Small-acreage Livestock Operators and Resource Management

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Ranchers, whether they operate big spreads or small ones, have much to share about their stewardship of natural resources. When they do share their knowledge about the management of cows and grass, academics have an opportunity to discover what ranchers know and how they put that knowledge into practice (Hanselka et al. 1990). In one sense, it is an opportunity to find out how effective, educators have been in disseminating information about "best" management practices. But how often do research or extension personnel avail themselves of the opportunity to find out what ranchers know? After all, the answers may be an indictment of how effective education efforts have been. A 1991 survey of small-acreage ranchers did show that they tend to set different strategic goals than do full-time ranchers (Rowan 1994). But how small-acreage ranchers really view resource management and how much technical information they possess and utilize in their small-acreage operations has not been fully explored.

In an effort to better understand ranchers' decision-making, livestock operators throughout the state of Texas were selected from a pool of names supplied by the Texas Beef Industry Council and initially surveyed by mail in 1990 (Rowan and White 1994). Results from that survey demonstrated a need for in-depth information about personal and ranch characteristics of small-acreage operators (Hanselka et al. 1990), especially in areas of the state where average ranch size was small. Subsequently, ranchers from the Blacklands/Cross Timbers region operating less than 271 acres were personally interviewed in 1991–92 (Rowan 1994). These operators were questioned about the kinds of resource practices they utilize to support strategic goals. Small-acreage operators were asked to identify from a list the kinds of things that they needed to achieve in order to meet their personal/resource goals (i.e., lifestyle, financial, rangeland, physical, human, and animal). They were then asked to identify from a list the kinds of technical practices that they utilized within each resource category. Lastly, respondents were asked to agree or disagree with opinion statements within each personal/resource category.

From responses to various questions, respondents were sorted into categories according to whether they were: a) totally reliant on ranch income sources, b) partially reliant on ranch income and partially reliant on off-ranch income, or c) not reliant on ranch income. In addition, under each of the above categories respondents were ranked as to whether they 1) owned all of the ranch, 2) owned and leased the ranch, 3) leased all of the ranch from someone else, 4) managed the ranch for someone else, or 5) owned the ranch but leased it to others.

Results

None of the 28 small-acreage respondents were totally reliant on ranch income sources. In addition, there were no respondents who leased all their ranch from someone else (solely a tenant rancher), no one managed the ranch for someone else, and no one leased all of their acreage to someone else. The sample population all owned some land, but were not totally dependent on the ranch to support itself or the respondent's lifestyle. That categorization supports the responses given in the survey. Respondents were the primary decision-maker on the small-acreage ranch and they did not make decisions from a strictly profit-oriented motive (Rowan 1994).

Nearly half of the respondents were full owners of their ranch but were only partially reliant on ranch income and partially reliant on off-ranch income. One-fourth of respondents owned and leased land from others while being partially reliant on off-ranch income sources. An additional one-fourth of respondents owned all of their land but did not rely on income from the ranch.

Lifestyle Resources

Slightly more than one-third of respondents maintained off-ranch employment to achieve their desired lifestyle. Forty-six percent maintained off-ranch investments. Fully eight of ten respondents maintained a livestock herd to achieve their lifestyle goals, but only forty-two percent felt it necessary to achieve an economic profit to meet their lifestyle goals. Respondents were equally split between whether a suitable forage base helped meet their lifestyle

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Research was funded by The Texas Agricultural Extension Service and the Thomas M. O'Connor Professorship.

goals or not. However, less than a third of respondents provided diverse wildlife habitat (e.g., open, edge or cover areas) to enhance their lifestyle.

When considering the practices respondents were using to augment their lifestyles, more than two-thirds were seeding introduced grasses and forbs as opposed to twelve percent seeding native grasses and forbs. One-half assisted their children/grandchildren in raising livestock because of its importance to their lifestyle.

