

Relationship of Precipitation to Rangeland Forage Production

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Shortgrass rangelands at the Kansas State University Agricultural Research Center–Hays, have been used for grazing research since the 1940s. Various studies during this period have monitored different aspects of rangeland plant composition, forage production, and grazing animal weight gains, and in many years all three. For studies with similar stocking rates, rangeland production was compared with annual precipitation or specific monthly combinations of precipitation data for 40 years to find the best relationships between the times of year precipitation is received and end of the growing season forage production.

The analysis has been refined and the relationship between May and June precipitation and forage yield is stronger when precipitation during that time period is average (6.25 inches) or below. However, with above average precipitation the relationship disappears. We get above average yield with above average precipitation, but it is almost unpredictable as to how much more. It is possible that with above average rainfall there are either larger rainfall events that probably runoff and don't result in more pasture yield, or our soils may be more saturated with above average rainfall so that additional rainfall events will not infiltrate as readily, which would also result in some runoff and thus not correlate well with predicting yield.

This May and June period coincides with the physiological stages of our dominant rangeland grasses in which the most rapid growth occurs. In fact, nearly 65% of the forage produced within a growing season usually occurs by the end of June. The relationship of end of season pasture yield and May and June total rainfall, especially when below average, appears to support that precipitation during May and June is critical for rangeland grasses and forbs to reach their growth potential.

The dry conditions in western Kansas have producers considering their options for rangeland use for the coming grazing season. The May and June precipitation total is a tool for making decisions that relate to expected total forage produced in a growing season, which in turn can inform decisions on making stocking rate adjustments for the remainder of the growing season, especially when rainfall is below average.

The end of June is a logical within growing season trigger date for decisions to adjust stocking rates on pastures in western Kansas, and could be especially useful this growing season with much of the region experiencing drought conditions.

For more information, please contact the local K-State Research and Extension Office.

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