

Accessing Reduced-Lignin Alfalfa Cultivars in Water-Limited Environments

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The lack of best management practices for reduced lignin alfalfas contributed to the abrupt alfalfa area reduction in central Great Plains (CGP). With the introduction of reduced-lignin cultivars, producers can increase harvest intervals while maintaining similar quality and quantity to that of conventional cultivars. While reduced-lignin alfalfa cultivars have been found to be beneficial in other regions, their performance is unknown in water-limited environments, such as western Oklahoma.

Thus, this study's objective was to compare aboveground dry matter (ADM) yield and quality of a reduced lignin alfalfa with three reference alfalfa cultivars at different harvest schedules in western Oklahoma. This study was established in two locations (near Lahoma and Stillwater, OK) in September of 2019. The experimental design was a split-plot arranged in 3x4 factorial with 4 replications, where harvest intervals (28, 35, and 42 days) were the main plots and cultivars were the subplots (54HVX41, 54VR10, DKA44-16RR, WL 356 HQ.RR). A sample of 1 m² was taken from the center of each subplot at its assigned harvest interval. Samples were weighed, dried, and ground to pass through 1-mm sieve. NIRS analysis was used to estimate forage quality factors of crude protein (CP), acid detergent lignin (ADL), and *in vitro* dry matter digestibility 48 hours (IVTDMD).

Prolonged droughts during summer showed a greater influence in ADM accumulation than harvest intervals. In 3 of 4 site-years, the reduced lignin alfalfa had less ADM than only one reference cultivar. No ADL differences among cultivars were observed in Stillwater. Conventional cultivars reduced their lignin contents to values similar to the reduced lignin in drought conditions, which are commonly recurring in the CGP. The presented data is a subset from a comprehensive study that evaluates soil-water dynamics and water use efficiency of the tested harvest interval and cultivars.