Three of four respondents were satisfied with ranching as their life's work, but fewer than two-thirds felt ranching was the best occupation for them. More than three-fourths felt it was important for the entire family to be involved in the ranching operation. Given a choice between spending money on education for a family member or for ranching purposes, sixty percent chose education, twenty percent chose ranching purposes, and twenty percent were undecided. The importance of lifestyle as more than just a home and a piece of land was underscored when seventy-five percent of respondents agreed that they were satisfied with their involvement in community activities.

Financial Resources

Just as they did under lifestyle goals, slightly more than one-third of all respondents needed to maintain off-ranch employment to achieve their financial goals. However, sixty-nine percent maintained off-ranch investments to meet their financial goals. Eighty-nine percent of respondents needed the income from domestic livestock to meet financial goals, but only four percent needed income from leased hunting privileges. Eight of ten respondents said that they did not need to participate in government programs to meet their financial goals.

In an effort to meet the financial goals (explicit or implicit) that they had set for their livestock enterprises, three-fourths of respondents culled cows on a regular basis, eighty-one percent marketed weaned or yearling animals, and two-thirds attempted to reduce the costs of production. Before making important financial management decisions, slightly more than two-thirds of respondents discussed these decisions with family members and/or business associates and nine of ten said they were comfortable with this level of communication. Fewer than two of three respondents enjoyed developing a step-by-step plan for responding to the financial management needs of their ranch and home. Sixty percent thought their net incomes were greater than similar small-acreage operations, while ninety-five percent thought their debt level was lower than similar operations.

Rangeland Resources

Eighty-five percent of respondents said that they needed to grow lots of grass to accomplish their rangeland goals. Nearly forty percent planned to eliminate all brush to reach their goals for their rangeland, while less than 1 in 10 were committed to growing more trees and shrubs. Nearly ninety percent were involved in the fertilization of introduced grasses. Two-thirds of small-acreage operators had used mechanical brush and weed control on their rangeland acreage and nearly three fourths had used chemical brush and weed control techniques. Nineteen percent had used prescribed fire as a management tool.

Fifty-eight percent of respondents said that they were rotating animals among pastures. About the same percentage recognized the need to improve distribution of animals in pastures, but only one in four were planning to do more fencing or construct more stock watering facilities. Seven out of ten respondents believed that they were using the proper stocking rates on their rangeland. However, only fifteen percent conceded that they used the proper mix of animals (e.g., kinds and/or classes) in their ranch operations.

All respondents agreed that they enjoyed rangelands in their natural state, but that response was mitigated when seven of ten indicated that they liked improving rangeland by planting introduced plant species. Seventy percent of respondents believed that rangeland was an important resource for recreational activities, twenty percent disagreed, and ten percent were undecided. When asked if management decisions, more than anything else, were implemented to prevent soil erosion, seven out of ten respondents agreed with that statement. When asked if the best way to utilize rangeland was through livestock grazing, only sixty percent responded affirmatively. As for the other forty percent, there probably is overlap with respondents who enjoyed viewing rangelands in their natural state (i.e., an aesthetic resource) and those believing that rangelands are an important recreational resource.

Physical Resources

Forty percent of respondents felt that they needed to maintain off-ranch employment to achieve their goals for physical resources and five of ten needed to maintain off-ranch investments for that purpose. Developing better construction skills was viewed by fifty-six percent of respondents as necessary to help achieve their goals for physical resources. Only one-third felt that the development of additional water supplies was necessary to achieve their goals for facilities.

The kinds of practices that small-acreage ranchers were utilizing to improve their physical facilities were straightforward. Nearly all were repairing fences, seventy-two percent were building new fences, about half were building and/or repairing roads, and forty-eight percent were planning to build new corrals. Evidently, small-acreage operations in the Blacklands/Cross Timbers region are well watered because only twelve percent planned to drill more water wells, and only twenty percent planned to dig new earthen ponds.

