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An Economic Comparison Of Intensive Beef Cow-Calf Programs With Cotton and Soybeans

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Preface

This report compares three intensive cow-calf programs with cotton and soybeans. Data used in the report were taken from experiments conducted during a 15-year period at the Red River Valley Experiment Station, Bossier City. Experimental regimes were conducted consecutively rather than simultaneously. Therefore, comparisons must be made with due consideration for differences in productivity among periods as well as confounding of year effects with breed effects resulting from crossbreeding in the third time period. Since this report is based on experimental data, levels of outputs shown here should not be compared directly with actual farm records. The comparisons shown are believed to be valid since data for all enterprises were obtained from experiments conducted under similar conditions at the same location. Therefore, while the absolute level of performance might vary between the experiment and an actual farm, the relationships among enterprises should remain relatively constant.

The stability of these relationships is examined in the report by comparing the enterprises at various price levels. As price levels increase, the cow-calf programs become more competitive with the row-crop enterprises. Based on 1979 price and cost relationships, the creep-graze system with F_1 calves gave the highest returns of the cow-calf systems considered. Returns per acre from this system were slightly higher than returns from soybeans but were lower than those from cotton. However, labor requirements per acre were considerably higher for all cow-calf systems than for cotton or soybeans.

Contents

An Economic Comparison of Intensive Beef Cow-Calf Programs With Cotton and Soybeans

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This study compares the economic potential of three beef cow-calf programs with cotton and soybean enterprises. Data for the comparison were obtained from experiments conducted during the period 1962-76 at the Red River Valley Experiment Station, Bossier City, La., on alluvial soils. All physical input-output data used were taken from experiment station records and may or may not reflect levels of production attainable by farmers. The objective of this analysis was to determine if intensive cow-calf programs could compete economically with traditional row crops for available resources in agricultural production.

Pasture Program

The general pasture program for the beef cattle experiment was begun in 1955. A 16-acre Coastal bermudagrass pasture was established and cross-fenced into two pastures of equal size. Each fall the pastures were over-seeded with Louisiana S-1 white clover and ryegrass. A total of 250 pounds of nitrogen was applied in split applications to the pastures in early spring, midsummer, and late summer. Accumulated manure was spread three times per year. Pastures were clipped and surplus forage was harvested as hay. Pastures were alternately grazed and harvested to provide continuous grazing for the cattle. Coastal bermudagrass was allowed to grow as much as possible in the late fall for stubble grazing. Hay harvest was possible in all but one year, 1969. During 1969, excess hay from previous years was used for winter feeding.

Cow-Calf Program

The basic cow-calf program involved 24 cows and 24 calves on the 16 acres of pasture. This general stocking rate was maintained throughout the experiment. This program was designed to evaluate beef production per

acre from pastures stocked at a given level rather than to evaluate breeding performance. Brood cows were bred during a 75-day breeding season to calve between September 15 and December 1. Calves were weaned in mid-July at about 9 months of age. All calves were vaccinated for blackleg, and brood cows were vaccinated annually for vibriosis and leptospirosis. In addition, brood cows received an injection of vitamin A prior to the breeding season. Cows were wormed twice in the fall and twice in the spring to control internal parasites. External parasites were controlled by spraying or dusting four times per year. Total medication cost was estimated to be $9.50 per head at 1979 prices.

Hereford brood cows were used in the cow-calf program throughout the 15-year period (1962-76). However, three different management programs were followed within the 15-year period. During the first 5-year period (1962-66), cows were bred to Hereford bulls and the calves received no supplemental feeding of any kind. Hereford bulls were also used during the second 5-year period (1967-71), and the calves received an average of 587 pounds of supplemental grain. During the third 5-year period (1972-76), Hereford brood cows were bred to several different breeds of bulls to produce crossbred calves and the calves were permitted to creep graze an additional 4 acres of ryegrass from December 1 through July 15. The animals were fed hay harvested from the pastures. During the first two 5-year periods, slightly more hay was required than was harvested from the pastures, while surplus hay was harvested during the third time period. After adjusting for the additional land required to produce hay and the land used for creep grazing, the effective stocking rates were .74 acre per cow for the first 5-year period, .69 acre per cow for the second period, and .83 acre per cow for the last 5-year period when creep grazing for the crossbred calves was included. This program involved an additional 4 acres for creep grazing (December-July). Additional hay could have been harvested from these acres, and credit for an additional 2 tons per acre for the 4 acres was included in this system. Since the experimental regimes were conducted consecutively rather than simultaneously, comparisons must be made with due consideration for differences in productivity among periods as well as the confounding of year effects with breed effects resulting from crossbreeding in the third time period.

