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DRAINAGE AND IRRIGATION, SOIL, ECONOMIC, AND SOCIAL CONDITIONS, DELTA AREA, UTAH

DIVISION 3

Economic Conditions

W. PRESTON THOMAS and GEORGE T. BLANCH

Utah Agricultural Experiment Station

UTAH STATE AGRICULTURAL COLLEGE

Logan, Utah

FOREWORD

Project 90—A Study of Factors Influencing the Financial Condition of Certain Utah Irrigation and Drainage Projects—was undertaken in 1928 as an intensified study of local areas. This study was divided among four departments, with a project leader for each particular phase of the study. These four project leaders, guided by the Station Director, have constituted a committee in immediate charge of this project. Subprojects and their respective leaders have been: A—Engineering and Engineering Economic Aspects, O. W. Israelsen; B—Soil Productivity Aspects, D. S. Jennings; C—Contributing Sociological Aspects, J. A. Geddes; and D—Economic Aspects, W. Preston Thomas.

The Delta Area was chosen as the first locality to be brought under study. The findings and conclusions of this investigation have been or will be published under the general title: "Drainage and Irrigation, Soil, Economic, and Social Conditions, Delta Area, Utah," with the following divisions, each as a separate Station bulletin:

Division 1—Drainage and Irrigation Conditions (Utah Station Bulletin 255)

Division 2—Soil Conditions (Utah Station Bulletin 256)

Division 3—Economic Conditions (Utah Station Bulletin 273)

Division 4—Social Conditions (Not printed)

Bulletin 273 (Division 3—Economic Conditions), the third of this series of four publications, includes a study of the economic phases of the situation in the Delta Area, Millard County. The work of the Agricultural Economics Division on this study has been closely correlated with the other three divisions, both in the collection of data and in analysis of results.

DRAINAGE AND IRRIGATION, SOIL, ECONOMIC, AND SOCIAL CONDITIONS, DELTA AREA, UTAH

DIVISION 3: ECONOMIC CONDITIONS[1]

W. PRESTON THOMAS and GEORGE T. BLANCH[2]

INTRODUCTION

Since 1921 the economic position of the farmers of the Delta Area in Millard County, Utah, has been unfavorable. In addition to the problem of low farm prices during this period, the Delta Area has experienced extreme water shortage, low crop yields (especially since 1925 for the major crop, alfalfa-seed), and excessive irrigation and drainage costs. These factors have made it impossible for many of the farmers to pay their farm expenses, support their families, and make payments on their indebtedness. Many landowners have not been able to make these payments; as a result, a considerable amount of the land in this area has changed from individual ownership to that of corporation, county, and state. The transfer of ownership to corporations and to the State of Utah has come about as a result of foreclosure of farm mortgages held by lending companies and by the State Land Board. Many farms have been entirely abandoned. This situation is a result of the cumulative effects of local problems, arising principally from soil conditions, water-supply, drainage, low crop yields, and because of the national adverse financial situation.

The Delta Area was settled by white people about 1860. It was not until 1901, however, as a result of the Carey Act, that new irrigation projects were constructed and a large part of the present cultivated area settled. The majority of those settling the Delta Area came from other parts of Utah. However, some few came from adjoining states and from the Middle West. The early settlers procured their land from the state at a low cost. In the main, water was purchased from private development companies which had constructed irrigation systems.

Even before this area was drained, the production of alfalfa-seed on some of these soils led to the belief that the major portion of the land within the

area would produce a good crop of alfalfa-seed, in spite of the high percentage of alkali salts contained in the soil. Many farmers settled on poor land because they were unfamiliar with the area and the problem of alkaline soils, with the result that after all their equity had been exhausted many of them were forced to abandon their farms.

The apparent high income from seed production and what was thought to be an ample supply of irrigation water during a cycle of years of high precipitation, resulted in an attempt to farm large areas of extremely poor land and in the expansion of the irrigated area beyond the normal water-supply. As a result of increased irrigation water used in the area and lack of natural drainage, a considerable portion of the land became waterlogged, with the alkali concentrated at the surface.

An organized movement began in 1909 for the drainage of the area; however, it was not until 1913 that an active drainage campaign was begun by local people and public agencies. This drainage program was carried on for a number of years, resulting in the organization, under state drainage laws, of four drainage districts, the total acreage included in these four drainage districts being 82,400 acres. Actual construction of the drainage systems was done mainly between 1916 and 1920.

During the war period both production and price of alfalfa-seed were favorable, which greatly stimulated interest in the production of this crop. The large returns resulting from high prices and high yields on certain pieces of land during certain years were followed by a rapid rise in land values. Speculators capitalized on this situation by selling lands to settlers at prices based on high yields and high prices for alfalfa-seed.

A large acreage of non-productive heavy clay soils was included in the drainage districts.[3] Such lands could not bear the drainage costs. The high cost of installation during a period of greatly inflated prices made excessive acre costs for the drainage systems. The payment of such high costs was extremely difficult after 1921, when farm prices dropped to a very low point, and especially after 1925 when alfalfa-seed production began to fail.

The final result has been that the farmers have been unable to pay drainage, irrigation, and other taxes; consequently, the four drainage districts have defaulted on their bonds. The irrigation companies have had financial difficulties. Many farmers have lost their farms either through mortgage foreclosure or through having their farms taken over by the county for payment of delinquent taxes.

The problems had become so acute in this area by 1927 that the Experiment Station was requested to make a study of the situation. Studies were begun in 1928 covering soils, irrigation and drainage, sociological conditions, and economic factors. The findings from the investigations on irrigation and drainage are reported in Station Bulletin 255; results from soils investigations are reported in Station Bulletin 256. (See footnote 3)

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[3] "Drainage and Irrigation, Soil, Economic, and Social Conditions, Delta Area, Utah":
Division 1—Drainage and Irrigation Conditions. By O. W. Israelsen. Utah Agr. Exp. Sta. Bul. 255. 70 pp. 1935.

"Drainage and Irrigation, Soil, Economic, and Social Conditions, Delta Area, Utah":
Division 2—Soil Conditions. By D. S. Jennings and J. Darrel Peterson. Utah Agr. Exp. Sta. Bul. 256. 68 pp. 1935.

PURPOSE OF THE ECONOMIC STUDY

The study of the economic phases of the situation in the Delta Area of Millard County was made in an effort to determine the ability of the farmers, under present conditions, to pay high taxes, indebtedness, and other farm expenses, in addition to supporting the farm family, as well as to study the situation with a view to recommending needed adjustments in farm organization and other economic factors affecting the area as a whole.

SOURCE OF DATA

The principal source of data was from farm-management records secured from farmers of this area for 1929, 1930, and 1931. These survey records were taken according to soil types by means of a random sample. Information on tax delinquency and bonded indebtedness was secured from Millard County records and from the findings of a committee representing the holders of the drainage district bonds. Price data were secured from local seed buyers and from the Division of Crop and Livestock Estimates of the Federal Bureau of Agricultural Economics. Supplementary data were secured from the Irrigation and Drainage and the Soils sections of this study.

ALFALFA-SEED PRODUCTION

Another factor affecting economic life in the Delta Area was the sudden decline in alfalfa-seed production following 1925. In 1925, Utah produced 441,600 bushels of alfalfa-seed, or 39.9 per cent of the total production in the United States (Table 1 and Figure 1).

From 1930 to 1934, inclusive, alfalfa-seed production for Utah ranged from 18,000 bushels in 1932 to 59,400 bushels in 1934. In 1925, Millard County

PERCENTAGE UTAH ALFALFA-SEED PRODUCTION IS OF TOTAL GROWN IN THE UNITED STATES
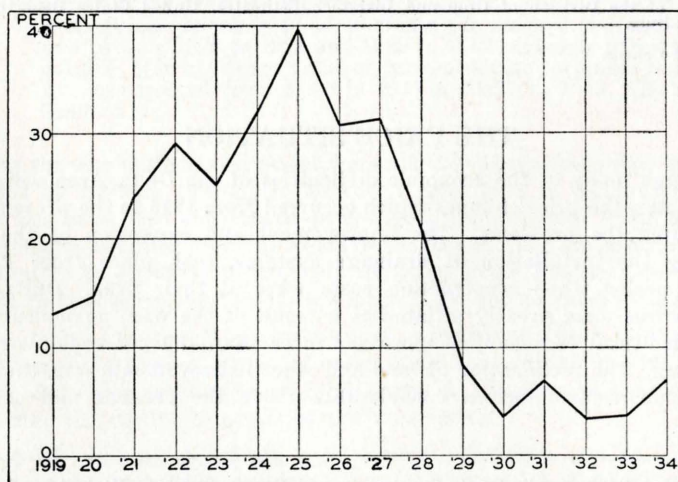

Figure 1. In 1925 Utah produced approximately 40 per cent of the alfalfa-seed grown in the United States. Since 1929 Utah has produced less than 10 per cent. (Data from Table 1.)

produced 294,000 bushels, or 66 per cent of the state's total.[4] Acre-yields in Utah declined from 6.4 bushels in 1925 (the peak year) to 1.5 bushels for the three-year period from 1929 to 1931, inclusive.

Table 1. Alfalfa-seed production, Utah and United States, 1919 to 1934, inclusive.[1]

Year	Utah		United States		Percentage Utah of United States	
	Acres Harvested	Bushels	Acres Harvested	Bushels	Acres Harvested	Bushels
	(Acres)	*(Bus.)*	*(Acres)*	*(Bus.)*	*Per cent*	*Per cent*
1919	13,000	59,000	......	450,000	...	13.1
1920	15,000	74,000	......	500,000	...	14.8
1921	28,000	140,000	......	583,000	...	24.0
1922	35,000	196,000	......	666,000	...	29.4
1923	45,000	212,000	......	833,000	...	25.5
1924	62,000	322,400	280,500	1,002,100	22.1	32.2
1925	69,000	441,600	294,100	1,107,500	23.5	39.9
1926	71,000	287,600	308,000	938,300	23.1	30.7
1927	72,000	265,000	236,900	851,400	30.4	31.1
1928	52,000	110,000	198,900	532,400	26.1	20.7
1929[2]	56,663	81,300	525,447	989,411	10.8	8.2
1930	35,000	42,000	440,900	1,165,600	7.9	3.6
1931	32,000	57,600	361,100	838,900	8.9	6.9
1932	15,000	18,000	301,400	595,300	5.0	3.0
1933	22,000	33,000	451,300	1,025,700	4.9	3.2
1934	27,000	59,400	392,000	820,700	6.9	7.2

[1]Estimates of the Division of Crop and Livestock Estimates, United States Department of Agriculture.

[2]Bureau of Census.

THE PRICE SITUATION

Although many of the economic difficulties of the Delta Area were local in character, the price changes which occurred from 1915 to the present have accentuated the problems. The improvement and expansion of the area, including the installation of drainage systems, took place from 1916 to 1920, a period when construction costs were at their peak. During this period prices were greatly inflated as a result of the war; agricultural and non-agricultural commodities increased more than 100 per cent above prewar prices. The reclamation of land and other improvements was, therefore, based upon a farm income considerably above the pre-war and post-war periods.

[4]"Alfalfa-seed Production." By J. W. Carlson and George Stewart. Utah Agr. Exp. Sta. Bul. 226. 54 pp. 1931.

"Alfalfa-seed Investigations in Utah." By J. W. Carlson. Utah Agr. Exp. Sta. Bul. 258. 48 pp. 1935.

The index of Utah farm prices for all commodities, based on 1910-1914 (equaling 100), increased rapidly from 1915 to May 1920, when the index stood at 253 (Figure 2). Within the year farm prices in Utah had dropped to pre-war level; from 1921 to 1929 there was a gradual improvement, the index ranging from 112 to 150 (Table 2). Following 1929 farm prices again dropped from an index of 150 to 59 in February 1933, since which time there has been a gradual improvement.

INDEX NUMBERS AND PURCHASING POWER OF UTAH FARM PRICES, 1910-35, INCLUSIVE

(1910-1914=100)
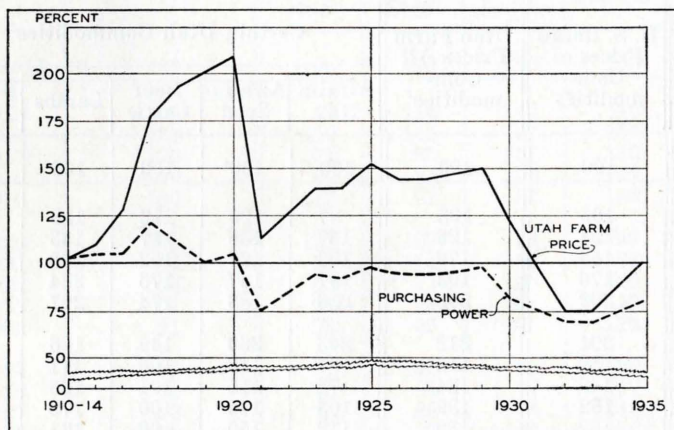
Figure 2. From 1915 to 1935, inclusive, prices paid producers in Utah for agricultural products fluctuated violently. The rapid increase in farm prices during 1917 to 1920 and the marked decrease for the two periods 1920 to 1921 and 1929 to 1932 seriously affected agriculture. The exchange value of farm products for goods bought by farmers ranged from $1.20 in 1917 to $0.67 in 1933. (Data from Table 3.)

During the war period farm prices were slightly above the prices of goods purchased by farmers (Table 3). However, from 1921 to the present time retail prices have been above farm prices, with the exchange value of Utah farm products ranging from 67 cents to 98 cents. The difference in exchange values of agricultural products for other goods has been one of the principal factors affecting agriculture since 1921, and especially since 1929.

In the main, the prices of agricultural products produced in the Delta Area followed the general prices of other farm commodities in Utah. However, the decreased production of alfalfa-seed in the area was much more serious than the decline in prices of this commodity.

One of the greatest handicaps confronting individuals and corporations is the contracting of debts at peak prices, the payment of which must be made when prices are low. The expansion and development of new areas usually takes place during periods of high prices. This was the case with

the Delta Area in that drains were laid and farms developed, including the irrigation systems, when prices were greatly inflated. Most of this development was done on borrowed money and the amount thus became fixed and definite. Although during the depression the exchange value of agricultural products may be 75 cents on the dollar for immediate purchase of goods, the value of agricultural products in payment of debts contracted when prices were high may range from 30 to 50 cents on the dollar.

