	....	....	2.5[1]
1923	75	18	47	10	....	8	10	....	....	....	1
1924	75	2	48	8	4	....	26	7	....	....	1
1925	155	....	79.5	....	....	....	27	14	28	9.5	1
Av.	91	14	56.6	3.6	2.4	4.8	17.4	4.2	5.6	1.9	1

[1]Cane, 2.5 acres.

Land Values vs. Cropping Systems

As the value of land increases, the size of business must be increased if interest on the investment is paid out of the products of the farm. This is also true of small farms whose total returns must provide a living for the farm family.

In the vicinity of Rocky Ford, Manzanola, Fowler and La Junta, there are many small tracts of land upon which an attempt is being made to carry on farming. Usually these farms carry a high valuation on account of the short distance from town or for other reasons. Some of these farmers are growing the so-called staple crops such as corn, alfalfa, grains, etc., while others are growing truck crops and seed crops or carrying a combination of these with some livestock.

Table 18 shows a small farm of the former type. This farm contains 21 acres and carries a total investment in land, equipment and livestock of $9,165.

TABLE 18.—SOURCES OF RECEIPTS AND LABOR INCOME, FARM 3.

Year	Farm area	Total capital	Receipts				Expenses	Farm income	Labor income (6% on investment) deducted
			Crops	Livestock	Misc.	Total			
1921	21	$8,922	$750	$ 29	$ 60	$ 839	$361	$478	$—.57
1922	21	8,961	416	442	60	918	478	440	—98
1923	21	9,219	557	523	30	1,110	618	492	—61
1924	21	9,302	665	617	65	1,347	645	702	144
1925	21	9,421	503	925	117	1,545	704	841	276
Av.	21	9,165	578	507	67	1,152	561	591	41

It will be noticed that the average labor income on this farm over the five years was only $41, and that the volume of business on this farm is represented by the gross returns of only $1,152 per year.

After subtracting a $600 wage for the operator from the farm income, there were only two years when anything was left for the use of the invested capital (2.56 percent in 1921 and 1.10 percent in 1925.) The average interest returned on the investment was a minus .15 percent. That is to say that this operator received nothing for the use of his capital when a wage was subtracted for his own work. (Table 19).

TABLE 19.—OPERATOR'S RETURN ON INVESTMENT, FARM 3.

Year	Farm income	Value operator's labor	Difference	Total capital	Percent return on investment
1921	$841	$600	$241	$9,421	2.56
1922	471	600	—129	8,922	—1.44
1923	440	600	—160	8,961	—1.78
1924	492	600	—108	9,219	—1.17
1925	702	600	102	9,302	1.10
Av.	589	600	—11	9,165	—.15

The cropping system for the most part has been corn, alfalfa, beets and grain, with a cherry orchard of four acres the first year. On account of unfavorable conditions for the production of cherries it was necessary to pull the orchard and plant the land to other crops. (Table 20.)

TABLE 20.—DISTRIBUTION OF CROP AREA (ACRES), FARM 3.

Year	Farm area	Crop area	Corn	Alfalfa	Beets	Seed cucumbers	Seed cantaloupes	Small grain	Misc.
1921	21	20	....	6	5	5	....	....	4[1]
1922	21	18	4	6	....	5	2	....	1
1923	21	18	4	6	4	....	....	4	....
1924	21	18	7	3	4	....	....	4	....
1925	21	18	8	3	3	....	....	4	....
Av.	21	18.4	4.6	4.8	3.2	2	.4	2.4	1

[1]Cherries, 4 acres.

The low return on this farm is not to be wondered at. It requires just as much equipment and as many horses to take care of three acres of alfalfa as to care for fifteen acres. This is also true of corn and most of the other staple crops that are produced in the region. Furthermore, the same supervision required on this small farm could handle a much larger crop area.

However, there is a solution for this. It is evident that the size of the business must be increased. Additional land with a correspondingly high capitalization will not solve the problem as long as staple crops are produced. It is necessary, therefore, to make such readjustments as will return a greater gross income.

In order to do this a different selection of crops must be made. By the substitution of some truck crops which give a higher gross return per acre it will be possible to increase the volume of business. It is true that more hours of work will be necessary. It is also true that the operator's labor can be more fully employed thru the use of such a cropping system. Crops such as tomatoes, celery,

Figure 11.—Tomatoes do well on irrigated farms in Otero County.

onions and possibly some seed crops where a satisfactory yield can be obtained should be given consideration.

