Short-Duration Grazing: An Economic Perspective

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The current economic difficulties in U.S. agriculture are being felt by the western ranching industry. Many ranchers are facing serious debt. Cyclical beef prices do not appear to be moving toward a favorable position for livestock operators. These realities have caused ranchers to search for ways to lower costs and increase productivity as a means of surviving the economic pressures. Short-duration grazing (SDG), with its purported increase in production efficiency, has attracted much attention toward meeting this end.

Short-duration grazing or a similar system has been the subject of considerable discussion in the range-management community. Symposia, workshops, and technical journal articles have been used as a forum to debate the biological, ecological, hydrologic, and economic implications of SDG. Current Research Information System reports reveal that 41 projects are now underway to examine questions about SDG. The projects are spread throughout the beef-producing states, so even more articles on SDG will probably be published soon.

Before this approach to management is adopted, some of the economic issues surrounding the adoption of SDG technology should be examined.

What is Short-Duration Grazing?

The range science community has recognized the difficulty in defining short-duration grazing. Some common definitions are intensive grazing management, Savory grazing method (Savory and Parsons 1980), holistic resource management, cell grazing, high-intensity short-duration grazing, time-controlled grazing, and high performance grazing. The term SDG is used in this paper in the context of a strategy of intensive management with higher stocking rates and more frequent movement than are associated with conventional management, such as deferred-rotation and rest-rotation grazing systems. This definition places short-duration grazing in the category of a management philosophy rather than a set of rules and guidelines that can be predefined and readily applied by any rancher. Malechek and Dwyer (1983) have referred to the management level necessary to maintain this grazing system as similar to managing a modern dairy; mainly, daily actions are required to ensure proper stocking control and timed changes.

Short-Duration Grazing and Economics Research

Research on the economics of SDG under all circumstances is difficult to establish because SDG represents a management philosophy. The observations of one study may be applicable in some ecosystems where the topography is gentle but not applicable where the topography is steep. Similarly, length of the winter feeding period may result in some ranches not being suitable for adoption of SDG with cow-calf enterprises. Any given research project may not result in a definitive answer on the biological, ecological, or economic acceptability of this management approach about all ecosystems, terrain, and owner categories. But, each research project will add information about the appropriateness of the technique in the circumstance under study. The combined case studies will eventually provide more general answers.

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Some current SDG research with economics as a major portion of the objectives is listed in Table 1. The sources of information include annual reports of universities and research agencies, as well as personal contact with range economists throughout the United States. Scientists have stated that economic analyses of additional projects will be performed as a portion of the overall study, but not as the major thrust.

Table 1. Some ongoing short-duration grazing economics research.

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<th>Principal Investigator</th>
<th>Affiliated University</th>
<th>Research Title</th>
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The primary questions being asked by the economics researchers can be summarized into four groups: (1) Will the economic position of the ranch be improved if SDG is adopted? (2) If SDG is adopted, what is the optimal investment? (3) What is the optimal stocking rate for maximum profit? (4) What are the cash flow implications if the investment involves a large capital outlay?

In any economic study, the examination of only the costs or returns may result in inappropriate interpretations and misallocations. Increased beef production per acre is not free—it requires additional investments in improvements and, perhaps, workforce. The optimal level of stocking, or beef production, will not be the point of maximum beef production but will fall somewhat short of that point. As the value of beef becomes greater relative to the cost of increased stocking (that is, the greater the ratio of the price of beef to the price of increased stocking), the closer the optimal stocking rate to the maximum beef-producing stocking rate. Similar arguments hold for maximizing forage production per acre and maximum production per animal.

No “new” tools are required to provide answers to questions being raised by ranchers, biologists, and managers. Some of the standard economic tools used to analyze the information from SDG are partial budgeting analysis, break-even analysis, optimization techniques, bioeconomic modeling, and simulation modeling. The ranching community must develop an understanding of the implications associated with each analysis. A rancher contemplating the decision to invest capital in SDG would be wise to develop ranch budget models reflecting current and proposed operations. Careful examination of the information will reveal the economics associated with adopting the new management.

Considerable work is underway on the biological and ecological impacts of implementing SDG. Short-duration grazing is still new enough that little information is known about long-term interactions necessary to develop effective simulation and bioeconomic models. A few models now exist and are being tested for applicability to SDG research.

Recent SDG Economics Research

In North Dakota, field-survey techniques were used to obtain cost and return information from ranches with SDG systems. This information was to develop models representing three ranch sizes. Preliminary results indicate that SDG increases not only the variable costs but also the fixed costs. The average increase in fixed costs, primarily fencing, watering equipment, and acquiring and feeding cattle for the three ranch sizes was 5%. These results contrast with those anticipated by Savory and Parsons (1980), who suggested that fixed costs would remain constant whereas variable costs would increase. Thus, Savory and Parsons anticipated average fixed costs would decline (cost/head), and average variable costs would remain constant.

