An Economic Analysis Of Intensive-Early Stocking, Season-Long Stocking And Prescribed Burning Programs For Stocker Cattle Operations In Central Oklahoma.

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Story in Brief

Deterministic budgets were formulated for four alternative stocker cattle grazing programs on a 2000 ac ranch. Estimated returns over operating costs ($/ac) were increased for intensive-early stocking compared to season-long stocking. Annual spring burning improved returns for both grazing programs but, the increase was proportionally greater with intensive-early stocking. Returns over cost are also presented for various combinations of weight gains and steer prices. Finally, a ten year analysis using historical market data indicated that estimated returns would have been greater (or less negative) for intensive-early stocking than season-long returns in 8 of the 10 years.

Introduction

Intensive-early stocking (IES) is a program that is gaining popularity among stocker cattle producers. The system has been evaluated and applied for several years in Kansas but few Oklahoma cattlemen have adopted the grazing program. Combining IES with conventional season-long grazing (SLS) and prescribed burning adds flexibility to a stocker cattle operation and provides an opportunity to spread production risks over a more diversified production system.

Previous research demonstrated that beef production per acre can be increased 30 to 40% with an IES system that utilizes two times as many stocker cattle for approximately one-half of a normal summer-long grazing season (McCollum, unpublished data; McCollum et al., 1986; Owensby, 1986; Launchbaugh et al.,1983). In addition, data from Kansas and Oklahoma indicates that prescribed burning increases summer gains of growing cattle by 9 to 12%; most of this extra gain occurs in the first half of the summer.

The following analyses were conducted to estimate the influences of IES, SLS and prescribed spring burning on the economics of stocker cattle production in north-central Oklahoma.

Materials and Methods

Budget analysis was conducted using assumptions based on steer performance data collected from an IES study at the Pawhuska Research Station (McCollum, unpublished data; McCollum et al., 1986), burning studies in Kansas and Oklahoma (McCollum et al., 1987; ; Anderson et al, 1970; D.M. Engle, pers. comm.), market information from the Oklahoma City National Stockyards, estimates of

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labor and machinery expenses derived from Walker (1986), and estimates of receiving program costs provided by Hicks et al. (1986) and D. Gill (pers. comm.).

Assumptions included the following:

1. The SLS enterprise had capacity of 400 head while the IES enterprise had an 800 head capacity.
2. Stocking densities were 5 ac/steer and 2.5 ac/steer for SLS and IES, respectively.
3. Steers weighing 475 lb/head were purchased in March, placed on a 28-day receiving program, then grazed from April 24 to July 12 (IES) or September 24 (SLS).
4. During receiving, cattle were fed 2 lb soybean meal and 10 lb prairie hay/head/day .
5. Death loss and morbidity rates were 2% and 25%, respectively.
6. Estimated gains were 250 and 175 lb/head, respectively, for SLS and IES steers.
7. SLS cattle were fed 1 lb soybean meal/head/day from July 13 to September 24. Supplement did not include an ionophore.
8. Spring burning increased gains 10 and 20%, respectively, for SLS and IES steers.
9. Cattle were marketed at the end of the respective grazing seasons.
10. Steer prices represented a 5 year average for 475 lb feeder steers purchased in February and, 650 lb and 725 lb steers sold in mid July and late September, respectively, at the Oklahoma City Stockyards.

In addition, IES and SLS returns were compared at various combinations of summer weight gains and selling prices. For these comparisons, it was as assumed that weight gain for IES steers was equal to 70% of the SLS weight gain.

Finally, market data from the Oklahoma City National Stockyards for the period from 1976-1985 was used to estimate the mean returns ($/acre) and variation of returns for the stocker operations outlined in the above assumptions. The standard deviation and coefficient of variation of the returns were used as indicators risk for the various programs.

All results are expressed on a per acre basis.

Results and Discussion

Estimates for returns above operating costs ($/ac) were positive for all four grazing programs indicating that, in the short run, all operations were economical (table 1). However, if fixed costs were included in the budget, season-long stocking had net losses while intensive-early stocking had positive net returns. Labor was included in the operating costs; if one assumes that labor was provided by the operator at no expense, then returns for all programs would have been in the positive. Combining spring burning with either grazing system enhanced net returns.

