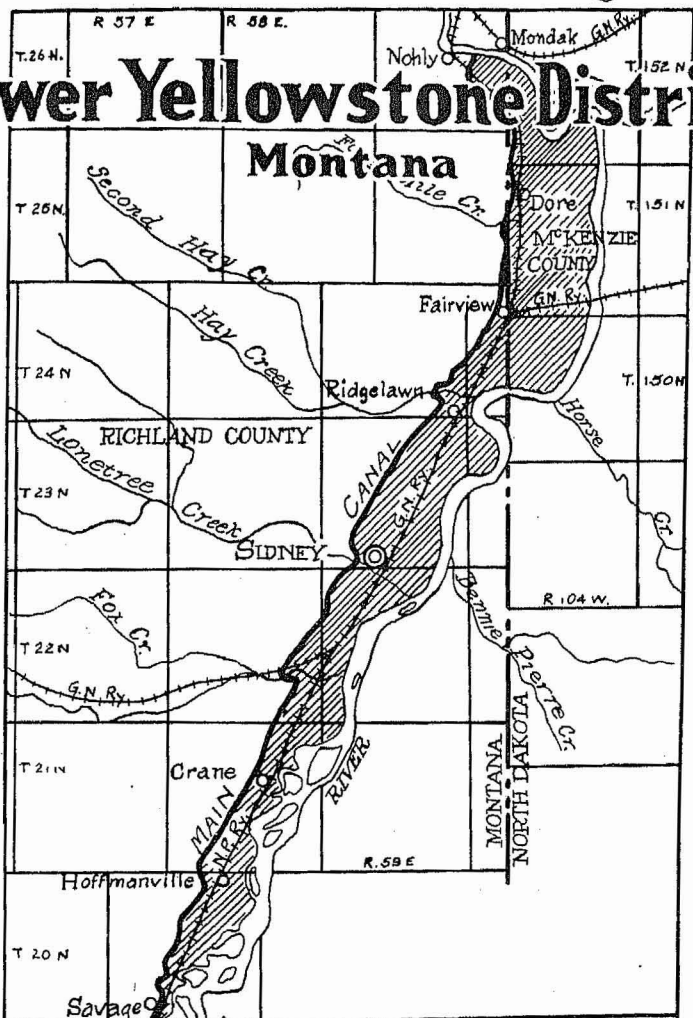


Agricultural Conference Report

Lower Yellowstone District



MONTANA EXTENSION SERVICE IN AGRICULTURE AND HOME ECONOMICS,
 J.C. Taylor, Director; Montana State College and the United
 States Department of Agriculture, Cooperating; Acts of Congress,
 May 8 and June 30, 1914.

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Introduction

The first organized effort to draw up a definite agricultural development program for the Yellowstone Irrigation Project was made at the Agricultural Economic Conference held at Sidney, April 1-2, 1927. Augustus Vaux of Sidney was general chairman of the conference and H. F. DePue, county agricultural agent for Richland County, was general secretary.

Previous to this conference leading farmers, farm women and business men had been appointed to committees to make studies of the production and marketing factors for the various important lines of farming conducted on the Project. These committees, of from 10 to 20 members each, were appointed to study and draw up recommendations for farm management, grain and forage, livestock, dairying, beets and beans, horticulture, poultry, beekeeping and farm living. Each committee met one or more times before the conference to assemble and consider the facts and information collected. In addition to the fact material gathered by committee members for the different agricultural communities of the Project, the committees also had before them the records of studies made by the Bureau of Reclamation of the United States Department of the Interior applying particularly to the Lower Yellowstone Project, and the results of studies carried on by the Montana Experiment Station and the Montana Extension Service, published in the Montana Extension Service bulletin, No. 81, "Basic Facts About Montana's Agriculture."

With all available information regarding soils, climate, markets, transportation facilities and other factors which have a bearing upon farming, livestock production and life upon the farm, the Agricultural Economic Conference convened at Sidney to draw up an agricultural program for the Lower Yellowstone Irrigation Project. This bulletin contains the basic information on the agricultural resources of the Project and the findings and recommendations of the Economic Conference.

In its work to draw up an agricultural development program for the Lower Yellowstone Irrigation Project, the Economic Conference had the cooperation of the Richland County Farm Bureau and other farm and business organizations as well as the active assistance of representatives of the Montana Extension Service.

Present Stage of Development

The Agricultural Economic Conference was indebted to H. A. Parker, manager of the Lower Yellowstone Project, for the following information:

“Location: The Lower Yellowstone Irrigation Project is situated in eastern Montana and western North Dakota. A small portion is in Dawson County, Montana, a little less than two-thirds in Richland County, Montana, and about one-third in McKenzie County, North Dakota. It comprises 58,561 acres of irrigable land along the west side of the Yellowstone River.

“The project lies between the main lines of the Northern Pacific Railway and the Great Northern Railway and is reached by branch lines to Sidney. There are no farms on the project that have to haul more than four miles to reach a railroad siding.

“Towns: Savage, Sidney and Fairview are the principal towns. They have populations of 250, 1800 and 700, respectively. Glendive, Montana, and Williston, North Dakota, are towns off the project, of about 5,000 population each. Both are reached in a few hours by automobile.

“Schools and Churches: The Lower Yellowstone Project is well provided with public schools. There are 16 grammar schools and three high schools. There are also 16 churches, representing many denominations.

“Highways: The combined Theodore Roosevelt Highway and Glacier Trail follows the Missouri River at the north end of the project. The National Parks Highway passes through Glendive, which is 17 miles from the south end of the project. The crossover between these main highways extends from Glendive, Montana, to Williston, North Dakota, and traverses the entire length of the project.

“Water Supply: The project has excellent water rights in the Yellowstone River, the largest tributary to the Missouri. The irrigation works consist of a diversion dam across the Yellowstone River at Intake and a main canal to carry this water through the project to a point near the Missouri River, a distance of 70 miles. Laterals, sublaterals, and necessary irrigation structures supply water to each farm. A direct-connected hydraulic pumping plant near Savage, Montana, furnishes water to 2,300 acres of bench land above the main canal. The permanent nature of the construction makes it possible to operate the system cheaply.

“Cost of Water: The cost of water for irrigation is low. The annual charges are made up of operation and maintenance and construction assessments. Operation and maintenance cost has averaged \$1.35 per acre for the past seven years. The total cost of construction, including the estimated cost of providing the drainage system, averaged \$66 per acre. This debt is interest free, except for delinquent payments, and is repaid by annual assessments arrived at by computing 5 per cent of the average gross annual crop values based on a period of 10 years. The average crop value per acre for the past 10 years amounts to \$30 an acre. Five per cent of this is \$1.50.

“Under the new contracts the Government will operate the project until 1932, when the operation and maintenance will be turned over to the water users, who are organized into two irrigation districts.

“Land Values: There is no public land open to entry on this project. Prices and selling terms on 77 farms are controlled until December 31, 1928, by options in favor of the United States. The prices vary from \$12 to \$110 an acre, depending on soil, number of irrigable acres, and value of improvements on each farm. These prices were fixed by an independent committee of appraisers who understand local soil and farming conditions and are regarded as being reasonable. Some of the farms are improved and have houses, outbuildings, fences, farm ditches, and a portion in alfalfa or prepared for irrigation. A portion of some of the farms are above the canals and the land may be used for dry farming or for pasture.

"Soil and Climate: The soil is a deep sandy or clay loam. It is fertile, retains moisture well, and is easy to work. The valley is long and narrow, which favors drainage. The percentage of seeped land is small. The surface of the land is generally level or gently sloping, which makes its preparation for irrigation simple.

"The last frost in the spring is about May 15, and the first in the fall about September 20. The average period between the last killing frost in the spring and the first in the fall is 129 days. Owing to the northern latitude, which is 48 degrees N., the days in summer are long and crops have a rapid growth. The summers are warm and sunny and the winters not nearly so severe as would be expected in this latitude, as they are moderated by Chinook winds. The average annual rainfall over a period of 21 years is about 14 inches.

"General: During 1926 there were 601 farms under cultivation. In addition to these, 133 farms were not farmed. The work was done by 321 farmers who actually lived on the farms. This indicates that the most urgent need is for more farmers. The United States Department of the Interior has issued a booklet, 'Opportunities for Farm Ownership on the Lower Yellowstone Project,' which gives additional information on the project and describes individual farm tracts available to prospective settlers."

Adjacent Non-Irrigated Land

While the Lower Yellowstone Conference was concerned with the development of a program for irrigated land, the committees recognized the importance of the vast dry land areas adjacent to or near the irrigated sections. Much of the nearby non-irrigated land is used for grazing purposes. Many ranchers are looking more and more to farmers on irrigated land for certain feeds, particularly alfalfa, corn and barley, which can be produced more abundantly under the ditch than on the dry lands. Thus a cash market is created for feed crops.

The existence of dry land ranch enterprises also provides a supply of feeder cattle and sheep which can be fattened for market on the feeds produced on the irrigated farms and on the

by-products of the sugar factory. As shown in the report of the livestock committee, livestock feeding is one of the most important agricultural enterprises on the project.

The relative importance of the irrigated land in Richland County as compared with the non-irrigated land of the county is indicated in Fig. 1 on this page. The figures used are taken

RICHLAND COUNTY

LAND AREAS AND VALUATIONS A PERCENTAGE COMPARISON

APPROXIMATE TOTAL LAND AREA 1,346,000 ACRES



TOTAL PRODUCTIVE AREA - 1,144,937 ACRES



TOTAL ASSESSED VALUATION - PRODUCTIVE LANDS



\$12,417,114

IRRIGATED

NON-IRRIGATED
TILLABLE

GRAZING

NON-PRODUCTIVE

FIGURE 1

from the report of the Montana State Board of Equalization for 1926. On the basis of area the irrigated land appears of little consequence but a comparison of total valuations gives a more accurate picture of its relative importance.

The total agricultural land of the county in 1926 had an assessed valuation of \$12,417,114, of which 12.9 per cent was on irrigated land, 59.5 per cent for non-irrigated tillable land, and 27.6 per cent for grazing land.

Table 1—How Richland County Compares with the State in Kinds of Land and Land Valuations.

	Total acres		Per acre value		Total value	
	County	State	County	State	County	State
Irrigated						
Land	26,440	1,453,621	\$60.90	\$50.80	\$ 1,610,230	\$ 73,850,741
Non-Irr.						
Tillable	464,089	20,034,669	15.95	12.86	7,400,827	257,824,423
Grazing						
Land	648,910	28,735,387	5.25	4.82	3,406,057	138,557,696
Totals.....	1,139,439	50,223,677	\$10.85	\$ 9.33	\$12,417,114	\$470,232,860

The crop and livestock enterprises in Richland County produced \$3,669,520 worth of products in 1926, of which \$2,300,120 came from crops and \$1,369,400 from livestock. The irrigated land contributed about one-fourth of the total values of crops and livestock.

Transportation and Markets

Situated between two transcontinental railroad systems with branch lines of both running into Sidney, the project is favorably situated from a transportation standpoint. Distance to leading centers of population which are or may become important marketing points for the project are shown in Figure 2 on page 9. The figure also gives freight rates to these markets on various farm products.