Location Plays a Part

Some farms are not so favorably situated as others in the county. Some have a good water supply thruout the year while others are not so sure of an adequate supply when the crop is planted.

Farm 4 is located in the Cheraw area and for four years, contained 80 acres. The fifth year 50 additional acres were rented. (Table 21). A fairly good balance has been maintained in the business, reflected thru the division of returns from livestock and crops. This has increased the efficiency of the operator. It will also be seen that on the average $161 has been received for work performed off the farm during the year. The average labor income over the five-year period was $604.

TABLE 21.—SOURCES OF RECEIPTS AND LABOR INCOME, FARM 4.

Year	Farm area	Total capital	Receipts				Expenses	Farm income	Labor income (6% on investment) deducted
			Crops	Livestock	Misc.	Total			
1921	80	$15,769	$1,251	$1,293	$ 75	$2,619	$2,028	$591	$—355
1922	80	15,865	931	2,660	100	3,691	1,336	2,355	1,403
1923	80	15,942	342	(1)	367	709	1,450	—741	—1,697
1924	80	14,909	2,752	1,259	100	4,111	1,652	2,459	1,564
1925	130	15,188	3,617	1,595	165	5,377	2,360	3,017	2,106
Av.	90	15,535	1,779	1,361	161	3,301	1,765	1,536	604

1 In 1923 the loss of 45 pigs was partly the cause for no livestock receipts. Then, too, the value of all livestock depreciated since 1922 to such an extent that the sale of livestock products was not sufficient to offset this loss.

After allowing a wage of $600 for the operator per year there was enough money to return him 6.02 percent on his investment. In addition, this farm furnished food for the family living to the value of $397 per year. (Table 22.)

TABLE 22.—OPERATOR'S RETURN ON INVESTMENT, FARM 4.

Year	Farm income	Value operator's labor	Difference	Total capital	Percent return on investment
1921	$ 591	$600	$ —9	$15,769	—.06
1922	2,355	600	1,755	15,865	11.1
1923	—741	600	—1,341	15,942	—8.41
1924	2,459	600	1,859	14,909	12.4
1925	3,017	600	2,417	15,188	15.91
Av.	1,536	600	936	15,535	6.02

Corn was grown every year, alfalfa every year and beets four years out of five. Wheat, oats, cantaloupes, cucumbers and beans were grown intermittently. Here again, however, when these changes were made, a comparatively small acreage was devoted to these crops, so that there was a definite plan more or less running thru the cropping system. (Table 23).

TABLE 23.—DISTRIBUTION OF CROP AREA (ACRES), FARM 4.

Year	Farm area	Crop area	Corn	Wheat	Oats	Other grain	Alfalfa	Beets	Beans	Cantaloupes	Cucumbers
1921	80	68	12	11	....	10	24	11	....	....	....
1922	80	58	18	....	....	....	27	9	....	....	4
1923	80	58	14	....	....	....	22	....	22	....	....
1924	80	62	12	3	....	....	22	17	....	....	8
1925	130	104	18	....	6	....	31	27	8	4	10
Av.	90	70	14.8	2.8	1.2	2	25.2	12.8	6	.8	4.4

While there are good years and poor years, due to the water situation principally, this system over a period of five years has been a good one to follow.

Crop Farming

Some men are particularly adapted to the production of farm crops and do not "take to" livestock so readily. These men, thru a system of crop rotation, have been able to maintain soil fertility fairly well and over a period of years have paid themselves wages and have earned something for their investment.

TABLE 24.—SOURCES OF RECEIPTS AND LABOR INCOME, FARM 5.

Year	Farm area	Total capital	Receipts				Expenses	Farm income	Labor income (6% on investment) deducted
			Crops	Livestock	Misc.	Total			
1921	108	$20,323	$3,050	$213	....	$3,263	$2,833	$430	$—789
1922	108	20,006	3,073	267	....	3,340	2,475	865	—335
1923	108	20,007	2,181	277	52	2,510	2,700	—190	—1,390
1924	108	19,664	4,191	604	....	4,795	2,515	2,280	1,100
1925	108	19,777	4,601	345	....	4,946	3,337	1,609	422
Av.	108	19,955	3,419	341	11	3,772	2,772	999	—198

Farm 5 comprises 108 acres and is located in the Manzanola district. Table 24 indicates that very little livestock is kept, only $341 per year coming from livestock and $3,419 from crops. In 1923

the operator had a labor income of $—1,390. This was a very wet year when crop yields were very low. In 1924 and 1925 the results were much better due to the larger yields and better prices. For the five-year period, after 6 percent interest has been deducted on his investment, he lacked $198 of having anything for his own work.