All respondents agreed that they liked to keep the ranch neat and well maintained. However, seventy percent acknowledged that they would rather work with livestock than make improvements on their land and/or buildings (24% undecided). Likewise, eighty-two percent agreed that

they made improvements on their ranches for economic purposes rather than for recreational opportunities (12% undecided).

Human Resources

Affirmative responses to questions about human resources were generally much lower than other resource categories. To achieve their goals for the efficient use of people, forty percent of respondents said that they were willing to match the individual talents of ranch workers with specific ranch tasks, less than half were involving children/grandchildren in ranch chores, four of ten were planning to raise their own awareness about the ranching profession, and only twelve percent wanted to learn computer skills. However, two-thirds of respondents were willing to adopt labor-saving technologies.

Examples of the kinds of human resource-related practices utilized by respondents were: eight percent were planning to purchase a computer, eight percent were willing to keep a list of talents of each family member, twenty-eight percent were willing to keep a list of the types of tasks on the ranch, twelve percent would train workers for specific tasks, and twenty-eight percent were willing to enroll in training classes. However, six of ten felt that they needed to attend more workshops and/or field days, two-thirds saw the need to keep more records on their ranching enterprise, and seven of ten saw a need to purchase and/or lease equipment.

Seeing the need to keep more records of each ranching enterprise and accomplishing that goal are two different things. Only one-third acknowledged that they enjoyed the office work required in ranching and only twelve percent enjoyed the business dealings (buying/selling vehicles and equipment or negotiating with lenders and dealers). Questioned about whether they liked buying and selling livestock, six of ten respondents agreed, but less than one-fourth agreed that they liked buying and selling grains and hay. Slightly more than one in ten agreed that they could enjoy working on a ranch operated by someone other than themselves. Nevertheless, more than three-quarters agreed that they could enjoy working in an occupation other than ranching.

Animal Resources

Ninety percent of respondents said that they liked to raise and/or care for livestock, but eighty percent said that they would rather manage for livestock than for wildlife (although 65% said they enjoy providing for native wildlife). To help them achieve their goals for their animals, more than three-quarters of respondents were setting livestock production standards, eighty-one percent were setting livestock stocking rates (73% thought they were using the "proper" rate), twelve percent were setting wildlife harvest rates, and eighty-five percent were monitoring livestock herd health.

When small-acreage producers compared themselves to other livestock producers, nearly two-thirds felt that they get better yields and/or higher levels of livestock production. Nine of ten felt that too many people overstock their rangeland (i.e., its the other guy's fault).

The kinds of technical practices used by small-acreage ranchers to improve their animal resources revealed different degrees of technology adoption (Table 1). For example, less than two out of ten respondents were using growth hormone implants, one-third were practicing seasonal breeding, and fifty-eight percent were immunizing against respiratory/reproductive diseases. However, three-quarters of respondents were setting standards for culling cows, three-quarters were treating for internal and external parasites, nearly nine of ten were feeding protein supplement, and ninety-six percent were feeding hay or grain supplement.

Table 1, Adoption rates for selected livestock practices by Blacklands/Cross-Timbers' small-acreage ranchers (<271 acres) compared to South Texas full-time ranchers.

Practice	Blacklands Small-acreage Operators	South Texas Full-time Ranchers[1]
	Percent Utilizing	
Use growth hormone implants	19	20
Treat animals for internal parasites	77	66
Treat animals for external parasites	73	71
Immunize against respiratory/reproductive diseases	58	78
Fertility test bulls	42	65
Practice seasonal breeding	35	46
Use performance tested bulls	19	—[2]
Pregnancy test cows	35	46
Artificially inseminate cows	27	12
Set standards for culling cows	73	—
Feed protein supplement	89	81
Feed hay or grain supplement	96	85
Creep feed calves	31	—
Rotate animals among pastures	58	—
Do more fencing	39	—
Provide more stock watering facilities	31	—

