REPORT

of

COMMITTEE ON THESIS

THE undersigned, acting as a committee of the Graduate School, have read the accompanying thesis submitted by Dana Walter Frear for the degree of Master of Science. They approve it as a thesis meeting the requirements of the Graduate School of the University of Minnesota, and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science.

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A

FARM MANAGEMENT SURVEY

in

BOULDER COUNTY, COLORADO

A thesis submitted

to the

Faculty

of the

Graduate School

of the

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by

Dana Walter Frear

in partial fulfillment

of the requirements

for the degree of

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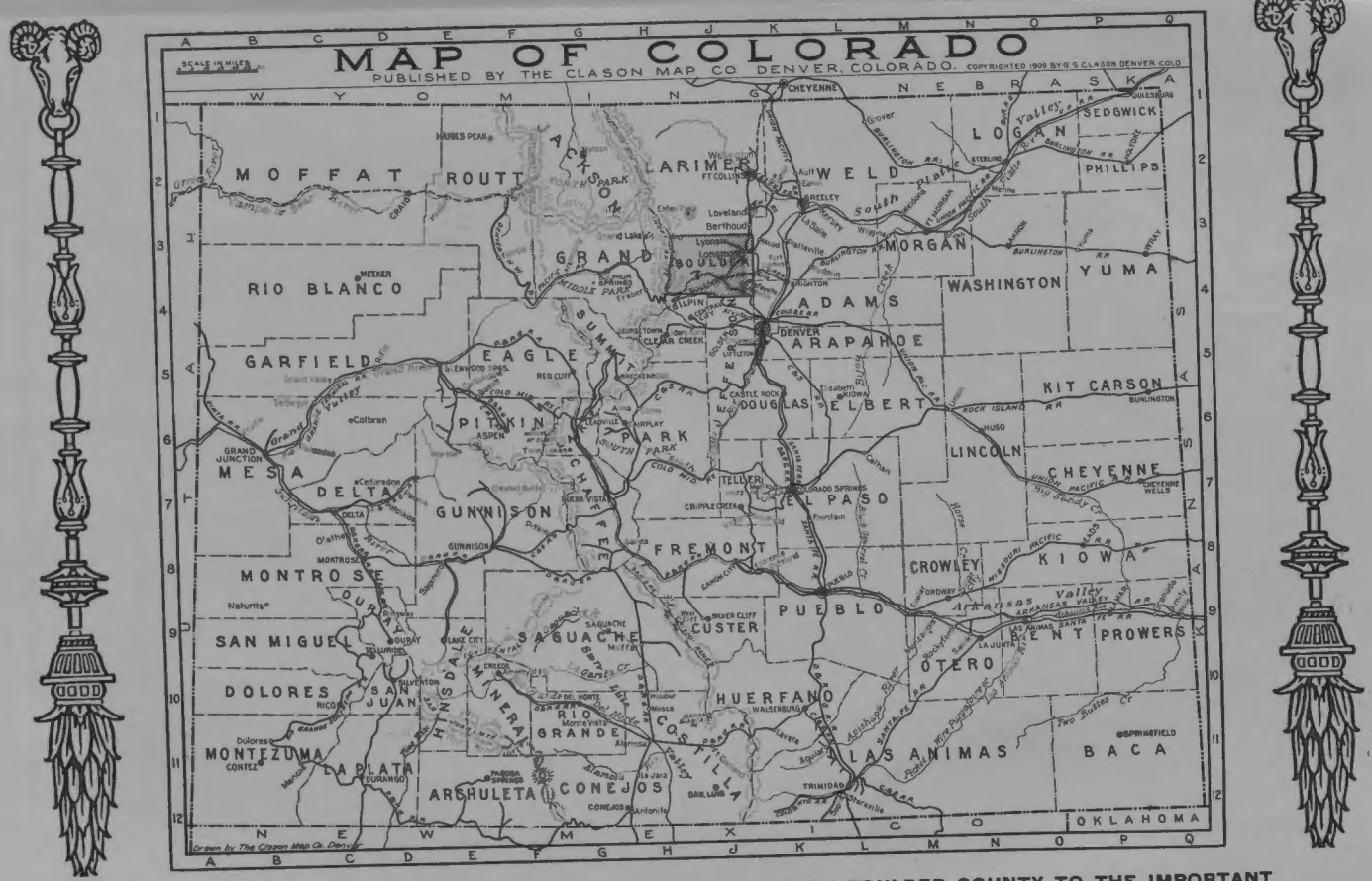

GENERAL STATE MAP SHOWING THE CONVENIENT LOCATION OF BOULDER COUNTY TO THE IMPORTANT CITIES, RESORTS AND RAILROADS OF THE STATE.

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FARM MANAGEMENT SURVEY IN BOULDER COUNTY, COLORADO

PREFACE

In this survey, complete data were obtained from thirty-two farms, of which twenty-one were operated by the owners and are designated as "Owner farms," eight by tenants and are designated as "Tenant farms," and three partly by owners and partly by tenants and are designated as "Part owner and tenant farms." The number of "Part owner and tenant farms" is so small that no attempt has been made to tabulate the data from them, excepting in the first table.

In carrying on the field work in this survey, the writer was assisted by four Colorado County Agriculturists, namely, Messrs. D. C. Bascom, Logan County; W. H. Lauck, El Paso County; S. V. Smith, Pueblo County; A. C. Cooley, San Luis Valley Counties; and Mr. C. J. Oviatt, State Leader of Farm Management Field Studies and Demonstrations for Wyoming; Mr. A. E. Bowman, Assistant State Leader of Wyoming; Mr. D. W. Working, in charge of the states of Colorado, Utah and Wyoming; and Mr. H. M. Dixon, Scientific Assistant,

Office of Farm Management, United States Department of Agriculture.

Much of the tabular work was done under the writer's direction by Mr. Walter Groom and Mr. Carl G. Morse, senior students of the Colorado Agricultural College. Helpful assistance was also rendered by Mr. O. S. Rayner, Assistant Professor of Agronomy in the Colorado Agricultural College. The brief agricultural history of the County was prepared from data furnished by Mr. D. W. Thomas, Secretary of the Longmont Commercial Association and of the Boulder and St. Vrain Valleys Agricultural Commercial Association.