TABLE 25.—OPERATOR'S RETURN ON INVESTMENT, Farm 5.

Year	Farm income	Value operator's labor	Difference	Total capital	Percent return on investment
1921	$ 430	$600	$—170	$20,323	—.83
1922	865	600	265	20,006	1.3
1923	—190	600	—790	20,007	—3.95
1924	2,280	600	1,680	19,664	8.5
1925	1,609	600	1,009	19,777	5.10
Av.	999	600	399	19,955	1.99

Table 25 shows that when wages of $600 per year have been deducted from the farm income, there is enough left to give the operator 1.99 percent on his investment.

TABLE 26.—DISTRIBUTION OF CROP AREA (ACRES), Farm 5.

Year	Farm area	Crop area	Corn	Wheat	Oats	Other grain	Alfalfa	Cantaloupes	Beans	Beets	Cucumbers	Miscellaneous
1921	108	91	4	28	....	....	40	4	....	....	15	....
1922	108	97.5	8	15	....	3	40	....	....	14	17.5	....
1923	108	97.5	9	15	1.5	3.5	40	....	3	10	14	1.5
1924	108	103	14	5	10	....	40	....	....	14	18	2
1925	108	98.5	8	5	14	....	35	....	....	10.5	20	6
Av.	108	97.5	8.6	13.6	5.1	1.3	31	.8	.6	9.7	16.9	1.9

Table 26 gives his cropping system. The acreage in beets, cucumbers and alfalfa is fairly constant. Other crops, however, are subject to considerable fluctuation. Under such conditions it is difficult to maintain a good rotation on the farm.

Furthermore, when there is hail, and there were several such storms during this period, the damage to the crops cannot be offset to any great extent by the sale of livestock products. There would no doubt be less risk in the farm business if more livestock could be kept to furnish manure for the crops and provide other sources of income.

SUMMARY

Some farmers on irrigated land in Otero County from 1921 to 1925 have found farming profitable. After paying the farm expenses

and allowing $600 per year for the operator, the owners in this survey made 2.2 percent on their investment; those who farmed their own land and rented some in addition made 3.66 percent on the investment while the tenants realized 23.4 percent on their invested capital. This invested capital averaged $19,747 for the owners, $15,410 for the owners additional and $2,496 for the tenants. Over and above these returns the farms provided a considerable quantity of food for family use.

On the average, there was little difference between the value of food furnished by the farm to the farm family, the owners getting food to the value of $310; the owners additional, $332; and the tenants, $289 per year.

The owners farmed an average of 92.8 acres; the owners additional, 119.3 acres; and the tenants, 121.47 acres over the five-year period.

The amount of livestock kept by the three groups varied to some extent. The owners had an average of 23.4 animal units; the owners additional, 30.8 animal units; while the tenants carried only 18.8 animal units per farm.

This condition is further reflected by the division of receipts for the three groups. The owners received 50 percent of their returns from crops and 45 percent from livestock and livestock products; the owners additional, 66 percent from crops and 30 percent from livestock; the tenants, 70 percent from crops and only 27 percent from livestock.

The additional land rented by the owners not only provided more cash crops but added some feed since more livestock was kept by this group and a larger percentage of the returns was from crops than for the owners. It was possible to do this without much increase in equipment and any increase in land investment. The tenants produced a high percentage of their crops for sale, as is evidenced by the small percentage of returns received from livestock and livestock products.

The type of farming is also indicated by the expense for hired labor. Twenty-seven percent of the owners' expenses is represented by labor; for the owners additional, 36 percent; while the tenant paid out 50 percent of his expenses for hired labor. Twenty-two percent of the owners' expenses went for taxes; 20 percent of the owners additional; and only 1 percent of the tenants' farm expenses.

The number of acres in the farm does not necessarily indicate

the size of the farm business. Many small farms give a greater gross return per acre than do some large farms.

Where farms are small and carry a high value per acre, truck crops or other crops that bring in more money per acre must be included in the cropping system if farming is to be profitable.

Some men utilize their own time and their horses and equipment during the slack period on the farm by doing some outside work.

Farms that are paying the highest rate of interest on the invested capital are those that have a well-worked-out cropping system and include enough livestock to utilize feed crops, to furnish barnyard manure for the crops and to provide profitable employment during the winter months.