[1] See Hanselka et al. 1991
[2] —Data unavailable

Utilization of Livestock Practices

Because so little data of this kind is available to compare against, it is hard to know if the adoption rates of small-acreage ranchers are "acceptable" or if educational opportunities are indicated. With that in mind, several professionals, including county agricultural agents, state range science specialists, state animal science specialists, and animal science faculty were asked to evaluate small-acreage ranchers' utilization of individual livestock practices (from Table 1) on a scale of 5=excellent-to-1=very poor (Table 2). For example, experts assigned a score to the average utilization rate of growth hormone implants (i.e., adopted by 19% of small-acreage operators) on a continuum of excellent to very poor.

Experts were then asked to repeat the process by scoring the adoption percentages in column 1 of Table 1 as if they were for full-time ranchers throughout the state of Texas.

Just as they scored small-acreage operators on their individual utilization of animal practices, experts were now asked, for example, to record their opinions on whether 19% of full-time ranchers using growth hormone implants was an excellent-to-very poor adoption percentage. Based on that comparison, two experts (1 and 5) felt that full-time ranchers should by adopting the practices at a higher rate compared to small-acreage operators (i.e., a lower overall score for full-time ranchers). Conversely, three experts felt that small-acreage operators should be adopting the practices at a higher rate than full-time ranchers (last row of Table 2).

Discussion

When strategic goals are considered, such as lifestyle, it is difficult to generalize how successful small-acreage ranchers have been in implementing practices to improve their rangeland resources, although expert systems may enhance predictability (Ekblad et al. 1991). Certain animal practices, for example, may be inconsequential to small-acreage producers when family lifestyle takes precedence over animal-enterprise improvement. Throughout the period of development of range management as an art and a science, professional educators have held opinions about what ranchers know about land/animal management. Nevertheless, advancing the idea of "best" management practices involves a re-evaluation by ranching professionals of the kinds of practices that ranchers utilize in their ranching operations. The problem with generalizing adoption rates across a heterogeneous group of ranchers is that adoption of technological practices is often location specific. For some practices, there may not be a "best" recommendation from experts. Disagreement may exist over whether, say, the feeding of hay to livestock by such a high percentage of ranchers (e.g., 96% of operators) is to be considered an excellent adoption rate or whether the practice should be discouraged among many operators (Table 2).

Considering the overall scores given by academic experts to the adoption rates in Table 2, there is a narrow range between the scores given small-acreage and full-time ranchers but experts 1 and 5 rated the adoption of animal practices higher for small-acreage ranchers than for full-time ranchers. Experts 2, 3 and 4 scored the reverse. Obviously, there is not total agreement as to whether full-time ranchers should be adopting practices at a higher rate than small-acreage operators. If the goals of small-acreage ranchers are in fact different than full-time ranchers (Rowan 1994), then it is reasonable to assume that small-acreage ranchers will adopt some technical practices at different rates than full-time ranchers. The relevant question to be addressed by change agents is: What are the common needs (technical practices) that exist between small-acreage and full-time ranching groups that can be met by current programs and which practices are utilized differently within each group requiring separate and unique educational programs?

The lifestyle of small-acreage ranchers is centered around a desire to own and manage livestock. Blacklands/Cross Timbers small-acreage ranchers do not express a desire to manage for or receive income from wildlife, however, they do express a small interest, probably an aesthetic one, in providing diverse wildlife habitat. To most of this group, being on a ranch, with all of its ameni-

Table 2. "Expert" opinions about the adoption rates of individual animal practices by small-acreage livestock producers and full-time ranchers, and an averagel adoption score each expert for both groups.

