

CROP AND LIVESTOCK OPPORTUNITIES  
ON PRAIRIE LAND FARMS  
OF EASTERN OKLAHOMA

A Summary

By  
William F. Lagrone

OKLAHOMA AGRICULTURAL EXPERIMENT STATION  
Oklahoma A. & M. College, Stillwater  
A. E. Darlow, Director  
Louis E. Hawkins, Vice Director

in cooperation with

Agricultural Research Service  
U. S. DEPARTMENT OF AGRICULTURE

CROP AND LIVESTOCK OPPORTUNITIES ON PRAIRIE  
LAND FARMS OF EASTERN OKLAHOMA

(A Summary)

By

WILLIAM F. LAGRONE

Agricultural Research Service, U. S. Department of Agriculture,  
stationed at Stillwater, Oklahoma

Important agricultural changes are occurring in eastern Oklahoma. Cotton as the major source of cash income has been declining in importance. Farmers are looking for new methods of profitable cotton production, and for alternative enterprises to supplement or replace it.

Possible alternative farming systems for eastern Oklahoma have been studied by farm economists at the Oklahoma Agricultural Experiment Station for the past several years. Each alternative was compared with the system now most prevalent. The alternatives which were studied included introduction of improved crop and livestock practices based upon (1) experiment station recommendations, (2) the judgment of technical production specialists and other agricultural workers, and (3) data obtained from farmers. Thus the study involved the cooperation of many persons and groups, including farmers actually operating in the area.

This report presents some of the highlights of the results of this research, insofar as it applies to farms on predominantly prairie soils. A bulletin giving more detailed results, and the procedures used in the study, is being prepared for publication.

The alternative systems which were studied are designated as (1) Cotton; (2) Cotton - Cash Grain; (3) Cotton - Beef Cattle; (4) Dairy, Grade A; (5) Dairy, Grade C; and (6) Beef Cattle. All are based on 160-acre units except Beef Cattle, which is based on a 320-acre unit.

The data and judgements presented herein refer directly only to eastern Oklahoma farms on prairie soils. In a different setting of soils and farm resources, the results would be expected to differ from those presented here. However, the "budget" plan of analysis illustrated by Table I could be used as a pattern for studying the situation on a different type of soil, or a different type or size of farm on prairie land.

The acreages of crops and numbers of livestock included in the present system with present production practices, and in alternative systems with improved production practices, are presented in Table III.

## INCOME

(See Table I)

"Will it pay?" and "how much will it pay?" are questions which every farmer wants to have answered about proposed farm adjustments and alternative farming systems. By all measures, the most profitable alternative farming system would be the Cotton system of farming. It would have the highest net cash income, and the highest net returns to capital, family labor, and management. In order, the next most profitable systems would be the Cotton-Cash Grain, Grade A Dairy, and Cotton-Beef Cattle. The present system has the lowest net cash income (cash receipts minus cash expenses) of any, although very little lower than the Grade C Dairy system. If annual depreciation is paid on buildings and machinery and value of home-used products added in, the result is returns to capital (investment), family and operator's labor, and management. This is approximately the amount of money that the farmer and his family would have left to maintain the farm dwelling, to buy clothes and food, to pay installments on the television set and other household appliances, and to make any principal or interest payment on long-term debts. This return would range from a high of \$5434 for the Cotton system down to \$1967 for the Grade C Dairy. Using this measure, the Grade C Dairy system would be less profitable than the present system.

If 5 percent interest is charged on the total investment in land, buildings, machinery, and livestock, the Cotton system would return much more to family labor and management than any other system, practically doubling or more returns from every system except the Cotton-Cash Grain. The 320-acre Beef Cattle system and the Grade C Dairy System would return the least to family labor and management. On the basis of returns per hour of family labor the Cotton-Cash Grain system leads with \$1.75 compared with \$1.63 per hour from the Cotton system. However, total returns are higher from the Cotton System because it utilizes considerably more hours of family labor. Only \$.36 per hour of operator and family labor would be returned by the 160-acre Grade C Dairy system and \$.48 per hour by the 320-acre Beef Cattle system.