The writer wishes to acknowledge the helpful assistance rendered by these men and by Mr. Frank C. Eckels, Secretary of the Boulder Commercial Club; Mr. C. L. Hover, President of the Boulder and St. Vrain Valleys Agricultural Commercial Association; and many others who helped make this survey.

D. W. Frear.

Fort Collins, Colorado,

May 15, 1915.

INTRODUCTION

This survey was conducted in Boulder County, Colorado, November, 1913. The accompanying map shows the location of Boulder County in the state.

Approximately three-fifths of the County lies west of the foothills of the Rockies and is very mountainous, varying in elevation from one to almost three miles.

The eastern portion of the County constitutes a broad plain which is well adapted to farming. It has an elevation, varying from less than five thousand feet east and south of the city of Longmont, to more than five thousand feet for most of the area, the average being about five thousand feet.

The annual rainfall of the plains section averages about fifteen inches per year.

As the resource map of the County shows, approximately one-half of the plains area of the County is irrigated, the balance of the section being idle or farmed without irrigation. The soil is fertile and, under proper management, gives good yields of the most common agricultural crops. Irrigation water is abundant, coming from the creeks of St.

Vrain, Left Hand, Boulder and Rock. Under irrigation, the land usually returns much larger yields than does land in other sections of the country, which is farmed with the natural rainfall.

The principal crops raised in the County are: alfalfa, wheat, sugar beets, field and canning peas, barley and oats, and both tree and bush fruits. Small fruits, including strawberries, raspberries, blackberries, gooseberries and currants, occupy about three hundred acres in the County and are grown with unusual success. Truck gardening is also very successful. Extensive feeding of cattle and sheep is carried on in the County during the winter months. About five hundred carloads of cattle are fed each year. Dairying and the raising of poultry, hogs and horses are important industries. The large acreage of alfalfa encourages the keeping of bees and enables the bees to make an abundance of the finest honey. Boulder County is the honey center of this country. In one year, $41,000 worth of honey has been shipped from the city of Longmont alone to eastern markets.

The growing of sugar beets is an important part of the farming of the County. It was introduced

into the County about the year 1903 by the building of a million dollar sugar factory at Longmont. More than 200,000tons of beets, valued at more than $1,000,000, are grown in the County each year. The soils of the County are especially adapted to the growth of the large yields of high quality beets. The average yield of beets is about fourteen tons per acre, which yield to the grower a net profit of about $40 per acre. The beet tops, beet pulp and refuse molasses, are valuable by-products from the field and factory, and are used extensively in the feeding of livestock.

Peas for canning are an important agricultural product. This is made possible by the presence at Longmont of the Empson Packing Company, one of the largest, if not the largest, pea canning factories in the country. Large acreages of peas for canning purposes are grown. It is said that $60 per acre profit is not an uncommon yield from canning peas. Besides peas, this Company cans sauerkraut, pumpkins, corn, beans and other farm products.

There are three flourishing flour mills in the County, the largest of which is incorporated for

$250,000 and maintains a branch mill in Denver. Its annual output is 360,000 one-hundred pound sacks of flour. Its annual capacity is 600,000 bushels of wheat. This mill is owned by the farmers of Longmont, who consider it a good business investment.

Potato Culture on Mountain and Plain

AGRICULTURAL HISTORY OF BOULDER COUNTY

The following account of the history of Boulder County was prepared from information furnished by Mr. D. W. Thomas, Secretary of the Longmont Commercial Association and of the Boulder and St. Vrain Valleys Agricultural-Commercial Association.

When settlers began drifting into the country along in the 60's, they found a typical Great Plains country of gently rolling hills and valleys, totally devoid of trees with the exception of willow, cottonwood, box elder, plum, thorn-apple, etc., along the streams. No one at that time thought of farming; the aim was cattle raising and the pioneers almost without exception possessed large cattle holdings. The old timers and retired farmers of the district of today are without exception the range riders and cow punchers of forty and fifty years ago. Farming began to be generally followed in the early 70's.

Natural conditions brought about gradual changes, however. The bottom lands along the streams were carpeted with luxuriant grass and, as the days went by, these bottom lands were farmed. Each spring

The Snowy Range as Seen From the Switzerland Trail

Typical Mountain Scenery in Boulder County, Colorado

brought on the uplands a growth of grass which, with the early days of June, began to cure by natural process and afforded good pasturage for the herds of the day.

The crops early grown were the crops to which the settler had been accustomed in his home country--wherever that might have been. It is said that every crop ever heard of in the farming sections of the east was at least attempted in the early days of this section. One year an excellent crop of tobacco was grown within a half a mile of what is now Longmont, but has never been grown since. Gradually, by the process of elimination, the country settled down to the growing of grains and potatoes, and later of alfalfa; it being learned by experience that these were the crops best adapted to existing conditions. Not for several years was it learned that winter wheat could be raised. Sole reliance was placed on spring wheat.

The spread of alfalfa was a matter of necessity. As the country settled up and the farmed area extended to the uplands, the supply of hay became totally inadequate. Someone--nobody seems to know who--began to grow alfalfa and, after a few years of success-

ful demonstration, a large part of the farming area was planted to the crop. As a logical result, the demand was soon outstripped by the supply and a market for alfalfa went begging. One year it sold for seventy-five cents per ton.

With the reaction, there began the grubbing up of the alfalfa fields,--two discoveries were made--one, that grubbing up the alfalfa with means at hand was a difficult job, and the other, that wheat following alfalfa on the same ground gave a large yield of grain.

Thirty to forty bushels was the normal yield of wheat. R. F. Coffin succeeded in clearing his land of alfalfa and planted spring wheat, his yield that year being seventy bushels per acre. He was the first man to practice crop rotation in the district. From that day it became the custom to follow the alfalfa with wheat.

Barley and oats grew successfully from the beginning and while fair success attended the growth of potatoes, the crop was raised more successfully in the valley of the Thompson and in the Greeley country to the north and east.

During these years the irrigation system had been developing toward its high state of efficiency of today. As stated above, the first farming was done in the bottom lands, where the water permitted the luxuriant growth of grasses in narrow strips along the streams. Short ditches, no more than a mile or two in length, were carried from the stream's edge and the water spread over the land in rough manner. These ditches were gradually extended to carry the water along the valley sides and, by experience, it was learned how best to handle it in fields thus brought under cultivation. And, as the watered area was extended, it was discovered that the land was of excellent fertility and productiveness. This naturally brought about a more elaborate extension of the ditches and the gradual organization of our present ditch system. As far as is known, the Pleasant Valley ditch in the country north of Longmont was the first ditch of large size to be constructed. The name of this ditch was later changed, and it is today known as the Longmont Supply Ditch.