On the basis of the annual per capita consumption of the United States, the 11,100 people of Richland County consume annually approximately 872 beef steers, 3,600 hogs, 750 sheep, 50,000 bushels of wheat, 181,500 pounds of butter, 38,500 pounds

DISTANCES AND FREIGHT RATES ON VARIOUS PRODUCTS FROM SIDNEY TO IMPORTANT MARKETS

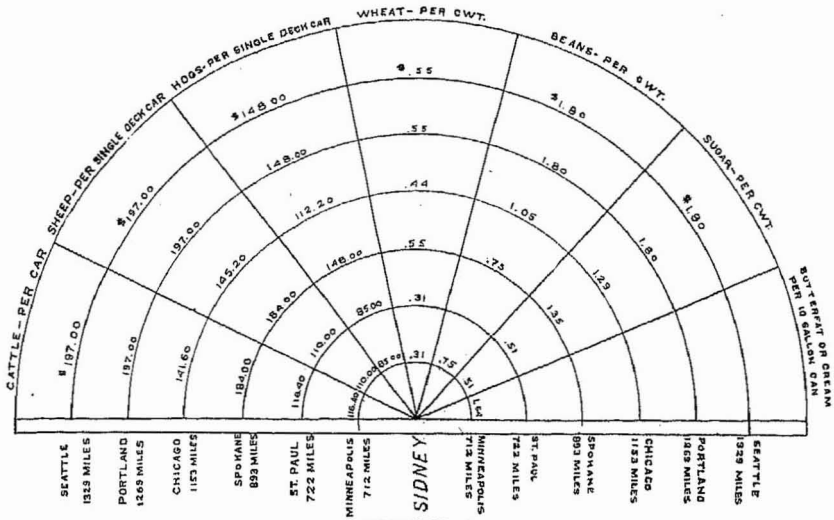


FIGURE 2

of cheese, 608,300 gallons of whole milk and cream and 19,800 dozens of eggs.

By far the greater part of the farm products produced on the project must be exported, making marketing a factor of the utmost importance.

Because of the problems of transportation and marketing, various cooperative and private enterprises for handling and processing agricultural products have been established within the area.

Local Industries

The factory of the Holly Sugar Company at Sidney has a capacity of 1,000 tons of beets daily. The Russell Miller Milling Company at Sidney has a capacity of 650 barrels of flour per day, and the Fairview Milling Company mill at Fairview has a capacity of 150 barrels per day.

The Yellowstone Cooperative Dairymen's Association, with a membership of 35, sold 40,000 pounds of butterfat in 1926. Other concerns and organizations handling farm products include the Northland Seed Company at Sidney, the Everett B. Clark Seed Company at Fairview, the Valley Mercantile and

Lumber Company at Sidney, and the Armour Creamery Company at Sidney.

With the flour mills and sugar factory located on the project, facilities are available for handling several times the present acreage of sugar beets and more than half of the wheat crop of 1926 could have been converted into flour and by-products at home.

Farm Development

A statistical picture of the Lower Yellowstone Irrigation Project is provided in the following tables, which have been compiled from the project census for 1926.

Table 2 gives details on number of farms, farm tenure, character of farms and operators and figures showing distribution of population.

Table 2—A Statistical Picture of the Project—1926.

Items	Number
Number of farms actually irrigated.....	471
Owners on farms (including entrymen).....	175—54.6%
Farmed by owners not living thereon.....	73
Tenants on farms	146—45.4%
Farmed by tenants not living thereon.....	207
Farms not farmed	133
Total farms on project	734
Good farmers	149
Fair farmers	101
Poor farmers	71
Poor crop results	231
Fair crop results	160
Good crop results	152
Excellent crop results	58
Population on farms	1,432
Average population on farms per farm.....	2.0
Public schools (entire project)	18
Towns (entire project)	8
Population of towns (entire project) total.....	2,820

Table 3 shows how the irrigated lands were used in 1926, the results in yields and financial returns.

Table 4 gives the livestock figures for the project, showing number and value of different classes of livestock as well as a summary of machine equipment used in operating farms.

Table 3—Crops Produced on the Project in 1926.

Crop	Area acres	Unit of yield	Yields			Values		
			Total	Average per acre	Per unit of yield	Total	Per acre	
Alfalfa, new	200	ton	.....	.....	.....	.....	.....
Alfalfa, hay	6,352	ton	15,204	2.4	10.00	\$152,040.00	\$ 23.93	
Alfalfa seed	32	bu.	158	4.9	12.00	1,896.00	59.25	
Barley	1,500	bu.	52,602	35.1	.50	26,301.00	17.53	
Beans	498	bu.	7,457	15.	1.90	14,358.00	28.83	
Beets, sugar	5,180	ton	50,286	9.7	6.00	301,716.00	.....
Beet tops	5,180	acre	.....	.....	5.00	25,900.00	63.25
Clover hay, sweet	64	ton	81	1.3	7.00	567.00	8.86	
Clover seed, sweet	2	bu.	.....	.....	4.20	.....	.....
Corn, Indian	961	bu.	17,968	18.7	.70	12,578.00	13.09	
Corn fodder	273	ton	549	2.0	3.00	1,647.00	.....
Corn stalks in field	961	acre	.....	.....	3.00	3,883.00	9.03
Corn fed in field	696	acre	.....	.....	14.00	9,744.00	14.00
Flax	225	bu.	2,143	9.5	1.90	4,072.00	18.01	
Garden	150	acre	.....	.....	.....	14,046.00	93.64
Hay	281	ton	267	0.9	8.00	2,136.00	7.60	
Oats	1,590	bu.	51,300	32.3	.45	23,085.00	14.52	
Onions	25	bu.	750	30.0	1.20	900.00	36.00	
Pasture (tame)	522	acre	.....	.....	10.00	5,220.00	10.00
Pasture (wild)	258	acre	.....	.....	5.00	1,290.00	5.00
Peas	304	bu.	3,750	12.3	1.90	7,125.00	23.44	
Potatoes	139	bu.	16,097	115.8	1.20	19,316.00	138.98	
Speltz	35	bu.	1,600	45.7	.50	800.00	22.86	
Wheat	4,136	bu.	90,570	21.8	1.25	113,212.00	27.37	
Miscellaneous*	33	.....	.....	.....	.....	2,244.00	68.00
Less duplicated areas	6,341	.....	.....	.....	.....	.....	.....
Total cropped	23,256	.....	.....	.....	.....	.....	.....
Stubble	75	.....	.....	.....	.....	.....	.....
Total and average						\$743,076.00	\$ 31.95	
						Acres	Farms	Per cent of project
Total area under irrig. dist. contract						58,248	734	99
Total irrigable area farms reported						35,225	471
Total irrigated area farms reported						23,331	471
Total cropped area farms reported, dry and irrigated						32,876
Grand total irrigated	23,331							

*Cabbage, sweet corn, melons, small fruit, bees and products of town gardens.

Table 4—Livestock Produced on the Project—1926.
Lower Yellowstone Project Census—1926.

Item	Inventory, January 1			Inventory, December 31			Increased Total value
	Number	Value	Total value	Number	Value	Total value	
Horses	1,982	\$ 42.00	\$ 83,244	2,002	\$40.00	\$ 80,262	\$2,982 Dec.
Mules	41	60.00	2,460	54	43.00	2,345	145 Dec.
Cattle—Beef	1,700	32.00	54,400	1,305	31.00	39,661	14,739 Dec.
Purebred Sires—Beef	11	153.00	1,683	15	131.00	1,965	282 Inc.
Scrub Sires—Beef	10	44.00	440	9	36.00	325	115 Dec.
Cattle—Dairy	1,923	50.00	96,150	1,928	50.00	96,400	250 Inc.
Purebred Sires—Dairy	19	81.00	1,539	17	95.00	1,620	81 Inc.
Scrub Sires—Dairy	5	32.00	160	8	36.00	291	131 Inc.
Sheep	3,243	11.00	35,673	4,230	8.00	33,840	1,833 Dec.
Hogs	3,357	13.00	43,641	5,207	11.00	57,062	13,421 Inc.
Brood Sows	300	19.00	9,500	588	6.00	3,801	1,099 Dec.
Fowls	18,500	.68	12,580	16,458	.83	13,605	1,025 Inc.
Bees, hives	490	10.00	4,900	588	6.00	3,801	1,279 Dec.
Totals.....			\$346,370			\$339,398	\$ 6,972 Dec.
Trucks, Tractors and Autos.....	160	245.00	39,200	275	\$198.00	54,395	15,195 Inc.
Equipment			168,000			169,682	1,682 Inc.
Grand Totals.....			\$553,570			\$563,475	\$ 9,905 Inc.

Remarks: Total number of feeders on project in 1926: 16,957 sheep, 2,232 cattle, hogs 775, having a value of \$225,-649.00, and are not included in the above figures.

Proceedings of the Lower Yellowstone Project Conference

Sidney, April 1-2, 1927

The conference opened in general assembly Friday morning, April 1, at 10:30 o'clock, with Augustus Vaux, general chairman of the conference, presiding. Seventy-four farmers of the Lower Yellowstone Irrigation Project registered for this session. Mr. Vaux opened the conference with a general statement of its objects and purposes. He stated that during the past twenty years water had been available to the project farmers but that in general satisfactory progress had not been made. However, many, during this period, had worked out successful farming systems, and it would be the aim of this conference to sift out the successful farm practices and formulate a definite agricultural program, based on practices that have been tried and found successful by the farmers of the project, taking into full consideration all available experimental and investigational data that will apply to the local conditions. Mr. Vaux further stated that the wide interest that had been manifested and the splendid cooperation that had been given by the commodity committeemen in their preliminary meetings indicated that there was an urgent need for an agricultural program of this kind. Mr. Vaux pointed out that while a few farmers had worked out successful farm programs and had adopted methods and enterprises that are economically sound, the majority have not, as yet, developed satisfactory farming systems. He urged that the methods and practices that are not economically sound be replaced by those that are. He stated that the objects of the conference are:

1—To arrive at definite conclusions as to just what methods and enterprises are practical;

2—To determine those that are not sound economically;

3—To follow up these conclusions with a program of putting the recommendations into effect through the cooperative efforts of the County Extension Service, the Reclamation Service, the Farm Bureau, the dairy association, the beet growers' association and all other kindred organizations.

Adjustments Needed

"The Agricultural Situation" was the topic discussed by Fred Bennion, county agent leader. Mr. Bennion said in part: "Most people are willing to admit that the farmers of the United States are facing a real farm problem and there are many ideas being advanced to help the situation. While there may be a number of ways in which the general farm situation may be improved it is apparent that competition between farmers and between farming sections is becoming keener and, therefore, farmers must learn to produce more efficiently. As a result farmers of the nation are paying more attention to their economic problems, to greater efficiency in production and marketing and to a better adjustment between producing sections. Agricultural conferences, where farmers come together to consider the problems and to work out an economically sound program of development, are efforts in this direction."

The afternoon session of the conference, April 1, was devoted to commodity group meetings in which the problems of each of the commodities under consideration were fully discussed. Each of the committees had met in previous meetings and discussed the subjects under consideration and obtained the necessary statistical and experimental data. Each of the groups considered the problems in detail and put their findings and conclusions into written form.

The commodity groups not finishing their reports on April 1 met again in the morning of April 2, completed their reports and put them into final order for presentation.

The afternoon session, April 2, opened with Mr. Vaux presiding. Approximately 150 farm men and women of the project attended this session. The commodity committee reports were taken up singly, and after their discussion and some modifications, were approved unanimously by the general session.

The following were the commodity group reports in order of their approval:

Livestock,	Horticulture,	Dairying,
Beekeeping,	Poultry,	Grain and forage crops,
Farm living,	Farm management,	Beets and beans.