Table 2. Index numbers of United States retail prices of commodities farmers buy and prices paid farmers in Utah, 1910-35, inclusive.

(1910-1914=100)

Year	U. S. Retail Prices of Commodities[1]	Utah Farm Prices All Commodities[2]	Certain Utah Commodities[2]				
			Alfalfa Hay	Alfalfa-Seed	Beef Cattle	Lambs	Butter-fat[3]
1910-1914	100	100	100	100[4]	100	100	100
1915	105	108	87	120	112	115	90
1916	124	125	137	138	117	133	95
1917	149	179	195	127	152	208	125
1918	176	193	157	147	176	224	146
1919	202	202	226	183	174	207	165
1920	201	212	243	260	149	186	186
1921	152	112	97	113	100	111	124
1922	149	124	78	115	101	163	111
1923	152	139	103	145	100	172	130
1924	152	139	119	150	106	171	141
1925	157	154	121	157	107	192	149
1926	155	143	96	131	119	182	146
1927	153	142	99	136	128	176	159
1928	155	148	120	144	159	183	159
1929	153	150	136	167	162	187	160
1930	145	121	99	144	136	126	123
1931	124	92	108	115	94	91	91
1932	107	73	99	81	73	68	66
1933	109	73	63	81	63	77	62
1934	123	89	140	115	64	90	76
1935	125	103	110	126	107	106	104

[1]"Agricultural Situation," January 1936. U. S. Bureau of Agricultural Economics.
[2]"Prices of Farm Products in Utah." Utah Agr. Exp. Sta. Bul. 217.
[3]Since 1925, quotations of Bureau of Agricultural Economics; previous to 1925, quotations adjusted on basis of butter prices to butterfat prices since that time.
[4]Base period for alfalfa-seed=1912-1914.

Payment of debts, whether public or private, under such conditions is the same as increasing the amount of debts. In other words, to pay off indebtedness requires the sale of approximately twice as much farm produce. The contracting of heavy indebtedness, both public and private, in the Delta Area, during a price inflation period was done with the expectancy of a continuation of high prices and improvement in crop yields as a result of

the installation of drainage systems. Conditions developed in reverse of those expected, in that prices fell and general crop yields did not improve, resulting in financial difficulties for both individuals and public agencies.

Table 3. Ratio of prices received by producers in Utah for farm commodities to United States retail prices of commodities purchased by farmers, 1910-35, inclusive.[1]

(1910-1914=100)

Year	All Utah Farm Commodities	Certain Utah Commodities				
		Alfalfa Hay	Alfalfa-Seed	Beef Cattle	Lambs	Butter-fat
1910-1914	100	100	100	100	100	100
1915	103	83	114	107	110	86
1916	101	110	111	94	107	77
1917	120	131	85	102	140	84
1918	110	89	84	100	127	83
1919	100	112	91	86	102	82
1920	105	121	129	74	93	93
1921	74	64	74	66	73	82
1922	83	52	77	68	109	74
1923	91	68	95	66	113	86
1924	91	78	99	70	112	93
1925	98	77	100	68	122	95
1926	92	62	85	77	117	94
1927	93	65	89	84	115	104
1928	95	77	93	103	118	103
1929	98	89	109	106	122	105
1930	83	68	99	94	87	85
1931	74	87	93	76	73	73
1932	68	93	76	68	64	62
1933	67	58	74	58	71	57
1934	72	114	93	52	73	62
1935	82	88	101	86	85	83

[1]See Table 2.

LAND OWNERSHIP

In the Delta Area 96,460 acres of land were listed in 1920 as belonging to individuals, corporations, cities, and Millard County. Of this acreage, 94,820 acres (98 per cent) was in private ownership, only 2 per cent being held by public agencies (Tables 4, 5).

In May 1936 there were 103,615 acres of land, the ownership of which was individual, city, county, and state (Figure 3). Of this, 42,605 acres (41 per cent) was privately owned and 61,010 acres (59 per cent) was held by public agencies. Through tax sales, Millard County has taken title to 55,025 acres, which represents 53 per cent of the total land in the area.

Table 4. Land in Delta Area, Millard County, Utah, classified according to private, county, state and city ownership, 1920 and 1936.[1]

Year	Acreages According to Ownership				
	Total	Private	County	State	City
	(Acres)	*(Acres)*	*(Acres)*	*(Acres)*	*(Acres)*
1920	96,460	94,820	. . . . .	. . . . .	1,640
1936	103,615	42,605	55,025	4,000	1,985
Change in Ownership from 1920 to 1936.	7,155	52,215	55,025	4,000	345
	Increase	Decrease	Increase	Increase	Increase

[1]Acreages, as shown, are included in the following townships (Salt Lake Base Meridian):
T. 15 S., R. 6, 7, 8 W.   T. 17 S., R. 6, 7, 8 W.
T. 16 S., R. 6, 7, 8 W.   T. 18 S., R. 6, 7, 8 W.

Table 5. Percentage of land owned privately and by public agencies, Delta Area, Millard County, Utah, 1920 and 1936.

Ownership	Year	
	1920	1936
	Per cent	*Per cent*
Privately owned	98	41
County owned	. .	53
State owned	. .	4
City owned	2	2

The change in ownership of land in the Delta Area from private to public ownership, principally county, has resulted from the heavy tax burden for special improvements, which has been beyond the ability of the land-owner to pay, as shown elsewhere in Bulletin 273. Low yields, together with low prices received from farm products since 1921 and especially since 1930, are also factors influencing the inability of individuals to retain ownership of their lands.

TAX DELINQUENCY

The large amount of tax delinquency in this area, which resulted in the county taking title to a large acreage of land, was the result of numerous fundamental local causes, which were aggravated by the depression during the period from 1930 to 1934. The laws of Utah provide that after taxes on property have been delinquent for four years, title to the property may be taken by the county. However, special legislation was enacted in 1932 and again in 1934 which extended the time that taxes may be delinquent before the county can take title to the property. As a result of this moratorium, the county did not, until May 1936, take title to property on which taxes had been delinquent since 1928.

The acreage of land held by Millard County shows considerable variation for different periods because of the policy of the county to sell its lands as quickly as possible in order to place them back on the tax rolls. The increase in state and corporate ownership is largely the result of inability of farmers to make payments on indebtedness and mortgage holders were forced to take over property to protect their interests.

Tax assessments on farm land and irrigation water, as reported by 85 farmers in the Delta Area for the year 1929, averaged $682 per farm, or $9.27 per acre (Table 6). These overhead charges were more than double the amount paid by 456 farm account cooperators who were operating irrigated farms in other parts of the state.

Table 6. Tax assessments on farm lands in Delta Area, Millard County, compared with those paid by farmers in other irrigated areas in Utah.

Item	Costs in Delta Area[1]		Costs in Other Irrigated Areas in Utah[2]	
	Per Farm	Per Acre[3]	Per Farm	Per Acre[3]
	(Dollars)	*(Dollars)*	*(Dollars)*	*(Dollars)*
Drainage taxes[4]	342	4.65	...	...
Irrigation taxes	111	1.51	70	1.31
State and county taxes........	155	2.11	161	3.01
Penalty and interest on unpaid taxes	74	1.00	...	...
Total taxes	682	9.27	231	4.32
Acres cultivated land	73.6	...	53.5	...

[1]As reported by 85 farmers for 1929.
[2]Based on 456 farm survey records and farm accounts kept in cooperation with Utah State Agricultural College, 1928-31, inclusive.
[3]Based on cultivated acreage per farm.
[4]A few of the farms were located outside of the drainage district.

The general county and state taxes were lower in the Delta section than in other areas where similar studies had been made. The excessively high taxes in the Delta Area are largely due to the drainage district assessment. In 1929 the average acre assessment for drainage purposes, based on cultivated land on the 85 farms surveyed, was $4.65.

If assessments levied by drainage districts on land included in the districts had been sufficient to pay annual charges for interest and sinking fund for bonded indebtedness, as well as operation and maintenance costs, the acre cost would have been $8.09.[5] This cost, added to the average cost of state and county taxes and interest on borrowed money (amounting to $4.97, as reported in farm expenses by 85 farms surveyed in the area for 1929), would have brought the total acre-cost to $13.06 for taxes and interest.

[5]"Drainage and Irrigation, Soil, Economic, and Social Conditions, Delta Area, Utah." Division 1—Drainage and Irrigation Conditions. Utah Agr. Exp. Sta. Bul. 255. By O. W. Israelsen. 70 pp. 1935.

COURT DECISIONS ON NON-PAYMENT OF GENERAL AND DRAINAGE TAXES[6]

Utah Supreme Court Decisions

Considerable litigation has resulted from refusal or failure of landowners to pay drainage taxes and general taxes levied on Delta Area lands. The decision of the Utah State Supreme Court in the case of Bessie A. Campbell v. Millard County Drainage District No. 3 (269 Pac. 1023), in which it was concluded that there is no "Blanket Lien Liability" in Utah drainage districts is reviewed briefly in Utah Station Bulletin 255 (page 47). (See Footnotes 3 and 5.)

A noteworthy District Court decision by Judge Cox in the case of Millard County and Parker Robinson v. Millard County Drainage Districts Nos. 1, 2, 3, and 4, et al. is also reviewed in Utah Station Bulletin 255 (pages 62 to 64). The District Court decided in this case that the sale of a certain 80-acre tract of land within Drainage District No. 4 to Millard County, because of the failure of its owner, George Q. Edwards, to pay the county, county school, state, and state school taxes for the year 1926, wiped out and extinguished the lien of all drainage bonds theretofore issued and sold by the defendant, Millard County Drainage District No. 4; also wiped out and extinguished all right of the defendant drainage district to levy and assess any drainage district taxes or assessments of every kind and nature, including drainage district maintenance taxes levied and assessed prior to the year 1926. Appeal was made to the Utah Supreme Court from the District Court decision in this case as well as from lower court decisions in several closely related cases. These cases, which were pending when Utah Station Bulletin 255 was published (1935) have since been decided.

On May 23, 1935, the Supreme Court of Utah rendered decisions in three cases concerning Delta Area taxation problems. These cases are: Hanson v. Burris et al. (45 Pac. 2d Series 400), Gardner v. Dobson et al. (46 Pac. 2d Series 422), and Millard County et al. v. Millard County Drainage District No. 1 et al. (46 Pac. 2d Series 423).

Henry Hanson purchased 80 acres of land situated in Millard County Drainage District No. 3 from the county after tax sale had been made due to failure in the payment of general taxes and after the period of redemption (4 years) had passed and tax deed issued. Hanson, as plaintiff, filed suit in the District Court, in which he prayed that title to the property be quieted in him. He joined as defendants all parties who appeared of record to have any interest in the issues, including the original owner, the mortgage holder, easement holders, judgment creditors, Millard County Drainage District No. 3, and certain bondholders.

The District Court decided in favor of Plaintiff Hanson, quieting title in him, and the defendants appealed to the Supreme Court of Utah, contending that parts of the drainage district law were unconstitutional. The crux of the suit revolved "around the impairment of the obligation of contract under the Federal Constitution" according to defendant appellants.

In the appeal to the Supreme Court both parties conceded that the lien which supports the bonded indebtedness is extinguished by the county tax

deed to the extent of the taxes that have been levied before the county takes title. The relation of the general tax lien to the drainage tax lien, and the significance of the concession stated in the preceding sentence, are described by the Supreme Court of Utah as follows:

"Appellants recognize, as it is apparent they must, that the case of Robinson v. Hanson, 75 Utah 30, 282 P. 782, 783, does decide that taxes for general governmental purposes, lawfully imposed by the state, are paramount to all other demands against the property to which the tax lien attaches. If one person claims title under a drainage deed and another under a deed based upon a general tax lien, the proceedings in both instances being regular, the former must yield to the latter.

"The parties to this cause agree that the lien which supports the bonded indebtedness is extinguished by the tax deed to the county to the extent of all drainage taxes that have been levied or assessed before the county takes title pursuant to sale for delinquent general taxes, and that a purchaser (not a redemptioner) from the county takes title from the county free and clear of all claims up to the time title is transferred from the county to the purchaser. This concession eliminates much from the discussion."

After showing that the situation confronting the court is not the ordinary one of a breach of contract between the parties to the contract, but that the failure of the land owner to pay his general taxes has set in motion procedure which affects governmental functions, the court further stresses the fact that general taxes are paramount by quoting from its decision in Robinson v. Hanson (282 Pac. 782) as follows:

" 'It is a recognized principle of law that taxes for general governmental purposes, lawfully imposed by the state, are paramount to all other demands against the taxpayer, although the statute imposing the tax does not expressly declare such priority. This rule rests upon public policy and necessity. Civil government cannot exist or be maintained without revenues, and taxes levied by the state for its support are founded upon a higher obligation than other demands. It is essential to the dignity and power of the sovereign state that taxes levied by it be promptly collected without fail.' Robinson v. Hanson, supra, and cases cited."

The necessary procedure on the part of the bondholders in order to protect their lien is stated by the court in the following language:

"Bondholders or others having liens who desire to protect them and prevent their being cut off must do so as any inferior lienholder: that is, pay the superior lienholder's claim. They may protect their security redeeming the land after sale at any time before the expiration of the period of redemption. The lien of the bondholders is of necessity extinguished when the county takes the title. The purchaser from the county (not a redemptioner) takes title free and clear of liens; otherwise, the county would be hampered in collection of taxes and prevented from again having the property returned to the assessment rolls."

The court refused to concur in the claim of the appellants that the changes in the Utah Drainage District laws had resulted in an impairment of the obligation of the bondholder's contract and an infringement of the United States constitutional provisions relating thereto. On the contrary, it held that "no right to pursue and make effective the drainage tax has been taken away or impaired,"[7] and it affirmed unanimously the judgment of the District Court quieting title to the land in the Plaintiff Hanson. Moreover, the decision of the court in this case is used as authority for the decisions on similar points of controversy in two additional cases also made on

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[7]The United States Supreme Court upheld this decision in a decision made March 2, 1936, which is reviewed herein following the review of the Utah Supreme Court decisions. The reasonings and precedents which form the basis of decision in the case of Hanson v. Burris are given extended consideration in a 23-page decision from which quotations are taken.