The larger ditches were built about 1870. Since that time they have been greatly extended.

The first really "big" ditch--the Highland--was begun in 1871. This ditch was begun by the "Chicago-Colorado Colony," but being unable to complete it, they turned it over to the farmers, who finished it.

For many years the country was considered a wheat, potato and alfalfa country. Other crops were grown, however, according to the fancy of the individual farmer and perhaps his special needs. The establishment of the Empson packing plant, about 1887, brought with it the development of pea raising as a special adjunct to that industry. Prior to that time, field peas were grown to some extent for forage. The packing plant has also made profitable, to some extent, the growing of pumpkins and beans.

The introduction of the beet sugar industry in 1902, brought with it the sugar beet, which, since that time, has grown to be one of the widest grown and most lucrative of the section's crops. And as a logical sequence to the growing of beets and the production of "pulp," a by-product of sugar making, there has grown up the cattle feeding industry, which from many standpoints, particularly that of maintaining the soil fertility, is of very great value to the country.

Sheep feeding is also engaged in, though not to the extent that it is in the Fort Collins district.

The increase of fruit growing has been slow. From the beginning, it seems that each farm has had its little clump of fruit trees--its orchard, planted without knowledge of the most adaptable fruits of the region and given but scant attention. The farmer was too busy with his broad fields to "waste time" on his orchard. This condition is gradually changing, however, as it is being learned that, being not well suited to field crops, the western portions of the agricultural section of the County, enjoying a sheltered location against the foothills, are very well adapted to apple and small fruit growing.

In regard to the Boulder Valley, it seems that its history has been similar to that of the St. Vrain Valley, with the exception that probably more attention has been given to fruit growing, particularly in the western portion.

Those sections of the County in the neighborhood of Louisville and Lafayette are, agriculturally speaking, about where the Longmont section was twenty years ago. Their development has not reached a very

advanced state, due, in part, to the fact that their water supply is not of the best, and also to the fact that prime attention was given to the exploitation of the coal mines.

The extreme southern portion of the County is much as the northern section would be, did it not have the sugar industry. The southern part is a fair farming section, having come up through the same stages of development as has the northern section and has a good future before it.

Views of the Cattle Feeding Industry

DEFINITION OF TERMS USED

The terms used here are synonomous with those used by the United States Department of Agriculture.*

Farm Capital.--The farm capital is the average at the beginning and at the end of the year of the value of all real estate, improvements, machinery, live stock, feed and supplies, and cash necessary to carry on the farm business. It includes the value of the farmhouse, but not the household furnishings.

Receipts.--The farm receipts include the amount received from the sale of all farm products and also the receipts from outside labor, rent of buildings, etc. If the value of buildings, stock, produce, or equipment is greater at the end of the year than at the beginning, the difference is considered a receipt.

Expenses.--The farm expenses represent the amount of money paid out during the year to carry on the farm business. If the value of buildings, stock, produce, or equipment at the end of the year is less than at the beginning, this loss is considered an expense. Household or personal expenses are not in-

*U. S. Dept. of Agriculture Bulletin 41, pp. 7-8.

cluded, except the value of board furnished to hired help.

Farm income.--The farm income is the difference between the receipts and expenses. It represents the amount of money available for the farmer's living, provided he has no interest to pay on mortgages or other debts.

Labor income.--The labor income is the amount that the farm operator has left for his labor after 5 per cent interest on the average capital is deducted from the farm income. It represents what he earned as a result of his year's labor after the earning power of his capital has been deducted. In addition to the labor income the operator received a house to live in, fuel (when cut from the farm), garden products, milk, butter, eggs, etc. The labor income corresponds to what a hired man receives when he is given so much cash wages, together with board and room.

Farm owner.--The term "farm owner" is applied to the man who works or manages the farm he owns.

Landlord.--The landlord is the owner of a farm which is rented to a tenant.

Tenant.--The tenant is the person operating a farm rented from one landlord.

In obtaining the diversity index, the following formula was used:

$D = N\left(1-\frac{S}{I}\right)$ in which

D = Diversity Index

N = Number of enterprises contributing to farm income (such as wheat, oats, alfalfa, poultry, dairying, sheep, etc.)

S = The sum of plus departures from the average amount of enterprises.

I = The sum of all enterprises.

In determining the animal units, the following scale of factors was used:

1 cow, bull, steer, horse or mule	equals	1 animal unit
2 calves, heifers or colts	equal	1 animal unit
7 sheep or 14 lambs	equal	1 animal unit
100 chickens	equal	1 animal unit

In determining the relative education of the farmers, the following plan of expressing the degree of education numerically has been used:

Degree of Education	Relative Value
One year of graded school	1
Two years of graded school	2
Eight years of graded school	8
Completion of eighth grade	8
One year of High School	9
Two years of High School	10
Completion of High School (4 years)	12
One year of Normal School	13
Two years of Normal School	14
Each additional year of Normal School represents an increase of 1	
One year of College	13
Graduation from College	16
Business College is considered year for year equivalent to High School	

TABLE I. Average of Principal Factors of all Farms

By Groups

	Group of Farms		
	21 Owner	8 Tenant	3 Part Owner and Tenant
Size of Farms	130	174	119
Crop Area	96	146	107
Capital	19300	4605	10812
Receipts	4184	3859	3127
Expenses	1710	2289	
Farm Income	2474	1570	2083
Labor Income	1509	1345	1574

TABLE II. The average size, crop area, capital, receipts, expenses, farm income, tenant's labor income and the landlord's percentage on investment of the 8 tenant farms.

	Tenant	Landlord
Acres in farm		174
Crop Acres		146
Capital	$4505	$25,283
Receipts	3859	2,584
Expenses	2289	848
Farm Income	1570	1,736
Labor Income	1345	
Interest on Investment	225	6.1%

Table II shows that the tenants on these 8 farms make an average labor income of $1406, after receiving interest of $225 on their investment at the rate of 5%. The landlords receive average interest on their investment

at the rate of 6.1%. This does not include taxes, but does include depreciation and repairs on buildings, fences and other farm improvements.