Cotton and Soybean Production

Data from experiments on the station served as a basis for the cotton and soybean production programs used in the comparison. Six-row equipment was assumed for both cotton and soybean production. The cotton production program involved deep tillage after stalk destruction, followed by a disking. Cotton land was set up in rows during the fall or winter with an allowance for re-hipping part of the acreage before planting. Sixty pounds

of nitrogen from anhydrous ammonia was applied in the spring. Weed control practices consisted of an application of a preemergence herbicide, two applications of a postemergence herbicide, and three mechanical cultivations. Insect control consisted of 12 applications of a synthetic pyrethroid material. Cotton was chemically defoliated and was mechanically harvested twice during the season. A charge for ginning was included in the cotton budgets.

Land preparation for soybean production consisted of disking two times, followed by a rowing-up operation. A bed conditioner was used just before planting. A preemergence herbicide was applied at planting and two mechanical cultivations were performed during the growing season. Two applications of a fungicide were utilized in soybean production. No insecticides were used.

Comparison of Enterprises

For purposes of this analysis, the beef cattle programs were treated as three distinct programs as noted previously. Technical input-output relationships discovered in the experiments were used in conjunction with estimated 1979 prices to develop costs and returns for the various beef programs. Although all three programs did not exist simultaneously in the experiments, this analysis provides comparisons of costs and returns for all systems in 1979 as well as in each of the 5-year periods. Historical experimental yield data for 1962-76 were used to establish the level of output for cotton and soybeans. Technology has changed over time, and therefore current (1979) technical inputs were used in conjunction with estimated 1979 prices to develop budgets for cotton and soybeans. The per-acre production for each of the enterprises is shown in Table 1. Comparisons shown in this report are based on experimental data and do not reflect actual farming situations. The results should not be compared directly with actual farm records.

A comparison of estimated 1979 costs and returns per acre for each enterprise is shown in Table 2. Cotton yielded the highest net return per acre of the enterprises considered ($251.48). The program utilizing F_1 calves with creep grazing was the most profitable beef program per acre and net returns from this program ($183.82) were slightly greater than those from soybeans ($182.35 per acre). This beef program had a less intensive stocking rate than the other systems (.83 acre per cow vs. .74 and .69 acre per cow). The beef program including creep feeding of grain yielded the largest output per acre (683 pounds), but did not yield the highest profit. Extra feed costs incurred for grain caused this program to have higher variable costs than the other feeding programs. Detailed budgets and supporting data for all enterprises in this comparison are shown in Appendix Tables 1-7.

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Table 1.—Average yields per acre for beef cattle, cotton, and soybeans, Red River Valley Experiment Station, 1962-76[1]

Year	Beef systems			Cotton (lint)	Soybeans
	No Creep feeding	Creep feed grain	F₁ calves, creep graze		
	------------------------Lb./A. ------------------------			Lb./A.	Bu./A.
1962	544			635	30.2
1963	520			667	42.1
1964	538			731	30.4
1965	544			621	40.0
1966	527			627	47.7
(5-year avg.)	(534)			(656)	(38.1)
1967		707		660	49.4
1968		653		509	47.4
1969		661		1,060	20.2
1970		688		1,164	29.7
1971		705		1,076	38.3
(5-year avg.)		(683)		(894)	(37.0)
1972			625	1,323	44.5
1973			589	970	60.4
1974			563	733	52.4
1975			573	1,215	56.3
1976			624	1,071	42.6
(5-year avg.)			(595)	(1,062)	(51.2)
Overall avg.				871	42.1

[1] Five-year averages may not equal those shown in budgets due to rounding.

The impact that different price levels would have on the economic relationships among these enterprises is shown in Table 3. Data in this table were based on the same levels of production and costs outlined above; the only change was in the product prices. Beef cattle become less competitive with cotton and soybeans as the product price level drops. The reverse relationship holds when product prices rise. For all levels of prices evaluated, the program involving F₁ calves with creep grazing was most competitive with the row-crop enterprises. If cattle prices were to rise by 10 percent and soybean prices were to remain at the base level, the program with F₁ calves and creep grazing would yield net returns per acre superior to soybeans. Data presented in Table 3 provide similar comparisons for additional relationships. These data may also be interpreted as changes in output as well as changes in price, or a combination of both.