May 23, 1935. The record of the decision for one of the cases (Gardner v. Dobson et al.) occupies only one page and concludes by affirming the judgment of the District Court quieting title in Gardner, purchaser from the county. In the other case, i. e., Millard County and Parker Robinson et al. v. Millard County Drainage No. 1 et al., the Supreme Court upheld that part of the judgment of the District Court which gave Parker Robinson clear title to the land he had purchased from the county free from all assessments, for principal and interest on bonds. However, the Supreme Court refused to sustain the lower court in that part of its decision which extended the rule it applied to the Parker Robinson lands to all of the lands theretofore acquired by Millard County by auditor's tax deed for the nonpayment of general taxes.

The lower court had justified its joining of Millard County and the defendants which had no direct interest in Parker Robinson lands, and thereby its extension of the rule to all lands acquired by Millard County as above stated, on the grounds that the Declaratory Judgments Act (Chap. 24, Laws of Utah 1925) permitted this action. This basis of justification of joining parties plaintiff and parties defendant not directly interested in the Parker Robinson lands was rejected by the Supreme Court which said: "The contention must fail on two grounds: First, that controversies cannot be joined *in parallel*, and Second, that the Declaratory Judgments Act did not dispense with the necessity of a *subject* in respect to which the judgment could operate."

The meaning of cases "in parallel," the necessity for a "subject" in every suit, and the facts that both were lacking in the case under discussion are fully considered in the Supreme Court decision. Suffice it here to say that the decision of the Supreme Court rejected the extension of the rule by the lower court to all lands theretofore acquired by the county, and, therefore, that part of the lower court's decision quoted in Utah Station Bulletin 255, fourth paragraph, page 63, is now null and void.

As interpreted by the Utah Supreme Court decision, this means that there can be no quieting of titles in the county by the wholesale through the blanket proceedings. On the other hand, to quiet title in the county or, its grantees, each particular tract of land must be described in litigation proceedings and the regularity and completeness of the tax proceedings leading up to the issuance of auditor's tax deed must be proved, together with the fact that the redemption period has expired—all these and other essential facts must be satisfactorily established in court for each tract of land before title in the county or its grantee can be affirmed and quieted.

United States Supreme Court Decisions

On March 2, 1936, the United States Supreme Court upheld the decisions of the Utah courts relative to the Utah State practice and the contractual rights of bondholders. In the case of George S. Ingram, Sherwood Green, Edward P. McKenna, et al., appellants, v. Henry Hanson[8] the United States Supreme Court said:

"It is not disputed that under the laws of Utah taxes for general governmental purposes are paramount to all other demands against the property to which the tax lien attaches."

[8]United States Supreme Court (Law. ed.), Advance Opinions, Vol. 80: 559.

With respect to the contentions of the bondholders (appellants) that the amendments to the Utah drainage law impaired the obligation of their contract in violation of the contract clause of the Constitution of the United States and also deprived them of their property without due process of law in violation of the Fourteenth Amendment, the United States Supreme Court called attention to the fact that the state district court had overruled these contentions and that judgment had been affirmed by the State Supreme Court.

The United States Supreme Court then indicated that two opinions were delivered by the Utah State Court and that by separate paths they had reached the same conclusion. It quoted Justice Moffatt, who wrote the principal opinion, as follows:

"The manner by which the drainage tax lien is made effective for the purpose of reaching the security to which the bond lien attaches is substantially the same since the amendment as before even considering the statutory references in the drainage tax law as making the procedure for the collection of general taxes applicable. By the procedure prescribed no added burden is placed upon the drainage district nor the bondholder whereby the lien provided by the statute is impaired, nor is it made more difficult of enforcement * * * That the lien for general taxes was superior to the lien for drainage district taxes was as much the law then as it is now. No right to pursue and make effective the drainage tax lien has been taken away or impaired * * * * Between the time of sale and expiration of the redemption period, and during which there is outstanding a certificate of sale for both delinquencies for non-payment of general and drainage taxes, the drainage district may pay general taxes and take tax sale certificate. After the period of redemption has expired the drainage district upon payment of the general taxes, is entitled to a deed vesting it with title to the property sold for drainage taxes, if general taxes have been paid and drainage taxes have not. This is the ultimate limit to which the drainage district and the bondholders were entitled to go at any time, whether before or after the amended statutes."

The Supreme Court further quotes from the Utah decision as follows:

"In the concurring opinion of Justice Wolfe, it was said that the words of the statute 'meant the same before the amendment of 1921 as the amendment itself specifies, and that said amendment was for the purpose of clarifying and not changing the law.' Further, that 'the tax officials in 1920, before and after the amendment, followed a procedure which was justified by the statutes throughout, and followed the method of assessing, notifying, levying, and collecting taxes as the same was in force at the time of the issuance of the bonds.' "

The decisions of the Utah courts, in upholding separate procedure in tax sales for failure to pay both drainage taxes and general state and school taxes as well as for declaring that the amendments of 1921 and 1925 to the Utah drainage district law providing for such separate procedure neither impair the obligations of the bondholders' contract nor deprive them of property without due process of law, are sound. They are made final by the decision of the United States Supreme Court, announced as follows:

"We see no reason for not accepting the ruling of the state court as to the construction of the statute in question and the state practice. We find no basis for a conclusion that, under the amendment, the procedure for enforcing the liens of drainage district taxes was substantially different from that which obtained before the amendment, or that the contract rights of the bondholders have been impaired * * * No question, materially different, is presented under the Fourteenth Amendment.

"The judgment is affirmed."

The court decisions of the District Court of Utah and the Supreme Courts of Utah and of the United States, on non-payment of general and special drainage taxes in the Delta Area, will undoubtedly have far-reaching effects upon the settlement of the complicated tax situation existing in this and other areas of the state.

ANALYSIS OF FARM BUSINESS

In order to study the organization and economic conditions of the farms in the Delta Area a number of farm business records were obtained for 1929, 1930, and 1931 (Appendix Table 1). Of the records obtained, 288 were used in a farm-business analysis. Of these, 85 were for the 1929 crop year, 92 for the 1930 crop year, and 111 for the crop year of 1931. These records, selected at random and according to soil type, were obtained from representative farmers by the survey method. The farms are widely scattered throughout the area and are a representative cross-section of the farming of the area.

The records contain information concerning (1) acreage and use of land, (2) investment and indebtedness, (3) crops grown and acre-yield of crops, (4) kind and number of livestock kept, and (5) itemized expenses and income. The 1929 records contain information on the amount of labor required for the production of alfalfa-seed and the amount of irrigation water received.

The average area of land per farm for the three years was 112.4 acres (Table 7). Of this, 70 acres (62.3 per cent) was cultivated, the balance being either pasture or waste land. The average acreage per farm decreased from 140.5 acres in 1929 to 95.6 acres in 1931. Most of this decrease was in non-cultivated land and is no doubt the result of the high taxes levied against it. In 1929 non-cultivated land made up about 48 per cent of the total land in the farm, while in 1931 it was only about 30 per cent. The income from

Table 7. Average acreage per farm of cultivated and non-cultivated land and percentage that each is of the total (288 farms, Delta Area, Millard County, Utah), 1929-31, inclusive.

Kind of Land	Year			Average
	1929	1930	1931	1929–31
No. Farms	85	92	111	288
	(Acres)	(Acres)	(Acres)	(Acres)
Cultivated land	73.6	69.9	66.5	70.0
Non-cultivated land	66.9	31.1	29.1	42.4
Total land	140.5	101.0	95.6	112.4
	Per cent	Per cent	Per cent	Per cent
Cultivated land	52.4	69.2	69.6	62.3
Non-cultivated land	47.6	30.8	30.4	37.7
Total land	100.0	100.0	100.0	100.0

this class of land was so low that it would not pay state and county and drainage taxes and other costs of land ownership. As a result, much of it has been permitted to revert to the county.

The United States Census Bureau in its report on agriculture (1930) has included the acreage per farm of various classes of land in each precinct. For the Delta Area these data show an average of 78 acres of cultivatable land per farm (Table 8). Survey records for 1929 show an average of 73.6 acres of cultivated land. The census data also show 43 acres of non-cultivated land as compared to 66.9, which is the average of the farms included in the survey.

Table 8. Average acreage per farm of various classes of land, and percentage each is of total land, Delta Area, Millard County, Utah. (As reported by Agricultural Census of 1930)[1]

Kind of Land	Acreage		Percentage of Total	
	(Acres)	(Acres)	Per cent	Per cent
Harvested	62	..	51.2	..
Crop failure	3	..	2.5	..
Idle or fallow	13	..	10.7	..
Total cultivatable	..	78	..	64.4
Plowable pasture	1	..	0.8	..
Other pasture	24	..	19.9	..
Total pasture	..	25	..	20.7
Other land	..	18	..	14.9
Total land	..	121	..	100.0

[1]Average of 612 farms in precincts of Abraham, Delta, Deseret, Hinckley, Oasis, Sutherland, and Woodrow.

A comparison of the acreage per farm cultivated land as derived from the survey records with that derived from the census records indicates that farms included in this study are representative of the entire area.

Table 9. Utilization of cultivated land, Delta Area, Millard County, Utah, 1929-31, inclusive.

Crop	Year			Average
	1929	1930	1931	1929–31
	(Acres)	(Acres)	(Acres)	(Acres)
Alfalfa	69.7	63.4	59.0	64.0
Wheat	3.0	4.0	3.5	3.5
Other grain	0.6	1.5	2.0	1.4
Other crops[1]	0.3	1.0	2.0	1.1
Total	73.6	69.9	66.5	70.0

[1]Includes potatoes, sugar-beets, and corn silage.

A large part of the uncultivated land was used for grazing purposes. However, most of this pasture was of poor quality, there being little grass. The principal forage plant was greasewood.

A large part of the cultivated land was used for the growing of alfalfa (Table 9). Wheat was the second most important crop on the basis of land use; however, this amounted to only from 3 to 4 acres per farm.

In 1929 practically 95 per cent of the cultivated land was planted to alfalfa (Table 10). By 1931 it had decreased to about 89 per cent of the total cultivated acreage.

Table 10. Percentage of total cultivated land used for different crops, Delta Area, Millard County, Utah, 1929-31, inclusive.

| Crop | Year | | | Average |
	1929	1930	1931	1929–31
	Percentage of Total Farms			
	Per cent	*Per cent*	*Per cent*	*Per cent*
Alfalfa	94.7	90.7	88.7	91.6
Wheat	4.1	5.7	5.3	5.0
Other grain	0.8	2.2	3.0	2.0
Other crops[1]	0.4	1.4	3.0	1.4
Total	100.0	100.0	100.0	100.0

[1]Includes potatoes, sugar-beets, and corn silage.

Between 1919 and 1932 a considerable change occurred in the utilization of the cultivated land of the area (Table 11). A summary of the tabulations of crop maps made in 1919 and 1932 by the Soils Division of the Station Agronomy and Soils Department shows that in 1919 only 40 per cent of the cultivated land was in alfalfa, while in 1932 about 90 per cent of the cultivated land was so used. In 1919 nearly one-third of the cultivated land was used for sugar-beets, while in 1932 no sugar-beets were

Table 11. Acres and percentage of total cultivated land used for different crops as shown by crop maps of the Delta Area, Millard County, Utah, 1919-32, inclusive.[1]

| Crop | Acreage | | Percentage | |
	1919	1932	1919	1932
	(Acres)	*(Acres)*	*Per cent*	*Per cent*
Alfalfa	15,533	36,874	40.1	89.9
Grain	10,683	3,119	27.6	7.6
Sugar-beets	12,502	0	32.3	0
Corn	0	1,003	0	2.5
Total	38,718	40,996	100.0	100.0

[1]Utah Agr. Exp. Sta. Bul. 256.

grown. The sugar-beet factory was moved from Delta during this period. The proportion of cultivated land used for growing grain decreased from approximately 28 to approximately 8 per cent. The eliminated crop and the crops that were decreased were replaced by alfalfa.

The extremely large percentage of cultivated land in alfalfa is in part a result of the nature of the soil, much of which is heavy and difficult to till. When once seeded to alfalfa it need not be plowed again for several years. Furthermore, the same characteristics make it relatively unfavorable for growing crops that require cultivation; limited rainfall in the spring and the tendency of much of the soil to bake makes it difficult to obtain a good stand of young plants. In addition, the amount of irrigation water has been so limited that a large acreage of crops could not be matured. Alfalfa will withstand long periods of drought without the necessity of reseeding; hence, in dry years only one or two crops of hay may be obtained, but the seeding is not lost. In the case of most annual crops that are not matured, the enterprise is a complete loss. A further reason for such a large proportion of the tillable area in alfalfa is that the type of farming in the area has been built around alfalfa-seed. Although the land is planted to alfalfa, much of it is used not for hay but to produce alfalfa-seed.

The proportion of the alfalfa acreage which had been left for seed declined from about 64 per cent in 1929 to 26 per cent in 1931 (Table 12, and Figure 4.). This decline in the percentage of alfalfa left for seed was largely the

ACREAGE OF ALFALFA PER FARM AND ACREAGE LEFT FOR SEED, DELTA AREA, MILLARD COUNTY, UTAH
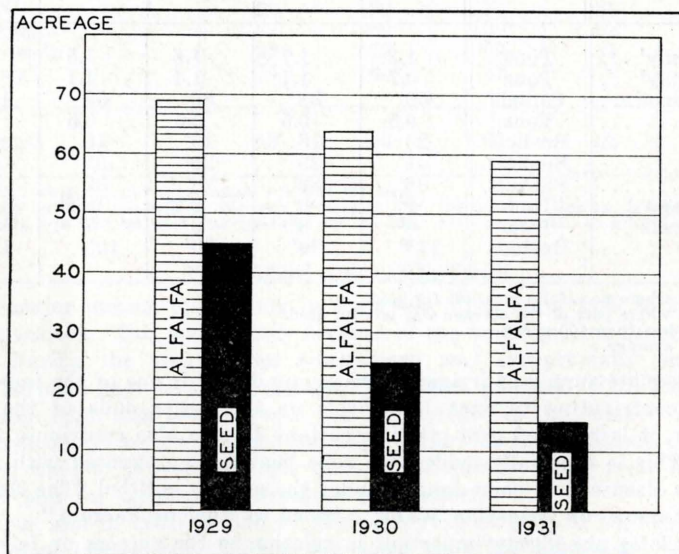

Figure 4.   In 1929 approximately two-thirds of the alfalfa acreage in the Delta Area was left for seed, while in 1931 only one-fourth was left for seed. (Data from Table 12)

result of low alfalfa-seed yields. When alfalfa was left for seed, not more than one crop of hay was ever secured and sometimes not any. When not left for seed, at least three cuttings were obtained, provided water was available.