A pile of sugar beets near beet dump 1½ miles north-east of Longmont, Colorado, November, 1913.

TABLE III. Relation of Highest Ten and Lowest Ten Degrees of Value of each Factor to Income. Comparison of all Farms with the Average of Those Having the Highest Ten and Those Having the Lowest Ten Degrees or Values of each Factor.

Factors	Average of Factors Influencing Labor Income		
	Highest Ten Average	Average of all Farms	Lowest Ten Average
Acres of Farms	198	130	63
A-Average Labor Income of These Farms	1999	1509	1067
Area in Crops	142	96	50
B-Average Labor Income of These Farms	1841	1509	1067
Farm Income	3587	3508	1431
C-Average Labor Income of These Farms	2306	1509	756
% Farm Income in Labor Income	64	60	53
Crop and Stock Receipts	5114	3452	1848
D-Average Labor Income of These Farms	2276	1509	790
% Receipts in Labor Income	45	44	43
Crop Receipts	3255	2225	1185
E-Average Labor Income	1917	1509	1109
% Receipts in Labor Income	59	68	99
Net Stock Receipts	1738	963	217
F-Average Labor Income	2054	1509	907
% Stock Receipts is of Labor Income	85	64	24
% Receipts from Crops	91	65	40
G-Average Labor Income	1020	1509	1798

TABLE III (Continued)

Factors	Average of Factors Influencing Labor Income		
	Highest Ten Average	Average of all Farms	Lowest Ten Average
Expenses per Acre	33	19	7
H-Average Labor Income	1317	1509	1798
Working Capital per Acre	49	33	18
I-Average Labor Income	1501	1509	1336
Animal Units	28	18	9
J-Average Labor Income	2036	1509	1101
Acres per Animal Unit	18	11	4
K-Average Labor Income of Farms	1298	1509	1633
Crop Acres per Work Horses	27	19	11
L-Average Labor Income of Farms	1574	1509	1357
Crop Acres per Animal Unit	12	8	3
M-Average Labor Income of Farms	1380	1509	1613
Average Number of Horses	8	5	3
Average Labor Incomes	2144	1509	981
N-Average Acres in Farms	156	130	84
Average Crop Acres	133	96	64
Total Acres per Horse	20	26	28
Crop Acres per Horse	15	19	21
Stock Products Sold per Animal Unit	71	41	13
O- Average Labor Incomes	1857	1509	1020
Diversity Index	4	3	2
P-Average Labor Incomes	1629	1509	1248
Total Receipts per Acre	69	46	23
Q-Average Labor Incomes	1319	1509	1613
Average Total Acres	71	130	188
Average Crop Acres	60	96	132

TABLE III (Continued)

Factors	Average of Factors Influencing Labor Income		
	Highest Ten Average	Average of all Farms	Lowest Ten Average
Crop Receipts per Crop Acre...	32	23	14
R-Average Labor Incomes.....	1744	1509	1315
Average Total Acres.....	125	130	131
Average Crop Acres.....	98	96	94
Average Capital.....	25599	19300	12418
S-Average Labor Incomes.....	2069	1509	1018
Average Acres in Farms.....	169	130	99
Average Number of Cows.....	7	3	2
T-Average Labor Incomes.....	1417	1509	1491
Average Receipts per Cow.....	41	34	28
Average Receipts per Cow.....	71	34	13*
U-Average Labor Incomes.....	1504	1509	1561
Average Number of Cows.....	7	3	7*
Average Years of Education of Farmers.....	10	8	6
Average Labor Incomes.....	1637	1509	1427

* Figures from only 5 farms; 6 farms had no cow receipts

A. It will be seen from Table 3 that the ten farms having the highest average area of 198 acres have a higher labor income than the average of all farms or the average of the farms having the lowest ten acreages.

B. The average labor income of the farms having the highest ten areas in crop is greater than the average labor income of all the farms or the average labor income of the farms having the lowest ten areas in crop.

C. We see that the labor income of the farms increases faster in proportion than does the farm income; that is, the average of the lowest ten farm incomes of $1431 has only 52% represented in the labor income. The average labor income of all farms of $2508 has 60% represented in the labor income, while of the farms having the highest ten farm incomes, an average of $3578, 64% is found in the labor income.

D. The labor income is much higher on those farms having high crop and stock receipts than it is on those farms having average and those with low crop and stock receipts. Of the farms having the highest

ten crop and stock receipts, which average $5114, the average labor income is equal to 45% of the crop and stock receipts. The average crop and stock receipts of all the farms, $3452, have an average labor income equal to 44% of the crop and stock receipts. Of the farms having the ten lowest crop and stock receipts, averaging $1848, the average labor income is equal to 43% of the crop and stock receipts. In other words, as the crop and stock receipts increase, a larger percentage of them is found represented in the labor income.

E. The farms with the highest ten crop receipts have an average labor income equal to 15.9% of the average crop receipts. The farms with the lowest ten crop receipts have an average labor income equal to 99% of the average crop receipts. The average of all farms which have average crop receipts less than the ten highest and more than the ten lowest, have an average labor income equal to 68% of the average crop receipts.

F. Of the farms having the highest ten net stock receipts, the average net stock receipts are equal to 85% of the average labor income of these

farms. Of the farms having the lowest ten net stock receipts, the net stock receipts equal 24% of the average labor income of the farms. The average net stock receipts of all the farms is equal to 64% of the average labor income of all the farms. As the average net crop receipts increase, the greater the average labor income and the greater the proportion of the net stock receipts found in the labor income.

G. The farms with the highest ten per cent of receipts from crops, 91, have lower labor incomes, $1036, than the farms with the lowest ten per cent receipts from crops, 40, while the farms with the intermediate per cent receipts from crops, 66, have an intermediate labor income, $1508. The average of the highest ten per cent receipts from crops is almost three times as much as the average of the lowest ten per cent receipts from crops, while the average labor income of the highest ten is less than one-half of the lowest ten. The farmers with the highest per cent of receipts from crops are the farmers with the lower labor income. This indicates that a high percentage of receipts from crops is not associated with a high labor income with these farms and the type of farming followed.

