

Repayment Capacity of Land Purchases

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An operating budget which considers all cash receipts and expenses is useful in estimating the loan repayment of an irrigated pasture purchase. An operating budget for a pasture is difficult to prepare unless rent values are used as income. The pasture enterprise and the livestock enterprise are often combined because the cash receipts from the livestock enterprise are used to pay the expenses on the pasture enterprise.

Following is an example of a budget developed for a single selected year, 1972, for a particular 100-acre parcel of irrigated pasture in the Turlock, California, area for grazing beef stocker cattle.

Single Year Budget

An operating budget was prepared using the best available cost and income estimates. The pasture cost was \$100,000 for the 100 acres with \$30,000 (30%) down. The down payment was considered a "sunk" cost, one which would be recaptured only when the property is sold. The \$70,000 balance was borrowed at 7% annual rate of interest to be paid back in 15 equal annual payments of \$7,685.62. For the area, experience indicates that with about two pounds per head daily of a grain or commercial

liquid feed supplement, a carrying capacity of four stocker cattle per acre can be carried for a 180-day grazing period and gain 1.25 pounds per head per day. Cattle prices were taken from Federal-State Market News Service reports for Stockton, California, using March 500-600 pound and October 700-800 pound prices for feeder steers, medium frame, number one muscle thickness.

The analysis showed that on a single year, there was a net loss to the operation of \$40.33 per acre (Table 1). This would make it difficult to make the annual payments on the property with the cash receipts from cattle sales. A future value analysis using a 7% annual interest rate predicted the loss would average \$72.29 per acre for the 15-year period.

Several questions remain: Is a one-year analysis indicative of 15-year results? Would historical cost and return data increase the accuracy of the prediction? How would net income compare if the property was purchased in a succeeding year? Would better opportunities be forthcoming?

Use of Historic Cattle Prices

A three-year average can mitigate some of the effects of the volatility of the cattle market. Greater numbers of historical years would be more effective in determining

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Actual pasture described in the article.

Table 1. Costs to raise stocker steers on 100 acres of irrigated pasture.

1972	
Cost of Irrigated Pasture:	
100 acres purchased at \$1,000 per acre:	\$100,000
30% down	\$30,000
70% borrowed	\$70,000
15 year amortized loan at 7%; annual payment	\$7,685.62
Property taxes at \$25 per acre	2,500.00
Fertilizer—300 lbs/acre single super phosphate at \$50 per ton	750.00
Irrigation District Taxes—\$2.50 per acre	250.00
Fence repair; weed control—\$3 per acre	300.00
Total Annual Cost of Pasture:	\$11,485.62
Cost per Acre:	\$114.86

Carrying Capacity: 4 head/acre for 180 days	
1.25 pounds average daily gain; 1% death loss	
Purchase weight 500 pounds at \$43.90/cwt = \$219.50	
Selling weight 725 pounds at \$37.31/cwt = \$270.50	
Cash Receipts: 396 head sold	\$107,117.01
Cash Expenses: 400 head purchased	87,800.00
Annual cost of pasture	11,485.62
Supplemental feed—2 lbs/head/day	
72 tons at \$75 per ton	5,400.00
Veterinary, medicine, fuel, trucking, misc. at \$7.50 per head	3,000.00
Interest on money to buy cattle at 8% for 180 days	3,463.89
Net Profit or Loss:	\$-4,032.50
Net Profit or Loss per Acre:	\$-40.33
Repayment Capacity of Land:	
-\$40.33/acre + \$76.85/acre loan payment = \$36.55/acre per acre	

the true long-term average, but would not be as useful as a price predictor because of the effects of past inflation. Another budget was prepared using average feeder cattle prices for 1970, 1971, and 1972. This budget analysis of the nearest three preceding years of historical feeder cattle prices resulted in a net loss of \$128.57 per acre. Applying a future value analysis with a 7% annual interest rate, the loss becomes \$230.47 per acre.

Sixteen-Year Follow-up Study

To evaluate how well the one-year and three-year estimates predicted long-term profit or loss, analyses were prepared for each of 16 years from 1972 to 1987 based on a 1972 land purchase. Actual costs of irrigation water, taxes, interest, cattle, supplemental feed, fertilizer, and other costs that existed each year were used. Table 2 shows the summary of these 16 annual results.