Table 12. Acreage of alfalfa per farm and percentage left for seed, Delta Area, Millard County, Utah, 1929-31, inclusive.

Item	Unit	Percentage of Total Acreage			Average
		1929	1930	1931	1929–31
		Per cent	Per cent	Per cent	Per cent
Total alfalfa	Acres	69.7	63.4	59.0	64.0
Alfalfa left for seed	"	44.4	23.8	15.4	27.9
Percentage Left for seed	%	63.7	37.5	26.1	43.6

CROP YIELDS

Yields per acre of all crops grown in the Delta Area were relatively low as compared to the state average (Table 13). For no crop was the average 1929-31 yield equal to the 1926-31 state average. Yields of alfalfa hay and alfalfa-seed, the important crops in this area, were only 60 and 36 per cent of the respective state averages.

Table 13. Average 1929-31 acre-yields of various crops grown on farms studied in Delta Area, Millard County, Utah, and averages 1926-31 state yields.

Crop	Unit	Acre-Yields				
		1929	1930	1931	Average 1929-31	State Yields Average 1926-31
Alfalfa hay[1]	Tons	1.2	1.7	1.6	1.5	2.5
Alfalfa hay[2]	Tons	0.7	1.1	1.4	1.1	..
Alfalfa-seed	Pounds	50	38	86	58	162
Chaff	Tons	0.5	0.5	0.5	0.5	..
Wheat	Bushels	20	18	19	19	30
Oats	Bushels	41[3]	29[3]	29[3]	33	38
Barley	Bushels	36[3]	32[3]	29	32	40
Corn-silage	Tons	8[3]	0	9.2[3]	8.6[4]	9.2
Sugar-beets	Tons	6[3]	8[3]	0	7[4]	11.4
Potatoes	Bushels	113[3]	130[3]	80[3]	108	153

[1]On farms where no alfalfa was left for seed.
[2]On farms where part of the acreage was left for seed.
[3]Based on less than 100 acres.
[4]Two-year average.

An adequate supply of irrigation water, no doubt, is one of the important factors contributing to such low yields on the better soils of the area. However, it is believed that other important factors also contribute to low yields. This is especially evident on soils heavily impregnated with alkali, which is discussed at some length under the section entitled "The Relation of the Amount of Irrigation Water Applied to Various Factors."

Crop yields are highly important in relation to the success or failure of an agricultural area. Within the limits of practical farming, the degree of success of any area is in large measure in direct relation to the yields of that area.

The relative productivity of the agricultural land of the Delta Area may be more clearly shown by means of crop-yield indexes,[9] the base of which represents the average state yields from 1926 to 1931, inclusive. The average state yields are also low when compared to yields in the better farming areas of the state and to yields secured by individual farmers. The average yield of all crops in the Delta Area from 1929 to 1931 was only 53 per cent of the 1926-31 state average (Table 14). The index varied from 42 in 1929 to 61 in 1931. These indexes are weighted by the number of acres of different crops grown in the area. As a result, group indexes largely represent the yields of the two important crops, alfalfa hay and alfalfa-seed. The index of alfalfa-seed was lowest of all. The three-year average was only 36 per cent of the state average. The highest index was for corn silage, but this crop was grown in such limited amounts that it was relatively unimportant in the group index.

Table 14. Index numbers of crop yields on farms studied in the Delta Area in Millard County, Utah, 1929-31, inclusive.
(Average crop yields for state, 1926-31=100)

Crop	Crop Index				
	1929	1930	1931	Average 1929-31	State Average 1926-31
Alfalfa hay[1]	48	68	62	59	100
Alfalfa-seed	31	23	53	36	100
Wheat	67	60	64	64	100
Oats	107	76	76	86	100
Barley	90	80	73	80	100
Corn-silage	87	00	100	93	100
Sugar-beets	53	70	00	61	100
Potatoes	74	85	52	70	100
All crops[2]	42	56	61	53	100

[1]On farms where no part of acreage was left for seed.
[2]Weighted by acres grown. In the case of alfalfa hay, the yield of hay on farms where no alfalfa was left for seed was weighted by the total acreage planted to alfalfa.

NUMBERS OF LIVESTOCK

The major income of farmers in the Delta Area from 1929 to 1931 was from livestock. This was largely because of the small returns from alfalfa-seed. During the years when alfalfa-seed was exceptionally profitable, many farmers kept no livestock other than work animals. With the decline in income from alfalfa-seed there was an increase in the number of farms that kept dairy cows, chickens, and hogs. Many of the additions, no doubt in part, were to provide a larger part of the family living from the farm rather than for commercial livestock production.

In 1929 and in 1931, 92 and 97 per cent, respectively, of the farms kept dairy cows (Table 15). During the same time the percentage of farms

[9]A crop-yield index is a percentage. It is the relation of yields of some particular time or place to an arbitrarily selected base. It may apply to a single commodity or to a group of commodities. An index for a group of commodities may be a simple average or it may be weighted.

keeping young dairy cattle increased from 68 to 92 per cent. The percentage of farms keeping sheep and hogs also increased while the farms keeping beef cattle decreased. The number of farms keeping beef cattle was almost negligible.

Table 15. Percentage of total farms keeping different kinds of livestock, Delta Area, Millard County, Utah, 1929-31, inclusive.

Kind of Livestock	Percentage for Farms Keeping Livestock		
	1929	1930	1931
	Per cent	Per cent	Per cent
Dairy cows	92	96	97
Young dairy cattle	68	80	92
Beef cattle	7	3	3
Sheep	28	44	47
Hogs	47	66	81
Horses	98	98	97
Chickens	82	89	86

Although dairy cows were kept on most of the farms, the average number kept per farm was only about five cows (Table 16). Likewise, the average number of hogs and chickens per farm was small. On most farms these were, no doubt, kept largely for family purposes.

Table 16. Average number of different kinds of livestock per farm on farms on which each kind of livestock was kept, Delta Area, Millard County, Utah, 1929-31, inclusive.

Kind of Livestock	No. of Livestock		
	1929	1930	1931
	(No.)	(No.)	(No.)
Dairy cows	5.1	5.7	5.0
Young dairy cattle	3.0	3.6	3.5
Sheep	210.0	130.0	110.0
Beef cattle	33.0	55.0	83.0
Hogs	2.0	2.7	3.0
Horses	3.6	3.8	4.0
Chickens	45.0	66.0	62.0

Although the percentage of farms keeping sheep increased, the average number of sheep per farm decreased. Within this area there are two types of sheep enterprises: One is the small farm flock, while the other is a larger unit which uses range land for grazing the sheep at least during part of the year. Usually these larger units are fed on the farm during the winter only. The average decrease in number of sheep per farm from 210 in 1929 to 110 in 1931 was due to the fact that most new sheep enterprises were of the small-farm-flock type. The average number of beef cattle per farm increased, this increase being the result of increased size of the larger beef cattle units and the elimination of the small units.

AVERAGE INVESTMENT PER FARM

The average investment from 1929 to 1931, inclusive, was $7804 (Table 17). During this three-year period, the average declined from $9303 in 1929 to $6973 in 1931. Most of the decrease was in the valuation of land. During this period there was a general decline in land values throughout the state.[10]

Table 17. Average capital invested per farm, Delta Area, Millard County, Utah, 1929-31, inclusive.

Investment in	Investment per Farm			
	1929	1930	1931	Average 1929-31
	(Dollars)	(Dollars)	(Dollars)	(Dollars)
Land	5612	3608	3845	4355
Buildings	1427	1463	1447	1446
Machinery and equipment	583	457	465	502
Livestock	1466	1331	932	1243
Feeds and supplies	215	276	284	258
Total investment	9303	7135	6973	7804

Investment in machinery and equipment as well as in livestock decreased during this period. The decrease in investment in livestock was the result of lower prices rather than because of a decrease in numbers or quality.

Of the total farm investment slightly more than one-half was in land and about one-fifth in buildings (Table 18). The percentage in livestock varied from 19 per cent in 1930 to 13 per cent in 1931.

Table 18. Percentage of total capital invested in different factors of production, Delta Area, Millard County, Utah, 1929-31, inclusive.

Factor	Percentage of Total Investment			
	1929	1930	1931	Average 1929-31
	Per cent	Per cent	Per cent	Per cent
Land	60	51	55	56
Buildings	15	20	21	19
Machinery and equipment	6	6	7	6
Livestock	16	19	13	16
Feeds and supplies	3	4	4	3
Total	100	100	100	100

A comparison of the average investment in land, buildings, and machinery and equipment, as derived from the farms studied in 1929 and the average reported by the Bureau of the Census (1930), indicate that the farms studied are representative of all farms in this area. The average investment in

[10]The index number of real estate values in Utah in 1929 was 127; in 1931 it was 122. "The Farm Real Estate Situation, 1932-33." By B. R. Stauber. U. S. Dept. Agr. Cir. 309. 1933.

land, as shown by the 85 survey records, was $5612 as compared to an investment of $6097 as reported by the Bureau of Census (Table 19). The greatest difference was in investment in buildings, where the survey showed an average investment of $1427 as compared to an investment of $2088, as shown by the census reports. It is probable that much of this difference may be the result of the different methods used in obtaining information from the farmers. The total investment was $7622 for the farms in the survey and $8711 for the farms reported by the census.

Table 19. Investment per farm in land, buildings, and equipment as shown by farm survey and by the Census, Delta Area, Millard County, Utah, 1929.

Investment in	Investment per Farm	
	Average of 85 Survey Records	Average of 612 Farms as Reported by Census[1]
	(Dollars)	(Dollars)
Total land	5612	6097
Total buildings[2]	1427	2088
Equipment and Machinery	583	526
Total	7622	8711

[1]Averages of all farms in the precincts of Abraham, Delta, Deseret, Hinckley, Oasis, Sutherland, and Woodrow.
[2]Includes dwelling.

In 1929 the farms of the Delta Area had an average indebtedness of $3825; in 1931 this indebtedness had been reduced to $2900 (Table 20). Most of the decrease was in mortgage indebtedness, for the change in the amount of notes was not great and the amount of unpaid taxes increased. Although the total indebtedness decreased, the net worth of the farmers also decreased. That is, the total investment decreased more than did the

Table 20. Average indebtedness and net worth per farm, Delta Area, Millard County, Utah, 1929-31.

Item	Indebtedness per Farm			
	1929	1930	1931	Average 1929–31
	(Dollars)	(Dollars)	(Dollars)	(Dollars)
Mortgages	2872	2301	1642	2272
Notes	405	261	301	322
Unpaid taxes	528	784	936	749
Other bills	20	....	21	
Total indebtedness	3825	3346	2900	3357
Net worth	5478	3789	4073	4447
Total investment[1]	9303	7135	6973	7804

[1]From Table 17.

indebtedness. The decrease in indebtedness is an indication of economic adjustments that have been going on in the area and which must continue to be made before a stable agriculture can be attained. The decreased indebtedness represents cancellation of debts by mortgage holders rather than payment of debts by farmers. During this period the average farm income was not adequate to pay all expenses and support the family; hence, there was no possibility of making payments to creditors. Had there been no cancellation of debts, the amount of debt would have increased.

The proportion of total farm investment represented by indebtedness and by operator's equity remained about the same during the three-year period. Debts represented a little more than 40 per cent and operator's equity a little less than 60 per cent of the total (Table 21). The form of indebtedness changed with the proportion of total investment in the form of mortgages, decreasing from 31 per cent in 1929 to 24 per cent in 1931, while unpaid taxes increased from 6 to 14 per cent.

Table 21. Percentage different classes of indebtedness and net worth are of total farm investment, Delta Area, Millard County, Utah, 1929-31, inclusive.

Item	Percentage of Total Indebtedness			
	1929	1930	1931	Average 1929–31
	Per cent	*Per cent*	*Per cent*	*Per cent*
Mortgages	31	32	24	29
Notes	4	4	4	4
Unpaid taxes	6	11	14	10
Other bills	[1]	0	[1]	[1]
Total indebtedness	41	47	42	43
Net worth	59	53	58	57
Total investment	100	100	100	100

[1]Less than 1 per cent.

FARM INCOME

The average total annual farm income of farmers in the Delta Area was small. It was not more than enough to provide a reasonable standard of living for the family, even if there had been no farm expenses to deduct. The average total yearly income for the three-year period, 1929 to 1931, inclusive, was only $1461 (Table 22); in 1929 this amounted to $1935, to $1212 in 1930, and to $1235 in 1931. The percentage decline from 1929 to 1931 was just about the same as the percentage decline in the price of all Utah farm commodities during the same period.[11]

This would indicate that there was not much change in quantity of produce marketed.

An average of 70 per cent of the total income was from livestock (Table 23 and Figure 5). Crops contributed 23 per cent. Livestock sales represented the most important single source of income. From this source was

[11]The index of wholesale prices of all Utah farm commodities in 1929 was 150; in 1930 it was 121 and in 1931 it was 92 (1910-1914=100).

Table 22. Amount and source of income per farm, Delta Area, Millard County, Utah, 1929-31, inclusive.