Following is the list of the names of those registering and taking part in the work of the conference:

O. M. Oppegaard	Geo. Dore, Sr.	R. J. Cowles
O. J. Karsten	Jim Wright	Theo Hundtofte
Halvor Arnsten	Frank Hilger	J. W. Mason
A. P. Anderson	Myron Pickering	Edward Neimann
R. W. Hass	H. A. McNutt	Mrs. R. J. Cowles
P. B. Harper	A. H. Phillips	Peter M. Petersen
R. D. Collins	Chas. Hardy	A. O. Good
Nels Back	W. N. Noteboom	Oscar Jorgenson
Marius Anderson	J. P. Brennan	K. Hundtofte
H. A. Parker	F. J. Cravath	M. Gabrielson
M. P. Stratta	Axel Danielson	M. B. Dore
A. A. Wagner	Augustus Vaux	Allyn Watts
David Stewart	S. J. Hardy	L. P. Brown
Geo. Pintler	Martin Iverson	L. A. Hardy
A. C. Rosenow	Andrew Anderson	L. E. Cowden
A. C. Madden	Leo Bose	Chris Petersen
Nels Nelson	Adolph Hedegaard	Fred Hurst
A. M. Cooley	M. H. Frederickson	John Ekerman
C. S. Milhiser	Mrs. O. P. Benson	Chas. Whitney
W. C. Howard	Mrs. C. S. Milhiser	N. H. Nelson
C. E. Varco	Mrs. L. E. Cowden	Valentine Koch
D. L. Howard	Mrs. Roy Collins	C. B. Ray
Jim Thorgersen	Hattie Whitney	Henry Dahl
H. V. Fawcett	Lena Burr	F. J. Fisher
Albert Groskinsky	Mrs. D. L. Howard	O. P. Benson
Johannes Petersen	Mrs. Henry Hardy	Soren Olesen
Ira Alling	Mrs. Chas. Hardy	John Christofferson
E. A. Watts	Mrs. Geo. Pintler	W. E. Haven
S. J. Curtis	Wilfried Lemieux	Hugo Boese
A. M. Setter		C. B. Patterson

The conference committees had the assistance of the following representatives of the Montana Extension Service:

Fred Bennion, state leader of county agricultural agents.

A. J. Ogaard, state agronomy specialist.

R. L. Waddell, state livestock specialist.

J. O. Tretsven, state dairy specialist.

E. E. Isaac, state horticulture specialist.

V. D. Gilman, state farm management specialist.

Miss H. E. Cushman, state poultry specialist.

Miss Blanche L. Lee, state leader of home demonstration agents.

Miss E. Miriam Hawkins, state home management specialist.

Miss Jessie McQueen, state nutrition specialist.

Miss Edith Mott, state clothing specialist.

Miss Fannie Gorton, home demonstration agent, Richland County.

H. F. DePue, county agricultural agent, Richland County, conference secretary.

Report of the Farm Management Committee

The average yields of crops on the Project are too low to be profitable. A careful study of the situation by the committee indicates that the reason for the low yields is that cultural methods practiced are not conducive to the highest yields, an adequate amount of water is not used efficiently, systematic crop rotations are not practiced, and there is not enough live-stock on many farms to furnish adequate supplies of barnyard manure to maintain soil fertility. The average crop yields for the project are not sufficient to bring a return equal to the cost of production.

Study Needed

Under present conditions farmers must make a more careful study of their farm business than they have in the past. The application of sound business methods, which result in greater efficiency in all phases of farm operations, must remain one of the chief essentials for successful farming.

Table 5—Present Utilization of Plow Lands.

Crop	Acres in cultivation	Per cent of land
Alfalfa Hay	8,028	24.5
Alfalfa Seed	258	0.8
Barley	2,676	8.2
Beans	640	1.9
Beets, sugar	5,194	15.8
Clover, sweet (hay and seed)	124	0.4
Corn	2,722	8.3
Flax	448	1.4
Garden	167	0.5
Hay (other than alfalfa and clover).....	967	2.9
Oats	2,167	6.6
Onions	25	0.1
Pasture (tame)	773	2.4
Pasture (wild)	1,516	4.6
Peas	728	2.2
Potatoes	152	0.5
Speltz	35	0.1
Wheat	6,153	18.7
Miscellaneous	33	0.1
	32,801	100.0

*Includes 23,256 acres cropped under irrigation and 9,545 acres dry farmed. The figures refer to production in 1926.

The present combination of crops on irrigated lands of the Project indicates a well balanced production. Approximately one-fourth of the acreage is in alfalfa, one-fourth in beans or potatoes, one-fourth in sugar beets and one-fourth in grains, pasture and miscellaneous crops. The acreage devoted to different crops is indicated by Table 5. Individual farmers may well establish a similar crop balance on their farms.

One of the most undesirable situations discovered by the committee is that, while there are 47,000 acres of irrigated land on the Project, in no season have more than 23,000 acres been irrigated. A more general and efficient use of water is highly desirable. Figure 3 shows that even farmers with plenty of irrigation water available are inclined to depend upon rainfall. Table 6 indicates the same thing as it shows the actual average yields of different crops and the yields that may be reasonably expected if water is used properly along with recommended production practices.

Table 6—Average Acre Yield of Irrigated Crops 1914 to 1926 Inclusive and Reasonable Expected Yield.

Crop	Unit of yield	Yield 1914-1926	Reasonable expected yield
Alfalfa Hay	ton	2.2	3.0
Alfalfa Seed	bu.	3.0	3.0
Barley	bu.	23.5	40.0
Beans	bu.	11.9	20.0
Beets	ton	9.2	12.0
Corn	bu.	27.6	35.0
Flax	bu.	8.3	12.0
Oats	bu.	31.2	55.0
Peas	bu.	14.5	20.0
Potatoes	bu.	129.0	200.0
Wheat	bu.	17.2	30.0

The combination type of farming where there is a desirable balance between crops and livestock is most successful on the project. Well managed farms of this kind yield an income which enables the operator to maintain a fair standard of living. However, the committee finds that the percentage of these successful farms is very small.

Beets, beans and grains are the main cash crops of the successful farms; barley, corn and other feed crops are produced and there is a desirable acreage devoted to pasture to

provide additional income from livestock. A few farmers have been unusually successful in fattening livestock for market.

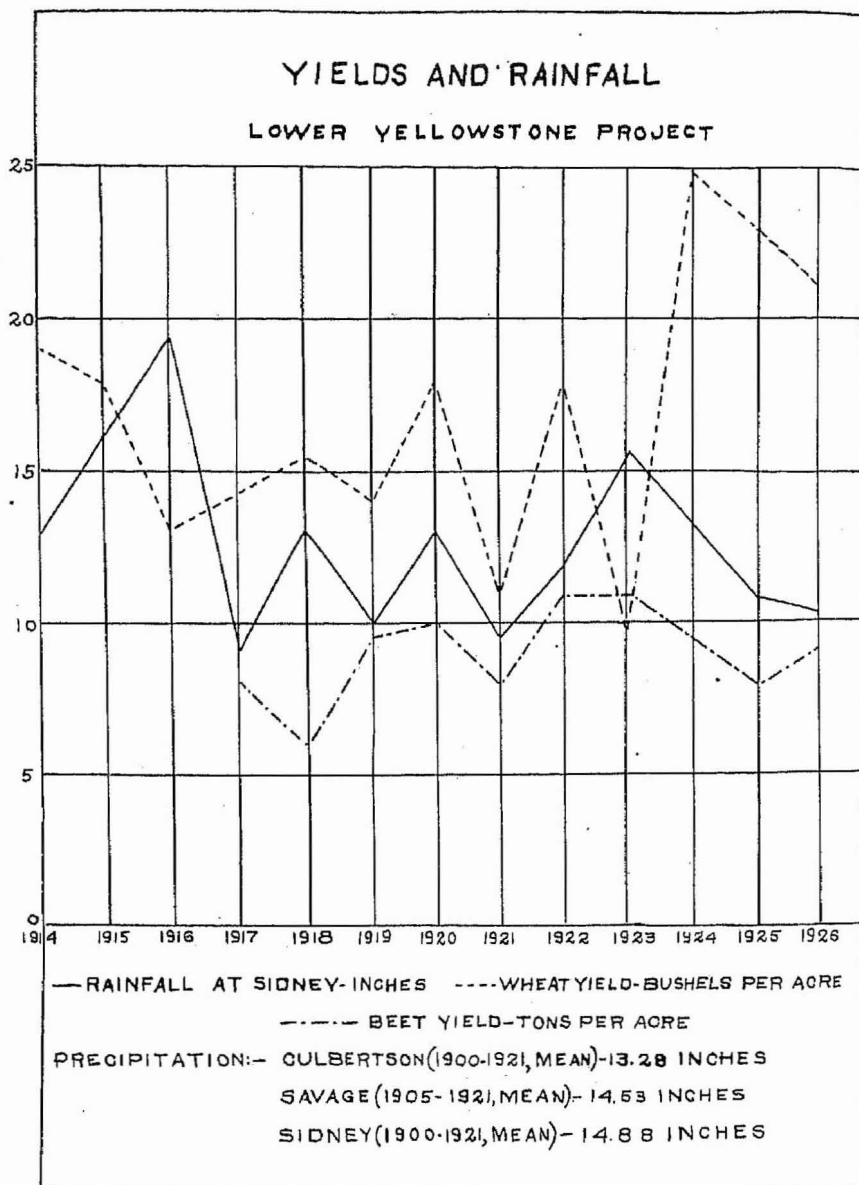


FIGURE 3

TREND IN PERCENT ACREAGE PRINCIPAL CROPS LOWER YELLOWSTONE PROJECT - 1917-26

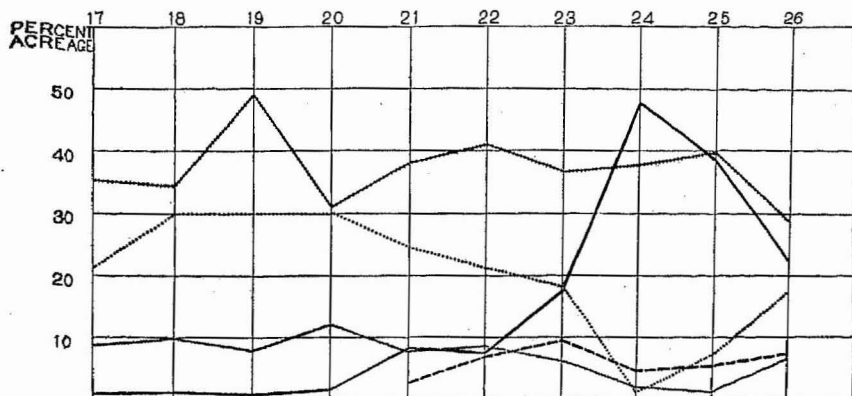


FIGURE 4

As shown at left—top line, alfalfa; second line, wheat; third line, oats; bottom line beets; broken line starting 1921, corn.

However, this requires skillful management and not every farmer can do it successfully. There appears to be an especially good opportunity for finishing hogs and sheep. Every farmer should make an effort to grow into the dairy, hog or sheep business or to develop a winter feeding enterprise. An 80-acre farm should have from eight to 12 cows and from five to 10 brood sows or a flock of at least 50 sheep. Livestock on the farm will utilize the feed produced, furnish manure and provide a source of revenue for winter labor.