Pasture costs per acre including the amortized mortgage payment of \$76.85 rose from \$114.85 in 1972 to \$154.30 in 1977. Cattle production costs, other than pasture feed and cost of the cattle themselves, varied from \$118.64 in 1972 to a high of \$281.94 per acre in 1980.

The dominant factor causing the wide fluctuation in profit or loss was the spread between purchase and sales prices of the cattle which averaged \$-8.44 per hundred weight for the 16 years of this study and varied from \$7.49 to \$-20.90 per hundred weight.

For the 15 years from 1972 through 1986, during the mortgage period, the net returns per acre were lowest (\$-458.77) in 1974 and highest (\$162.31) in 1978. Table

Table 2. Irrigated pasture purchased in 1972. Annual costs and returns per acre (dollars).

Year	Cattle sales	Cattle purchase costs	Pasture costs	Other cattle production costs	Profit or loss
1972	1071	878	115	118	-40
1973	1439	1224	115	189	-89
1974	872	1026	125	180	-459
1975	1052	583	129	168	172
1976	982	857	128	182	-185
1977	1127	775	154	157	41
1978	1613	1133	111	207	162
1979	2133	1788	114	249	-18
1980	1982	1639	117	282	-56
1981	1664	1452	123	268	-179
1982	1721	1319	123	255	24
1983	1535	1410	131	251	-257
1984	1677	1347	132	254	-56
1985	1547	1367	137	220	-177
1986	1651	1269	139	222	21
1987	2028	1418	71	230	309

2 shows the relationships between cattle sale prices, cattle purchase prices, pasture costs, and net returns. The actual net loss per acre averaged \$-73.08 for each of the 15 years that the mortgage was carried.

Succeeding Year Purchases

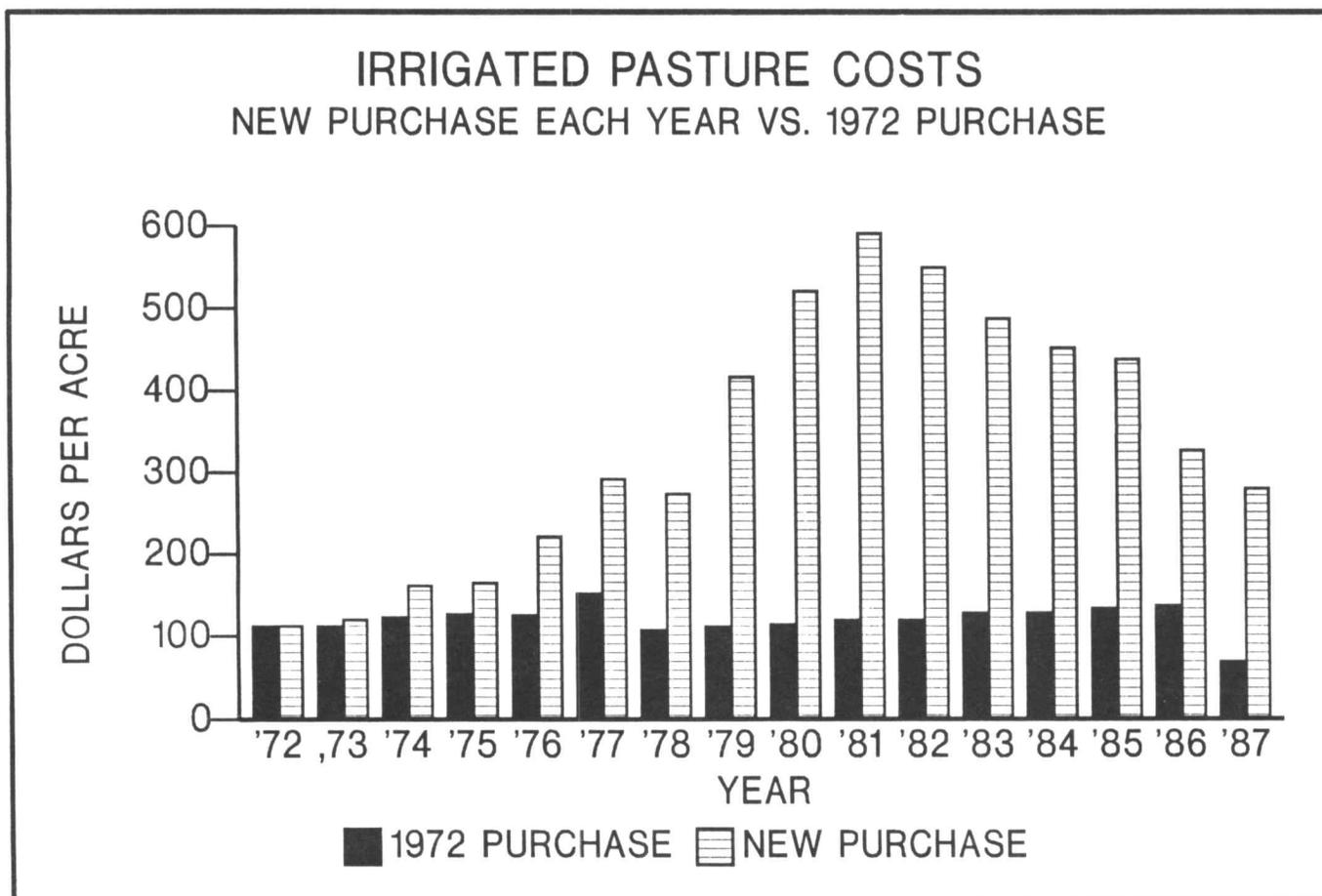
Since a 1972 purchase decision resulted in negative returns, an evaluation was made of whether a better purchase opportunity occurred in succeeding years. A new analysis was made for each year from 1973 through 1987 using all the same costs and returns as before except that in each one it was assumed that the purchase was made anew.