H. The farms with the highest ten expenses per acre, average, $38, have a lower average labor income than the farms with the lowest ten average expenses per acre, $7. All farms have an average expense per acre of $19, with an average labor income which is almost a mean of the highest ten and the lowest ten farms. It seems that with the type of farming followed, high expense per acre is not conducive to high labor income.

I. The farms with the highest ten average working capital per acre of $49, have a higher average labor income than the farms with the lowest ten average working capital per acre of $18, while the average working capital per acre of all farms, which is $33, represents farms having a labor income of $1,509. The farms with the higher working capital per acre yield the farmers a greater average income than the farms with low working capital per acre.

J. The farms with the highest ten animal units per farm, an average of 28, have an average labor income of $2036, almost twice as high as the farms with the lowest ten animal units per acre, an average of 9, which have an average labor income of $1,101. The average animal units of all the farms is 18, and these

farms have an average labor income of $1,509.

K. The farms having the highest ten acres per animal unit, an average of 18, have a lower average labor income of $1398, than the farms having the lowest ten acres per animal unit, an average of 4, which have an average labor income of $1,633. The average acres per animal unit of all the farms is 11, which farms have an average labor income of $1,509. This shows that for these farms the smaller the number of acres per animal unit, the higher the average labor income, and would indicate that the farmers that keep the larger number of animals on their farm, per acre, make the larger labor incomes.

L. The farms having the largest ten number of crop acres per work horse, 27, have an average labor income larger than the farms having the lowest ten number of crop acres per work horse, while all farms, having an average number of crop acres per work horse ~~for all farms~~, which is intermediate between the highest and lowest, also have an average labor income which is intermediate. For these farms it shows that on the average the farms which handle a large number of acres with one horse make a larger labor income than farms

which handle a small number of acres with each work horse.

M. The farms having the highest ten number of crop acres, 12, per animal unit have a lower average labor income than the farms having the lowest ten number of crop acres, 3, per animal unit, while the average number of crop acres per animal unit and the average labor income of all farms are intermediate between the two. Comparing paragraphs L and M, we see that the larger the number of acres per work horse, the more profitable the farms are. In other words, the fewer the number of work horses as compared with the number of acres, the more profitable the farms are. On the other hand, the smaller the number of acres per total animal unit, the more profitable the farms are; that is, the farms which have a large number of total animal units in proportion to the number of acres are the more profitable farms.

N. The farms having the largest ten number of horses, which are almost entirely work horses, have a much larger labor income than the farms having the lowest ten average number of horses.

By inspection of the original figures from

these farms, the farms which have a large number of horses have relatively larger acreages, both in their farms and in crops, than have the farms with a small number of horses. This would lead us to suggest that the larger farms, with a large number of work horses, are more profitable than the smaller farms with a small number of work horses. In other words, labor income on these farms is increased by increasing the acreages and an increase at the same time in the number of work horses, although the work horses probably do not increase in proportion as do the acreages.

O. The farms with the largest ten amounts of stock products sold per animal unit have an average labor income larger than farms with the lowest ten amounts of stock products sold per animal unit. In other words, the farms on which a large amount of stock products is sold per animal unit are more profitable than the farms on which a small amount of stock products is sold per animal unit. That is, high amounts of stock products are associated with high labor incomes.

P. The ten farms with an average diversity index of 4 have an average labor income of $1857 as

compared with all farms with an average diversity index of 3 and labor income of $1509 and the farms with the lower diversity index of 3 and labor income of $1348.

Q. The ten smaller farms with average of 71 total acres with total receipts of $69 per acre did not pay as well as the average of all farms with 130 acres with average total receipts of $46 per acre, nor as well as the ten larger farms with an average of 188 acres having average total receipts of $33 per acre. When the crop acres are considered in the same way, in place of the total acres, we find that the farms with the larger number of crop acres are the more profitable.

R. In contrast to paragraph Q, we find that the ten farms with the larger crop receipts per crop acre, $32, have larger labor incomes than the average of all farms which have $23 crop receipts per crop acre. The average of all farms in turn have a larger average labor income than the ten farms with smaller crop receipts per crop acre of $14. The ten farms with the larger crop receipts per crop acre have an average of 125 total acres and 98 crop acres, while the ten farms with the lower crop receipts per crop acre have an average of 131 total acres and 94 crop acres. One

reason that the farms with the smaller crop receipts per crop acre do not pay as well as the farms with the larger crop receipts per crop acre, is the fact that the farms with the smaller crop receipts per crop acre have a smaller acreage in crops than do the farms with the larger crop receipts per crop acre. The reason why the farms with the ten smaller crop receipts per crop acre have such a low average of receipts, $14, is due partly to the fact that two of these farms had no crop receipts at all. The fact that under Q the farms with the high total receipts per total acre and per crop acre are not as profitable as the farms with the low total receipts per total acre, is due probably to the fact that the acreage of the farms with the low receipts per acre are enough larger than the farms with the higher receipts per acre to more than make up the difference in receipts per acre. These figures indicate that where farms are about the same size an increase in receipts per acre will materially increase the labor income, but that where there is a great difference in the size of farms, it is more economical to cultivate the larger farms with only a small return per acre than it is to cultivate the smaller farms and

to attempt to make the same labor income by greatly increasing the receipts per acre. This is undoubtedly due partly to the fact that, where a very large return is received per acre, the extra expense involved will more than offset the extra large returns. In other words, farmers in this section of the State, with the type of farming generally followed, make larger labor incomes by the cultivation of larger acreages with relatively small amounts of labor and expense per acre.

S. The ten farms with the larger average capital, $25,599, have a larger average labor income than all the farms with an average capital of $19,300 and than the farms with the ten lower amounts of capital, which average $13,418. These figures indicate that large investments of capital are necessary for the production of large labor incomes in this County. This is probably due partly to the fact that land values in the county are high, and we see that the ten farms with the larger capital have an average of 70 more acres than the ten farms with the lower capital. At an average of $150 per acre the 70 acres would nearly make up the difference of $13,581 in the capital of the higher and lower capitalized farms.

T. The ten farmers having the larger average number of cows, 7, have a smaller average labor income than all farms which have an average of 3 cows and an average labor income of $1509.

We see that the 10 farms having the larger number of cows have an average return per cow of $41, while the 10 farms having the lower number of cows have an average return per cow of $28.

