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Farm Management

DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS

SEP 1929

OKLAHOMA AGRICULTURAL AND MECHANICAL COLLEGE

Department of Agricultural Economics
and
United States Department of Agriculture
Bureau of Agricultural Economics
Cooperating

SYSTEMS OF FARMING IN OKLAHOMA

NO. I. WHEAT FARMING IN NORTH CENTRAL OKLAHOMA

Preliminary report prepared by P. H. Stephens in the Department of Agricultural Economics, Oklahoma A. and M. College, Stillwater, Oklahoma. Dr. Emil Raichenstein of the Bureau of Agricultural Economics, United States Department of Agriculture, cooperated in the supervision of this project.

September 1929.

SURVEY OF A YEAR'S FARM BUSINESS IN BLAINE AND GARFIELD COUNTIES,
OKLAHOMA. March 1, 1928 to March 1, 1929

The United States Department of Agriculture, Bureau of
Agricultural Economics and the Department of Agricultural
Economics, Oklahoma A. and M. College, cooperating.

Results expressed in terms of averages per farm.

TABLE 1. FARMS GROUPED ACCORDING TO LABOR INCOMES, GARFIELD COUNTY, 1928.

Number of farms	Range in Labor Income	Acres in Wheat	Yield of Wheat per acre	Acres in farm	Prod. in Animal Units	Total Farm Inventory	Total farm receipts	Average labor income	Rate earned per cent
25	:-\$1000-0	120	16.1	228	14.9	\$ 23017	\$ 3102	\$-358	0.7
23	0-499	105	17.6	188	11.9	19367	3153	312	3.5
22	500-999	110	18.7	218	14.1	21115	3436	695	5.6
23	1000-1999	148	19.7	249	14.8	25790	5665	1433	8.4
13	3000-5530	202	22.2	369	23.4	37813	8527	2973	10.9

The profitable farms kept more livestock, raised more acres of wheat, and had higher yields per acre than the unprofitable farms. The largest losses were sustained where a large business was poorly managed.

TABLE 2. FARMS GROUPED ACCORDING TO THE RATE OF INTEREST EARNED ON THE FARM INVESTMENT. GARFIELD COUNTY, 1928.

Number of farms	Range in rate earned	Acres in wheat	Yield of wheat per acre	Acres in farm	Prod. in animal units	Average farm inventory	Total farm receipts	Labor income	Average rate earned
14	100-0	97	15.5	184	11.8	\$ 18491	\$ 2136	\$-679	2.2%
17	0-2.9	102	17.6	196	14.5	15059	2963	-138	2.0%
20	3.0-4.5	131	17.0	233	13.5	23458	3906	268	3.7%
20	4.6-6.9	120	18.8	240	14.8	24161	3845	740	5.6%
21	7.0-9.9	173	20.0	286	18.0	29087	6367	1553	8.2%
15	10.0-20.0	151	22.1	282	17.4	28126	6862	2646	12.3%
Average		131	18.7	240	15.1	24300	4410	803	5.9%

The farms making the highest average rate earned on the farm investment were above the average in acres of wheat, number of animals, and total inventory but were not largest farms.

TABLE 3. FARMS GROUPED ACCORDING TO ACRES OF WHEAT RAISED PER FARM
GARFIELD COUNTY, 1928.

Number of farms	Acres in wheat : Range	Yield of wheat : Average	Acres : in	Prod. : animal units	Average : farm inventory	Total : farm receipts	Labor : income	Rate : earned, per cent
16	: 29-79	: <u>64</u>	: 19.5 bu	: 153	: 13.1	: \$ 16125	: \$ 2834	: \$ 126 : 2.0%
29	: 80-104	: <u>91</u>	: 17.6	: 172	: 11.2	: 17464	: 2561	: 378 : 3.8%
23	: 105-149	: <u>119</u>	: 17.7	: 225	: 13.9	: 21162	: 3868	: 461 : 4.6%
21	: 149-199	: <u>175</u>	: 20.9	: 282	: 14.8	: 32037	: 5736	: 1338 : 7.2%
15	: 200-400	: <u>251</u>	: 18.4	: 407	: 22.8	: 3958	: 8033	: 1584 : 7.4%

Labor incomes increased more than proportionately with increases in the acres of wheat raised per farm. The yield of wheat per acre was not closely associated with the number of acres.