Net return per acre is perhaps the single most important consideration in enterprise selection, but labor requirements are also very important. Annual labor requirements per acre for the enterprises considered are shown in Table 4. Labor requirements per acre for the three beef cattle programs range from 166 to 181 percent of those for cotton. Soybeans require about

Table 2.—Comparison of estimated costs and returns per acre for selected beef enterprises, cotton, and soybeans, Red River Valley Experiment Station, 1979

	Beef systems				
	No creep feeding	Creep feed grain	F_1 calves, creep graze	Cotton	Soybeans
Item					
	--Dollars--				
Gross returns	347.84[1]	443.70[2]	417.20[3]	603.60[4]	260.40[5]
Variable costs	173.22	224.61	132.42	283.59	57.96
Fixed costs	109.14	114.78	100.96	68.53	20.09
Total specified costs	282.36	339.39	233.38	352.12	78.05
Net returns to land and management	65.48	104.31	183.82	251.48	182.35

[1]Production for this system is 3.96 cwt./cow and .74 acre/cow. Gross returns = 3.96/.74 x $65 = $347.84.

[2]Production for this system is 4.71 cwt./cow and .69 acre/cow. Gross returns = 4.71/.69 x $65 = $443.73.

[3]Production for this system is 4.96 cwt./cow and .83 acre/cow, plus .57 ton of hay per acre. Gross returns = (4.96/.83 x $65) + (.57 x $50) = $417.20.

[4]Production is 871 pounds of lint and 1,350 pounds of seed per acre. Gross returns = (871 x $.60) + (1,350 x $.06) = $603.60.

[5]Production is 42 bushels/acre. Gross returns = 42 x $6.20 = $260.40.

3.65 hours of labor per acre, or about 45 percent of the labor requirement for cotton. Total labor per cow is relatively constant among livestock systems, with the least intensive system (creep grazing) having the lowest labor requirement per acre.

Estimated costs and returns for each enterprise based on price relationships for the three time periods described earlier are shown in Tables 5-7. These tables were based on average production for each row crop enterprise for the 15-year period 1962-76. Input costs were indexed back to each time period from the 1979 base using the index of farm production expenses. Returns were based on the average level of production for 1962-76 and the average prices during each of the respective 5-year time periods. Production for each of the livestock programs was held constant for all time periods. Net returns for the various beef programs changed as a result of absolute price changes; relationships among the feeding programs did not change. Creep grazing with F_1 calves was most competitive with row-crop enterprises in all periods. During the 1967-71 time period, this feeding program yielded net returns greater than those from cotton and soybeans. Cotton lint prices were extremely depressed during this time (24 cents per pound) and soybean prices were about $2.65 per bushel. The price relationships among commodities were substantially different in each of the time periods included in the analysis.

Table 3.—Net returns per acre to land and management for selected beef cattle systems, cotton, and soybeans at selected price levels, Red River Valley Experiment Station, 1979[1]

| Price level | Beef price ($/cwt.) | Net returns - beef systems | | | Cotton | | Soybeans | |
		No creep feeding ($)	Creep feed grain ($)	F₁ calves, creep graze ($)	Price ($/lb. lint)	Net returns[2] ($)	Price ($/bu)	Net returns ($)
−20 percent	52.00	−4.09	15.57	105.08	.48	146.96	4.96	130.27
−10 percent	58.50	30.70	59.94	144.95	.54	199.22	5.58	156.31
Base	65.00	65.47	104.31	183.82	.60	251.48	6.20	182.35
+10 percent	71.50	100.26	148.68	222.69	.66	303.74	6.82	208.39
+20 percent	78.00	135.05	193.05	261.56	.72	356.00	7.44	234.43

[1]Assumes the following levels of production: no creep feeding—3.96 cwt./cow and .74 acre/cow; creep feed grain—4.71 cwt./cow and .69 acre/cow; creep graze—4.96 cwt./cow and .83 acre/cow, plus .57 ton of surplus hay per acre; cotton—871 pounds of lint and 1,350 pounds of seed per acre; soybeans—42 bushels per acre.
[2]Price for cotton seed held constant at $120 per ton for all lint price levels.