Crop Rotations

It is apparent that good crop rotations are necessary for efficient, profitable production. There is little opportunity in the production of a single crop year after year, whether it be beets, corn, wheat or other crop. There must be a proper system of production which will provide the necessary distribution of labor, maintain soil fertility and take care of the weed problem. The committee recommends the following as a possible combination of crops that can be worked into a successful rotation for a farm of 80 acres or more: alfalfa, 25 per cent; beets, 19 per cent; barley or oats, 10 per cent; pasture, 8 per cent (this should be a permanent pasture with the proper mixture of

TREND OF ACRE INCOME IN PRINCIPAL CROPS LOWER YELLOWSTONE PROJECT 1917-26

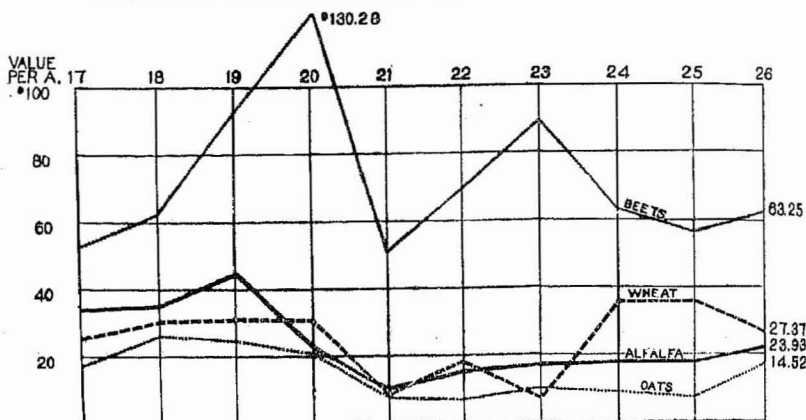


FIGURE 5

grasses); sweet clover, 7 per cent (for additional hay or pasture). The farmstead, roads and ditches will take up about 8 per cent of the land, leaving about 23 per cent of the acreage for such crops as corn, beans and potatoes, the choice of which should depend upon the individual needs of the farmer.

Table 7 shows the changes that have come in crop production in recent years and indicates that the acreage devoted to different crops is approaching a sound basis.

Aids in Selecting Crops

The committee presents the following suggestions to aid in the selection of crops:

Potatoes conflict with beets in labor requirements and, therefore, probably will not be grown to any great extent on the farm where there is a large beet acreage. Potato production is a specialized business requiring special attention. Beets and beans make a desirable combination from a labor standpoint and beans are desirable as a catch-crop to clean up land.

The corn-hog combination is especially desirable. High yields of corn are possible and net returns from hogs marketed on the west coast have been as high as those received by farmers in the northern part of the Corn Belt.

Table 7—Percentage of Irrigated Crops.

Years	Alfalfa	Wheat	Oats	Barley	Flax	Beets	Garden	Corn	Potatoes	Total %
1914	18	26	16	11	10	-----	-----	-----	-----	81*
1915	27	38	15	6	5	-----	-----	-----	-----	91
1916	31	27	14	10	8	-----	-----	-----	-----	90
1917	36	21	9	5	13	1	-----	-----	-----	85
1918	35	30	10	6	7	2	-----	-----	-----	90
1919	48	30	8	4	2	2	-----	-----	-----	94
1920	31	30	12	3	7.5	2.5	-----	-----	-----	86
1921	37	25	7.5	1.5	0.5	8	1	3	1.5	85
1922	41	21	8	1	-----	7	1	7	4	90
1923	36	17	7	2	0.5	17.5	1	9	2	92
1924	37.5	0.6	2.3	1.1	0.4	46.8	0.8	4.7	0.8	95
1925	39.2	5.4	1.5	2.2	1.2	38.0	0.7	5.4	0.7	84.3
1926	28	17.7	6.8	6.4	1.0	22.2	0.6	7.1	0.6	90.4

*Miscellaneous crops make up balance of acreage.

Sweet clover may be substituted for part of the alfalfa acreage and used for hay or pasture. Sweet clover is especially recommended for rough land to provide additional pasture.

Wheat has proved profitable in a few instances but the 12-year wheat average has been too low to return the cost of production. Fixed charges for water, interest, taxes, etc., are such that low yields of wheat are unprofitable. In general, the committee finds that feed crops, such as barley and corn, yield higher average returns. Under the existing low-yield conditions, wheat production cannot be recommended for the project and the continued production of this crop is not in keeping with the progressive development of farming.

General Recommendations

A combination of hogs and dairy cattle is desirable and the committee would encourage the rapid development of this type of enterprise. Such development must be accompanied by an increase in feed supplies. Sheep also are profitable and the committee believes that every farm of 80 acres, where the maximum number of hogs and cows are not kept, should have at least 50 sheep.

Lack of finances does not necessarily bar a farmer from getting into hogs, cows or sheep. Those with limited finances may start out with a few head of stock and gradually expand, or those with inferior stock may build up their herds and flocks by the use of purebred sires.

Every farmer should aim to become an efficient feeder of livestock. From past experience it appears that a farmer with a knowledge of feeding and with a good supply of feed, has little difficulty in securing credit to purchase livestock for feeding purposes.

The farmer with little experience should start livestock production in a small way—to grow into the business rather than go into it. This system will avoid costly mistakes and requires a minimum of capital.

To be successful on this project a farmer must organize his work so as to distribute his labor throughout the year.

The farmer who does not have a well balanced system of farming will find it more and more difficult to obtain credit.

There still is considerable irrigable acreage on the Project that is not being farmed. More settlers are needed for the proper utilization of the land. There is also need for more intensive systems of production.

Under present conditions it is especially essential that farmers keep accounts, make careful studies of their farm business, outlook reports and markets. Every farmer should know the varieties of crops best adapted to his conditions, the enterprises and combinations of enterprises to which he and his farm are best suited, the products which are likely to produce the greatest returns and the most favorable markets.

The education of young people is a matter that deserves the serious attention of all and in this connection the committee believes that Boys' and Girls' 4-H Club work has a place of first importance in the work of developing agriculture as it teaches in a practical way the fundamentals of crop and livestock production and home making and stimulates a greater interest in agricultural problems.

For bringing about the proper development of agriculture on the Project the committee concludes that more efficient methods must be adopted, larger yields must be obtained, crops must be properly balanced with adapted systems of crop sequence and rotations and there should be an increased production of good livestock and livestock products. There appears little hope for the farmer who does not adhere to these general principles.

There are a number of successful farming enterprises on the project and the studies of the committee lead to the conclusion that there is real opportunity provided sound and efficient methods are followed, and provided a proper balance is maintained between adapted crops and good livestock.

Approved by the Committee:

CHARLES HARDY, Chairman.	A. H. PHILLIPS,
JAMES P. BRENNAN,	L. P. BROWN,
J. A. LOKEN,	SAM HARDY,
CLAYTON WORST,	WM. NOTEBOOM,
L. W. THOMPSON,	H. A. McNUTT.

Report of Grain and Forage Committee

The committee on grain and forage crops recognizes that the successful farming enterprise on the Lower Yellowstone must have an efficient combination of cash crops, feed crops and livestock. Livestock is essential and for that reason the successful farmer must devote a considerable part of his time and his acreage to the production of feed, hay and pasture, as well as to the production of cash crops. It is the effort of this committee to indicate the methods of production, varieties and combinations of crops which are giving best results and which may be used as a basis for future development. That there has been considerable progress made in recent years is shown by the changes in production indicated in Tables 5 and 7. Table 6 shows that there is room for improvement in production methods since crop averages are still considerably below the reasonable possibility. Table 8 shows that there is a wide fluctuation in yields from year to year. The committee believes that the proper use of water and adapted methods of production will make these year-to-year fluctuations less extreme.

Alfalfa

Alfalfa must be regarded as the fundamental crop for the irrigation project. It is the foundation of nearly all systems of farming, adapted to this project.

ALFALFA TREND - 1917-26 LOWER YELLOWSTONE PROJECT

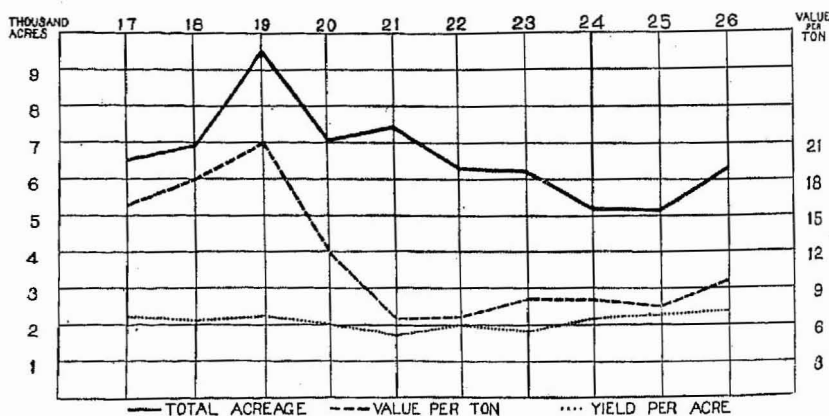


FIGURE 6

Table 8—Acre Yields for Different Crops.

Crop	Unit	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
Alfalfa	ton	2.5	2.3	2.3	2.2	2.1	2.2	2.0	1.8	2.0	1.9	2.1	2.2	2.4
Beans	bu.	.....	.....	9.0	6.4	8.4	17.7	13.3	13.8	11.7	12.5	10.4	12.6	15.0
Beets	ton	.....	.....	.....	8.0	6.6	9.2	10.0	8.3	10.8	10.5	9.7	8.7	9.7
Corn	bu.	32.8	.....	28.3	27.3	32.9	29.4	29.5	31.0	28.9	25.6	23.9	23.4	18.7
Garden* .....	.....	78.65	66.30	117.86	102.76	92.27	94.64	127.10	71.35	75.95	76.10	82.30	91.67	93.64
Oats	bu.	30.7	37.7	27.7	25.9	32.1	28.0	34.4	23.3	35.6	25.0	45.0	25.6	32.3
Potatoes	bu.	140.4	89.5	210.0	115.0	125.8	130.0	139.0	129.5	144.6	127.0	106.0	104.3	115.8
Wheat	bu.	19.6	18.2	13.8	14.1	15.8	13.7	18.4	11.4	18.5	9.4	25.0	23.9	21.8

*Figures shown represent value per acre.

During the past eleven years the average yield of alfalfa has been 2.2 tons per acre and the average price during this period has been \$10.80 per ton. The alfalfa acreage in 1926 was 8,454 acres, of which 1,902 acres were raised without irrigation. Alfalfa has held a commanding place on the Project, varying from 18 to 48 per cent of the total irrigated acreage. It appears to the committee that in order to make the alfalfa crop as profitable as it should be, the average yield should be increased to at least three tons and we believe this easily can be done if it is properly irrigated and handled.

For maximum effects from a legume in the rotation, the period of production for the alfalfa field should be shortened. This is especially true as farming systems become more intensive.

Alfalfa should be renovated by spring cultivation where it is four or more years old. It is often good practice to run the spring tooth harrow over two-year-old fields while the disk is usually best on the older fields.

In general, irrigation methods may be improved in the following respects:

1. Irrigate earlier in the spring, especially on the lighter soils.
2. As a general rule, irrigate about two weeks before each cutting.
3. The quality of hay is lowered when the field is irrigated immediately before cutting.

The average quality of alfalfa hay in this territory can be materially improved by curing in the bunch rather than drying in the swath. Getting the hay into windrow or bunch as rapidly as possible will tend to preserve the leaves which are high in feeding value. As a general rule, wherever possible the first crop should be cut earlier than it is being cut at the present time.

Objections to alfalfa, because it is difficult to subdue, may be overcome by either of the following methods:

1. Crown by shallow plowing in late summer before growth stops, cultivate and then plow early the next spring. This is suggested where a cultivated crop follows alfalfa.

2. Plow in spring after growth has started and plant some small grain crop.

In making new seedings, observe the following points:

1. Prepare a good firm seed bed containing plenty of moisture. If seed bed is dry, irrigate before seeding.

2. Do not seed nurse crop too heavily.

3. Seed pure home grown Grimm alfalfa of known germination at the rate of eight to ten pounds of seed per acre, provided seed is over 85 per cent in germination.

Sweet Clover

Sweet clover will never become a serious competitor of alfalfa. Its use is very limited at the present time, only 124 acres of it being grown for hay and seed in 1926. However, it is especially adapted for short rotations and for the lighter, sandy types of soils that are run down. It is recommended that farmers of the Project study the possibilities of sweet clover. Recommendations that may be made at this time are:

1. Sweet clover is especially adapted to seepy, rough, or other land where alfalfa is not a success.

2. Sweet clover is a quick soil builder as compared with alfalfa and fits better into short rotations.

3. It has an important place as a pasture crop, especially on lands not suited to permanent pasture mixtures.

4. Sweet clover can also be utilized as a legume crop in the rotation to the extent that it can be profitably used as a pasture.