TABLE 4. FARMS GROUPED ACCORDING TO THE YIELD OF WHEAT PER ACRE.
107 GARFIELD COUNTY FARMS 1928.

Number of farms	Yield of wheat : Range	Acres : in	Acres : in	Prod. : animal units	Average : farm inventory	Total : farm receipts	Labor : income	Rate : earned, per cent
	: bu. : bu.	: wheat	: farm	:	:	:	:	:
22	: 10-15	: 13.7	: 131	: 238	: 12.7	: \$ 20543	: \$ 3466	: \$ 265 : 3.3
33	: 16-18	: 17.0	: 120	: 222	: 14.7	: 21615	: 3643	: 477 : 4.4
27	: 19-20	: 19.7	: 125	: 232	: 16.7	: 24716	: 4592	: 1003 : 7.1
25	: 21-40	: 24.0	: 151	: 271	: 16.0	: 30695	: 6059	: 1478 : 7.7

The average labor incomes increased consistently with increases in the yields of wheat per acre.

TABLE 5. COMPARISON OF 13 MOST PROFITABLE FARMS WITH THE AVERAGE OF THE 107 SURVEYED IN GARFIELD COUNTY, 1928.

	: Acres:	: Acres:	: Acres:	: Yield of:	: Number of:	: Farm	: Labor
	: of :	: all :	: in :	: wheat :	: producti:	: inventory :	: income
	: Wheat:	: Crops:	: farm :	: bushels :	: units :	: total :	
13 farms	:	:	:	:	:	:	:
making la-	:	:	:	:	:	:	:
bor in-	: 195 :	: 249 :	: 367 :	: 22 :	: 26.9 :	: \$36944 :	: \$2981
comes of	:	:	:	:	:	:	:
\$2000 or	:	:	:	:	:	:	:
more	:	:	:	:	:	:	:
Average	:	:	:	:	:	:	:
of 107	: 151 :	: 167 :	: 239 :	: 18 :	: 15.6 :	: 24300 :	: 803
farms	:	:	:	:	:	:	:

TABLE 6. PER CENT DETERMINATION OF THE RELATIVE EFFECT OF FOUR FACTORS ON LABOR INCOME GARFIELD COUNTY 1928.

Acres of wheat per farm	:	12.06 %
Yield of wheat per acre	:	14.26 %
Number of prod. animal units per farm	:	9.56 %
Receipts per prod. animal unit	:	13.19 %
Total per cent determination	:	49.07

Variations in the four factors, acres of wheat, yield of wheat per acre, number of productive animal units and receipts per productive animal unit were associated with 49 per cent of the variations in the labor incomes made by these 107 Garfield County farmers in 1928.

The yield of wheat per acre was slightly more important in its effect upon labor income than was the number of acres of wheat raised per farm. The amount of receipts per animal was considerably more important than the number of animals kept. It takes both quality and quantity to make a profitable farm business, but of the two, quality is the more important.

TABLE 7. THE AVERAGE EFFECT ON LABOR INCOME OF FOUR FACTORS EACH ACTING INDEPENDENTLY 107 GARFIELD COUNTY FARMS 1928.

Factor	: Increase in
	: Labor income
A 1 acre increase in acres of wheat per farm	: \$ 5.19
A 1 bushel increase in yield of wheat per acre	: 97.28
An increase of 1 prod. animal unit kept per farm	: 28.83
An increase of \$1 in receipts per prod. animal unit	: 11.14

TABLE 8. FARMS GROUPED ACCORDING TO NUMBER OF ACRES OF CROPS GROWN PER MAN. 110 BLAINE COUNTY FARMS, 1928.

Number of farms	Acres of crops per man	Acres of crops	Productive animal units	Average farm investment	Number of men per farm	Labor income	
	Range	Average	per farm				
32	0-99	<u>77</u>	133	12.0	\$ 15372	1.7	\$ 359
29	100-119	<u>104</u>	139	10.3	15533	1.3	464
36	120-199	<u>139</u>	181	10.4	21130	1.3	457
13	200-300	<u>217</u>	276	12.1	29164	1.3	1445

The farms on which over 200 acres of crops were grown per man made labor incomes averaging \$1445. The number of animals kept per farm and the number of men employed were practically uniform in the last three groups of farms, table 8. Economy in the use of labor, as indicated by the acres of crops grown per man, is an important factor in determining farm profits.

