

## **Optimum Stocking Rate, Monitoring, and Flexibility**

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# Optimum Stocking Rate, Monitoring, and Flexibility

## Key components of successful grazing management programs

By J. Alfonso Ortega-S., Steven D. Lukefahr, and Fred C. Bryant

### On the Ground

- This case study demonstrates the importance of adaptive management to the resilience of a ranch.
- With a combination of strategic livestock and grazing management, especially adjusting the stocking rate to variability in forage production, we were able to increase the grazing capacity and the profitability of the ranch, even during drought.
- The major concern during the drought should not be the productivity or profitability of the ranch, but rather the integrity of the plant communities and the herd in order to re-establish the production cycle following the severe drought.
- Managing flexible grazing management programs with proper monitoring of weather, forage standing crop, cattle condition, and markets to make informed and timely decisions largely determines the resilience and profitability of the operation.

**Keywords:** grazing management, ranch profitability, optimum stocking rate, flexible grazing, monitoring.

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As Frank Price stated in describing his 30-year grazing program, “The biggest problem for me is that I can never come up with a grazing plan that I can stay with—I am continually changing grazing rotations, time, and stock numbers... But that is one of the reasons that this program works. It is not a system. It is a continually changing program that moves with the weather, livestock, and markets.”<sup>1</sup> The concept of strategically managing a flexible stocking rate and monitoring range and animal responses to adapt to changing conditions is not new; as a matter of fact, academicians and extension agents have published in-

formation and made recommendations for decades. However, in most cases practitioners have a hard time applying these recommendations. A Google search using the words “determining proper stocking rate” yielded 10 million results and “determining carrying capacity” over 30 million results, providing an idea of how often this concept has been discussed. Methods to calculate correct stocking rate are also available in rangeland texts and extension publications. Similarly, published scientific and popular articles with recommendations and benefits of managing rangeland at “proper” or “moderate” stocking rate in different environments are very easy to find. However, it is difficult to manage ranches using a single “correct” stocking rate for rangelands characterized by variable rainfall patterns; it is a moving target, is dynamic in time and space, and is affected by climatic factors that we cannot control.

The first step in successful ranching is developing clear goals and objectives because the grazing program must be part of the overall management strategy (see *Provenza et al., this issue*). Development of a grazing management program must consider enough flexibility to respond to environmental variations, as well as livestock requirements and market opportunities. In this context, we illustrate the art and science of combining critical components of grazing management to preserve the integrity and productivity of pastures, optimizing biological and economical outputs from livestock.

### Stocking Rate

Stocking rate is the most important factor affecting the results of a grazing management program.<sup>2,3</sup> The relationships between stocking rate and animal performance and production per unit area have been documented<sup>4</sup> after considering 25 North American stocking rate studies. The economic optimum stocking rate will be higher than the rate that maximizes production per head, and lower than the rate that maximizes production per acre (see *Frasier and Steffens, this issue*). However, the limited ability to monitor and predict forage production and availability and to relate it to carrying capacity and animal production is a major management limita-

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