5. Sweet clover seed production on irrigated land is not advisable.

6. Sweet clover should be seeded on approximately the same kind of seed bed as alfalfa at the rate of eight to twelve pounds of seed per acre.

Corn

During the past twelve years, 1915-1926, the average corn yield on the Project has been 27.6 bushels per acre and the acreage of corn on the project in 1926 was 2,722, of which 792 acres were raised without irrigation. Corn is a sure feed crop if good methods and adapted varieties are used. It is one of the surest and best yielding feed crops for the lighter types of soils.

The committee recommends:

1. That corn fits well into the rotation and is particularly valuable due to the fact that it produces much feed and is an intertilled crop. When harvested with livestock it is the cheapest grain feed that can be grown on the project.

2. Corn is recommended as a feed crop on all soils except the heaviest types. Barley is better adapted to the heavier soils.

3. The acreage of corn now grown can be considerably increased. Enough should be produced to supply the demand for local feed supplies.

4. The following varieties are recommended for hogging off: Gehu and Stewart strains of White Flint; for corn to harvest: Northwestern Dent, Wisconsin 25, Falconer and Pioneer White Dent.

5. The best planting dates are May 10 to 25.

6. It costs from \$20 to \$25 per acre to produce a crop of corn up to harvest time and if the corn crop can be utilized by hogging off it makes a very economical feed. It costs from 12 to 16 cents per bushel to harvest corn.

7. Unless methods of corn production are used that will bring a yield of 35 bushels to the acre, corn will not be profitable.

8. Seed corn grown on the project has strong vitality and is a dependable cash crop.

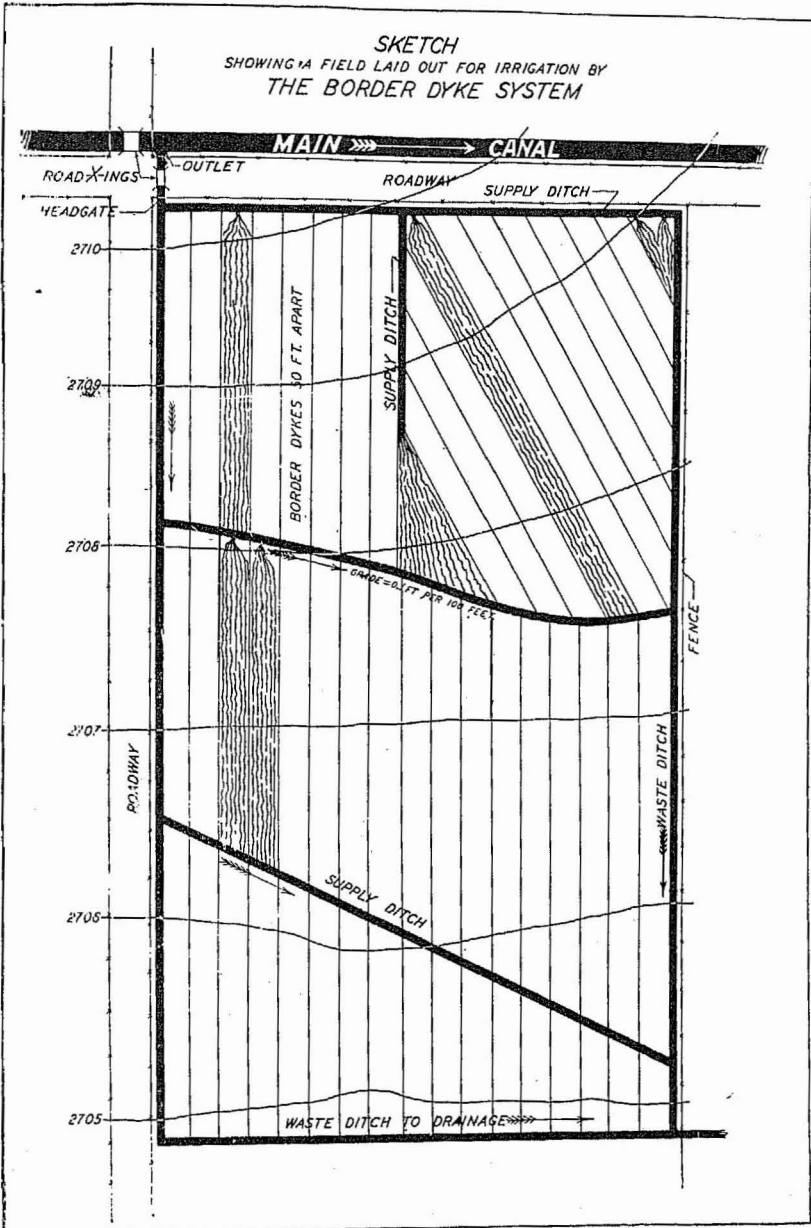


FIGURE 7

Barley

The average yield of barley during the period, 1915-1926, was 23.6 bushels per acre. In 1926 there were 2,676 acres of barley, of which 1,176 were grown without irrigation. However, the yield has been improved during the past three years, due to better varieties and cultural methods. The acreage of barley during the past three years has rapidly increased, due to the fact that there has been a keen local demand for feed purposes.

The committee finds:

1. That there is room for more barley than is now being grown since barley is a very important feed crop for farmers that have the heavier types of soil.

2. Barley is the most important small grain feed crop. The following varieties are recommended: Trebi, as the highest yielding bearded variety, and Faust's 1573 if a beardless, hulless variety is desired.

3. A good seed bed and early planting are especially recommended.

4. One and a half bushels of seed are recommended for the lighter types of soil and early plantings, and two bushels for the heavier types of soil, especially with late seedings.

5. It costs from \$25 to \$30 per acre to produce barley and considering the average price that is obtained, a forty-bushel or higher yield is absolutely essential to pay cost of production.

Oats

During the past 12 years the yield of oats has been 31 bushels per acre. In 1926 there were 2,167 acres grown, of which 577 acres were not irrigated. Oats are becoming unpopular with many, due to the fact that it has been instrumental in introducing wild oats. From comparative costs of production and yield of feed per acre, barley will give greater returns than oats.

The committee recommends:

1. That unless a minimum yield of 55 bushels per acre is obtained, cost of production will not be obtained.
2. Farmers should plant only pure Victory oats that are free from wild oats and other noxious weeds.
3. Only sufficient oats should be grown to furnish the actual needs of individual farmers.

Wheat

The average yield of wheat for the past 12 years has been 17.2 bushels per acre. The yield of wheat has been satisfactory when it has followed intertilled crops like beets and beans. However, it has been a very unsatisfactory crop following wheat or other small grain crops.

The committee recommends:

1. Wheat is perhaps the leading cash crop but where the individual has use for feed, barley will pay better.
2. Wheat should be included in the rotation only when it can follow an intertilled crop and only when there is no demand on the farm for feed.
3. At present all farmers should grow pure Marquis. Supreme may become the leading variety, provided the tests continue to show up as favorably as they have in the past.
4. Generally, wheat will not be a profitable crop unless a yield in excess of 30 bushels is obtained.

Flax

The average yield of flax for the past 12 years has been 8.2 bushels per acre and this is found unprofitable.

The committee recommends:

1. That the only possibilities for flax production is in using it as a catch crop on grain land. Wheat-flax mixture deserves more attention. Farmers must obtain a 12- to 15-bushel yield in order to obtain the cost of production, under present conditions.

Weeds

Canadian thistle and wild morning glory or bindweed are the most serious weeds on the Project. It is recommended that an educational and demonstrational campaign be started immediately, (1) to acquaint farmers with the nature and characteristics of such weeds as the Canadian thistle, wild morning glory, Russian knapweed, sow thistle, etc.; (2) to arouse proper interest in the seriousness of these weeds; (3) to start methods of practical eradication or control. The committee emphasizes the importance of this problem.

Pastures

1. High priced land can be used profitably for pasture.
2. Huntley mixture is recommended for permanent pasture lots and for limited pastures not included in the rotation.
3. Sweet clover is the best pasture for use in the rotation from the standpoint of carrying capacity and beneficial effects within the rotation. It is also recommended for rough, seepy, soured, gravelly land not adapted for permanent pasture.

Seed Peas

From information that the committee has been able to obtain, it is not advisable to extend the seed pea acreage as the climatic conditions are not suitable for production. However, the committee does recognize the possibilities of bean production.

Crop Rotation Recommendations

1. The committee emphasizes the importance of barnyard manure and believes that the farmers are underestimating its value. It particularly recommends that livestock enterprises be increased to the extent that all roughages be consumed on the farm and that all manure be used to the greatest advantage. Manure should be applied just previous to the crop in the rotation from which maximum yields are desired.

2. The legume crops, alfalfa and sweet clover, are essential in our cropping system and they are the only two legumes that can be recommended at present for soil building purposes.

3. Crop rotations on the Project under present conditions must be more or less flexible. The practical application from year to year of the facts and principles of crop sequence are more important than the attempt to operate under a fixed and definite cycle of cropping.

4. A greater amount of beets is grown following beets than is desirable at the present time. We believe that under average conditions, two years of beets are sufficient.

5. If an intertilled crop like beans or corn cannot follow alfalfa, a small grain crop should be used to subdue it.

6. Wheat, barley, and other small grain crops should be grown after beets or after alfalfa.

7. Beets should be grown on intertilled land with barnyard manure applied the year previous to the planting of beets.

8. Sweet clover should be planted with a small grain nurse crop and should be followed by an intertilled crop.

Approved by the Committee:

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Report of Beet and Bean Committee

Sugar Beets

Rotations: The committee believes that rotations are absolutely essential for the successful production of sugar beets. The following practical rotations which have been followed with success by farmers on the Lower Yellowstone Project, are recommended:

1. Alfalfa—5 to 7 years.
Beans or corn—1 year.
Beets—2 years.
Barley, wheat or oats—1 year.
2. Alfalfa—5 to 7 years.
Beans, potatoes or flax—1 year.
Beets—1 year.
Barley or oats—1 year.
3. Sweet clover—1 year.
Beans, corn or potatoes—1 year.
Beets—1 year.
Barley or wheat—1 year.

The rotation, including sweet clover, is recommended particularly for light, sandy soils, where the manure supply is limited. In each of the above rotations, alfalfa or sweet clover is seeded as a nurse crop with the small grain crop.

Cost of Production: The committee has studied the cost of production very carefully and finds that it varies with different farmers. However, when all costs are taken into consideration, including the overhead of taxes, interest, and water charges on the land, the cost will run from \$65 to \$75 per acre. If the costs run much under \$65, the beet grower may be neglecting essential practices and thus obtain a reduced yield. We also find that if costs much exceed \$75 per acre, practices are being followed which probably are not efficient. While the cost of beet production seems high, only about half of this amount represents cash outlay, the rest represents the labor of the farmer.

Planting Dates: There are various opinions as to the best time to plant beets. Planting dates will vary somewhat according to the types of soils. For lighter soils earlier seeding is suggested. As far as possible, beets should be seeded during the thirty-days period from April 20 to May 20. Where a beet stand has been damaged by frost or other cause and has to be reseeded, reseeding should be done before June 1. If this can not be done before June 1, the land should be seeded to some crop other than beets.

Rate of Seeding: The committee recommends the planting of 16 to 20 pounds of seed per acre.

Depth of Planting: On a properly prepared seed bed where moisture conditions are favorable, seed should be planted to a depth of one inch. Beets should be planted with the irrigation attachment on the planter to prevent blowing, to make irrigation possible and to assist in blind cultivation.