Minnesota Bulletin number 117, page 56, shows that the average annual cost of a milch cow in Minnesota for the years 1903-1907 was $41. It is likely higher now and would be still higher in Colorado, where labor and concentrates are higher.

So that these figures indicate that the ten farms keeping the higher number of cows have cows which are not paying for themselves, or if they pay at all, do not pay enough to make up for the weakness of other factors on these same farms.

U. Is discussed under Table IV.

V. A comparison of the average education of the farmers with their average labor income, shows that the ten farmers with the better education, an average of 10 years schooling, have an average labor

income of $1646, as compared with an average labor income of $1509 for all farmers the average of whose education is eight years of schooling, and of $1417 average labor income for the ten farmers with an average education of only six years schooling.

Feeding steers beet tops and alfalfa near sugar beet dump north-east of Longmont, Colorado, November, 1913.

TABLE IV. A comparison of all factors of the farms having the ten higher and the farms having the ten lower receipts per cow.

	10 farms with higher receipts per cow	10 farms with lower receipts per cow
Average receipts per cow	71	12
Labor Income	1504	1561
Capital	18049	19243
Expenses	1202	2199
Receipts	3638	4722
Farm Income	2436	2523
Crop Receipts per Crop Acre	19	26
Total Receipts per Total Acre	53	42
Stock Products Sold per Animal Unit	59	27
Diversity Index	3.8	3.2
Number Horses	5.7	6.2
Crop Acres per Animal Unit	4.3	9.6
Crop Acres per Work Horse	15	21
Acres per Animal Unit	7	12
Animal Units	19.7	19.3
Working Capital per Acre	40	30
Expenses per Acre	20	19
Per Cent Receipts from Crops	51	78
Net Stock Receipts	1218	639
Crop Receipts	2737	4085
Area in Crops	70	108
Area in Farm	92	138

Table IV shows that the ten farms having the higher receipts per cow have an average lower labor income than the ten farms with the lower receipts per cow.

By an examination of the other factors in connection with these two farms it is seen that the ten farms with lower receipts per cow and which also have the higher average labor income have a larger farm income, larger crop receipts per acre, larger number of crop acres per work horse, larger per cent of receipts from crops, larger crop receipts from crops, larger area in crops, and larger area in farm, than the ten farms with the larger receipts per cow.

The farms with the lower receipts per cow have an average of 38 more crop acres and an average of $1348 more from crops than the other ten farms. This serves to emphasize the showing made in Table 3 that size is an important factor for these farms.

The extra returns made per cow and the extra average receipts per animal unit on the ten farms with the larger receipts per cow, appear to have not been able to make up for the average deficiency of 38 crop acres on these farms.

The fact that both of these groups of farms have about the same number of animal units, 19.7 and 19.3 respectively, would indicate that dairying is not as profitable (as carried on) as is the keeping of other forms of live stock than dairy cows.

Some of the factors which may have prevented a larger labor income on the ten farms with the larger receipts per animal unit are:

Smaller crop receipts per acre.

Smaller crop acres per work horse.

Larger working capital per acre.

Smaller crop receipts.

Smaller acres in crops.

The whole survey indicates that market crops are profitable products to raise on these farms.

TABLE V. Comparison of farms with highest ten and those with lowest ten labor incomes with all farms.

Factors	Average of 10 highest labor incomes	Average of all owner farms	Average of 10 lowest labor incomes
Farm Income	$3436	$2508	$1514
Labor Income	2362	1509	696
% Labor Income is of Farm Income	68.7		45.9
Acres in Farm	138	130	118
Crop & Stock Receipts	4794	3452	2163
Crop Receipts	2790	2225	2048
Net Stock Receipts	1556	963	494
% Receipts From Crops	66	65	70
Expenses per Acre	19	19	20
Average Capital	21477	19002	16139
Working Capital per Acre	32	33.5	37
Animal Units	25	18	12
Acres per Animal Unit	7	11	17
Crop Acres per Work Horse	16	19	21
Crop Acres per Animal Unit	5.6	8	10
Average Number of Horses	6.8	5.5	3.8
Average Number Cows	6	3.4	3
Receipts per Cow	41.4	34.2	26. 1
Stock Products Sold per Animal Unit	53	41	23.4
Total Receipts per Total Acre	47	46	46
Crop Receipts per Crop Acre	26	23	24
Diversity Index	3.8	3.4	2.9
Years of Education of Farmer	7.5	8.6	9.1
Acres in Crops	108	130	118

TABLE IV1. Number of Farms with More or Less than the Average Degree or Value of Factors which Affect Labor Income.

Factors	Farms with more Than Average of Factors		Farms with less Than Average of Factors	
	No. of Farms	% of Total No.	No. of Farms	% of Total No.
Labor Income	7	33	14	67
Area in Farm	9	43	12	57
Area in Crop	11	52	10	48
Farm Income	8	38	13	62
Crop and Stock Receipts	8	38	13	62
Crop Receipts	11	52	10	48
Net Stock Receipts	7	33	14	67
% Receipts from Crop	13	62	8	38
Expenses per Acre	8	38	13	62
Working Capital per Acre	8	38	13	62
Animal Units	6	29	15	71
Acres per Animal Unit	6	29	15	71
Crop Acres per Work Horse	8	38	13	62
Crop Acres per Animal Unit	8	38	13	62
Average No. of Horses	9	43	12	57
Average No. of Cows	9	43	12	57
Stock Products Sold per Animal Unit	10	48	11	52
Diversity Index	8	38	13	62
Receipts per Acre	7	33	14	67
Average Capital	10	48	11	52
Receipts per Crop Acre	10	48	11	52

TABLE VII. Distribution of Receipts on Owner Farms

Receipts From:	Total	Average Per Farm	Percent of Total Receipts
Corn	$.00	0.24	
Wheat	14,898.00	709.43	21.50
Oats	1,434.00	68.28	2.07
Barley	1,965.00	93.57	2.83
Alfalfa*	5,618.00	267.52	8.10
Native Hay*	240.00	11.43	0.35
Hay	5,858.00	278.95	8.45
Sugar Beets	17,938.00	854.19	25.86
Canning Peas	854.00	40.67	1.23
Truck Crops	50.00	2.38	0.07
Apples	3,193.00	152.05	4.61
Berries	438.00	20.86	.63
Cattle	7,411.00	352.90	10.68
Horses	1,125.00	53.57	1.62
Sheep	6,505.00	309.76	9.38
Hogs	3,718.00	177.04	5.36
Poultry	1,818.00	86.57	2.62
Labor	1,400.00	66.67	2.02
Miscellaneous	744.00	35.43	1.07
TOTAL	69,354.00	3,302.56	100.00