Item	Income per Farm			
	1929	1930	1931	Average 1929-31
	(Dollars)	(Dollars)	(Dollars)	(Dollars)
Crops:				
Alfalfa hay	66	73	267	136
Afalfa-seed	306	104	90	167
Alfalfa chaff	13	5	10	9
Grain	21	26	21	22
Potatoes	7	3	2	4
Miscellaneous crop receipts	0	14	4	6
Total receipts from crops	413	225	394	344
Livestock:				
Dairy products	339	303	229	290
Eggs	57	71	48	59
Wool	157	120	68	115
Livestock sales	820	441	404	555
Other livestock receipts	0	2	1	1
Total receipts from livestock	1374	937	750	1020
Total receipts from crops and livestock	1786	1162	1144	1364
Miscellaneous farm receipts[1]	149	50	91	97
Total farm receipts (All cash)	1935	1212	1235	1461
Income other than from farm	259	189	186	211
Total farm and other income	2194	1401	1421	1672

[1]Income from such sources as feeding or pasturing livestock, labor of farm operator away from farm, rental of farm machinery or equipment, etc.

received an average of 38 per cent of the total income. Dairy products which made up 20 per cent of the income were second in importance. Alfalfa-seed was the most important of the crops, contributing an average of 11 per cent of the total income. This varied, however, from 16 per cent in 1929 to only 7 per cent in 1931. As the income from alfalfa-seed decreased, the income from alfalfa hay increased. In 1931 hay accounted for 22 per cent of the income, while in 1929 it was only 3 per cent.

FARM EXPENSE

Relative to the farm income, the expenses of the farms in the Delta Area were extremely high. With average farm receipts of only $1461, the average cash operating expenses alone were $1304 (Table 24). When livestock purchases were added, the total cash expenses were $1470, or $9 more than the total farm receipts. The only year in which the total cash farm expenses did not exceed the total farm receipts was 1931. Total cash operating expenses decreased from $1639 in 1929 to $1009 in 1931. This was due in part to declining prices and in part to an effort on the part of farmers to reduce

SOURCE OF FARM INCOME, DELTA AREA,
MILLARD COUNTY, UTAH, 1929, 1930, and 1931
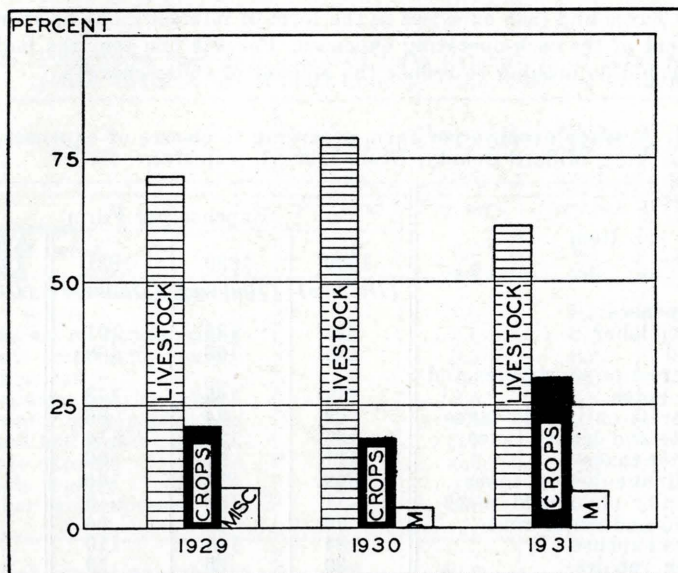
Figure 5. Approximately three-fourths of the farm income, as reported on farms surveyed in the Delta Area, was from livestock. (Data from Table 23)

Table 23. Percentage of total farm income from different sources, Delta Area, Millard County, Utah, 1929-31, inclusive.

Item	Percentage of Total			
	1929	1930	1931	Average 1929–31
	Per cent	Per cent	Per cent	Per cent
Crops:				
Alfalfa hay	3	6	22	9
Alfalfa-seed	16	9	7	11
Alfalfa chaff	1	..[1]	1	1
Grain	1	2	2	2
Miscellaneous crop receipts	0	1	..[1]	..[1]
Total receipts from crops	21	18	32	23
Livestock:				
Dairy products	18	25	18	20
Eggs	3	6	4	4
Wool	8	10	6	8
Livestock sales	42	37	33	38
Total receipts from livestock...	71	78	61	70
Total receipts from crops and livestock	92	96	93	93
Miscellaneous farm receipts ...	8	4	7	7
Total farm income	100	100	100	100

[1]Less than 0.5 per cent. Receipts from potatoes and from other livestock were also less than 0.5 per cent.

expenses. However, the possibility for the farmers to reduce cash expenses is limited to those expenses that are not set by contract or by a public agency. Taxes and cash expenses in the form of interest make up more than 50 per cent of the cash-operating expenses. For any one year the individual farmer could do nothing to reduce the amount of those charges.

Table 24. Average expense per farm according to classes of expenses, Delta Area, Millard County, Utah, 1929-31, inclusive.

Item	Expense per Farm			
	1929	1930	1931	Average 1929–31
	(Dollars)	*(Dollars)*	*(Dollars)*	*(Dollars)*
Cash expenses:				
Hired labor	221	136	101	153
Feed	144	106	109	120
Interest on mortgages and notes	211	165	113	163
Interest on unpaid taxes	63	84	86	78
State and county taxes	155	128	114	132
Water taxes	111	97	86	98
Drainage district taxes	342	274	146	254
Penalty on unpaid taxes	11	10	5	8
Land and water rent	79	38	54	57
Auto expense	184	144	110	146
Cash repairs	39	25	19	28
Other cash expenses	79	56	66	67
Total cash operating expense	1639	1263	1009	1304
Livestock purchased	370	60	68	166
Total cash farm expense	2009	1323	1077	1470
Non-cash expenses:				
Decreased inventory	132	314	61	169
Depreciation	125	106	106	112
Unpaid family labor	279	235	203	239
Interest on operator's equity	293	205	212	237
Total non-cash expense	829	860	582	757
Total farm expense	2838	2183	1659	2227

The drainage district tax, which for the three-year period amounted to an annual average of $254, was the largest single item of expense. This was followed in order by interest charges on mortgages and notes ($163), hired labor ($153), and auto expenses chargeable to the farm ($146).

In addition to cash expenses there were other farm expenses which did not involve a direct outlay of cash. These are designated as non-cash expenses and consist of decreases in inventory values of livestock, feeds, and supplies, depreciation in buildings and equipment, unpaid family labor, and interest on capital owned by the farmer. For the three years (1929 to 1931, inclusive) the average amount of these expenses was $757, which item added to the average cash expense brought the total farm expense to $2227.

Total cash-operating expenses averaged 58.5 per cent of the total farm expenses (Table 25). It was approximately the same for each of the three

years. Non-cash expenses varied from 29 per cent in 1929 to 39 per cent in 1930, the average of the three-year period being 34 per cent.

Table 25. Percentage that each class of farm expense is of total farm expense, Delta Area, Millard County, Utah, 1929-31, inclusive.

Item	Percentage of Total			
	1929	1930	1931	Average 1929–31
	Per cent	Per cent	Per cent	Per cent
Cash expenses:				
Hired labor	7.8	6.2	6.1	6.9
Feed	5.1	4.9	6.6	5.4
Interest on mortgages and notes	7.4	7.6	6.8	7.3
Interest on unpaid taxes	2.2	3.8	5.2	3.5
State and county taxes	5.5	5.9	6.9	5.9
Water taxes	3.9	4.4	5.2	4.4
Drainage district taxes	12.1	12.6	8.8	11.4
Penalty on unpaid taxes	0.4	0.5	0.3	0.4
Land and water rent	2.8	1.7	3.2	2.5
Auto expense	6.5	6.6	6.6	6.5
Cash repairs	1.4	1.1	1.1	1.3
Other cash expenses	2.8	2.6	4.0	3.0
Total cash operating expense	57.8	57.9	60.8	58.5
Livestock purchased	13.0	2.7	4.1	7.5
Total cash farm expense	70.8	60.6	64.9	66.0
Non-cash expenses:				
Decreased inventory	4.7	14.4	3.7	7.6
Depreciation	4.4	4.8	6.4	5.0
Unpaid family labor	9.8	10.8	12.2	10.7
Interest on equity	10.3	9.4	12.8	10.7
Total non-cash expense	29.2	39.4	35.1	34.0
Total farm expense	100.0	100.0	100.0	100.0

Nearly 60 per cent of the total farm expenses were expenses that were more or less beyond the power of the individual farmers to reduce (Table 26). These varied from approximately 54 per cent in 1929 to 65 per cent in 1930. Most of the variation was in non-cash expenses. This group of expenses was relatively stable, being approximately 35 per cent of the total annual expenses.

Because such a large portion of his total farm expense is beyond his control, the average farmer can do little toward reducing expenses. Therefore, if the farms of the area are to become self-supporting and a part of a stable agricultural society, one of two things must take place: (1) Ways of increasing considerably the average farm income without a corresponding increase in expenses must be found or (2) extreme adjustments must be made in farm expenses, which means reduction in the tax and interest burden.

Table 26. Percentage that certain expense beyond the farmer's control is of total farm expenses, Delta Area, Millard County, Utah, 1929-31, inclusive.

Item	Percentage of Total			
	1929	1930	1931	Average 1929–31
	Per cent	Per cent	Per cent	Per cent
Cash expenses:				
Interest on mortgages and notes	7.4	7.6	6.8	7.3
Interest on unpaid taxes	2.2	3.8	5.2	3.5
State and county taxes	5.5	5.9	6.9	5.9
Water taxes	3.9	4.4	5.2	4.4
Drainage district taxes	12.1	12.6	8.8	11.4
Penalty on unpaid taxes	0.4	0.5	0.3	0.4
Land and water rent	2.8	1.7	3.2	2.5
Total fixed cash operating expense	34.3	36.5	36.4	35.4
Non-cash expenses:				
Decreased inventory[1]	4.7	14.4	3.7	7.6
Depreciation	4.4	4.8	6.4	5.0
Interest on equity	10.3	9.4	12.8	10.7
Total fixed non-cash expense	19.4	28.6	22.9	23.3
Total fixed farm expense	53.7	65.1	59.3	58.7

[1]Ordinarily, this item is not a fixed expense. It is included here because it is felt that most of this decrease is due to price changes, inasmuch as numbers of livestock increased. However, it was not intended that price changes should be reflected in inventory values within a year.

SUMMARY OF FARM BUSINESS ANALYSIS

The most commonly used measure of success in farming is labor income. It is the amount that the farm operator receives for his labor and management during the year, in addition to a house in which to live and farm produce for the family living. Although of little value as a measure of the welfare or success of the farmer, it is a good measure of the profitableness of the farm business.

Table 27. Average farmer's labor income, Delta Area, Millard County, Utah, 1929-31, inclusive.

Item	Labor Income per Farm			
	1929	1930	1931	Average 1929–31
	(Dollars)	(Dollars)	(Dollars)	(Dollars)
Total farm income	1935	1212	1235	1461
Total farm expense[1]	2764	2087	1659	2170
Labor income[2]	—829	—875	—424	—709

[1]Includes interest paid and interest on operator's equity at 5 per cent.
[2]Labor income represents the returns to the farm operator for his labor and management during the year after all farm expenses have been paid, including family labor (other than that of the operator) and interest on owned capital. In addition to labor income, the operator receives farm privileges which include the house to live in and produce from the farm for family living.

As measured by labor income, the farms in the Delta Area were not profitable during the 1929-31 period. The average farmer had a labor income of minus $709 (Table 27). This means that not only did the average farmer receive nothing except farm privileges for his labor, but he lacked $709 of having income sufficient to pay all farm expenses. The amount of the labor income varied from minus $875 in 1930 to minus $424 in 1931. Obviously, a condition of this kind cannot be long endured without seriously affecting the standard of living of the farm families and the stability of the social and economic institutions of the area.

FARMERS RANKED ACCORDING TO LABOR INCOME, DELTA AREA, MILLARD COUNTY, UTAH
1929, 1930, and 1931
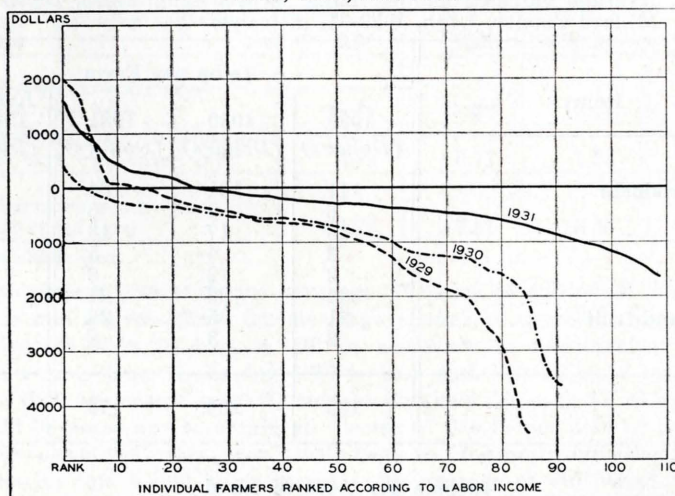
Figure 6.   A majority of farmers whose farm business was studied in the Delta Area had a minus labor income for the three years included in this study. (Data from Appendix Table 1)

Table 28. Average family income per farm, Delta Area, Millard County, Utah, 1929-31, inclusive.

Item	Family Income			
	1929	1930	1931	Average 1929–31
	(Dollars)	(Dollars)	(Dollars)	(Dollars)
Labor income	—829	—875	—424	—709
Interest on equity	293	205	212	237
Unpaid family labor	279	235	203	239
Income away from farm	259	189	186	211
Value of family living from farm	195	204	179	193
Total family income	197	—42	356	171

Lest the reader be led to think of labor income as a measure of social well-being, let it be repeated that this is a measure of the success of the farming enterprise only. The total family income is a better measure of the well-being of the family or of the standard of living (Table 28).

This includes labor income for the operator, interest on equity, unpaid family labor, income away from the farm, and value of family living from the farm (Table 29). In the Delta Area the total average family income was only $171. In 1931 it was $356, while in 1930 it was minus $42. It was, of course, impossible for the families to live on such incomes. The result was that many of the farm expenses were not paid, which increased the indebtedness of the farmer. Furthermore, it is likely that the standard of living of many of the families was much lower than is desirable.

Table 29. Average value of family living secured from farm, Delta Area, Millard County, Utah, 1929-31, inclusive.