Practice	Adoption Rate	Score 5=Excellent 4=Good 3=Fair 2=Poor 1=Very Poor									
		Small-acreage					Full-time				
	[1]%	[2]#1	#2	#3	#4	#5	#1	#2	#3	#4	#5
Use growth hormone implants	19	3	2	1	3	4	2	3	2	4	1
Treat animals for internal parasites	77	4	3	4	2	5	4	4	4	3	5
Treat animals for external parasites	73	4	3	4	4	5	3	3	3	4	5
Immunize against respiratory diseases	58	4	1	3	3	3	2	3	3	4	2
Fertility test bulls	42	2	1	2	3	3	3	3	3	3	2
Use performance tested bulls	19	3	1	3	2	5	3	4	4	3	2
Pregnancy test cows	35	2	2	3	2	5	2	5	4	3	2
Artificially inseminate cows	27	4	1	2	3	5	4	3	3	4	5
Set standards for culling cows	73	4	1	2	3	5	4	3	3	4	5
Feed protein supplement	89	4	2	3	4	5	4	4	4	4	1
Creep feed calves	31	4	2	2	3	2	4	3	1	3	1
Rotate animals among pastures	58	3	3	3	3	4	3	4	2	3	2
Do more fencing	39	3	3	2	4	4	4	2	1	3	4
Provide more stock watering facilities	31	4	2	2	4	4	4	2	2	3	4
Average score		3.50	2.06	2.69	3.00	4.06	3.25	3.31	2.81	3.44	3.00

[1]Adoption percentages from Table 1.
[2]Evaluations from five different experts

ties, is considered the best situation for them even if their incomes are lower than if they lived and worked elsewhere. Because most respondents have had other careers or are currently working off the ranch, they recognize that they could enjoy working in another occupation. It's just that they have arrived at a point in their lives when they prefer being small-acreage operators.

Besides their reliance on off-ranch employment and investments, small-acreage producers depend on little else to achieve their financial goals except the sale of domestic livestock. None of the other potential sources of income were utilized by more than 20% of respondents (i.e., leasing grazing or hunting privileges to others, small business venture on the ranch, government programs, exotic wildlife, or advance marketing). Because their financial goals are fairly straight-forward, it is not surprising that 80% of respondents found it relatively easy to stay within their financial plans.

The rangeland and animal resource goals of small-acreage ranchers appear, on the surface, to be consistent with their overall lifestyle goals which are based upon livestock ownership. However, these small-acreage operators' main goal for their animals is to increase carrying capacity. More animals are better than less. That is not perhaps a goal unique only to small-acreage ranchers. Nevertheless, small-acreage operators appear to be achieving their increased carrying capacity by the establishment of introduced grasses, such as Coastal Bermudagrass. These introduced species require more capital inputs in the way of fertilizer and weed control, but generally have much higher levels of production than the native species. The result is that more animals can be run on the same amount of acreage. This is not to say that seeding introduced grasses and forbs is a "bad" thing. Many ranching decisions are trade-offs between costs and benefits. Increased production levels from highly fertilized Coastal Bermudagrass come at the expense of higher production costs and increased management responsibility.

From responses to the statewide survey of livestock operators (Rowan and White 1994) the Range Program Group of The Texas Agricultural Extension Service concluded that stocking rate decisions are the most important issue related to range management. Efforts to develop baseline information about ranchers' decisions resulted in a new program called Project Range Care. The emphasis is to re-educate ranchers about stocking rate decisions. Changing ranchers' perceptions about their own stocking rate decisions is a formidable task. By way of example, seventy-three percent of respondents believed that they were setting the proper stocking rates, but ninety percent also felt that too many people overstock their rangeland. It would appear that ranchers, even small-acreage ranchers, can detect overstocked rangeland when they see it, except when it is their "own." For ranchers to arrive at that conclusion is a typically human cognitive process. Rationalization is not necessarily a deliberate attempt to distort the truth (Halpern 1989), it is rather a comparative process that favors a certain conclusion over all others. It is not for change agents to judge the conclusions that ranchers come to, per se, but rather to restructure the decision process from which those conclusions are reached. Ranchers should look as objectively at the stocking rate decisions that they make on their own side of the fence as they do about their neighbor's.

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