Figure 1 shows the pasture production costs assuming a new purchase each year compared to pasture production costs based on the 1972 purchase. Costs increased dramatically each succeeding year until 1981. With lessened land values and interest rates in 1982 through 1986, total costs decreased, but never down to the level of the 1972 purchase. Therefore, a purchase made in any year after 1972 would have resulted in greater net losses to the operation.

Discussion

The original 1972 analysis showed negative returns of \$40.33 per acre for the year. Using three-year historical average (1970-72) cattle prices, for March purchases and October sales, indicates expected negative returns of \$128.57 per acre—more than three times the loss shown for the 1972 data. Analysis for the following fifteen years showed an average loss of \$73.08 per acre per year.

Single year prices underestimated future losses while substituting the three near-past year cattle prices overestimated future losses. A future value analysis of the first year loss gave a very close estimate of \$-72.29 per acre. However, deciding the appropriate interest rate is not easy, and doing so in a year which is far from average can accentuate deviation from average.



The average 15-year difference between cattle purchase and sale prices was \$-8.44/hundred weight (cwt). In 1972, the difference was \$-6.59/cwt. and for the 1970-72 average it was \$-8.69. There are too many factors affecting the net returns to conclude that a specific price spread should always be used in making long-term decisions. Yet, this spread between cattle purchase and sales price seems to be the dominant factor in estimating whether or not grazing beef cattle can pay all the cash costs. Because yearly and seasonal cattle prices fluctuate widely, and because cattle prices differ at each market outlet, the price relationship for a particular set of marketing conditions needs to be determined. In this study, the 3-year average price spread of \$-8.69 was closer to the actual \$-8.44 which occurred in the following years than was the single year 1972 estimate of \$-6.59.

The major pasture production costs in this study were mortgage payments. The operation would not have suffered cash losses if the land was owned outright, but would have averaged \$6.17 net returns per acre. This explains the continued existence of many irrigated pasture cattle operations that are paid for or have a lower mortgage payment than the one in this study. In this

study, irrigation district water costs \$2.50 to a high of \$15.00 per acre. Typical costs for pumping water outside the district have ranged from \$48.00 to \$70.00 per acre. These costs would present different results from those observed in this study.

Both the original predictions and follow-up studies indicated the cattle operation would not pay the mortgage. Succeeding years only presented poorer opportunities. This should not be construed to mean that all irrigated pasture operations with stocker cattle are unprofitable. Different marketing techniques such as hedging and options, changing marketing months, as well as a number of other alternatives might improve net returns. The decision to rent the property rather than own cattle likely would have paid the mortgage since pasture has rented for about \$125.00 per acre and pasture costs in this study averaged \$126.30 for 15 years.

Irrigated pasture land prices have remained above the level that a beef cattle stocker operation could pay for from 1972-1987 in Central California. Pressures which have kept prices up include competition from dairy heifer raising enterprises, and continued speculation that land values will continue to rise enough to more than recapture all costs at time of sale.