## WHAT THE STUDY INDICATES

Considerable opportunity for increasing efficiency in the production of crop and livestock enterprises through improvements in production practices exists on Prairie soils of Eastern Oklahoma. Present research appears to indicate practical possibilities of doubling per acre yields of cotton and feed crops. Legumes, sweet clover in particular, would be grown in rotation with row crops. Beef production per acre of pasture land could be increased more than 100 percent over the present production level with an improved pasture program of seeding, liming, and fertilizing. Since many present pastures have received some improvement, the production increase above the level of unimproved pasture would be even greater. An improved pasture and general management program on dairy farms would result in average annual milk production per cow of 6000 pounds of 4 percent milk

with a relatively low rate of concentrate feeding to milk produced (1 pound of concentrates to 4.6 pounds of milk).

Cotton appears to be the most profitable enterprise and farming systems emphasizing the more efficient production of cotton appear to afford opportunities for greatest farm incomes on farms with Prairie soils. The problem of cotton harvesting, hiring labor or using mechanization, must be met and solved if large per farm acreages of cotton are to be grown; but it appears that as many cotton production problems in Eastern Oklahoma have been caused by low yields and too little cotton as by high yields and too much cotton for the available labor supply. Even with reductions in seed cotton prices below 12 cents per pound (32 cents per pound of lint), cotton systems of farming would compare favorably with most other systems if prices received for products of these other systems were maintained at the indicated price level (See Table II). It appears, therefore, that farmers should grow as much cotton as maintenance of soil fertility would permit and should use improved practices to increase per acre yields and thereby improve efficiency in cotton production. The present production control program places an ineffective ceiling on the number of acres of cotton which could be produced on the individual farm.

On farms with Prairie soils, a Cotton-Cash Grain system offers income opportunities second only to a specialized Cotton system. This system also offers the additional advantage of requiring very little hired labor (for cotton harvesting). It would actually return more per hour of operator and family labor than would the Cotton where improved practices are used for growing cotton, \$1.75 compared with \$1.63 per hour, because it requires fewer hours of man labor. The time not needed for home farm work might be utilized in doing custom combining for neighboring farmers; and, therefore, the Cotton-Cash Grain system would have more attractions than the Cotton system to some farmers. Thus, the next best alternative to cotton, in terms of money returns, would be the production of small grains and grain sorghum for sale in addition to cotton.

The 160-acre Grade A Dairy would provide an income greater than a 160-acre Cotton-Beef Cattle farm or 320-acre Beef Cattle farm. Returns per hour of operator's labor would be higher on the Cotton-Beef Cattle farm, but more labor would be utilized by the Grade A Dairy system. The constant day-to-day attention demanded by the Grade A Dairy system would make it less attractive to some farmers as a production alternative. The 160-acre Grade C Dairy system and the 320-acre Beef Cattle system would return the least to operator and family labor. The returns per hour of labor are higher on the Beef Cattle system than on the Grade C Dairy system.

Rough approximations appear to indicate that about 2 sections (1280 acres) of prairie land devoted to beef cattle production (20 cents for beef calves) would be needed to equal returns to labor and management from a 160-acre farm devoted to specialized improved cotton production (12-cent seed cotton). If this were carried out, 8 cotton farms and their operators would need to be replaced for each 1 beef cattle farm and its operator. If we assume 100 percent equity in investment for

both owner-operators on cotton and beef cattle farms, returns to capital, labor, and management would be equal from about 5 quarters (800 acres) in beef cattle production and 1 quarter in specialized improved cotton production.

The importance of significant educational, credit, and cash assistance to producers which have facilitated adjustments in recent years to livestock systems of farming should not be overlooked. Governmental payments for pasture establishment, fertilizing and liming, etc., have not been considered as sources of farm income in any alternative system of farming discussed but these expenses have been charged as farm expenses at market prices. Many adjustments to livestock farming systems were needed because of the type and condition of soil and farm resources. Probably other adjustments to increased livestock production were undesirable in the long-run and reflect an improper allocation of farm resources and improper use of land.