Item	Value per Farm			
	1929	1930	1931	Average 1929–31
	(Dollars)	(Dollars)	(Dollars)	(Dollars)
Dairy products	111	101	104	106
Poultry	6	9	6	7
Hogs	15	17	13	15
Sheep	3	4	5	4
Beef	3	2	6	4
Eggs	34	33	21	29
Garden and fruit	21	35	22	26
Flour	2	3	2	2
Total	195	204	179	193

Income per Acre of Land

One of the chief reasons for the extremely low income of the Delta Area farms was the low income per acre of land. The area of farms was relatively large as compared to the general irrigated farms of the state. When income is measured on an acre basis it emphasizes the low productivity of the area. It also emphasizes the fact that if income per acre cannot be materially increased, the number of acres per farm must be increased if a farm income of such size as to make possible a reasonable return to the farm family is to be obtained.

Most of the alfalfa hay was fed on the farms where produced. The amount sold when added to the receipts from alfalfa-seed returned only $4.85 per acre of alfalfa (Table 30). The acre-returns of grain and other crops grown was slightly more, but the average acre-return from all crops grown was only $4.91. All of these crops, however, with the exception of alfalfa-seed, were grown primarily for use on the farm. They were fed to livestock from which source the major part of the income was obtained. The three-year average receipts from livestock per acre of cultivated land was $14.83, varying from $18.65 in 1929 to $12.44 in 1931. Part of this income should, of course, be credited to farm pastures and to public range lands. The total farm income from all sources amounted to only $20.68 per acre of cultivated

land. The year of highest per acre income was in 1929, when an income of $26.29 was obtained.

Table 30. Average cash income per acre of various crops grown and income from livestock and total farm income per acre of cultivated land. Delta Area, Millard County, Utah, 1929-31, inclusive.

Source of Income (per Acre)	Acre Returns			Average 1929-31
	1929	1930	1931	
	(Dollars)	*(Dollars)*	*(Dollars)*	*(Dollars)*
Alfalfa[1]—per acre grown	5.46	2.87	6.22	4.85
Grain—per acre grown	7.00	5.00	3.96	5.32
Other crops—per acre grown	11.67	12.14	2.50	8.77
All crops—per acre cultivated land	5.61	3.21	5.91	4.91
Total livestock—per acre cultivated land	18.65	13.39	12.44	14.83
Miscellaneous farm receipts— per acre cultivated land	2.02	0.71	1.36	1.36
Total farm receipts—per acre cultivated land	26.29	17.31	18.43	20.68

[1]Includes alfalfa-seed.

If the present size of farms (average, 70 acres of cultivated land) is to continue and a gross farm income large enough to provide a satisfactory labor income is to be had, it will be necessary to considerably increase the per acre income. Assuming $750 to be a satisfactory labor income and further that an income of $1.30 may be obtained for each $1 of expense,[12] it would be necessary to obtain an income of $46.43 per acre of cultivated land. To accomplish this, crop yields have to be greatly increased. An alternative to this would be to increase the acreage of cultivated land per farm. Assuming the same ratio of farm income to farm expenses as above, with an income per acre of $20.68—the same as the 1929-31 average, 157 acres of cultivated land would be necessary to provide a labor income of $750. With the same assumptions but with an income per acre the same as in 1929 ($26.29 per acre of cultivated land), 124 acres of cultivated land would be necessary for a labor income of $750.

Because of the heavy nature of a large part of the soils it is not likely that much intensification of the agriculture of the area will take place. The possibility for any considerable increase in yields of alfalfa at present is not anticipated.

Farm Expense per Acre of Cultivated Land

Not only was the income per acre of cultivated land small, but relative to the income the expenses were extremely large (Figure 7). The average cash expense was slightly larger than the total income in two of the three years. Whereas the average farm income per acre of cultivated land was $20.68, the average cash expense was $20.79 (Tables 30 and 31). In ad-

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[12]This was the ratio of farm income to farm expense for 53 general irrigated farms in Utah in 1934. "Annual Farm Business Analysis of Farm Management Demonstrations Conducted in Utah, 1934," by Cruz Venstrom and Edith Hayball. Mimeographed publication of U. S. A. C. Extension Service.

FARM INCOME AND FARM EXPENSE PER ACRE, DELTA AREA
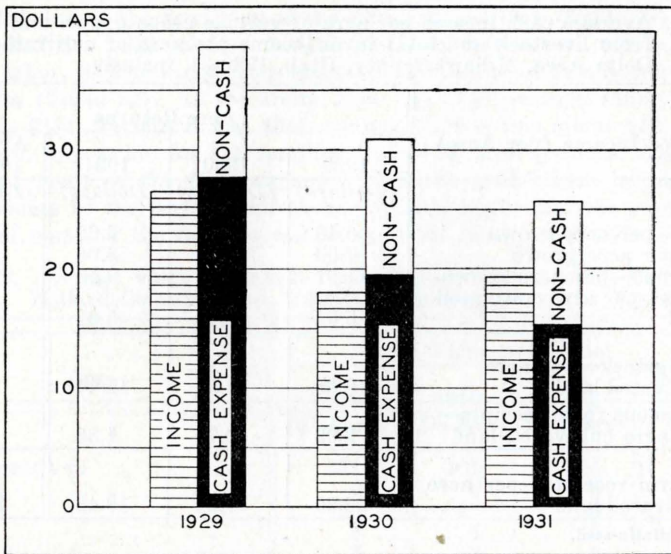## MILLARD COUNTY, UTAH, 1929, 1930, and 1931

Figure 7.   Farm expenses exceeded farm income during the years 1929, 1930, and 1931. (Data from Tables 30 and 31)

dition to cash expenses, there were non-cash expenses of $10.76 per culti-vated acre, which made the total farm expenses amount to $31.55 per acre.

Obviously this unbalanced relationship between income and expense can-not continue for long. If the present farm units are to be maintained, either incomes must be increased or expenses decreased. During the 1929-31 period, expenses were reduced about one-third, but even then many expenses, par-ticularly taxes and interest charges, went unpaid.

The various forms of taxes made up a considerable part of the farm ex-pense. State and county taxes, water taxes, and drainage district taxes amounted on the average to $6.87 per acre of cultivated land (Table 32), which is approximately one-third of the total gross farm receipts. If tax penalties and interest on unpaid taxes are added to the direct tax charges, this item is nearly 40 per cent of the gross farm receipts. In 1930 these expenses were equal to 49 per cent of the gross farm income.

Table 31. Various classes of farm expenses per acre of cultivated land, Delta Area, Millard County, Utah, 1929-31, inclusive.

Class of Expense	Expense per Acre			
	1929	1930	1931	Average 1929–31
	(Dollars)	(Dollars)	(Dollars)	(Dollars)
Total cash expense	27.30	18.93	16.15	20.79
Total non-cash expense	11.26	12.30	8.72	10.76
Total farm expense	38.56	31.23	24.87	31.55

Table 32. Average expense per acre of cultivated land for various forms of taxes, Delta Area, Millard County, Utah, 1929-31, inclusive.

Form of Tax Expense	Taxes per Acre			
	1929	1930	1931	Average 1929–31
	(Dollars)	(Dollars)	(Dollars)	(Dollars)
Drainage district tax	4.65	3.92	2.19	3.59
State and county tax	2.11	1.83	1.71	1.88
Water tax	1.51	1.39	1.29	1.40
Interest on unpaid taxes	0.85	1.20	1.29	1.11
Penalty on unpaid taxes	0.15	0.14	0.07	0.12
Total taxes	9.27	8.48	6.55	8.10
Percentage of gross farm income per acre	35	49	36	40

Income That May Apply on Expense

Notwithstanding the existence of first mortgages, tax claims, and other forms of expense, the need for family living has first claim upon the income from the farm. If the income is inadequate to satisfactorily meet family needs and all other expenses, the requirements of the family may be reduced, as they often are to bare necessities, but these bare necessities must be met before any other expenses are paid. Proceeding on this assumption, in order to satisfactorily meet the family needs, in the Delta Area, an amount of money approximately equal to the sum of the value of the operator's labor, value of unpaid family labor, and interest on the owner's equity would be needed.[13] By subtracting this amount from the total farm income the amount that may be used to pay expenses is obtained.[14]

According to assumptions made, the average amount needed to meet family expenses was $1066 (Table 33). The amount decreased from $1372 in 1929 to $858 in 1931. From this amount would have to be obtained all purchased food, clothing, household improvements, education, recreation, charitable contributions, and savings. If these amounts were used for satisfying family wants, then an average of only $606 would have been available to apply on farm expenses. This amount would have paid only about 43 per cent of the cash expense of the farm. The remainder (57 per cent) would have remained unpaid and would have been added to the indebtedness, and in a relatively short time the farmer's equity in the farm would have been completely wiped out.

The foregoing merely emphasizes the fact that the farms in the Delta Area did not produce sufficient income to provide for the family wants and to pay all other expenses. It further indicates the pressing need for some reorganization of the agriculture of the area.

Relation of Acres of Cultivated Land to Other Factors

In an endeavor to find the most satisfactory farm organization for the area and to obtain information that could be used as a basis for determining

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[13]It is recognized that in reality most farm families did not use this amount for family purposes. However, their needs were not satisfactorily cared for.

[14]In 1929 and 1930 the farmers were asked what their net farm income should be to give their families a reasonable standard of living. According to the replies, the average family in 1929 needed $1427 and in 1930 about $1605.

Table 33. Estimated amount of money that could have been used to meet expenses after satisfactorily meeting family needs, Delta Area, Millard County, Utah, 1929-31, inclusive.

Item	Amount			
	1929	1930	1931	Average 1929-31
	(Dollars)	*(Dollars)*	*(Dollars)*	*(Dollars)*
Estimated alternative value of operator's labor[1]	800	600	443	607
Value of unpaid family labor. . .	279	235	203	239
Interest on operator's equity. . .	293	205	212	220
Estimated amount needed for family living	1372	1040	858	1066
Total farm income	1935	1212	1235	1461
Amount remaining to pay expenses[2]	822	361	563	606
Percentage of cash farm expenses that could be paid. .	*Per cent* 42	*Per cent* 29	*Per cent* 52	*Per cent* 43

[1]1929 and 1930 values were estimated on the basis of farmer's estimates in connection with other studies. The value in 1931 was obtained from the farmers in the Delta Area.
[2]Includes income away from farm.

adjustments that might be made to improve the condition of the average farm, farm records were divided into groups and analyzed on the basis of several different factors. These analyses did not show any one type of farm organization to be particularly more successful than the average, which indicates that, regardless of form of organization, the major weakness of the agriculture of this area is common to all farms.

The general relationship between size of farms and farm profits in the United States is that as size of farm business increases farm profits increase also. However, the opposite of this general relationship prevailed in the Delta Area. It is axiomatic that whenever the per unit cost of production exceeds the selling price of the commodity produced, then the larger the farm business the larger will be the loss. The reason for the larger losses on the larger sized farms, is, no doubt, the result of low crop yields, exceptionally high tax costs, and an unfavorable relationship between prices of goods bought and amount received for goods sold. By obtaining higher crop yields, adjustment of indebtedness, and a return to normal price relationships it is expected that the farms in the Delta Area will show the usual relationship between size of farm business and farm profits.

The type of farm organization and yields of principal crops was not greatly different on the farms of different sizes. Farms of less than 50 acres of cultivated land had 89.4 per cent of the cultivated acres in alfalfa, while farms of more than 100 acres had about 95 per cent of the cultivated acres in alfalfa (Table 34). The labor income for the group of small farms was minus $502 as compared to minus $1279 for the largest farms. Although farm income and farm expense both increased as size of farm increased, the income increased slightly more than did the expense, as is shown in the income per $1 of expense. For the small farms each $1 of expense returned only $0.71 in farm income, while for the largest farms each $1 of expense returned $0.82 in farm income.

Table 34. Analysis of farm business of farms of different sizes, Delta Area, Millard County, Utah, 1929-31.[1]

Factors Used in Analysis of Farm Business	Unit	No. Acres of Cultivated Land			All Farms
		Less than 50	50-99	100 or More	
Size of farm business:					
Acres of cultivated land	Acres	32	71	168	70
Total acres in farm	Acres	55	105	282	112
Total capital invested	$	4,520	8,580	14,502	7,804
Farm balance (percentage)					
Cultivated land in alfalfa	%	89.4	90.6	94.7	91
Alfalfa left for seed	%	43.7	41.4	45.8	44
Total income from livestock ...	%	66	63	65	65
Productivity of farm (yield per acre)					
Alfalfa	Tons	1.13	1.13	0.94	1.1
Seed	Lbs.	65	58	53	57
Farm income:					
Alfalfa-seed	$	76	158	431	167
Dairy products	$	290	307	248	290
Total livestock	$	526	1024	2306	1020
Total farm income	$	800	1629	3521	1580
Income away from farm	$	222	191	222	211
Farm expense:					
Total cash expense	$	745	1411	3213	1413
Total non-cash expense	$	381	731	1064	640
Total farm expense	$	1126	2142	4277	2053
Farm Success:					
Labor income	$	−502	−798	−1279	−750
Miscellaneous:					
Farm income for each $1 expense	$	0.71	0.76	0.82	0.77
Percentage debts are of total investment	%	37	43	48	43
Total No. Farms		121	121	46	288

[1]Average of yearly averages.

Relation of Yield Per Acre of Alfalfa to Other Factors

Because such a large part of the crop land of the Delta Area is in alfalfa, the yield per acre of alfalfa will almost serve as a crop index for the area. As the acre-yield of alfalfa increased, the percentage of the alfalfa acreage left for seed decreased (Table 35). This accounts in part for the difference in the average yields of the four groups. The average of the three years' records shows little relationship between yield per acre of alfalfa hay and yield per acre of alfalfa seed. As measured by labor income, farms with the highest hay yields were the most profitable. The lowest yielding group had a labor income of minus $890, while the farms with a yield of more than

1.75 tons per acre had a labor income of minus $551. As measured by ratio of farm receipts to farm expenses, the highest yielding farms were also the most efficient. However, even these received an income of only $0.87 for each dollar of farm expense. Undoubtedly, low crop yield is one of the fundamental reasons for unsatisfactory economic conditions in the area. This factor also makes it exceedingly difficult, if not impossible, to change the farm organization to make any substantial improvement, unless some of the least productive land is eliminated from cultivation.