TABLE 9. FARMS GROUPED ACCORDING TO THE AMOUNTS OF GROSS RECEIPTS PER ACRE. 110 BLAINE COUNTY FARMS, 1928.

Number of farms	: Gross receipts : <u>per acre</u> : Range	: Acres : of : Average : crops : : per : : farm	: Produc- : tive : animal : units : : :	: Average : farm : inventory :	: Number : of : men : per : farm :	: Labor : income	
20	: \$ 500-9.99	: \$ 8.10	: 156	: 9.0	: \$ 17468	: 1.4	: \$ -346
31	: 1000-13.99	: 11.39	: 172	: 11.6	: 16996	: 1.4	: 181
36	: 1400-19.99	: 16.16	: 171	: 11.1	: 21682	: 1.4	: 757
23	: 2000-40.00	: 25.22	: 163	: 12.0	: 18502	: 1.5	: 1489

The farms that had less than \$10 of gross farm receipts per acre, on the average lacked \$346 of paying expenses. The farmer worked a year for nothing and lost \$346.

On the farms that had over \$20 of gross receipts per acre, there was left after paying all other expenses, \$1489 as pay for the farmer's own labor and management.

TABLE 10. FARMS GROUPED ACCORDING TO NUMBER OF PRODUCTIVE ANIMAL UNITS KEPT PER MAN. 110 BLAINE COUNTY FARMS, 1928.

Number of farms	Number of productive animal units per man, per range	Number of productive animal units per farm, average	Acres of crops per farm	Total acres in farm	Number of cows	Number of hens	Receipts from livestock	Labor income
32	0-5.9	5.8	144	181	3.6	75	\$ 503	\$ 346
34	6-8.9	10.5	176	233	5.8	93	584	470
31	9-11.9	13.9	179	242	7.2	101	879	759
13	12-25.0	17.8	172	238	7.6	110	1000	871

The farms keeping the most livestock made the most money. Increasing the amount of livestock kept is one way of increasing the size of the farm business.

Note: The following are equivalent to one animal unit: 1 cow, 1 bull, 2 young cattle, 1 horse or mule, 2 colts, 5 hogs, 10 pigs, 7 sheep, 14 lambs, or 100 hens. Horses and mules are not included in the number of productive animal units unless kept primarily for breeding purposes.

TABLE 11. FARMS GROUPED ACCORDING TO TOTAL FARM INVESTMENT PER ACRE. 110 BLAINE COUNTY FARMS, 1928.

:Total farm in-			:Productive Value of			:	
Number	vestment per	Acres	animal	real es-	Average	Labor	
of	acre	per	units	tate per	farm	income	
farms	Range	Average	farm	acre	investment		
19	:\$50.69	:\$ <u>54.88</u>	237	10.3	\$44.74	\$13029	\$394
22	70-79	<u>70.45</u>	221	11.5	59.07	15629	439
37	80-99	85.68	216	10.9	70.30	18478	707
32	100-200	103.15	226	11.7	88.93	23297	831

The best land is usually the best to buy. Good land is generally underpriced relative to poor land. It is generally easier to pay interest on \$100 land than \$50 land when the earning power of the land is considered. Land is cheaper than labor.

TABLE 12. FARMS GROUPED ACCORDING TO POWER EQUIPMENT. 110 BLAINE COUNTY FARMS, 1928.

Power equip- ment	Number of farms	Per cent of farms	Median age of opera- tors	Acres in crops per farm	Total invest- ment per farm	Invest- ment in mach. per farm	Mach. repairs and de- precia- tion	Labor income
Tractor and combine	23	21	36	196	\$23,681	\$1,873	\$733	\$903
Tractor only	41	37	39	172	18,520	842	279	697
Combine only	7	6	39	154	15,758	1,143	294	847
No power machinery	39	36	42	140	17,129	428	135	127
Average	110	100	39	167	\$18,930	\$930	\$324	\$592

Note: Labor income is receipts minus expenses, minus 5 per cent interest on the average investment; it is the return to the operator for his own labor and management.

Power farming was more profitable than horse farming in Blaine County in 1928. One of the reasons for this was that from 24 to 56 more acres of crops were grown per farm on the farms using power equipment. The larger incomes on the power equipped farms was due to the combination of larger acreages and greater efficiency in the use of labor.