### INVESTMENTS REQUIRED

Investment is the average capital required to keep a particular farming business or system of farming in operation. It may be conveniently divided into the value of land, buildings, machinery and equipment, and livestock on hand. Total investment for 160-acre farming systems, excluding value of the farm dwelling, ranged from \$6435 for the Cotton-Improved Practices system to \$12,508 for the Grade A Dairy system (Table I). The investments required for the Cotton-Beef Cattle and Grade C Dairy systems are very similar to the Grade A Dairy, \$11,445 and \$11,765 respectively. The Cotton-Cash Grain system would require an investment of \$6985 compared with an investment of \$6511 for the present system. The 320-acre Beef Cattle unit, twice the number of acres as in other alternatives, would require an investment of \$22,383, or about twice the investment required for the 160-acre alternatives with major beef cattle or dairy enterprises.

The investment required would be a major factor affecting the ability of individual farmers to make desired adjustments in their farming business. In view of this importance, the character and type of the significant differences in capital requirements for alternative farming systems are considered. The investment in land would be the same for all 160-acre systems, \$4000, or \$25 per acre for surface rights only. The investment in farm buildings, other than the farm dwelling, would be of greater dollar value on farms with major livestock enterprises but would not be a significant proportion of total investment in any farming system. Farm machinery and equipment investment for the alternative farming systems would be least on the Cotton and greatest on the Grade A Dairy system. Investment in livestock would be insignificant on the Cotton and Cotton-Cash Grain systems, but would account for about 40 percent of total investment requirements on the Cotton-Beef Cattle and Dairy systems of farming. The 320-acre Beef Cattle system would require a land investment of \$8000 and a livestock investment of \$11,255. This would amount to 36 percent in land and 50 percent in livestock of the total investment of \$22,383 required for the Beef Cattle alternative.

## PRICES AND COSTS

(See Table II)

For purposes of budgeting alternative farming systems reported in this study, the 1946-50 price level was used for estimating prices received for farm products and paid for items used in production. Thus the prices used in Table II are not forecasts of future prices. At the present time, February, 1954, prices received by farmers are about the same or slightly lower (considerably lower for cattle) than those presented in Table II. Prices paid for production items are, in general, higher than those presented in Table II.

Oklahoma state prices were adjusted, where necessary, to eastern Oklahoma conditions. The prices for different kinds of cattle sold are based on usual relationships during the period, 1946-50, within an average of about \$18 per hundred-weight for all cattle. The price for veal calves represents lower quality animals, mixed dairy and beef, than does the price for feeder beef calves.

Using the same price level as a basis for calculation, tractor costs for a medium two-row tractor amounted to about 75 cents per hour of use. Machinery costs per hour of use, both depreciation and repair costs, vary with the machine used, with a range of from \$0.24 per hour for a two-section harrow to \$1.09 per hour for a grain drill, with an average of about \$0.50 per hour.

TABLE I. --Comparison of Costs, Returns, and Investment for  
Alternative Farming Systems.

(Dollars)

	Present Practices	Improved Practices					320-Ac. Beef Cattle
		Cotton	Cotton- Cash Grain	Cotton- Beef Cattle	Dairy Grade A; Grade C		
<u>Investment*</u>							
Land	4000	4000	4000	4000	4000	4000	8000
Buildings	700	625	625	1010	1648	1173	1500
Farm machinery & equip.	1281	1520	2070	1830	2320	2052	1628
Livestock	530	290	290	4605	4540	4540	11255
Total investment	6511	6435	6985	11445	12508	11765	22383
<u>Gross Cash Income</u>							
Crops:							
Cotton	1748	8121	2030	2030	0	0	0
Gr. Sorghums	0	0	2646	0	0	0	0
Other crops	1256	1070	1070	111	74	74	0
Total crops	3004	9191	5746	2141	74	74	0
Livestock:							
Beef and veal	249	124	124	2541	596	596	6140
Milk and butterfat	61	0	0	0	6525	4763	0
Chickens & eggs	125	125	125	125	125	125	125
Total livestock	435	249	249	2666	7246	5484	6265
Total cash income	3439	9440	5995	4807	7320	5558	6265
<u>Cash Expenses</u>							

TABLE II. --Estimated Prices Received for Farm Products and Paid for Items Used in Production, 1946-50 Price Level, Eastern Oklahoma.