Per acre returns for different steer gains and price combinations are presented in tables 2 and 3. These estimates suggest that season-long stocking is the better alternative when gain potential and/or selling prices are low. Intensive-early stocking programs necessitate

Table 1. Summary of livestock receipts ($/acre) and production costs ($/acre) for alternative stocker cattle systems.

	No Burning		Burning	
	SLS	IES	SLS	IES
Livestock receipts	88.02	163.33	90.99	172.04
Total operating costs	86.54	160.41	88.90	163.71
Returns above total operating costs	1.48	2.92	2.09	8.33
Total fixed costs	2.37	2.36	2.67	2.70
Returns to land, management and risk	(.89)	.56	(.58)	5.63

Table 2. Estimated returns ($/acre) above total operating costs for intensive-early stocking for various weight gain and steer price combinations.

Selling price, $/cwt	Steer weight gain, lbs/head				
	140	157	175	192	210
	$/acre				
60.00	-15.76	-11.76	-7.53	-3.53	.71
62.00	-10.94	-6.81	-2.43	1.70	6.08
64.00	-6.12	-1.85	2.67	6.93	11.45
66.00	-1.29	3.10	7.76	12.16	16.82
68.00	3.53	8.06	12.86	17.39	22.19

Table 3. Estimated returns ($/acre) above total operating costs for season-long stocking for various weight gain and steer price combinations.

Selling price, $/cwt	Steer weight gain, lbs/head				
	200	225	250	275	300
	$/acre				
58.00	-9.80	-6.96	-4.12	-1.28	1.56
60.00	-7.16	-4.22	-1.28	1.66	4.60
62.00	-4.51	-1.47	1.56	4.60	7.64
64.00	-1.87	1.27	4.41	7.54	10.68
66.00	.78	4.01	7.25	10.48	13.72

rapid weight gains and/or high selling prices in order to recoup operating costs during the shortened period of ownership. Most cattlemen recognize this and place older steers with more gain potential into intensive-early stocking systems.

Results of the ten year historical analysis are shown in table 4. Estimated returns for intensive-early stocking exceeded season-long returns in 8 of the 10 years and as a result mean returns over the time period were greater for intensive grazing. A prescribed burning program improved the receipts for both programs but the increase was proportionally greater for intensive-early stocking. Most of the increased gains from burning occur during the intensive-early stocking period thus, the combined effects of increased gain and cattle numbers accentuate the influence of burning with intensive-early stocking.

The standard deviation (S.D.) and coefficient of variation (C.V.) of returns may be used to measure enterprise risk. When measured by S.D. of returns, risk increases as a consequence of adopting IES. However, when risk is measured in terms of relative dispersion (C.V.), the two enterprises are characterized by nearly equal levels of risk. Prescribed burning decreases relative income variability for both grazing programs. "Downside risk" is usually of more interest to producers and can be estimated by determining the number of annual return estimates that were below the mean return value. On a per acre basis, season-long stocking returns fell below the mean value of $5.14 of the 10 years. In contrast, intensive-early stocking returns were below the mean return in 8 of 10 years.

Although intensive-early stocking offers the opportunity to increase returns to an operation, the chances of experiencing large loss is also greater. If a producer is not planning to retain ownership into the feedlot, the better alternative would be a combined season-long and intensive-early stocking program utilizing prescribed burning.

For a more detailed report of these analyses the reader is referred to Bernardo and McCollum (1987).

Table 4. Estimated returns ($/acre) from four alternative stocker cattle systems, 1976-1985 (real 1985 dollars).

Year	No Burning		Burning	
	SLS	IES	SLS	IES
1976	(8.59)	(5.81)	(8.13)	(.34)
1977	(.79)	2.14	(.24)	7.44
1978	27.68	40.02	29.66	48.90
1979	9.71	3.20	12.42	14.36
1980	18.70	24.36	20.62	33.18
1981	5.53	(5.18)	6.66	.95
1982	8.93	13.50	9.84	19.58
1983	(6.00)	(4.16)	(5.58)	1.06
1984	3.44	4.31	4.11	9.72
1985	(7.21)	(6.29)	(6.85)	(1.22)
Mean	5.14	6.61	6.25	13.36
S.D.[1]	11.69	15.24	12.34	16.50
C.V.[2]	2.27	2.31	1.97	1.23

[1]Coefficient of variation of returns.

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