* Duplicated in "Hay" and not added in Total

Table VII. shows the distribution of receipts of the owner farms. The products arranged in the order of the percentage which they contribute to the total receipts are as follows with their percentages: Sugar beets, 25.86 percent; wheat, 21.50 percent; cattle, 10.68 percent; sheep, 9.38 percent; hay, 8.45 percent; hogs, 5.36 percent; apples, 4.60 percent; barley, 2.83 percent; poultry, 2.62 percent; oats, 2.07 percent; labor, 2.02 percent; horses, 1.62 percent; canning peas, 1.23 percent; miscellaneous, 1.07 percent; berries, .63 percent; corn, a negligible amount.

It will be seen from this table that sugar beets, wheat and cattle are the highest three contributors to the farm receipts. Alfalfa hay contributes 8.15% to the total contribution of hay, as compared with .35% for native hay. In their contribution to the farm receipts, sheep are about twice as important as hogs.

When arranged by groups of products into field crops, fruit and live stock, their importance is as follows: Field crops, 61.94%; live stock, 29.66%; Truck fruit, 5.31%; labor and miscellaneous, 3.09%.

Of course this table does not show the relative profitableness of the different farm products.

While the table shows that sheep contribute almost twice as much to farm receipts as do hogs, this does not ~~not~~ necessarily mean that sheep contributed any more net profit to the farmer than did the hogs. In fact a farmer might have lost money on his sheep and made it up on his hogs. Inspection of the original figures reveals the fact that only one farmer out of the ehtire 21 had any sheep, and that the entire income from sheep, shown in the table was from one farm. On this one farm however sheep contributed so largely to the farm income that there is no question but that they contributed largely to the labor income.

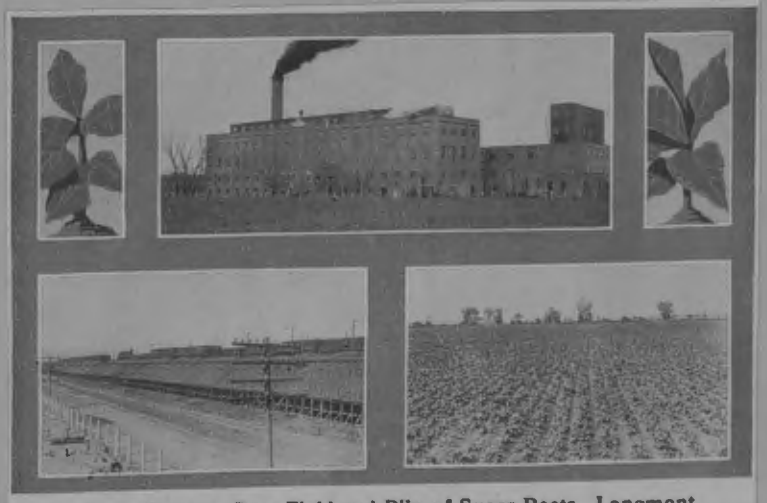
Some Boulder County Agricultural Resources

TABLE VIII. Average Distribution of Receipts on all Owner Farms Compared with Those on Farms with the Highest Ten Labor Incomes and Those with the Lowest Ten Labor Incomes.

Source of Receipts	Highest Ten Labor Incomes Average		All Farms Average		Lowest Ten Labor Incomes Average	
	Amount per farm	% per farm	Amount per farm	% per farm	Amount per farm	% per farm
Corn	.50	6.01	.34			
Wheat	649.7	14.24	709.43	21.50	734	34.80
Oats	143.4	3.15	68.38	2.07		
Barley	82.9	1.82	93.57	2.83	76	3.63
Hay	233.8	5.13	278.95	8.45	368	13.71
Sugar Beets	1389.3	30.51	854.19	25.86	389	18.44
Canning Peas	57.4	1.26	40.67	1.23	28	1.33
Truck Crops			2.38	.07		
Apples	198.8	4.36	152.05	4.61	121	5.74
Berries	43.8	1.00	20.86	.63		
Cattle	527.8	11.59	352.90	10.68	200	9.48
Horses	99.5	2.18	53.57	1.62	13	.62
Sheep	650.5	14.28	309.76	9.38		
Hogs	258.1	5.67	177.04	5.36	114	5.40
Poultry	100.2	2.20	86.57	2.62	70	3.31
Labor	81.00	1.78	66.67	2.02	59	2.79
Miscellaneous	37.5	.82	35.43	1.07	37	1.75
TOTAL	4554.20	100.0	3302.56	100.0	2109	100.00
Hay and Grain		**24.35**		**34.85**		**51.14**
Sugar Beets		**30.51**		**25.86**		**18.44**
Livestock		**35.92**		**29.76**		**18.81**

Table VIII shows that the farms with the ten larger labor incomes have 24.35% of their income from hay and grain, 30.51% from sugar beets, and 35.92 from live stock, as compared with 34.85% from hay and grain, 25.86% from sugar beets, and 29.76% from live stock for all farms and 51.14% from hay and grain; 18.44% from sugar beets and 18.81% from live stock for the ten farms with the lower labor incomes.

The farms that pay the better have larger incomes from cattle and sugar beets than do the farms that do not pay so well, while these farms in turn have a higher percentage of receipts from hay and grain than do the better paying farms.



Sugar Factory, Beet Field and Pile of Sugar Beets, Longmont

Interest Received by Landlords

Seven landlords receive an average of 6.1% gross interest on their investments. The amounts vary from 2.67% to 8.4%.

Taxes have been deducted, but repairs and depreciation on buildings, fences, etc., are included.

Fattening steers near Longmont, Colorado, November, 1913.

TABLE IX. Comparison of Farm Number One with the Farms with the Ten Higher and the Farms with the Ten Lower Labor Incomes.