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Table 4.—Annual labor requirements for selected beef cattle systems, cotton, and soybeans, Red River Valley Experiment Station, 1979

	Beef cattle				Annual labor requirement per acre[1]
Enterprise	Livestock labor	Pasture labor	Hay labor	Total labor	
	----------------------------Hours/cow----------------------------				Hours
Beef systems					
No creep	6.8	1.23	2.87	10.90	14.73
Creep grain	6.8	1.28	2.20	10.23	14.83
F1 calves, creep graze	6.8	1.38	3.13	11.31	13.63
Cotton					8.19
Soybeans					3.65

[1] Per-acre labor requirements based on .74 acre/cow for no creep feeding, .69 acre/cow for creep grain, and .83 acre/cow for creep grazing. Hours per acre for no creep feeding = 10.9/.74 = 14.73; hours/acre for creep grain = 10.23/.69 = 14.83; hours/acre for creep grazing = 11.31/.83 = 13.63.

Table 5.—Estimated costs and returns per acre for selected beef systems, cotton, and soybeans, Red River Valley Experiment Station, 1962-66

	Beef systems				
Item	No creep feeding	Creep feed grain	F1 calves, creep graze	Cotton	Soybeans
	--Dollars--				
Gross returns[1]	142.67[2]	181.98[3]	172.67[4]	287.69[5]	104.58[6]
Variable costs[7]	73.72	95.59	56.36	120.70	24.67
Fixed costs[7]	46.45	48.85	42.97	29.17	8.55
Total specified costs[7]	120.17	144.44	99.33	149.87	33.33
Net returns to land and management	22.50	37.54	73.34	137.82	71.36

[1] Gross returns based on average prices received for the 5-year period. Livestock prices were the average price of all calves at Louisiana auction markets for the 5-year period plus $3 per hundredweight to account for the higher quality animals in the experimental program.

[2] Production for this system is 3.96 cwt./cow and .74 acre/cow. Gross returns = 3.96/.74 x $26.66 = $142.67.

[3] Production for this system is 4.71 cwt./cow and .69 acre/cow. Gross returns = 4.71/.69 x $26.66 = $181.98.

[4] Production for this system is $4.96 cwt./cow and .83 acre/cow, plus .57 ton of hay/acre. Gross returns = (4.96/.83 x $26.66) + (.57 x $23.22) = $172.67.

[5] Production is 871 pounds of lint and 1,350 pounds of seed per acre. Gross returns = (871 x $.29) + (1,350 x $.026) = $287.69.

[6] Production is 42 bushels per acre. Gross returns = 42 x $2.49 = $104.58.

[7] Input cost data are 1979 estimates indexed back to the appropriate time period using the index of farm production expenses. The index number for 1962-66 is 93.2, with 1967 = 100 and 1978 = 219.

Table 6.—Estimated costs and returns per acre for selected beef systems, cotton, and soybeans, Red River Valley Experiment Station, 1967-71

| Item | Beef systems | | | Cotton | Soybeans |
	No creep feeding	Creep feed grain	F_1 calves, creep graze		
	---Dollars-------------------------------------				
Gross returns[1]	172.15[2]	219.60[3]	206.20[4]	245.49[5]	111.30[6]
Variable costs[7]	85.10	110.35	65.06	139.33	28.48
Fixed costs[7]	53.62	56.39	49.60	33.67	9.87
Total specified costs[7]	138.72	166.74	114.66	173.00	38.35
Net returns to land and management	33.43	52.86	91.54	72.12	72.95

[1] Gross returns based on average prices received for the 5-year period. Livestock prices were the average prices of all calves at Louisiana auction markets for the 5-year period plus $3 per hundredweight to account for the higher quality animals in the experimental program.

[2] Production for this system is 3.96 cwt./cow and .74 acre/cow. Gross returns = 3.96/.74 x 32.17 = $172.15.

[3] Production for this system is 4.71 cwt./cow and .69 acre/cow. Gross returns = 4.71/.69 x 32.17 = $219.60.

[4] Production for this system is 4.96 cwt./cow and .83 acre/cow, plus .57 ton of hay/acre. Gross returns = (4.96/.83 x $32.17) + (.57 x $24.24) = $206.20.

[5] Production is 871 pounds of lint and 1,350 pounds of seed per acre. Gross returns = (871 x $.24) + (1,350 x $.027) = $245.49.

[6] Production is 42 bushels per acre. Gross returns = 42 x $2.65 = $111.30.

[7] Input cost data are 1979 estimates indexed back to the appropriate time period using the index of farm production expenses. The index number for 1967-71 is 107.6, with 1967 = 100 and 1978 = 219.

