Long-Term Forage and Cow-Calf Performance and Economic Considerations of Two Stocking Levels on Chihuahuan Desert Rangeland

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Abstract

Forage and cow-calf productivity on two lightly and two conservatively grazed pastures were evaluated over a 15-year period (1997–2011) in the Chihuahuan Desert of south-central New Mexico. Spring-calving Brangus cows were randomly assigned to pastures in January of each year. Pastures were similar in area (1,098 ± 69 ha, mean ± SE) with similar terrain and distance to water. Utilization of primary forage species averaged 27.1 ± 3.0% in lightly stocked pastures and 39.4 ± 4.0% on conservatively stocked pastures. No differences in perennial grass standing crop (163.5 ± 52.2 kg·ha⁻¹) and calf weaning weights resulted (P > 0.10) between light and conservative treatments. Lightly grazed pastures yielded greater (P < 0.05) kg of calf weaned·ha⁻¹ and calf crop percent than conservatively grazed pastures in 1998 due to complete destocking of conservatively grazed pastures during that slight drought (i.e., rainfall was 75% of normal in 1998). After the initial 5 years of study (1997–2001), all pastures were destocked for 4 years (2002–2005) due to drought as rainfall was only 50% or less of normal. Pastures were then restocked for another 6 years (2006–2011). Postdrought, the percentage change in perennial grass standing forage crop (kg·ha⁻¹) was -4.0 and -14.4 ± 2.5 % (P < 0.05) in the light and conservative grazed pastures across the 6 years, respectively. While conservative stocking rates may provide higher net financial returns than light stocking rates during nondrought years as there were more AU per pasture, potential losses from cattle liquidation during short-term droughts could nullify this advantage. Results suggest that light grazing use of forage is a practical approach for Chihuahuan Desert cow-calf operations to minimize risk of herd liquidation during short-term drought.

Introduction

A major managerial challenge confronting ranchers on desert rangelands is that periodic droughts necessitate destocking to avoid harmful impacts on soils, vegetation, and livestock (Holechek et al., 2011). Global warming has the potential to exacerbate frequency and severity of drought, especially on desert rangelands (Brown and Thorpe, 2008; Polley et al., 2013). In the Chihuahuan Desert of New Mexico, 5 multyear droughts have occurred in the 44-year period from 1969–2013 (Petrie et al., 2014). During these types of droughts, many ranchers were most likely forced to relocate or liquidate their livestock, creating challenges to finance herd rebuilding when the drought ends (Doye et al., 2013). These challenges are exacerbated on large-rangeland ranches because naive cattle are not as adapted to desert environments and may select lower-quality diets and have less desirable grazing distribution patterns than cattle born, raised, and kept on the ranch (Bailey et al., 2010).