Cultivation: If the soil crusts or bakes after seeding so that the beet seed cannot get out of the ground, it is advisable to use a roller or harrow to break the crust. Wherever possible, one blind cultivation should be made before the beets are up. Following this, beets should be cultivated often enough to control weeds and keep the surface soil in a good, mellow condition. Usually from five to eight cultivations are necessary.

Thinning: Beet thinning should be done when four leaves have appeared on the plant. Plants should be thinned to a distance of 12 inches in the row. The rows should be 22 inches apart. Beet help should be instructed to leave the largest and strongest plants. It is best for beet growers to spend several days' time in the field with the beet labor, supervising the thinning and seeing to it that the beets are thinned to the proper distance and that the strong plants are left.

Irrigation: It is somewhat difficult to state just how often beets should be irrigated. However, the best rule to go by is to use water when the plants need it. This can only be ascertained by keeping in close touch with growth and condition of the plants. When beets begin to need water they turn a darker

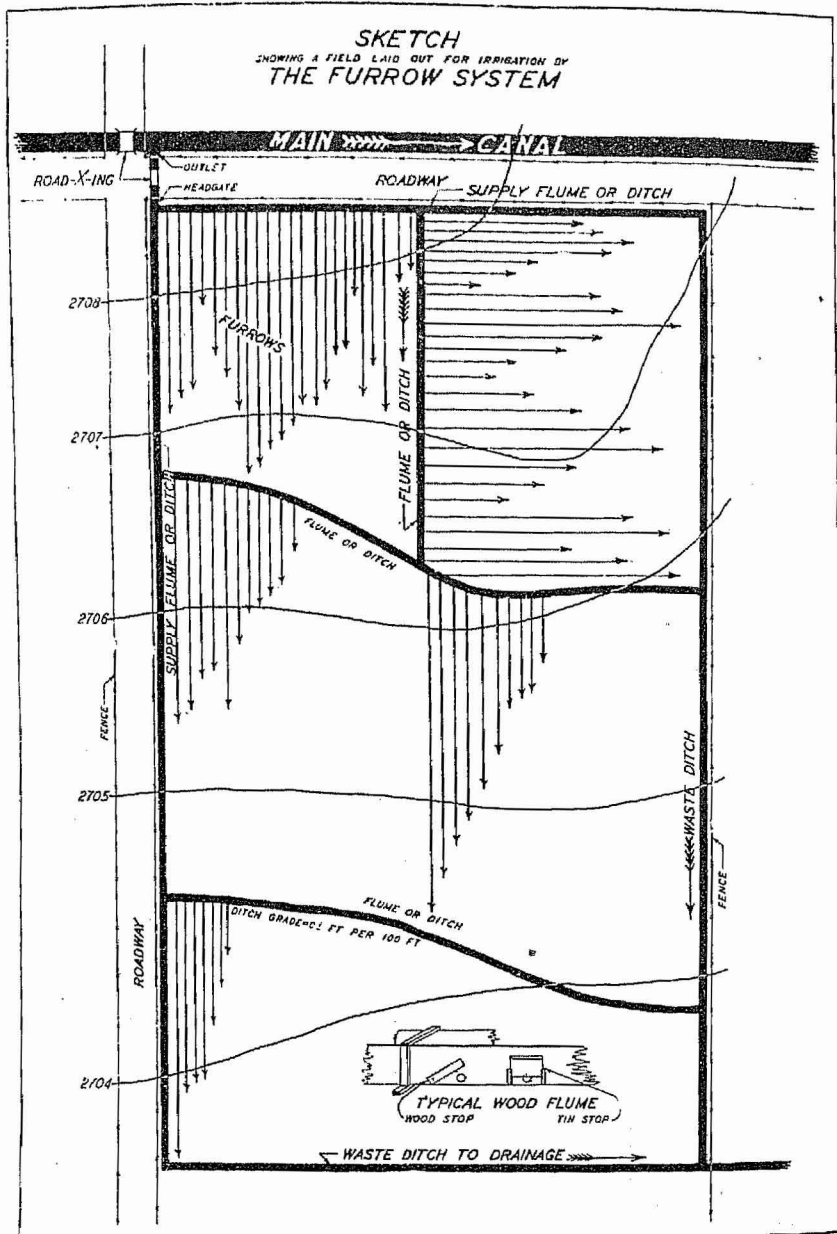


FIGURE 8

green and when the plant is pulled up, the roots are dry in appearance. Beets should be given all the water they need but should not be over-watered.

Harvesting: Harvesting dates will vary. However, the committee suggests that the growers cooperate to the fullest extent with the sugar company and in turn that the sugar company take into consideration the season when making its recommendations. Growers with the larger acreages should begin their harvesting somewhat earlier than the growers with the smaller acreages in order to reduce the possibility of loss from freezing. Farmers should deliver beets immediately following topping but when this cannot be done they should be put in silos.

Reasons for Low Yields in Valley: The committee suggests the following reasons for low beet yields on the Project:

1. Lack of soil fertility.
2. Poor seed.
3. Poor stands.
4. Not blocking and thinning at proper time.
5. Lack of early irrigation.
6. Poor cultivation.

SUGAR BEET YIELD PER ACRE LOWER YELLOWSTONE PROJECT 1926

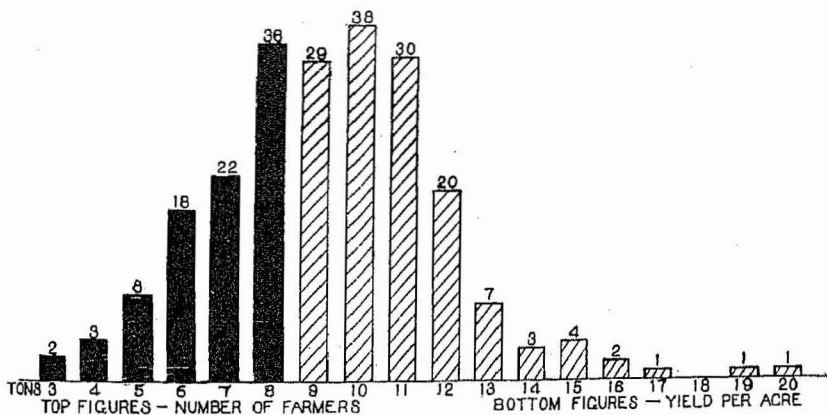


FIGURE 9

The committee recommends that the counties make a special effort to keep up roads in vicinity of beet dumps. It is estimated that \$20,000 per year will be saved to the beet growers in hauling charges, if good roads are maintained.

Beans

Beans can be made a profitable crop on this project, but the average yields are too low at the present time. Greater attention should be given to proper seed bed preparation, irrigation and cultivation. The Great Northern variety is recommended as the standard commercial bean of the Lower Yellowstone Project. The efforts being made to improve the Great Northern variety from the standpoint of uniformity, disease resistance, and yield are commended. Seed certification should be put in operation as soon as practical. The seeding rate should be varied to suit soil conditions. While the average seeding rate in the Billings area runs from 25 to 35 pounds per acre, the majority of the bean growers of the Lower Yellowstone Project have been practicing heavier seeding and believe it to be advisable. Perhaps on the average types of lighter soils 30 to 40 pounds is sufficient and more than this may be advisable on the extremely heavy types of soils.

Seed Bed Preparation: Beans should have a thoroughly prepared seed bed and plenty of moisture should be furnished to germinate the seed immediately.

Beans go well with alfalfa and sugar beets and should be seeded on alfalfa sod that has been crowned early in the fall and again plowed in the spring. Beans should be followed by beets. Beans should be seeded from 2½ to 3½ inches deep on the average.

Cultivation: Beans should be cultivated often enough to keep down weeds and maintain a good surface soil condition.

Irrigation: The committee recommends that there be a good moist seed bed. If necessary, the field should be irrigated before seeding. Bean plants need plenty of moisture during the early period of growth and there should be sufficient moisture in the ground when the pods begin to set to complete the

filling. However, beans should not be irrigated after the pods begin to set because it will prolong growth and make them subject to frost.

Harvesting: Bean pulling should start when about 75 per cent of the pods have begun to turn brown. Immediately following pulling the beans should be windrowed with a side delivery rake. If a side delivery rake is not available, plants may be pulled by hand and placed in piles about double the size of a wash tub. If there is rain, beans in the windrows or piles may need turning. Keep close watch over them until they are dry enough to thresh or stack. If the beans cannot be threshed as soon as dry, they should be stacked and the top of the stack should be covered with hay or straw.

Yields: Considering the cost of production of beans, unless a grower obtains 15 to 20 bushels per acre, he will not receive cost of production.

Marketing: There is a possibility in cooperative marketing and the larger the acreage, the easier the bean marketing situation will be.

Rotations: Beans fit well into the alfalfa-beet rotations as an intermediate crop and farmers should consider them more seriously, particularly where methods are used that will insure yields of twenty bushels or more.

Approved by the Committee:

GEO. PINTLER, Chairman.
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W. C. HOWARD,
HALVOR ARNSTON,
P. B. HARPER,
MARIUS ANDERSON,
M. P. STRATTE,
A. C. ROSENOW,
NIELS NIELSON
C. S. MILHISER,

C. E. VARCO,
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SAM HARDY,
DAVE STEWART,
O. M. OPPEGAARD,
O. J. KARSTEN,
A. P. ANDERSON,
NELS BACK,
H. A. PARKER,
A. A. WAGNER,
A. C. MADDEN,
A. M. COOLEY,
W. C. HOWARD
JIM THORGERSON.

Report of Livestock Committee

Horses

There are 601 farms in use on this project, averaging almost 80 acres each. The horse population is 3.3 per farm. It is believed that the horses now in use are past average middle age and soon will begin dying off. The price of horses is likely to increase sufficiently to warrant the raising of good colts to replace the old brood mares.

The committee recommends that enough good brood mares should be kept on each farm to produce from one to two colts per year.

In view of the general type of farming that will be followed, the most suitable size of horse is from 1,400 pounds up.

A 40-acre farm unit needs at least three good work horses; an 80-acre farm, four good horses, and a 160-acre farm at least six good horses. Where beets are raised this number must be increased considerably.

At the present time each farm on the Project has 2.2 beef cattle which are being kept on a yearly basis. This indicates that farmers have found them unprofitable, otherwise it is assumed that the numbers would be greater.

Under present conditions beef cattle should not be raised on this project as pasture land can be utilized more profitably by other kinds of stock.

Hogs

There has been a steady increase of hogs on the project in recent years. In 1920 the census reported 1,600 head, in 1926 the number had increased to 5,200 head or approximately 8.5 hogs per farm. In 1925 there were 500 brood sows, in 1926 there were 588. At present there is less than one brood sow per farm. Diseases have not been troublesome and reasonable sanitary measures will prevent appearance of disease.

Every farmer on an 80-acre farm should keep at least five brood sows of good quality, preferably purebred of the larger breeds of lard hogs. Where a farmer has proper housing facilities, two litters should be raised each year. Only a portion of the sows should be bred for fall farrowing. Farrowing should be done early. Pasture is necessary for economical production.

Alfalfa, sweet clover, or mixed pasture is satisfactory. One acre of pasture should carry two brood sows and their litters of from 12 to 16 pigs. Adequate feed supplies must be grown. There should be an acreage of corn for hogging off, and barley should be grown each year.

Sheep

In 1926 there were 4,330 sheep on the Project, an average of seven sheep per farm. There is an excellent opportunity for the keeping of small flocks of sheep that will live largely from waste products and that will help control weeds. The sheep market looks quite favorable and there is opportunity for success.

For small farms where dairy cows and hogs are not kept in large numbers, the committee recommends a minimum of 50 ewes for the farm. On larger farms with ample help, sheep also may be kept with dairy cows and hogs.

Sheep will furnish an income twice a year, a factor which the committee considers very important.