Table 7.—Estimated costs and returns per acre for selected beef systems, cotton, and soybeans, Red River Valley Experiment Station, 1972-76

| | Beef systems | | | | |
Item	No creep feeding	Creep feed grain	F₁ calves, creep graze	Cotton	Soybeans
	--Dollars--				
Gross returns[1]	212.40[2]	270.93[3]	259.78[4]	450.96[5]	230.16[6]
Variable costs[7]	130.83	169.65	100.02	214.20	43.78
Fixed costs[7]	82.43	86.69	76.26	51.76	15.17
Total specified costs[7]	213.26	256.34	176.28	265.96	58.95
Net returns to land and management	−.86	14.59	83.50	185.00	171.21

[1]Gross returns based on average prices received for the 5-year period. Livestock prices were the average prices of all calves at Louisiana auction markets for the 5-year period plus $3 per hundredweight to account for the higher quality animals in the experimental program.

[2]Production for this system is 3.96 cwt./cow and .74 acre/cow. Gross returns = 3.96/.74 x $39.69 = $212.40.

[3]Production for this system is 4.71 cwt./cow and .69 acre/cow. Gross returns = 4.71/.69 x $39.69 = $270.93.

[4]Production for this system is 4.96 cwt./cow and .83 acre/cow, plus .57 ton of hay/acre. Gross returns = (4.96/.83 x $39.69) + (.57 x $39.35) = $259.78.

[5]Production is 871 pounds of lint and 1,350 pounds of seed per acre. Gross returns = (871 x $.448) + (1,350 x $.045) = $450.96.

[6]Production is 42 bushels per acre. Gross returns = 42 x $5.48 = $230.16.

[7]Input cost data are 1979 estimates indexed back to the appropriate time period using the index of farm production expenses. The index number for 1972-76 is 165.4, with 1967 = 100 and 1978 = 219.

Summary and Implications

Based on data presented in this analysis, the cow-calf program utilizing F_1 calves and creep grazing generated net returns about equal to those from soybeans, but less than those from cotton. These results were based on experimental yields and current (1979) cost-price relationships. If relative prices change in favor of beef cattle, they could generate profits superior to soybeans or cotton, depending upon the extent of the change. Although comparisons of the beef cattle programs must be made with caution, it appears that the program utilizing crossbred calves and creep grazing has the greatest economic potential. This program was slightly less intensive than the others (.83 acre per cow *vs*. .74 and .69 acre per cow) and utilized less labor per acre. However, labor requirements for both row-crop enterprises were considerably lower than those for the creep grazing program. Labor availability for an individual farmer may be a critical factor that provides a relative advantage for the soybean enterprise, which is the least labor intensive (3.65 hours per acre).

Average production among the 5-year periods was relatively stable for all enterprises. Year-to-year variations did exist, which could alter the relationships shown in Table 3. For example, a 10 percent increase in output of the creep grazing program would make net returns from that program superior to net returns from soybeans. Historically, changes in prices have been of a larger magnitude than changes in production. Therefore, changes in product prices will play a dominant role in deciding the profitability of the enterprises considered in this report.

Appendix Table 1.—Estimated 1979 costs per head for a cow-calf operation (no creep feeding), Red River Valley Experiment Station, 1962-66[1]

Item	Unit	Price or cost/unit (dollars)	Quantity	Value or cost (dollars)
Variable costs				
Pasture (sodseed)	tons	75.08	0.67	50.30
Stock salt	cwt.	3.50	0.50	1.75
Bone meal	cwt.	18.50	0.50	9.25
Medication	head	9.50	1.00	9.50
Hay (pasture)	tons	13.86	1.13	15.66
Hay (produced)	tons	21.98	0.36	7.91
Tractors (fuel, lube, repairs)	dol.			0.81
Machinery (fuel, lube, repairs)	dol.			4.09
Equipment (fuel, lube, repairs)	dol.			3.26
Labor, tractor & machinery	hrs.	3.27	2.40	7.85
Labor, livestock	hrs.	3.27	4.40	14.39
Interest on operating capital	dol.	0.10	40.42	4.04
Total variable costs				128.18
Fixed costs				
Pasture (sodseed)	acre	7.61	0.67	5.10
Hay (pasture)	tons	6.34	1.13	7.16
Hay (produced)	tons	6.92	0.36	2.49
Interest on livestock capital	dol.	0.10	492.00	49.20
Interest on other equipment	dol.	0.10	49.88	4.99
Depreciation on other equipment	dol.			7.84
Other fixed costs, mach. & equip.	dol.			3.98
Total fixed costs				80.76
Total specified costs per head				208.94
Total specified costs per cwt.				52.76

[1]Average weight of weanling calves was 3.96 cwt.