Wilson (1985) found that implementation costs for SDG systems on six ranches in Arizona varied from $3 to $15/acre. The number of employees remained the same on each ranch, but the amount of time used for ranch management was dramatically increased. Using an optimization model developed from the six ranches studied, he found that profitability of the ranches was highly sensitive to production efficiency and initial investments required. His finding implies that smaller investments per cow in SDG systems will generally result in more profitable operations than large-scale investments on a per-cow basis. Ranchers may be ahead to concentrate their investments in improvements that are functional, yet inexpensive. Wilson’s research also showed that profitability is not as sensitive to stocking rate as it is to investment costs.

Conner and Chamberlain (1985), working in the rolling plains of Texas, studied the SDG stocking rates necessary to match profits with those of conventional grazing systems. Their research suggests that if adoption of SDG for a 3,000-acre ranch results in a decrease of more than 25 pounds per calf at weaning and a 5% decline in conception rates, SDG would likely result in less profit than for conventional grazing systems. They state that budgeting analyses show that break-even stocking rates are sensitive to cattle prices and conception rates. Results suggest that the favored management style should be conservative in periods of low cattle prices and high interest rates.

Management Considerations

Cash-flow requirements are a primary concern to any manager considering SDG. Large initial investment in fencing, water developments, handling facilities, and additional livestock will have a dramatic influence in the initial period. Alternative techniques available for financing investments should be fully explored, and a plan should be developed for repayment. The goal of the individual rancher must be con-
sidered as a part of the investment strategy. Alternative uses of the money cannot be overlooked in the analysis. Some may find that if profit maximization is the real goal, ranching may not be the most appropriate place for their investment.

Risk is another aspect that must be considered by managers. Risk increases proportionally to management intensity (Whitson 1982) and is higher in SDG systems because of the capital and technical expertise required. Price variation, precipitation variability, and animal diseases must be considered. The risks are compounded by consequences of missing the move date of livestock by 1 or 2 days for any reason (family sickness, equipment failure, unforeseen emergency). Managers can adopt policies that will reduce the risks. This may mean: including only part of the ranch in the SDG system; investing some assets in off-ranch enterprises; following market prices carefully to buy and sell when the market suggests; stocking SDG systems with cattle not owned by the rancher; and alternative marketing strategies (e.g., hedging).

Biological capability of the land is one of the most important unknown factors associated with SDG. If economics are to be used as a guiding rule for setting stocking rates, variable rate data for stocking and livestock response under various management strategies are essential. If a rancher stocks beyond the long-term biological capability of the land, short-term profits may be possible; however, continued stocking for short-term profit will likely destroy the resource. Careful analyses should be performed before a rancher accepts a new stocking rate.

The biological capability will not likely be similar for all ecosystems, nor for all topography within an individual ecosystem. The actual variables that will result in changes in capacity are not fully known. Ongoing research at various field stations will help define the variables, but these will be most applicable in their own surroundings. Trial and error may prove to be the most useful procedure for an individual ranch.

Important social implications are associated with acceptance of SDG as a new management style for the ranch. This style is a significant departure from the traditional. The correlation between former ranching knowledge and ability and skills to succeed at SDG is not known. An Australian rancher reportedly found a new source of water on his land, which made irrigation farming and higher profit achievable. The rancher explained the reason for not developing the water, "If I had wanted to be a farmer I would have bought a farm." Off-ranch income may be the force permitting some ranchers to stay in operation. With losses each year, some have explained that the off-ranch income permits them to ranch. Smith and Martin (1972) explained this phenomenon in Arizona with a view that ranching lifestyle may be a consumption good; that is, some ranchers are in ranching because they choose that lifestyle regardless of whether a modification would result in more profit. Thus, they are willing to "pay" to maintain their lifestyle.

The social implication is that the adoption of SDG may be viewed as a departure from the lifestyle selected by the rancher. In another rancher's words, "If I had wanted to be a dairy farmer I would have bought a dairy." Wilson (1985) has found some supporting evidence for this hypothesis in Arizona: ranchers who are more progressive and have already modified ranching management to accommodate new marketing strategies, grazing systems, and breeding practices are more apt to succeed at SDG. Hypothetically, then, ranchers who are more akin to traditional seasonal-long grazing management would be less likely to adopt SDG, and if they did adopt it, would be less likely to succeed.

Conclusions

Economics can provide information to managers about whether to adopt SDG, the most profitable level of stocking, and the optimal level of investment, and also information on cash-flow alternatives. The models necessary to provide this information rely on the biological relations between inputs and outputs, which are only now beginning to be made available to the economist. Studies are being conducted that will enable us to perform economic analyses on selected SDG system implementations. General conclusions about the economics of SDG may be possible as additional studies are reported.

Several important considerations must be examined by ranchers contemplating use of SDG. Risk management and social implications associated with SDG must be carefully examined. Ranchers unwilling to accept a change in lifestyle (from the traditional grazing manager to a more intense "dairy" manager) will likely find difficulty in managing under the concepts of SDG. Preliminary research suggests that this may prevent many ranchers from adopting SDG, even if it is proved to be biologically and ecologically sound for their physical resources. Progressive ranchers are more likely to find success with SDG. Short-duration grazing may not be the recommended style of management for all ranchers in all circumstances even under known ecological and biological conditions.

Literature Cited


