

Impact of potassium application and harvest regime in alfalfa yield, forage quality and stand persistence

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Study Background

In recent years, interest in alfalfa has increased in the southeastern United States following the release of newer varieties that are more adaptable to the harsh environment in the region. Alfalfa is a high yielding, high quality forage, that can be harvested from Mid-March to November across the South however, nutrient management of alfalfa stands is critical to maintaining stand persistence and yield. Potassium is one such nutrient that is especially important for alfalfa growth, longevity, disease resistance, photosynthesis and respiration. Splitting applications of potassium has shown to have a better distribution with nutrient availability during times of growth, coupled with better use of those nutrients by the plant.

Harvest timing can also impact stand life. Current recommendations for appropriate harvest timing based on stage of maturity are at the 10% bloom stage, however, these recommendations are primarily based on research conducted in northern climates with different alfalfa varieties. In our climate, high temperatures and humidity, with low rainfall, may influence appropriate harvest timing to maximize stand persistence and yield.

The objective of this trial is to determine the impact of potassium fertilization and harvest regime on forage yield of plant persistence of 'Bulldog 805' alfalfa in the Southeastern US.

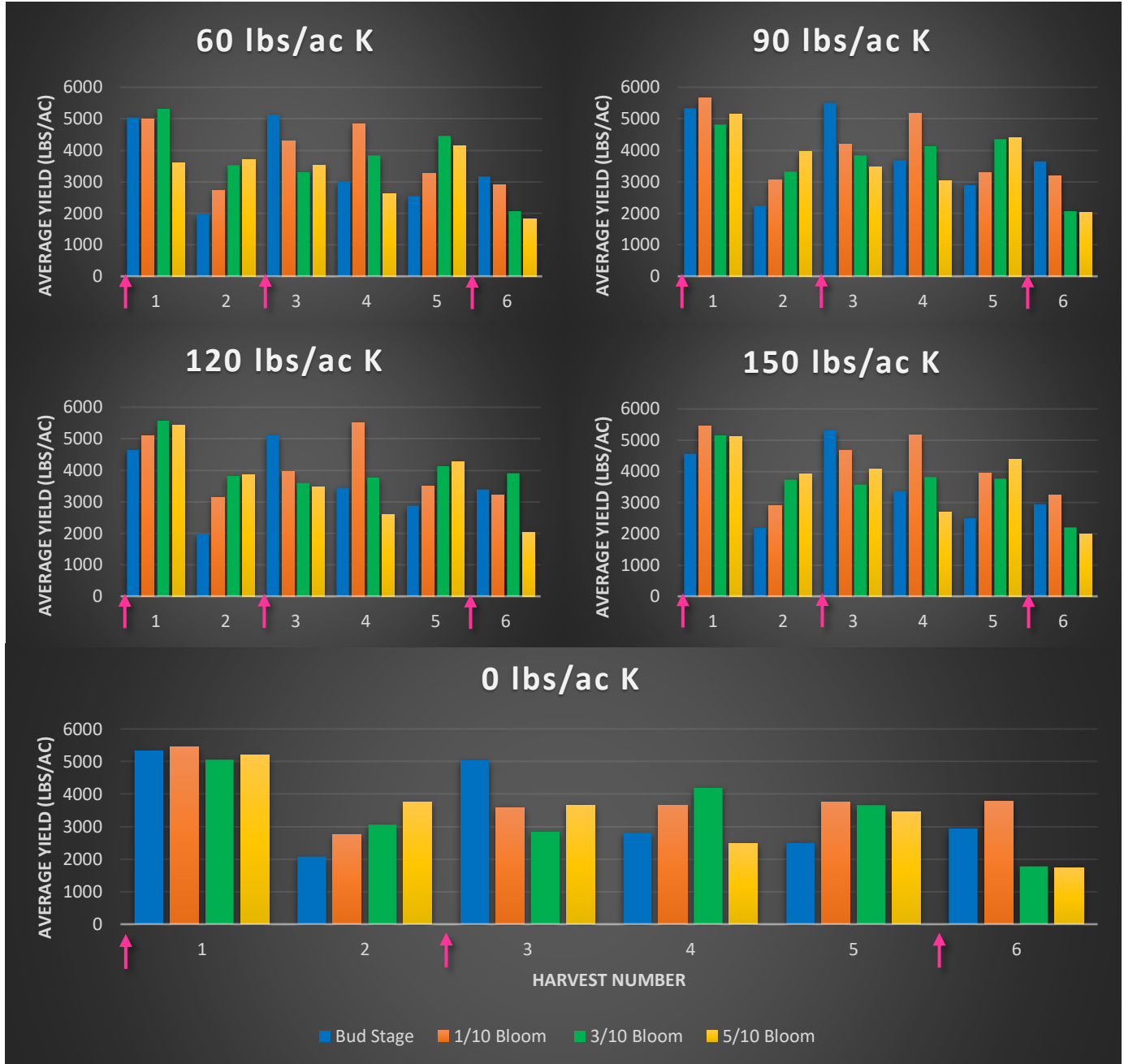
Experimental Design

This experiment was established in the Fall of 2016 and is currently on-going at the UGA Coastal Plain Experiment Station, Beef Cattle Unit, in Tifton, GA. Data collection began on the two-year stand of alfalfa with 14 inch row spacing in 2016. The main plot comprised of 16 150 sq. foot plots that were randomly assigned to 4 harvest treatments (4 replications of each treatment): bud stage, 10% bloom stage, 30% bloom stage and 50% bloom stage. Within each maturity stage, sub plots were assigned to evaluate the influence of five different potassium rates (0, 60, 90, 120 and 150 pounds per acre) split applied at 3 times throughout the season: before the first cutting, after the second cutting, and the fall before the last cutting. All remaining nutrients were applied as necessary per UGA recommendations and annual soil test analysis. Scouting for pests occurs weekly and insecticide is applied as required for stand maintenance as needed.

At each harvest, plots are visually assessed to determine ground cover and percent bloom, shoots are collected and evaluated for estimation of leaf:stem ratio and mass/shoot. Yield is determined by harvesting the whole plot, and grab samples are collected for nutritional analysis and mineral composition. Stand density is assessed before the first and after the last harvest each year, and soil samples are collected at the beginning and end of each harvest year to determine nutrient removal.

Preliminary Results

Preliminary yield data from 2017 harvests are shown below. Each figure illustrates the average yield of each maturity stage by harvest number (correlates with the date/month of each maturity harvest beginning in May of each year for a total of 6 harvests across the season) within each application rate (60, 90, 120, 150 lbs/acre and 0 as our untreated control). Timing of potassium application are illustrated by arrows within each figure.



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