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Appendix Table 2.—Estimated 1979 costs per head for a cow-calf operation (creep grain), Red River Valley Experiment Station, 1967-71[1]

Item	Unit	Price or cost/unit (dollars)	Quantity	Value or cost (dollars)
Variable costs				
Pasture (sodseed)	tons	75.08	0.67	50.30
Stock salt	cwt.	3.50	0.50	1.75
Bone meal	cwt.	18.50	0.50	9.25
Medication	head	9.50	1.00	9.50
Hay (pasture)	tons	13.86	1.05	14.55
Hay (produced)	tons	21.98	0.09	1.98
Grain creep feed	cwt.	5.66	5.87	33.22
Tractors (fuel, lube, repairs)	dol.			0.18
Machinery (fuel, lube, repairs)	dol.			4.09
Equipment (fuel, lube, repairs)	dol.			3.52
Labor, tractor & machinery	hrs.	3.27	2.40	7.85
Labor, livestock	hrs.	3.27	4.40	14.39
Interest on operating capital	dol.	0.10	43.93	4.39
Total variable costs				154.98
Fixed costs				
Pasture (sodseed)	acre	7.61	0.67	5.10
Hay (pasture)	tons	6.34	1.05	6.66
Hay (produced)	tons	6.92	0.09	0.62
Interest on livestock capital	dol.	0.10	492.00	49.20
Interest on other equipment	dol.	0.10	52.54	5.25
Depreciation on other equipment	dol.			8.37
Other fixed costs, mach. & equip.	dol.			4.00
Total fixed costs				79.20
Total specified costs per head				234.18
Total specified costs per cwt.				49.72

[1]Average weight of weanling calves was 4.71 cwt.

Appendix Table 3.—Estimated 1979 costs per head for a cow-calf operation (creep graze), Red River Valley Experiment Station, 1972-76[1]

Item	Unit	Price or cost/unit (dollars)	Quantity	Value or cost (dollars)
Gross receipts				
Hay (excess)	tons	50.00	0.47	23.50
Total				23.50
Variable costs				
Pasture (sodseed)	tons	75.08	0.67	50.30
Stock salt	cwt.	3.50	0.50	1.75
Bone meal	cwt.	18.50	0.50	9.25
Medication	head	9.50	1.00	9.50
Hay (pasture)	tons	13.86	1.62	22.45
Creep grazing	acre	33.02	0.17	5.61
Tractors (fuel, lube, repairs)	dol.			0.18
Machinery (fuel, lube, repairs)	dol.			4.09
Equipment (fuel, lube, repairs)	dol.			3.75
Labor, tractor & machinery	hrs.	3.27	2.40	7.85
Labor, livestock	hrs.	3.27	4.40	14.39
Interest on operating capital	dol.	0.10	42.89	4.29
Total variable costs				133.41
Net variable costs				109.91
Fixed costs				
Pasture (sodseed)	acre	7.61	0.67	5.10
Hay (pasture)	tons	6.34	1.62	10.27
Creep grazing	acre	3.09	0.17	0.53
Interest on livestock capital	dol.	0.10	492.00	49.20
Interest on other equipment	dol.	0.10	56.72	5.67
Depreciation on other equipment	dol.			8.99
Other fixed costs, mach. & equip.	dol.			4.04
Total fixed costs				83.80
Total specified costs per head				217.21
Net specified costs per head				193.71
Net specified costs per cwt.				39.05

[1]Average weight of weanling calves was 4.96 cwt.

Appendix Table 4.—Estimated 1979 costs per acre for soybeans, Red River Valley Experiment Station, 1962-76

Item	Unit	Price or cost/unit (dollars)	Quantity	Value or cost (dollars)
Gross receipts				
Soybeans	bu.	6.20	42.00	260.40
Total				260.40
Variable costs				
Pre-harvest costs				
Soybean seed	bu.	12.00	1.00	12.00
Preemergence herbicide	qt.	3.54	0.80	2.83
Fungicide	lbs.	7.50	1.00	7.50
Airplane (lo vol)	acre	1.90	2.00	3.80
Machinery (fuel, lube, repairs)	acre	2.27	1.00	2.27
Tractors (fuel, lube, repairs)	acre	8.56	1.00	8.56
Labor (tractor & machinery)	hrs.	3.27	2.52	8.25
Other labor	hrs.	3.27	0.45	1.47
Interest on operating capital	dol.	0.10	19.63	1.96
Subtotal, pre-harvest				48.65
Harvest costs				
Machinery	acre	7.09	1.00	7.09
Labor (tractor & machinery)	hrs.	3.27	0.68	2.21
Subtotal, harvest				9.31
Total variable costs				57.96
Income above variable costs				202.44
Fixed costs				
Machinery	acre	13.03	1.00	13.03
Tractors	acre	7.06	1.00	7.06
Total fixed costs				20.09
Total specified costs				78.05
Net returns to land and management				182.35