Factors	Average of 10 highest Labor Incomes	Farm Number One	Average of 10 lowest Labor Incomes
Farm Income	$3436	$1761	$1514
Labor Income	$2362	$ 817	$ 696
% Labor Income is of Farm Income	68.7	46.4	45.9
Acres in Farm	138	337	118
Acres in Crops	108	176	83
Crop & Stock Receipts	$4794	$3096	$2163
Crop Receipts	$2790	$2888	$2048
Net Stock Receipts	$1556	$ 208	$ 494
% Receipts from Crops	66	89	70
Expenses per Acre	$ 19	$ 6.40	$ 20
Average Capital	$21477	18874	$16139
Working Capital per Acre	$ 31	$ 16.20	$ 37
Animal Units	25	15.5	12
Acres per Animal Unit	7	15.3	17
Crop Acres per Work Horse	16	23.5	21
Crop Acres per Animal Unit	5.6	11.3	10
Average Number of Horses	6.8	7.5	3.8
Average Number cows	6	3.5	3
Stock Products sold per Animal Unit	$ 53	$ 13.42	$ 23.4
Receipts per Acre	$ 47	$ 13.70	$ 46
Receipts per Crop Acre	$ 26	$ 16.40	$ 34
Diversity Index	3.8	3.294	2.9

Farm #1 Compared with Average of Ten Better Farms.

Labor income low. This farm is larger than the average best ten farms, has a greater number of acres in crops, and crop receipts are high. However, the stock receipts are less than one-seventh of the average of the best ten farms, which coincides with the fact that there are on the farm of 237 A. only 15.5 animal units and 15.3 A. per animal unit, compared with the better farms averaging 139 acres with 35 animal units, or 7 acres per animal unit. Apparently this farm has not enough live stock.

Strawberry Culture in Boulder County

TABLE X. Comparison of Farm Number 19 with the Farms with the Ten Higher and the Farms with the Ten Lower Labor Incomes.

Factors	Average of 10 highest Labor Incomes	Owner Farm Number 19	Average of 10 lowest Labor Incomes
Farm Income	$ 3436	$1330	$ 1514
Labor Income	$ 2363	$ 220	$ 696
% Labor Income is of Farm Income	68.7	16.5	45.9
Acres in Farm	138	80	118
Acres in Crops	108	68.5	83
Crop & Stock Receipts	$ 4794	$2232	$ 2163
Crop Receipts	$ 3790	$1835	$ 2048
Net Stock Receipts	$ 1556	$ 535	$ 494
% Receipts from Crops	66	82.2	70
Expenses per Acre	$ 19	$ 46.70	$ 20
Average Capital	$21477	$22199	$16139
Working Capital per Acre	$ 31	31.86	$ 37
Animal Units	25	21	13
Acres per Animal Unit	7	3.9	17
Crop Acres per Work Horses	16	17.1	21
Crop Acres per Animal Unit	5.6	3.25	10
Average Number of Horses	6.8	4	3.8
Average Number cows	6	4	3
Stock Products Sold per Animal Unit	$ 53	$ 15	$ 23.4
Receipts per Acre	$ 47	$ 63.50	$ 46
Crop Receipts per Crop Acre	$ 26	$ 26.80	$ 34
Diversity Index	3.8	4.998	2.9

Farm Number 19 Compared with Average of Ten Better Farms

Labor income low. Area in farm and crops low. Crop receipts low. Stock receipts about 1/3 of that of the better farms. Animal units for the farm are relatively high compared with number of acres in the farm, there being only 3.9 acres per animal unit while there are 7 acres on the better farms. There does not appear to be the proper balance between crops and stock sold. The farm is likely too intensively stocked and the net receipts per animal unit are too low, being only $25 as compared to $62 on the better farms. The Diversity Index is high.

Suggestions: Increase quantity of product per animal unit or improve the quality of the product. Possibly reduce the animals and increase the returns per animal and sell more crops.

S U M M A R Y .

This survey shows that the farmers of Boulder County make good labor incomes.

The highest average of labor income is from the three part owner and tenant farms, the next higher being from the twenty-one owner farms, and the lowest from the eight tenant farms.

The gross average income of the landlords is 6.1%. This does not include taxes, but does include depreciation and repairs on buildings, fences and other farm improvements. Deducting these items would likely make a great reduction in the interest on the investment, so that the net returns would not be very large.

The farms having the higher ten degrees of value of the following factors- area of farms, area in crops, farm income, crop and stock receipts, working capital per acre, animal units, crop acres per work horse, average number of horses, stock products sold per animal unit, diversity index, crop receipts per crop acre, average capital, average years of education of farmers,-have higher average labor incomes than the farms having the ten lower degrees of value of these

factors. It appears that a high degree of value of these factors is associated with and helps to produce high labor incomes.

In farms having the ten lower degrees of value of the following factors - per cent receipts from crops, expenses per acre, acres per animal unit, crop acres per animal unit, total receipts per acre, average number of cows and average receipts per cow,- have higher average labor incomes than the farms having the ten higher degrees of value of these factors. It appears that a high degree of value for these factors is not associated with nor does it tend to produce a high labor income with the conditions under which farming is carried on in this country.

Large farms with large capital invested, with large percentage of receipts from stock and low percentage of receipts from crops, with a large number of animals per farm and with a high degree of diversity are more profitable in Boulder County than other types of farms.

Dairying as carried on in the county evidently does not pay on the average. This may be due to the fact that the cows themselves do not pay, or that on these farms the other enterprises are so weak that their

deficiency more than offsets the returns received from the cows.

The farms with the ten higher labor incomes have a higher degree of value of the following factors- acres in farm, crop and stock receipts, net stock receipts, average capital, animal units, average number of cows, receipts per cow, stock products sold per animal units, total receipts per total acre, crop receipts per crop acre and diversity index than the ten farms having the ten lower labor incomes.

The high receipts for the farms come from the products in the order named: sugar beets, wheat, cattle, sheep, hay, hogs, apples, barley, poultry, oats, labor, horses, canning peas, miscellaneous and berries.

The farms with the ten higher labor incomes have a higher percentage of receipts from sugar beets and from live stock than do the farms with the lower ten labor incomes, or than the average of all farms.

The farms with the ten lower labor incomes have a much higher per cent of receipts from hay and grain than the average of all farms or the farms with the ten higher labor incomes. These figures indicate that sugar beets and live stock are more profitable cash products on these farms than hay and grain.