Table 35. Analysis of farm business of farms with different yields of alfalfa, Delta Area, Millard County, Utah, 1929-31, inclusive.[1]

Factors for Analysis of Farm Business	Unit	Yield per Acre of Alfalfa (tons)				Average of All Farms[2]
		Less than 0.5 Ton	0.5 to 0.9 Ton	1 to 1.75 Tons	1.75 or More Tons	
Size of farm business:						
Total capital invested	$	5060	6988	6597	8372	6677
Farm balance (percentage):						
Alfalfa acreage left for seed	%	71	55	28	25	48
Total income from livestock	%	55	51	54	45	51
Productivity of farm (yield per acre)						
Alfalfa	Tons	0.30	0.69	1.24	2.43	0.98
Seed	Lbs.	57.6	47.2	76.0	57.4	55.2
Farm income:						
Total income from livestock	$	421	490	578	758	532
Total income from farm ...	$	766	953	1063	1681	1034
Farm expense:						
Interest and taxes	$	631	658	654	682	666
Total cash expense	$	980	1025	1078	1407	1092
Total non-cash expense	$	462	492	426	535	473
Total farm expense	$	1442	1517	1504	1942	1565
Farm success:						
Labor income	$	−890	−810	−668	−551	−777
Family income	$	−383	−151	−45	110	−159
Miscellaneous:						
Farm income for each $1 expense	$	0.53	0.63	0.71	0.87	0.66
Percentage debts are of total investment	%	46	43	42	41	43
Total No. Farms		60	67	77	46	250

[1]Farms receiving more than $2000 income from livestock not included.
[2]Average of yearly averages.

Relation of the Amount of Irrigation Water Applied to Various Factors

It is generally recognized that one of the most serious problems of this area is the shortage of irrigation water.[15] For the 1929 crop year, data were

[15]See Footnote 5.

obtained relative to the amount of irrigation water applied per acre of culti-
vated land during the year. The farms applying different amounts of water
were not greatly different either in size or in type of farm organization
(Table 36). The tendency was for less alfalfa acreage to be left for seed
when a larger amount of water was applied. This is to be expected, as seed
does not require as much water as does a second and third cutting of alfalfa

Table 36. Analysis of farm business of farms applying different amounts of
irrigation water, Delta Area, Millard County, Utah, 1929.

Factors Used in Analysis of	Unit	Amount of Water Applied per Acre				All Farms in 1929
		Less than 1 acre-foot	1 acre-foot	1.1 to 1.9 acre-feet	2 or more acre-feet	
Size of farm business:						
Acres of cultivated land	Acres	53	95	68	60	74
Total acres in farm	Acres	77	144	108	98	141
Total capital invested ..	$	8848	8970	8400	8383	9304
Farm balance (pctg.):						
Cultivated land in alfalfa	%	94	94	96	92	95
Alfalfa left for seed	%	70	58	66	54	63
Total income from livestock	%	62	66	64	48	65
Productivity of farm (yield per acre)						
Alfalfa	Tons	0.53	0.41	0.66	0.84	0.68
Seed	Lbs.	41.8	39.5	42.9	61.2	49.8
Farm income:						
Alfalfa-seed	$	193	276	246	267	306
Total livestock income ..	$	596	1350	1162	834	1374
Total farm income	$	957	2030	1804	1728	2104
Income away from farm	$	302	99	197	478	259
Farm expense:						
Interest and taxes	$	590	1259	911	808	963
Total cash expense	$	1105	2172	1958	1774	1936
Total non-cash expense .	$	599	514	509	641	705
Total farm expense	$	1704	2686	2467	2415	2640
Farm success:						
Labor income	$	−1105	−1027	−915	−990	−880
Family income	$	−6	−268	−9	190	146
Miscellaneous:						
Farm income for each $1 expense	$	0.56	0.76	0.73	0.72	0.80
Percentage debts are of total investment	%	27.0	50.4	47.4	40.5	41.1
Average amount of water applied	Acre-feet	0.69	1.0	1.54	2.25	1.23
Total No. Farms		12	17	28	16	85

hay. The yield of alfalfa per acre with less than one acre-foot of irrigation water applied was 0.53 ton, while the yield of alfalfa with the application of 2 or more acre-feet of water was 0.84 ton per acre, which was an increase in yield of alfalfa of only 0.31 ton per acre. An average yield of alfalfa of only 0.84 ton per acre, with the application of 2 or more acre-feet of water, is a low production when compared to yields in other sections with a similar amount of water applied. According to Israelsen,[16] 2.25 acre-feet is near to the optimum water application for this area. Obviously, some factors other than water-supply affect yields, especially on the poorer soils. Undoubtedly, increasing the amount of irrigation water applied on the better soils to the optimum amount would increase acre-yields.

Relation of Number of Dairy Cows to Various Factors

Although the Delta Area is not an important dairy section, dairy products are one of the major sources of income. However, the number of dairy cows kept had practically no effect upon the labor income of the farms (Table 37).

Although the addition of more dairy cows increased total farm income, farm expenses increased in an almost corresponding amount. Farmers keeping two or less cows—many of this group had none at all, and those kept were largely for family use—had a labor income of minus $753. Farmers keeping more than six cows had a labor income of minus $731. The larger number of dairy cows per farm tended to be associated with the higher yields of alfalfa as well as with farms with the highest capital investment. Furthermore, those farmers with the greatest number of dairy cows received a larger return from each dollar of expense; those with more than six cows received $0.77 as compared to $0.55 for farmers with two cows or less.

REORGANIZATION OF FARM BUSINESS

From the foregoing it is apparent that some changes in the economy of agriculture of the Delta Area are desirable and necessary. The changes that may be desirable from the point of view of establishing a long-time stable agriculture are made uncertain by the problem of variation in the yield of alfalfa-seed. The agriculture as it is now organized was largely based on alfalfa-seed production. This organization functioned satisfactorily until about 1927, since which time yields of seed have been so low as to be unprofitable. Should there be a return to the yields of 1925 and 1926 and a reasonable probability of obtaining those yields regularly, the changes that would be necessary would be relatively unimportant, as compared to the changes necessary if the experiences of the past few years in the production of seed are to continue. If profitable seed yields are definitely a thing of the past the major income in the future must be from other sources and major changes must be made.

Inasmuch as the future of seed production is not definitely known, the only reasonably safe guide is past experience. The yields on the average have been extremely low since 1927, with no sign of improvement except in 1934. The risk is too great to make it practicable to attempt to continue with seed as the major enterprise. However, alfalfa-seed may well continue to be an important crop, but it is a "gambling" crop and the farm should be so organized that the income from other enterprises will pay for the opera-

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[16]*Ibid*: 28.

Table 37. Analysis of farm business of farms with different numbers of dairy cows, Delta Area, Millard County, Utah, 1929-31, inclusive.[1]

Factors for Analysis of Farm Business	Unit	No. Dairy Cows Per Farm			Average of All Farms[2]
		2 or Less	2.1 to 6	6.1 or More	
Size of farm business:					
Acres of cultivated land	Acres	54	63	68	62
Total acres in farm	Acres	80	98	92	92
Total capital invested	$	4746	6610	8407	6601
Farm balance (percentage):					
Cultivated land in alfalfa	%	94	88	93	90
Alfalfa left for seed	%	50	43	44	45
Total income from livestock . .	%	37	51	60	52
Productivity of farm (yield per acre)					
Alfalfa	Tons	0.69	1.0	1.22	1.0
Seed	Lbs.	54	48	60	53
Farm income:					
Alfalfa-seed	$	136	131	158	139
Dairy products	$	43	208	492	238
Total livestock income	$	263	500	843	527
Total farm income	$	706	982	1413	1022
Income away from farm	$	235	205	154	200
Farm expense:					
Interest and taxes	$	625	656	697	659
Cash expense	$	956	1044	1236	1070
Non-cash expense	$	337	452	611	464
Total farm expense	$	1293	1496	1847	1534
Farm success:					
Labor income	$	−753	−751	−731	−746
Total family income	$	−114	71	203	58
Miscellaneous:					
Farm income for each $1 of expense	$	0.55	0.66	0.77	0.67
Percentage debts are of total investment.	%	60	42	37	44

[1]Farms with more than $2000 income from livestock omitted.
[2]Average of yearly averages.

tion of the farm even though alfalfa-seed may be a failure during any one year.

The adjustments that seem desirable can be made only with the cooperation of the entire population of the area. Some things may be done by the individual farmer; some are problems that can be met only by the united action of a majority of people involved.

The suggested reorganization of the agriculture of the Delta Area involves five major steps, each of which is interrelated with the other four:

(1) Taking from cultivation all large areas of land that normally do not produce sufficiently to pay the costs of cultivation

(2) Transfer of irrigation water from the less productive soil to the better soils of the area

(3) Establishment of larger farm units

(4) Livestock production as the major enterprise of the area

(5) Reduction of costs of public services for agriculture, the basis of such costs being the capacity of the land to pay for itself

The first step should be to eliminate from cultivation all large areas of land that normally do not produce sufficiently to pay the costs of cultivation. The data presented indicate that this may be a considerable part of the present cultivated area. However, the decision as to just which tracts of land should be eliminated from cultivation should be based upon a study of each individual tract. This study should include not only the yields for as long a period as possible but all factors that affect the yields, particularly the soil (its physical nature and the alkali content) and the water-supply (its adequacy, cost, and loss involved in getting it to the land).

All available data indicate that in the Delta Area a yield of about 2 tons of alfalfa per acre is necessary to pay production costs (Table 38). Although this does not include all costs that could be charged against the alfalfa crop it is sufficient for practical purposes. Man labor makes up the largest single cost item ($5.55). With larger farm units the amount of labor required per acre might be reduced slightly. The same may be true of horse labor and machinery and equipment costs. The costs of irrigation water and state and county taxes ($1.40 and $1.88 per acre, respectively) are of such a nature that the individual farmer can do nothing about them. Maintenance cost of drains only has been included. This has been reported by Israelsen in Station Bulletin 255 to be $1 per acre per year. He further reports that the annual charge per acre of cultivated land to pay the annual interest and the sinking fund required to liquidate the bonded irrigation and drainage debt in 40 years would be $5.59 per acre. If this charge were really made

Table 38. Cost of growing and harvesting an acre of alfalfa hay, Delta Area, Millard County, Utah.

Item of Cost	Amount	Rate	Total Cost
Man labor[1]	18.5 hours	$0.30	$5.55
Horse labor[1]	20.9 "	0.10	2.09
Machinery and equipment[2]		. . . .	1.50
Cost of irrigation water[2] (operation and maintenance only)	. . . . . .	. . .	1.40
Maintenance of drains[3]	. . . . . .		1.00
State and county taxes[2]	. . . . . .	. . . .	1.88
Interest on investment in land and water[2]	$50	5%	2.50
Total costs	. . . . . .	. . . .	15.92
Tons of hay necessary to pay costs (hay at $8 per ton)	2	$8.00	$16.00

[1]Labor requirements on alfalfa in Millard County—average of records on 26 farms. Unpublished data of Utah Agricultural Experiment Station.
[2]Based on average costs for 1929-31, inclusive.
[3]Utah Agr. Exp. Sta. Bul. 255:56.

and paid, the necessary alfalfa yield would need be about 2.7 tons. However, it is doubtful that much of that expense will be paid. It is larger than can be carried by the agriculture of the area.

The estimated receipt of $8 per ton is approximately the average price received for hay sold in the Delta Area from 1929 to 1931. The fact that the hay may be fed to livestock rather than sold does not invalidate the general conclusions stated, as over a period of time the hay will not return on the average a considerably higher price when fed than it does when sold direct. The margin between the gross return from feeding and from selling direct is largely payment for labor and other related costs.

The estimated cost of growing and harvesting an acre of alfalfa-seed is slightly more than to grow and harvest an acre of alfalfa hay (Table 39).

Table 39. Average cost of growing and harvesting an acre of alfalfa-seed, Delta Area, Millard County, Utah.

Item of Cost	Amount	Rate	Total Cost
Man labor[1]	16.4 hours	$0.30	$4.92
Horse labor[1]	17.8 "	0.10	1.78
Machinery and equipment costs[2]		....	3.50
Cost of irrigation water[2]		....	1.40
Maintenance of drains[3]		....	1.00
State and county taxes[2]		....	1.88
Interest on investment in land and water[2]	$50	5%	2.50
Total costs		....	$16.98
Amount of production necessary to pay costs:			
Tons hay	0.6	$8.00	4.80
Lbs. seed	102	0.12	12.24

[1]Average labor requirements as obtained in 1929.
[2]Based on the average costs for 1929-31, inclusive.
[3]Utah Agr. Exp. Sta. Bul. 255:56.

The cost for man and horse labor is slightly less, but the machinery and equipment cost, which includes cost of threshing, is considerably more. The per-acre cost of threshing naturally varies as the amount of vegetation to be threshed varies.[17] The estimated cost used here is approximately the average cost for 1929, 1930, and 1931 when yields were low.

The total cost per acre is estimated at $16.98. The cost of man labor ($4.92) is the largest item. Machinery and equipment costs, including the average cost of custom threshing, was estimated at $3.50. The investment in land and water was assumed to be $50 per acre and the interest charges $2.50 per acre.

A yield per acre of hay of 0.6 ton which could be sold at $8 per ton and 102 pounds of alfalfa-seed to be sold at an average price of $0.12 per pound

[17]The usual basis for custom threshing of seed is a set amount per hour. The amount varies according to the size of the threshing machine. Within the past few years, it has varied between $4 and $7 per hour.

for seed would be necessary to meet the minimum costs of production. This is nearly double the average yield of 1929, 1930, and 1931.

There has been no attempt to include all costs in the above, only the more important ones being considered. On the basis of these data and the experience of various experiment station workers, the conclusion seems reasonable that land which will not produce on the average at least 2 tons of alfalfa or 0.6 ton of alfalfa plus 100 pounds of seed cannot be profitably cultivated. The land that will not do this should be used for a less intensive purpose, namely, pasture.