Appendix Table 5.—Estimated 1979 costs per acre for cotton, Red River Valley Experiment Station, 1962-76

Item	Unit	Price or cost/unit (dollars)	Quantity	Value or cost (dollars)
Gross receipts				
Cotton lint	lbs.	0.60	871.00	522.60
Cotton seed	lbs.	0.06	1,350.00	81.00
Total				603.60
Variable costs				
Pre-harvest costs				
Preemergence herbicide	lbs.	2.75	0.50	1.38
Nitrogen 82	cwt.	9.00	0.60	5.40
Cotton seed	cwt.	28.00	0.20	5.60
Postemergence herbicide	lbs.	2.05	0.75	1.54
Lay-by herbicide	lbs.	3.27	1.00	3.27
Insecticide	qt.	52.48	1.50	78.72
Airplane (lo vol)	acre	1.90	12.00	22.80
Defoliant	gal.	12.50	0.25	3.13
Airplane (hi vol)	acre	2.40	1.00	2.40
Insect scout	acre	4.00	1.00	4.00
Machinery (fuel, lube, repairs)	acre	3.08	1.00	3.08
Tractors (fuel, lube, repairs)	acre	14.61	1.00	14.61
Labor (tractor & machinery)	hrs.	3.27	3.35	10.96
Other labor	hrs.	3.27	1.64	5.36
Interest on operating capital	dol.	0.10	55.39	5.54
Subtotal, pre-harvest				167.79
Harvest costs				
Ginning	lbs.	0.07	871.00	60.97
Machinery	acre	35.56	1.00	35.56
Labor (tractor & machinery)	hrs.	3.27	3.20	10.46
Subtotal, harvest				106.99
Total variable costs				274.78
Income above variable costs				328.82
Fixed costs				
Machinery	acre	55.99	1.00	55.99
Tractors	acre	12.53	1.00	12.53
Total fixed costs				68.53
Total specified costs				343.30
Net returns to land and management				260.29

Appendix Table 6.—Machinery and equipment fixed and variable costs per hour, Louisiana, 1979

| Machine | Code[1] | Variable costs per hour | | | | Fixed costs per hour | | | Interest cost per hour | Total ownership and operating cost per hour[3] |
		Repairs	Fuel	Lubri-cants[2]	Total variable	Depreci-ation	Insur-ance	Total fixed		
					----------------Dollars----------------					
Tractor, 31-55 HP	2	1.051	0.888	0.133	2.071	0.631	0.068	0.699	0.756	3.526
Tractor, 56-80 HP	3	1.420	1.404	0.211	3.034	1.024	0.110	1.134	1.226	5.394
Tractor, 106-130 HP	5	2.065	2.786	0.418	5.268	1.984	0.214	2.198	2.376	9.843
Pickup truck	10	0.460	1.434	0.215	2.109	1.105	0.053	1.159	0.590	3.858
5-Ton truck	12	0.963	2.868	0.430	4.262	2.188	0.147	2.334	2.334	6.662
Combine, medium	14	17.317	3.055	0.458	20.830	15.410	1.061	16.471	11.791	49.092
Cotton picker, 2R	16	21.054	3.302	0.495	24.851	19.984	1.376	21.361	15.291	61.503
Cotton picker, 2R	17	21.054	3.302	0.495	24.851	19.984	1.376	21.361	15.291	61.503
Disk, 6R	32	2.818	0.0	0.0	2.818	2.549	0.171	2.720	1.898	7.436
Hipper, 6R	38	1.093	0.0	0.0	1.093	0.989	0.066	1.055	0.736	2.884
Chisel plow	45	0.679	0.0	0.0	0.679	0.615	0.041	0.656	0.458	1.793
Cultivator, 6R	48	1.279	0.0	0.0	1.279	1.157	0.078	1.235	0.861	3.375
Cult-post, 6R	51	1.759	0.0	0.0	1.750	1.591	0.107	1.698	1.185	4.642
Planter-pre, 6R	57	2.520	0.0	0.0	2.520	2.603	0.174	2.778	1.938	7.236
Stalk shredder 2	60	0.373	0.0	0.0	0.373	0.675	0.045	0.720	0.503	1.596
Spike harrow, 4R	62	0.200	0.0	0.0	0.200	0.181	0.012	0.193	0.135	0.528
Conditioner, 6R	65	1.399	0.0	0.0	1.399	1.266	0.085	1.350	0.942	3.691
Trailer, utility	67	0.213	0.0	0.0	0.213	0.214	0.018	0.232	0.199	0.644
Cotton trailer	68	0.500	0.0	0.0	0.500	0.476	0.035	0.511	0.389	1.400
Mower-conditioner	71	6.739	0.0	0.0	6.739	2.709	0.182	2.891	2.017	11.701
Hayrake	72	1.016	0.0	0.0	1.016	0.736	0.049	0.785	0.548	2.349
Hayfork	73	0.077	0.0	0.0	0.077	0.070	0.005	0.075	0.052	0.204
Grain drill	74	1.049	0.0	0.0	1.049	1.085	0.073	1.157	0.808	3.014
Round baler	75	4.020	0.0	0.0	4.020	3.479	0.227	3.706	2.521	10.247
Rotary mower	78	0.126	0.0	0.0	0.126	0.333	0.022	0.355	0.248	0.729
Sprayer-jet	91	0.458	0.0	0.0	0.458	0.309	0.019	0.328	0.206	0.992
Fert-Dist-PTO	92	0.320	0.0	0.0	0.320	0.289	0.019	0.309	0.215	0.844