Black-face sheep are recommended.

Irrigated pastures of sweet clover or mixed grass are recommended. An acre of good pasture will carry from eight to ten ewes and their lambs through the season.

Woven wire fences 26 inches high are necessary. Sheep will pay for the necessary fence in less than a year.

Sheep will be a factor in keeping ditch banks clean and will eventually cut down the operating costs of the Project.

Table 9—Livestock Trends, 1917-1927.

Year	Dairy	Beef	Sheep	Hogs
1917	890	1,747.	10,491	2,900
1918	894	2,300	2,339	2,221
1919	1,312	1,835	2,350	2,170
1920	1,370	1,960	1,575	1,990
1921	1,300	1,930	485	1,600
1922	1,823	1,681	752	1,782
1923	1,961	1,660	2,779	2,096
1924	1,980	1,640	4,040	3,475
1925	1,975	1,800	10,000	2,770
1926	1,947	1,721	3,243	3,857
1927	1,953	1,329	4,230	5,795

The above figures do not include feeders in 1925 and 1926; these are as follows:

1925	.....	1,400	13,500	.....
1926	.....	2,232	16,957	775

Livestock Feeding

In November, 1926, there were 16,957 sheep, 2,232 cattle, and 775 hogs being fed on the Project. There has been a rapid increase in the amount of livestock being fed for market during the past few years and generally the results have been satisfactory.

No farmer should sell roughage from his farm. It should be fed to livestock if the fertility and productivity of the farm are to be maintained.

It is recommended that feeding operations be increased as feed supplies warrant.

The kind of stock a farmer should feed will depend upon his likes, his equipment, his feed and market conditions.

The committee recognizes the possibility of finishing livestock in this section, due to the advantages of plentiful supplies of alfalfa, corn, barley and sugar beet by-products.

Where possible farmers will do better to feed their own stock. Generally farmers cannot make money feeding stock for their gain at 12 cents per pound unless feed prices are low.

Steps should be taken to make credit available for local feeders having supplies of feed.

Cattle and sheep should be dipped in the fall before starting to feed; especially is this true of stock that comes from the range.

General Conclusions

It appears to the committee that one of the most serious shortcomings of farming on the Lower Yellowstone Project is the serious lack of livestock. If the above recommendations are carried out the Project farmers within the next five to ten years can be producing from \$500,000 to \$800,000 more pork, lamb, mutton, dairy products and colts.

Approved by the Committee:

HENRY W. HARDY, Chairman.	NELS BACK,
S. J. HARDY,	NELS A. NELSON,
BOB FLYNN,	AXEL DANIELSON,
WM. NOTEBOOM,	AUGUSTUS VAUX.

Report of Dairy Committee

The number of cows on the Lower Yellowstone Project in 1926 was 1,928, or 3.2 cows for each of the 600 farms. The cow population for the Project has remained practically constant since 1922, when there were 1,960 cows. However, there was an increase of approximately 100 per cent from 1916 to 1922.

The committee believes that from a feed point of view, a considerable increase in the dairy business is warranted and suggests that the cow population of 3.2 cows per farm be increased to at least 8 to 12 per farm. Feeds are relatively cheap and plentiful for dairying. Records that have been kept on the Project indicate that feed cost of producing butterfat has been from 18 to 20 cents per pound where the cows produced from 240 to 275 pounds of butterfat per year. The figures are based on hay valued at \$12 per ton and grain at \$1.50 per cwt.

Recommendations

1. National, state and local conditions favor a further development of the dairy industry and dairying should be given a larger place in the agriculture of the Lower Yellowstone District.

2. There are, at present, six cream buying stations and one creamery operating on the Project that handle approximately 40 to 50 per cent of the butterfat produced, the rest of the cream being shipped direct to creameries located elsewhere. Such factors as the lack of cream grading and the high cost of operating cream stations, have lowered the local price of butterfat to producers. The local marketing organization has been a big factor in obtaining increased prices for the members of the association. Therefore, the cooperative marketing of butterfat is recommended and the committee advises that such steps be taken as are necessary to bring about marketing of butterfat produced on the Project, in this manner. The committee believes that the additional prices received will justify the existence of the association and will make dairying more profitable.

3. In order to insure the highest possible return for dairy products, a more rigid enforcement of the laws pertaining to the checking of creameries in regard to butterfat tests, is recommended.

4. The committee asks that creameries adopt a rigid cream grading system and fix price scales on the basis of quality.

5. In view of the high cost of operating cream stations, which in turn influences the price paid for butterfat, the direct selling of cream and the discontinuance of local stations are favored.

6. Since increased productivity of the dairy herd can be obtained only through selection and better breeding, the exclusive use of purebred sires is urged.

7. Since the keeping of systematic records is essential to dairy success, a cow testing association is urged. If such an association is not feasible, private herd records should be kept.

8. In order to obtain a higher price for butterfat and increase production dairymen should arrange to have a larger percentage of their cows freshen in the fall and winter months, providing suitable feed and shelter are available.

9. The use of milking machines is practical on the farms where a large number of cows are milked.

10. The housing facilities for dairy cows vary greatly. There are a few well constructed barns but the majority of barns are more or less temporary structures and are not adequate. Improvement in barns should be made as rapidly as possible. While housing is a factor, good results are being obtained by especially good care and feeding with inexpensive buildings. While the dairy herd should be well housed in winter, it is good practice to allow them exercise and sunshine in an open yard in good weather during the warmer part of the day.

11. The common practice of letting the dry cow "rough it" around the straw pile is not conducive to high production. Instead, a dry cow should be given a six to ten weeks' dry period when she should be fed so as to get into good condition for the following lactation period. If a desirable condition cannot be

obtained on hay alone, each cow should receive a few pounds of grain daily.

12. With grain at ordinary prices, it is profitable practice to feed some grain to the high-producing cows, especially following calving, in order to get the greatest and most economical production.

13. It is profitable to put forth special effort in putting up a high quality hay for dairy cows.

14. Silos are practical on the large dairy farms where 15 or more cows are kept.

15. Every farmer should provide maternity pens for his cows.

16. The committee condemns the general practice of shipping in dairy cows for the further development of the dairy industry in this section, and recommends that dairymen raise their own heifer calves from their best cows and good purebred sires.

17. As it is impossible to obtain maximum results from cows where they have only cold water to drink in the winter time, farmers should try to arrange a system of management so that their dairy herds may have warm water at least twice daily.

18. Better practices are recommended in feeding and caring for calves.

19. To prevent the spread of contagious abortion in the Lower Yellowstone district, farmers should be very cautious in buying cows from outside herds.

20. The continuation of the area testing of cattle as a means of eradicating and preventing the spread of bovine tuberculosis, is favored.

21. Herd sires should be kept separate from the herd and not permitted to run at large.

22. The committee does not favor the use of commercial mineral mixtures. Instead, sterilized bone meal may be used in special cases where there is a mineral deficiency in the feed. The use of potassium iodide to prevent goitre in calves is advocated.

23. The practice of crossing breeds is not recommended. Such practices result only in off-colored and inferior animals of a lowered sales value.

24. In view of the limited amount of irrigated pasture used on the Project and since the best and most economical production of milk is found where choice pasture is used, every farmer who makes dairying a part of his business should try to establish a permanent irrigated or sub-irrigated tame grass pasture near his farmstead. Sweet clover pasture may also be practical on many farms as such pasture furnishes an abundance of feed if properly handled and fits in well with other crops.

Approved by the Committee:

MARTIN IVERSON, Chairman.
NELS HEPFISTAD,
S. M. STARR,

PETER ANDERSON, JR.,
R. J. COWLES,
ANDREW ANDERSON,
ANTON FRANDSEN.

Report of Horticultural Committee

Potatoes and Vegetables

Commercial Potato Production: Commercial potato production on the Lower Yellowstone Project has fallen somewhat below local consumption. The 125 acres grown on the average have not met the demand in the past two years. An increase in production to take care of local needs is recommended. The committee feels that this district is too far from the central markets to warrant commercial potato production on a large scale. It costs between \$50 and \$60 per acre to produce commercial potatoes and the committee is of the opinion that a 200-bushel yield per acre is the minimum a grower should be satisfied with. A low unit cost of production is dependent upon high yields. This means that the use of culls and poor seed must be discontinued.

Certified Seed Potatoes: According to market conditions and the general outlook, the committee believes there is possibility for the growing of a limited acreage of certified seed potatoes for the southern seed trade. However, this is a specialized business and unless a farmer is willing to make a close

study of the business and follow certification rules closely, it is not advisable for a farmer to attempt to grow this class of potato. However, success depends upon enough potatoes being grown in a community so that they may be shipped in carload lots. Here, again, production costs are relatively high and, on the average, a grower cannot hope to succeed unless he follows cultural methods that will yield a minimum of two hundred bushels of marketable stock.

Market condition is one of the first things to look to before going far with certification. With the competition from other districts closer to the markets than Montana, successful growing of certified seed in this area can only be on the basis of superior quality.

Other Garden Crops

In addition to growing sufficient to supply local demands the following offer some possibilities:

Onions: The committee feels that if marketing conditions can be improved, a small commercial acreage might be attempted. The varieties recommended are: Mountain Danvers and Australian Brown.

Cabbage: If proper storage facilities are available, a small commercial acreage may be grown. The possibilities of kraut production should be studied. Varieties recommended for the Project are: Copenhagen and Danish Baldhead.

Sweet Corn: There may be possibility of growing a commercial acreage for canning and for seed purposes. Growing sweet corn for seed should be investigated. Varieties recommended are Early Sunshine and Golden Bantam for early production and Evergreen for late production.

Cantaloupes: There is some possibility of limited commercial production. The following varieties are recommended: Burel Gem, Emerald Gem and Greeley Wonder.

Watermelons: It may be possible to establish a sufficient acreage to supply the markets in adjoining territories. Varieties recommended are Kleckley Sweet and Tom Watson.

Cucumbers: The committee doubts if cucumbers can be grown commercially unless the price received is in the neighborhood of four dollars per hundred.

Asparagus: The committee believes that the possibility for commercial production should be considered. Martha Washington is the recommended variety.

Miscellaneous Garden Crops: Carrots, rutabagas, turnips, beets, celery, parsnips, lettuce, tomatoes, etc., should be grown in sufficient quantity for home use and to furnish local markets. There may also be possibilities of growing some of these crops in sufficient quantities to meet the demand from nearby territories.

Berries and Fruits

Strawberries: At the present time the supply being grown is not sufficient to supply the local market and the committee recommends that the acreage be increased to a considerable extent. There is splendid possibility for developing commercial acreages. The markets will be satisfactory if the proper varieties are grown and if the product is marketed in standard containers. The average yield from strawberries in this section will be from one to three hundred crates per acre and the average price received is from three to three dollars and fifty cents per crate. Varieties recommended are: Dunlap, for an early heavy crop, and Progressive Everbearing, for a fall crop.

Tree Fruits: One of the requirements for successful tree fruit culture is a good windbreak.

Apples: The following varieties are hardy and can be grown on the Project: Wealthy, Duchess, Yellow Transparent, Okabena, Pattens Greening, Whitney No. 20 and the Hyslop, Florence and Siberian Crabs.

Plums: The following varieties are recommended: Sapa, Opata, Hanska, and Waneta.

Small Fruits

Raspberries: The Latham, Sunbeam, and St. Regis varieties are recommended for home production. Black cap raspberries are not recommended.

Currants and Gooseberries: These small fruits do well and are recommended for home production.