TABLE 12a. FARMS GROUPED ACCORDING TO POWER EQUIPMENT. 106 GARFIELD COUNTY FARMS, 1928.

Power equip- ment	Number of farms	Per cent of farms	Median age of opera- tors	Acres in crops per farm	Total invest- ment per farm	Invest- ment in mach. per farm	Mach. repairs and de- precia- tion	Labor income
Tractor and combine	33	31	36	220	\$32,941	\$2,359	\$683	\$1,427
Tractor only	36	34	42	160	25,093	1,098	286	580
Combine only	4	4	44	168	20,880	1,000	247	760
No power machinery	33	31	45	124	16,927	215	74	426
Average	106	100	41	167	\$24,800	\$1,206	\$340	\$803

The use of power equipment on Garfield County farms was even more pronounced in its effect on labor income than on Blaine County farms. The farms having both a tractor and a combine raised 96 more acres of crops and made labor incomes averaging \$1000 more than the farms using only horses. Wheat on these 106 Garfield County farms averaged 18.6 bushels per acre in 1928. Large power equipped farms, having a large cash expense, would not show up to as great an advantage in a year of low yields.

TABLE 13. FARMS GROUPED ACCORDING TO AMOUNT OF GROSS RECEIPTS
PER FARM. 110 BLAINE COUNTY FARMS, 1928.

Number: of farms	Gross receipts : farm : Range :Average	Acres : of : wheat	Yield : of : wheat	Prod. : animal : units	Cash : expense : per : farm	Average : farm : inventory	Labor : income
26	\$ 870-1999: \$ 1431	95	13	7.6	\$ 1012	\$ 12981	\$ -181
29	2000-2999: 2469	124	13	10.0	1521	13911	258
25	3000-3999: 3466	154	16	11.3	1789	20086	672
30	4000-4500: 5560	183	16	14.6	2880	25436	1409

A farmer has to sell over \$4000 worth of products from his farm each year in order to make a good income. It is easier to make a large income by increasing the volume of the business than to further decrease the expenses on most farms.

TABLE 14. FARMS GROUPED ACCORDING TO NET RECEIPTS PER \$100
INVESTED IN LIVESTOCK. 107 GARFIELD COUNTY FARMS, 1928.

Number: of farms	Receipts per \$100 : invested in live- : stock : Range :Average	Acres : in : farm	Number : of : cows	Number : of : chickens	Value of : livestock : products : used at : home	Net increase : and sales of : livestock	Labor : income
27	\$ 0-59 : \$ 42	231	6	105	\$ 177	\$ 417	\$ 254
35	60-89 : 71	223	8	111	172	798	444
26	90-119: 100	229	8	135	177	1278	973
19	120-200: 150	296	10	122	166	2176	1608

High producing animals are profitable; lower producers are expensive "hay burners". Where the number of livestock is large a smaller portion of the total production is used at home. \$173 worth of home raised meat, milk, and eggs were used in the average Garfield County home. The value of these perquisites, meat, milk, eggs, garden, use of auto, farm raised fuel, and house rent are not included in farm receipts. Labor income is the cash income of the farmer in addition to these perquisites.

TABLE 15 ESTIMATED RECEIPTS AND EXPENSES PER COW PRODUCING 250 POUNDS
OF BUTTER FAT PER YEAR - NORTH CENTRAL OKLAHOMA.EXPENSES

<u>Feed</u>	<u>Cost</u>	
Grain, 2000 pounds	\$ 35	
Hay, 1½ tons	15	
Fodder or silage, 2 tons	15	
Pasture, 300 days	10	
TOTAL		\$ 75

Investment and Cash Costs

Interest on \$150 cow @ 6%	\$ 9	
Depreciation on \$150 cow	10	
Interest and depreciation on \$50 investment in dairy buildings and equipment	5	
Veterinarian	1	
TOTAL		\$ 25

Labor

160 hours man labor @ 25¢ per hour	\$ 40	
TOTAL		40

Cost of keeping cow one year - - - - - \$ 140

RECEIPTS

Butterfat, 250 pounds @ .40¢	\$ 100
Skim milk, 5000 pounds @ .40¢ per cwt.	20
Calf at birth value	10
Manure, 10 tons @ \$1.00	10
TOTAL receipts for one year	\$ 140