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[1]Code refers to machinery item number in machinery description table.
[2]Lubricants for machines without engines are included in repair costs.
[3]Total ownership and operating costs equal fixed costs plus interest cost plus variable costs.

Appendix Table 7.—Description of machinery and equipment items used in budget preparations, Red River Valley Experiment Station, 1979

Machine	Code	Size	Purchase Price	Salvage value	Annual hours used	Years owned	Hours life	Performance rate (hours/acre)
			----------------dollars----------------					
Tractor, 31-55 HP	2	43.0[1]	7,800	1,568	625	16	10,000	1.000
Tractor, 56-80 HP	3	68.0[1]	12,780	2,543	625	16	10,000	1.000
Tractor, 106-130 HP	5	118.0[1]	24,773	4,930	625	16	10,000	1.000
Pickup truck	10	0.5[2]	6,930	2,508	800	6	4,000	1.000
5-Ton truck	12	5.0[2]	10,890	2,140	400	10	4,000	1.000
Combine, medium	14	16.0[3]	38,993	8,172	200	10	2,000	0.283
Cotton picker, 2R	16	6.0[3]	50,567	10,598	200	10	2,000	0.702
Cotton picker, 2R	17	6.0[3]	50,567	10,598	200	10	2,000	0.573
Disk, 6R	32	21.0[3]	6,345	1,247	200	10	2,000	0.151
Hipper, 6R	38	21.0[3]	2,462	484	200	10	2,000	0.134
Chisel plow	45	12.0[3]	1,530	301	200	10	2,000	0.283
Cultivator, 6R	48	21.0[3]	2,880	566	200	10	2,000	0.151
Cult-post, 6R	51	21.0[3]	3,960	778	200	10	2,000	0.179
Planter-pre, 6R	57	21.0[3]	6,480	1,273	200	10	2,000	0.156
Stalk shredder 2	60	7.0[3]	1,260	248	150	10	1,500	0.319
Spike harrow, 4R	62	14.0[3]	450	88	200	10	2,000	0.159
Conditioner, 6R	65	21.0[3]	3,150	619	200	10	2,000	0.116
Trailer, utility	67	1.0[3]	720	77	200	15	3,000	1.000
Cotton trailer	68	10.0[3]	2,700	416	400	12	2,000	1.000
Mower-conditioner	71	9.0[3]	5,058	994	150	10	1,500	0.191
Hayrake	72	10.0[3]	1,373	270	150	10	1,500	0.198
Hayfork	73	2.0[3]	261	51	300	10	3,000	1.000
Grain drill	74	10.0[3]	2,700	531	200	10	2,000	0.306
Round baler	75	18.0[3]	6,390	1,172	150	10	1,500	0.204
Rotary mower	78	5.0[3]	621	122	150	10	2,000	0.407
Sprayer-jet	91	12.0[3]	495	124	150	8	1,200	1.000
Fert-Dist-PTO	92	20.0[3]	540	106	150	10	1,500	0.110

[1]Drawbar Horsepower.　　[2]Tons.　　[3]Feet.

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