(Dollars)

	Unit	Price		Unit	Price
<u>Prices received for farm products sold</u>					
Cotton (in seed)*	lb.	0. 12	Feeder beef calves	cwt.	20. 00
Oats	bu.	0. 85	Cull beef cows	cwt.	13. 00
Grain Sorghum	bu.	1. 40	Cull dairy cows	cwt.	11. 00
Sweet clover seed	lb.	0. 10	Veal calves (mixed dairy)	cwt.	17. 00
Corn	bu.	1. 50	Week old calf	No.	12. 00
Butterfat	lb.	0. 61	Grade A milk	cwt.	5. 00
Eggs	doz.	0. 37	Grade C milk	cwt.	3. 65
Poultry meat	lb.	0. 23			
<u>Prices paid for items used in production</u>					
<b>Seed:</b>			<b>Contract work:</b>		
Cotton	lb.	0. 10	Cotton picking	cwt.	3. 25
Oats	bu.	1. 75	Combining	acre	3. 25
Grain sorghum	lb.	0. 10	Baling hay	ton	6. 00
Corn	lb.	0. 17	Hauling oats	bu.	0. 04
Lespedeza	lb.	0. 16	Hauling grain sorghum	bu.	0. 07
Vetch	lb.	0. 16	Sodding bermuda	acre	8. 00
Rye	bu.	2. 25	Cleaning and sacking		
Sudan	lb.	0. 12	sweet clover seed	cwt.	0. 50
Hop clover	lb.	0. 50	Feed grinding	cwt.	0. 25
Ladino clover	lb.	1. 25	Hauling milk	cwt.	0. 50
<b>Fertilizer:</b>			Grain drill rental	acre	1. 00
5-10-5	ton	42. 00	Cotton dusting mach. rental	acre	. 10
4-12-4	ton	40. 00	<b>Feed:</b>		
33-0-0	ton	76. 00	Prairie hay	ton	10. 00
0-20-0	ton	30. 00	Cottonseed meal	ton	80. 00
Lime (spread)	ton	3. 50	Hog supplement	cwt.	6. 00
<b>Insecticides:</b>			Laying mash	cwt.	4. 50
3-5-40	lb.	0. 11	Chick starter	cwt.	5. 00
3-10-40	lb.	0. 14	Hoeing labor	hour	0. 40
			Tractor driving	hour	0. 60

\* Equivalent to about 32 cents per pound for lint and \$70 per ton for cottonseed if cotton were ginned. Most cotton is sold in the seed by farmers in Eastern Oklahoma.



TABLE III. --Cropland and Livestock Organizations for  
Alternative Farming Systems

	Improved Practices					
	Present Practices	Cotton	Cotton-Cash Grain	Cotton-Beef Cattle	Dairy	Beef Cattle
	(Acres)	(Acres)	(Acres)	(Acres)	(Acres)	(Acres)
Land use:						
Cropland	94	120	120	54	84	59
Permanent pasture	41	25	25	91	61	234
Woods and other	25	15	15	15	15	27
Total land	160	160	160	160	160	320
Cropland Organization:						
Cotton	31	72	18	18	--	--
Corn	32	--	--	--	12	--
Grain sorghum	--	--	54	--	--	--
Oats	31	--	--	--	--	--
Oats & sweet clover	--	24	24	6	4	--
Sweet clover (2nd yr.)	--	24	24	6	4	--
Oat & Lespedeza hay	--	--	--	24	29	59
Vetch & rye pasture	--	--	--	--	23	--
Sudan pasture	--	--	--	--	12	--
	(Number)	(Number)	(Number)	(Number)	(Number)	(Number)
Livestock organization:						
Dairy cows	4	2	2	2	23	2
Dairy heifers (1-2 yrs.)	--	--	--	--	4	--
Dairy heifer calves	--	--	--	--	4	--
Dairy bulls	--	--	--	--	1	--
Beef cows	--	--	--	25	--	63
Beef heifers (1-2 yrs.)	--	--	--	4	--	10
Beef heifer calves	--	--	--	4	--	10
Beef bulls	--	--	--	1	--	3
Hens	50	50	50	50	50	50