With the elimination from cultivation of the less productive lands, the irrigation water that has been used on them may now be most profitably transferred to the more productive lands which will provide a more adequate water-supply there and will tend to increase the acre-yield on those lands. The accomplishment of this transfer may in some cases involve the transfer of water without land and may furthermore involve transfers from one irrigation company to another. To successfully consummate this, the cooperation of all individuals and organizations concerned will be necessary.

A third step in the suggested reorganization of the agriculture of the area is the establishment of larger farm units. Even with acre-yields of 2 tons of alfalfa and a normal ratio of farm income to farm expenses,[18] the average size of present farm units is too small to return a satisfactory living for the farm family. From a farm of 70 acres of cultivated land with no livestock except the necessary horses, the gross income would probably not be in excess of $1000. Assuming an income of $1.50 for each dollar of expense, the return to the farmer would be only $333.

If the average amount of cultivated land were supplemented by the average amount of livestock that could be kept on the farm the gross income may be increased to about $1200. With the same ratio of income to expenses this would mean a labor income of about $400. It should not be forgotten that this is on the basis of the assumption that farm expenses would be reduced to two-thirds of the farm income. This would mean that the farm expenses of the average farm in the Delta Area would have to be reduced from $2227, the average of the 1929-31 period, to approximately $800. Probably one of the easiest ways to decrease the expenses per acre is to increase the number of acres.

With an acre-yield of 2 tons of alfalfa, a farm unit of 150 acres of cultivated land is necessary in order to provide a reasonable family living. Assuming, as before, that an acre-yield of 2 tons of alfalfa is obtained and that no livestock is kept except the necessary work horses, then the gross income from a 150-acre farm would be about $2150. With the further assumption that an income of $1.50 is received for each $1 of expense, then a labor income of approximately $700 may be available.

It is further suggested that on a farm with 150 acres of cultivated land, if range rights for grazing livestock on public lands can be obtained, a sheep or beef cattle enterprise of about 75 animal units should be added to the farm business. This would be in addition to keeping eight head of dairy cows, two hogs, a farm flock of chickens, and the necessary horses

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[18]The normal ratio of farm income to farm expense varies considerably from one farm to another and also from one type of farming to another. For the type of farming and the conditions in the Delta Area an average income of $1.50 for each $1 of expenses would probably be about as much as can be expected.

to provide power to operate the farm. With good management such a unit should increase the gross returns to about $4000. With the further assumption that an income of $1.50 can be obtained for each $1 of expense, this would result in a labor income of about $1300 which would sustain a suitable standard of living for the average farm family.

The fifth step in the reorganization of the agriculture of the Delta Area is the readjustment of costs to correspond with the ability of the land to pay. This is probably the most difficult of realization of all suggestions and assumptions. With the present production and income of the area, the agriculture cannot pay the service charges on public and private debts in addition to costs of special improvement districts. The capacity of the land to pay should be the basis for determining the amount of the public charges and the adjustments to be made.

Although it is not within the province of Bulletin 273 to suggest how such adjustments could be brought about, it may be pertinent to emphasize the acute financial situation of the area and the inability of the poorer farms to pay present public and private indebtedness. Land values will no doubt remain far below the values of 1918 to 1920, the period during which many farms were purchased. Expenses in the form of interest and special improvement taxes are outside the power of the individual farmer to reduce. There is need for cooperation in working out these financial problems.

The farmer may be able to operate his farm more efficiently, which will assist in increasing his income and in reducing farm operation expenses. Regardless of how expenses are reduced, the fact remains that unless expenses which are beyond the control of the individual farmer are considerably lowered, a much larger gross return than has been estimated is necessary in order to support the farm family and to maintain the farm.

SUMMARY

Since 1921 the economic position of the farmers of the Delta Area, Millard County, Utah, has been unfavorable. In addition to the problem of low farm prices during this period, the Delta Area experienced extreme water shortage, low crop yields (especially since 1925 for the major crop, alfalfa-seed), and excessive irrigation and drainage costs. These factors made it impossible for a large number of farmers to pay farm expenses, support their families, and make payments on indebtedness.

During the war period both production and prices of alfalfa-seed were favorable, which greatly stimulated interest in the production of this crop. The large returns resulting from high prices and high yields on certain pieces of land during certain years were followed by a rapid rise in land values.

The apparent high income from seed production and what was thought to be ample supply of irrigation water during a cycle of years of high precipitation resulted in an attempt to farm large areas of extremely poor land and in the expansion of the irrigated area beyond the normal water-supply. As a result of increased irrigation water used in the area and the lack of natural drainage, a large part of the land became waterlogged and alkaline.

Four drainage districts, including 82,400 acres of land, were organized under state irrigation and drainage laws. Installation of drainage systems was done during the period from 1916 to 1920.

The improvement and expansion of the area, including the installation of drainage systems, took place during a period when construction costs were at their peak. From 1915 to 1920 prices were greatly inflated as a result of the war; agricultural and non-agricultural commodities increased more than 100 per cent above pre-war prices. Reclamation of land and other improvements, therefore, were based upon a farm income considerably above the pre-war and post-war periods.

A large acreage of non-productive or low grade land was included in the drainage districts. Such lands could not bear the drainage costs. The high costs of drainage systems installed during a period of highly inflated prices made excessive the per-acre cost.

The four drainage districts have defaulted on their bonds. The irrigation companies have had financial difficulties. Many farmers have lost their farms either through foreclosure of the mortgages or through having their farms taken over by the county for payment of delinquent taxes. The court decisions of the District Court of Utah and the Supreme Courts of Utah and of the United States, on non-payment of general and special drainage taxes in the Delta Area, will undoubtedly have far-reaching effects upon the solution of the complicated tax situation existing in this and other areas of the state.

In the Delta Area in 1920, 96,460 acres of land were listed as belonging to individuals, corporations, cities, and Millard County. Of this acreage, 94,820 acres (98 per cent) was in private ownership, only 2 per cent being held by public agencies.

In May 1936 there were 103,615 acres of land, the ownership of which was individual, city, county, and state. Of this, 42,605 acres (41 per cent) was privately owned and 61,010 acres (59 per cent) held by public agencies. Through tax sales Millard County had taken title to 55,025 acres which represented 53 per cent of the total land in the area.

The average farm investment for the three years 1929, 1930, and 1931 on the farms surveyed was $7804. Indebtedness was $3357, with a net worth of $4447.

The average area of land per farm was 112.4 acres. Of this, 70 acres (62.3 per cent) was cultivated, the balance being either pasture or waste land. During the period from 1929 to 1931, inclusive, 91.6 per cent of the cultivated land was planted to alfalfa.

The average total yearly income per farm for this period was only $1461. With average farm receipts of only $1461, the average cash operating expenses alone were $1304. When livestock purchases were added, the total cash expenses were $1470, or $9 more than the total farm receipts. With the exception of 1931, cash farm expenses exceeded total farm receipts. The possibility for the farmers to reduce cash expenses is limited to those expenses that are not set by contract or by a public agency.

On the farms surveyed in 1929, the average interest due on mortgages and notes was $211. Total taxes and interest charges amounted to $893 per farm. Cash expenses in the form of interest and taxes made up more than 50 per cent of the cash-operating expenses.

As measured by labor income, the farms of the Delta Area were not profitable during the 1929-31 period. The average farmer had a labor income of minus $709. This means that not only did the average farmer receive

nothing except farm privileges for his labor, but that he lacked $709 of having income sufficient to pay all farm expenses.

In the Delta Area the total average family income was only $171. This included the labor income for the operator, interest on equity, unpaid family labor, income away from the farm, and value of family living from the farm.

The average acre-return from all crops grown was only $4.91. The three-year average receipts from livestock per acre of cultivated land amounted to $14.83. The total farm income from all sources amounted to only $20.68 per acre of cultivated land.

The average cash expense was $20.79. In addition to cash expense, non-cash expense amounted to $10.76 per cultivated acre, making the total farm expense $31.55 per acre.

Yields per acre of all crops grown in this area were relatively low as compared to the average of the state. For no crop was the average 1929-31 yield equal to the 1926-31 state average. Yields of alfalfa hay and alfalfa-seed, the important crops in the area, were only 60 and 36 per cent, respectively, of the state averages. The average yield of all crops in the Delta Area for the 1929-31 period was only 53 per cent of the state average from 1926-1931. While an inadequate supply of irrigation water no doubt is one of the important factors contributing to such low yields on the better soils, on an average for the area an increased amount of water applied in 1929 did not materially increase yields or farm income. This was especially true where there were other important factors contributing to low yields such as high impregnation of alkali in the soils.

The major income of farmers in the Delta Area during 1929, 1930, and 1931 was from livestock. This was largely because of the small returns from alfalfa-seed. During the years when alfalfa-seed was exceptionally profitable, many farmers kept no livestock other than work animals. With the decline in income from alfalfa-seed there was an increase in the number of farms that kept dairy cows, chickens, and hogs. Many of the additions were, no doubt in part, to provide a larger portion of the family living from the farm rather than for commercial livestock production.

Alfalfa-seed yields on the average have been extremely low since 1927, with no sign of improvement except in 1934. The risk is too great to make it practicable to attempt to continue with seed as the major enterprise, unless alfalfa-seed yields can be materially increased.

The adjustments that seem desirable can be made only with the cooperation of the entire population of the area. Some things may be done by the individual farmer and some are problems that can be met only by the united action of a majority of people involved.

The suggested reorganization of the agriculture of the Delta Area involves five major steps, each step being interrelated with the other four:

(1) Taking from cultivation all large areas of land that normally do not produce sufficiently to pay the costs of cultivation

(2) Transfer of irrigation water from the less productive soils to the better soils of the area

(3) Establishment of larger farm units

(4) Livestock production as the major enterprise of the area

(5) Capacity of the land to produce should be the basis for the reorganization program for the area.

APPENDIX

Table 1. Labor income as reported by individual farmers, Delta Area, Millard County, Utah, 1929-31, inclusive.

Record No.	Labor Income	Record No.	Labor Income	Record No.	Labor Income	Record No.	Labor Income
	(Dollars)		*(Dollars)*		*(Dollars)*		*(Dollars)*

1929—85 Records

Record No.	Labor Income	Record No.	Labor Income	Record No.	Labor Income	Record No.	Labor Income
72	1951	62	—313	52	—684	63	—1505
8	1807	27	—320	91	—696	4	—1544
79	1670	92	—364	19	—706	59	—1566
80	1645	89	—402	84	—736	12	—1598
5	786	38	—406	61	—745	2	—1730
1	690	26	—432	43	—775	66	—1782
10	481	47	—441	9	—808	73	—1854
50	225	14	—443	16	—832	25	—1938
23	116	75	—458	3	—882	69	—1941
39	103	20	—466	34	—925	53	—1947
13	89	33	—473	30	—943	64	—1963
32	47	40	—475	31	—945	35	—2046
65	1	51	—477	46	—967	77	—2248
29	—22	7	—573	86	—979	68	—2370
45	—24	54	—589	60	—1025	24	—2668
41	—30	82	—605	67	—1062	17	—2675
81	—55	48	—617	71	—1232	15	—2711
22	—127	6	—626	70	—1235	18	—2932
49	—250	90	—636	85	—1334	55	—3266
78	—256	56	—645	74	—1404	88	—3573
87	—299	42	—658	76	—1428	58	—4210
						83	—4531

1930—92 Records

Record No.	Labor Income	Record No.	Labor Income	Record No.	Labor Income	Record No.	Labor Income
122	419	106	—421	105	—731	34	—1289
129	292	7	—440	92	—753	86	—1289
126	140	121	—459	128	—754	70	—1301
104	7	109	—481	12	—763	131	—1325
85	—9	89	—483	84	—767	116	—1330
35	—15	90	—491	25	—774	66	—1346
110	—106	54	—503	19	—802	74	—1446
87	—156	3	—511	132	—859	53	—1558
111	—171	123	—523	107	—870	108	—1580
32	—243	6	—537	49	—885	77	—1604
45	—245	65	—552	71	—902	76	—1616
113	—265	120	—562	60	—924	101	—1622
117	—284	9	—564	72	—965	125	—1824
13	—292	14	—568	102	—1012	73	—1853
30	—300	91	—591	41	—1015	112	—1892
42	—305	26	—599	1	—1063	103	—2010
130	—326	33	—608	39	—1145	2	—2330
115	—342	93	—634	68	—1175	79	—2836
40	—351	62	—656	78	—1181	4	—3026
127	—359	27	—660	124	—1229	55	—3253
61	—362	20	—665	64	—1236	5	—4053
67	—394	22	—691	118	—1267	18	—4101
114	—402	63	—696	80	—1280	119	—5383

Record No.	Labor Income	Record No.	Labor Income	Record No.	Labor Income	Record No.	Labor Income
	(Dollars)		*(Dollars)*		*(Dollars)*		*(Dollars)*

1931—111 Records

Record No.	Labor Income	Record No.	Labor Income	Record No.	Labor Income	Record No.	Labor Income
113	1604	61	—44	18	—340	74	—720
253	1106	237	—55	71	—371	217	—739
259	968	215	—59	107	—379	52	—765
122	887	37	—88	251	—380	274	—816
104	836	245	—92	47	—381	67	—824
79	714	219	—93	209	—394	86	—869
25	556	110	—95	129	—409	93	—913
236	446	252	—105	22	—411	5	—917
101	409	228	—123	102	—417	53	—920
11	404	264	—131	262	—420	261	—933
111	325	89	—153	273	—428	60	—1002
256	325	7	—156	77	—435	34	—1065
234	226	207	—160	80	—456	35	—1084
115	226	221	—173	12	—474	201	—1100
269	195	49	—184	121	—475	247	—1111
226	193	271	—215	130	—491	118	—1146
205	180	202	—219	92	—524	85	—1182
275	145	124	—225	208	—529	55	—1269
73	138	203	—229	54	—531	112	—1294
90	123	41	—231	1	—546	242	—1308
91	91	211	—233	243	—579	66	—1343
218	17	232	—249	123	—619	272	—1381
13	6	68	—252	84	—628	4	—1438
109	—7	106	—275	64	—652	31	—1487
30	—13	126	—279	76	—656	103	—1518
63	—24	220	—283	212	—663	233	—1563
117	—35	223	—298	263	—669	108	—2656
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