TABLE 16. ESTIMATED RECEIPTS AND EXPENSES OF A HEN PRODUCING
12 DOZEN EGGS PER YEAR.EXPENSESFeed

Grain - 40 pounds	\$.75	
Mash - 30 pounds	.75	
Skim milk - 50 pounds @ .40¢	.20	
Shell, etc.	<u>.05</u>	
TOTAL		\$ 1.75

Investment and Cash Costs

Interest on \$1.50 hen @ 6%	\$.09	
Death loss @ 11%	.16	
Depreciation during year	.75	
Poultry house and equipment		
\$3 investment, interest and depreciation @ 10%	.30	
Veterinarian	<u>.05</u>	
TOTAL		\$ 1.35

Labor

Two hours man labor @ 25¢	\$.50	
TOTAL		.50

Total cost of keeping a hen one year \$ 3.60

RECEIPTS

12 Dozen eggs @ 30¢ - - - - - \$ 3.60

TABLE 17. TYPICAL FARM ORGANIZATIONS IN GARFIELD COUNTY.

Size of farms	: 160 : acre : farms	: 240 : acre : farms	: 320 : acre : farms
Number of farms	: 42	: 10	: 12
Crops, acres	: 85	: 129	: 174
Wheat	: 27	: 35	: 40
Feed crops	: 40	: 68	: 86
Pasture	: 8	: 8	: 20
Roads, waste, etc.			
Livestock, number.			
Cattle	: 10	: 12	: 15
Horses and mules	: 5	: 5	: 6
Hogs	: 2	: 3	: 3
Sheep	: 1	: 10	: 10
Chickens	: 103	: 140	: 172

S U M M A R Y

Average inventory	:\$ 15,955	:\$ 26,564	:\$ 32,962
Farm receipts			
Increase in inventory	: 15	: --	: 400
Crops sold	: 1,253	: 2,145	: 2,706
Livestock sold	: 387	: 556	: 461
Miscellaneous	: 630	: 926	: 922
Total receipts	: 2,285	: 3,627	: 4,439
Expenses			
Farm expense (cash)	: 920	: 872	: 1,215
Decrease in inventory	: --	: 241	: --
Livestock bought	: 97	: 160	: 176
Labor hired	: 61	: 103	: 71
Family labor	: 68	: 140	: 220
Total expense	: 1,146	: 1,518	: 1,632
Farm income	: 1,149	: 2,109	: 2,807
Interest charge @ 5%	: 798	: 1,328	: 1,648
Labor income	: 351	: 781	: 1,159
Rate earned on investment	: 3.6	: 5.7	: 6.8

TABLE 18. TYPICAL FARM ORGANIZATIONS IN BLAINE COUNTY, OKLAHOMA, 1928.

	:	160	:	240	:	320
Size of farms	:	acres	:	acres	:	acres
Number of farms	:	50	:	5	:	13
Crops, acres.	:		:		:	
Wheat	:	102	:	151	:	200
Feed crops	:	20	:	26	:	34
Pasture	:	29	:	53	:	68
Roads, waste, etc.	:	9	:	10	:	18
Livestock, numbers	:		:		:	
Cattle, mature	:	4	:	5	:	9
Cattle, young	:	6	:	6	:	9
Horses and mules	:	5	:	5	:	7
Hogs	:	2	:	4	:	4
Sheep	:	1	:	3	:	1
Chickens	:	86	:	93	:	83

S U M M A R Y

Average inventory	:\$	13,112	:\$	18,256	:\$	24,801
Receipts	:		:		:	
Increase in inventory	:	1,153	:	1,153	:	1,153
Crops sales	:	1,359	:	1,886	:	2,527
Livestock sales	:	257	:	589	:	285
Miscellaneous	:	466	:	544	:	884
Total receipts	:	2,082	:	3,019	:	4,419
Expense	:		:		:	
Farm expense (cash)	:	763	:	974	:	1,542
Decrease in inventory	:	41	:	6	:	---
Livestock purchased	:	58	:	243	:	74
Labor hired	:	55	:	35	:	184
Family labor	:	90	:	114	:	258
Total expense	:	1,007	:	1,372	:	2,058
Farm income	:	1,075	:	1,647	:	2,091
Interest charge	:	657	:	913	:	1,240
Labor income	:	418	:	734	:	851
Rate earned	:	4.1	:	6.3	:	6.3