Shelterbelts

The committee believes that every farm on the Project should have a good shelterbelt. It believes that a shelterbelt is one of the most important things on the farm. Such plantings are absolutely necessary for the production of fruits, and assist in growing good gardens. In addition they improve the appearance of a farm home and add a great deal to the value of a farm. It is recommended that every farmer should study the shelterbelt proposition and that the site be laid out correctly. Adapted varieties of trees and shrubs should be used and sufficient attention should be given them to maintain a healthy condition. The following varieties of trees and shrubs are recommended: For the outside rows, to serve as snow catchers—Native Plum, Russian Olive and Pin Cherry; broad leafed varieties for inner plantings—willows, green ash, Native Elm and Chinese Elm. Such conifers as the spruces, Scotch Pine and Jack Pine can be grown with special care. A windbreak should be at least 100 feet wide and the inside of the windbreak should be at least 150 feet to 200 feet away from the buildings to be protected. Trees should be spaced six feet apart in rows fourteen to sixteen feet apart.

Shade trees and ornamental shrubs when properly placed about the house add much to the appearance and value of the place.

Approved by the Committee:

A. M. SETTER, Chairman.
S. J. CURTIS,
JIM WRIGHT,
FRANK HILGER,
GEORGE DORE, JR.

Report of the Beekeepers Committee

At present there are approximately 1,200 colonies of bees on the Project with an estimated production of 70,000 to 120,000 pounds of honey per season.

There are about 8,000 acres of alfalfa and 150 acres of sweet clover grown in the valley and under favorable conditions this should be sufficient pasture for the bees of the valley.

But it is the experience of beekeepers that alfalfa yields practically no honey, perhaps owing to the fact that it is cut for hay and not allowed to blossom. Consequently the wild sweet clover added to the small acreage of that which is cultivated, must be depended upon for a full crop of honey. However, wild sweet clover can be depended upon only about one year in two for the greater part of the Project.

It is evident that poor distribution of yards is a material cause of loss of yield, certain parts of the valley being overstocked while in others pasture is going to waste. It is the opinion of the committee that it would be to the advantage of beekeepers to agree upon a distribution of yards that will take care of this problem, the proper distribution being from three to four miles apart.

Cost of Production

Production costs vary but the figures given are conservative and approximately correct. The figures give the cost per pound of producing honey based upon a yield of 100 pounds of honey per colony, and a cost of \$25 per colony. Present prices are used as a basis for the estimates:

Interest on investment at 6%.....	1½c
Requeening and replacement of winter losses.....	2 c
Selling, collecting and occasional bad accounts.....	2½c
Cost of pails and other containers, labels, etc.....	2 c
Operating cost	5 c
Total.....	12½c

The wintering problem should have careful study. Winter losses are heavier than they should be and the committee believes there is opportunity for correcting this condition.

Marketing

The committee believes that cooperation in marketing might reduce costs somewhat. There also is need of an educational program to create a better demand for honey. Montana produces more honey than is consumed at home, making it necessary for beekeepers to sell out of the state. At present producers are not receiving cost of production on eastern markets.

Approved by the Committee:

MYRON PICKERING, Chairman.
P. B. HARPER.

Report of Farm Living Committee

We, as a farm living committee, believe:

1. That better living should be the end in view in better farming and better business.
2. That, therefore, a consideration of home improvement should go hand in hand with consideration of the improvement in agriculture.
3. We recognize the fact that economic progress is essential to a good standard of living.
4. We do not believe that the amount of money spent for family living is necessarily indicative of the standard of living maintained. It is not so much how much money is spent, but for what we spend it, that determines our standard of living.

Home Living

Situation: The situation in Richland County, as shown by the report of the home living committee, is as follows: The rural housewife spends a daily average of from nine to 10 hours working in the kitchen. The tasks which are most tiring and time consuming are washing, ironing, scrubbing and cleaning, thereby showing a need for more home conveniences.

The following home conveniences are recommended as suitable for the Lower Yellowstone Project:

1. Home water systems—pressure, gravity (spring, wind-mill, or gasoline engine) or hand power.
2. Sewage disposal—septic tank, cesspool or open drain.
3. Lighting system—electric, power, or home plant; carbide, gasoline or kerosene mantle lamp.
4. Heating systems—hot air with pipe or pipeless furnace, coal and wood heating stoves.
5. Power washing machine—electric or gasoline engine for power.
6. A more convenient kitchen arrangement and storage space for utensils and supplies.
7. Better refrigeration—ice, iceless, or electric refrigerators, or cold cellar.

8. Kitchen equipment—oil stove, pressure cooker or steam canner, bread mixer, gasoline, gas, or electric iron, good ironing board (cabinet kind preferred), high stool, self-wringing mop, floor waxing outfit.

9. Linoleum covering for kitchen floor.

10. A time budget is recommended in order to lessen the amount of time and labor consumed in housekeeping.

The ultimate goal is to have a home that is comfortable, attractive, convenient, sanitary and hospitable.

Foods and Nutrition

The committee agrees that a large number of diseases such as colds, coughs, indigestion, stomach trouble, diabetes, kidney trouble, appendicitis, scurvy, etc., and the resulting doctor and medicine bills, are largely preventable. Since the kind and amount of food consumed play such a large part in the maintenance of good health, the committee makes the following recommendations:

1. That the farm should produce, as far as possible, the individual daily food requirement, which should include the following:

- a. One quart of milk for children.
- b. One pint of milk for adults.
- c. Two vegetables in addition to potatoes—should include a leafy vegetable.
- d. Fruit once or twice daily.
- e. A raw fruit or vegetable or canned tomatoes.
- f. A whole grain in bread or cereal twice daily.
- g. One serving of any two of the following—eggs, cheese, meat, dried peas or beans.

2. The committee urges adequate home food preservation to include canning, drying and storing. That a definite fruit and vegetable budget be worked out in order to plan a garden which will supply the family with fresh vegetables in season, and create a surplus to be canned or stored for the winter months. One-fourth acre devoted to an intensively cultivated garden will supply an average family and afford an easy and efficient means of reducing the yearly cost of food.

3. The committee believes that farm women should inform themselves of food values and methods of overcoming food prejudices, better methods of food preparation and more economic use of food in meal planning.

4. Parents should cooperate with teachers and health workers to correct, as far as possible, the physical defects of school children. School children should have a hot dish at school during the cold months.

Clothing

Most of the women of the Project own sewing machines and do all or part of the sewing for the family. There is need for more help with selection, finishing and budgeting. Clothing which is comfortable, suitable, attractive, serviceable, reasonable in price and hygienic is essential to a good living.

The committee recommends that all rural women should do some sewing; the kind and amount to be determined by the materials on hand; cost, availability and values of suitable ready made garments as compared with home made garments; training and experience of women and girls of the family; time and strength of home maker, and age, number and sex of children.

Sewing equipment should include a sewing machine, dress form, patterns, fashion magazine, good cutting scissors, and a table large enough for laying out patterns.

Advancement

There should be time and opportunity for mental and spiritual development to be secured through education for both adults and juniors, to include reading of good literature, music, nature study and recreation. It is further recommended that adults cooperate more closely with teachers and leaders, through parent teachers' associations, to gain these ends. More effort should be made to provide good clean amusement and sports for the older boys and girls through such organizations as scout organizations, Y. M. C. A., gymnasiums, entertainments and camps.

The committee further recommended that every effort be made to make the farm home surroundings attractive by the

use of flowers, vines, trees and shrubs. The following flowers thrive without much care: Wild aster, wild geranium, five finger plant, wild flowering currant, wild rose, wild gooseberries, buffalo berries, and such vines as grapes, ivy, woodbine and Virginia creeper.

Approved by the Committee:

MRS. D. L. HOWARD, Chairman.	MRS. CHAS. HARDY,
MRS. HARRY MORAN,	MRS. R. HASS,
MRS. G. DORE, SR.,	MRS. H. ANDERSON,
PEARL BARKER,	MRS. R. COLLINS,
MRS. CLARK BROOKS,	MRS. L. P. BROWN,
MRS. J. P. BRENNAN,	MRS. A. PERRSON,
MRS. GEO. PINTLER,	MRS. S. M. STARR,
	MRS. HENRY HARDY.

Report of Poultry Committee

For the United States as a whole there has been a slightly greater increase in poultry than in population, but at the same time there has been a greater per capita consumption of poultry and poultry products. Along with the increase in consumption has come a change in demand on the part of the egg-consuming public, the large consuming centers now have a preference for graded, guaranteed eggs. A careful study of costs and returns shows that the poultry producers in important poultry sections of the United States can make a profit on eggs that are carefully graded and sold on carlot basis to eastern markets. In order to sell on a carlot basis, however, there must be from forty to fifty thousand birds on a relatively small area, all producing the same color and quality of eggs. Consequently, there must be a very large increase in the number of birds being kept locally before eggs can be produced and sold on a graded, carlot basis.

On the Lower Yellowstone Project there has been a gradual increase in the hen population per farm since 1916. In December of that year there were 11,944 birds, and in December, 1926, the number had increased to 16,458, making a little more than 27 birds per farm.

According to the best estimates obtainable, the production per hen is entirely too low. The average production of eggs per chicken is insufficient to pay feed costs. Nor has the turkey business been increased to the extent that conditions seem to warrant. Neither has capon production been tried out sufficiently. Both turkeys and capons appear to have a place as it seems obvious that both can be made profitable and will add considerably to the farm income. It appears that turkeys can be produced at a cost of around 20 cents per pound and, with market prices ranging from 35 cents to 50 cents per pound, there is a good possibility for profit. Records indicate that capons can be produced for approximately \$1.50 per bird and at present they are selling at \$2.50 to \$3.00 per bird. However, both capons and turkeys should be produced in sufficient quantities for growers to establish pools and market their birds collectively. Turkey and capon production might well be developed so that at least a carload of dressed poultry could be sold on Thanksgiving and Christmas markets and a carload of late turkeys and capons shipped during January.

Recommendations

1. It is not advisable to expand the egg phase of the industry at present beyond farm flock units of production since only local markets are available. Nevertheless, these farm flocks can be made more profitable than at present by employing better practices of feeding and management, also by building more Montana type houses, or remodeling present houses to meet necessary requirements of light, ventilation, floor space and sanitation.

2. That the farm flock should not have more than 100 hens, preferably of a dual purpose breed. Only one breed should be kept on a farm so that the product marketed will be more uniform and therefore command better prices. The reason for recommending dual purpose breeds is that if cooperative turkey marketing can be perfected the farmers on the Project may caponize their surplus cockerels and market them with the turkey growers in their after-Christmas shipment of turkeys. Farmers should not raise capons unless they have

provision for taking care of these birds separately and unless there is sufficient feed to finish them.

3. In order to have a more uniform egg production throughout the year to supply local needs, early developed pullets are recommended. This means early chicks. Where growers are using their own breeding stock a more general use of incubators is suggested. A more extensive use of baby chicks from accredited flocks and hatcheries is urged since by this means heavier producing strains can be introduced into the area at lowest expense.

4. That there is room for a local accredited hatchery in this area where farmers may purchase local accredited chicks.

5. That, in so far as possible, stores should cooperate in a plan of buying and selling eggs on a basis of grade.

6. Constant and vigorous culling is advised.

7. The vigor and vitality of flocks should be maintained at all times and all diseased birds should be removed at once.

8. Where turkeys are raised on the Project the committee strongly emphasizes the importance of selling turkeys dressed, as the price of birds sold live-weight is never comparable to that of dressed turkeys. Late hatches are discouraged. Not over one tom and 12 hens should be kept on a farm except where special conditions of time, feed and range permit. Turkeys should be kept until they are finished before killing as well-finished birds bring greater profits.

Approved by the Committee:

MRS. L. E. COWDEN, Chairman.
MRS. O. P. BENSON,
MRS. CARL HALVER,
MRS. WM. MARSHALL,

ADOLPH HEDEGAARD,
MRS. ROY COLLINS,
MRS. M. H. FREDERICKSON,
MRS. R. J. COWLES.