Managing Alfalfa-Bermudagrass Mixtures in the Southeast: Simulated Grazing Small Plot Evaluation in Alabama

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Background

Alfalfa was once the dominant perennial legume species utilized in the Southeast (Figure 1); however, the hot, humid environment and elevated insect pressure soon eliminated many alfalfa stands. In recent years, breeding efforts have focused on improved varieties with adaptation to growing conditions in the Southeast. Recently, there has been growing interest on interseeding high-quality legumes, like alfalfa, into existing bermudagrass stands (Figure 2) as a step towards improving forage, animal, and ecosystem sustainability in the region.

Figure 1. Alfalfa in Headland, AL - April 2017

Figure 2. Alfalfa interseeded into bermudagrass, Shorter, AL - April 2018

Bermudagrass is one of the most abundant perennial warm-season grasses grown for pasture in the Southeast. Incorporating legumes into perennial warm-season grass pastures can produce significant economic and environmental benefits to southeastern livestock and forage systems. Alfalfa may be a fit for interseeding into bermudagrass sods to provide extended seasonal forage use, and improved stand quality and utilization within the first growing season.

Forage nutritive value of alfalfa meets or exceeds nutritional requirements of most livestock and including it in warm-season perennial pastures can improve herbage quality. This improvement may result in greater herd performance and create an environment for the return of nutrients to the grazed ecosystem. Refined grazing strategies for integrated alfalfa-bermudagrass systems may be an option for increasing alfalfa contribution in the Southeast. ***Identifying harvest management practices that promote stand persistence is critical for on-farm adoption of this system.***

The objective of this research is to determine the influence of harvest height and frequency on mixed alfalfa-bermudagrass stand yield, sward canopy characteristics, persistence, and nutritive value over time under simulated grazing. This will help to establish more defined grazing parameters for use in mixed alfalfa-bermudagrass systems in the Southeast.

Experimental Design

This experiment is on-going in Shorter, AL at the E.V. Smith Research Center on a previously established field of 'Tifton 85' bermudagrass. Pre-inoculated 'Bulldog 805' alfalfa was planted with a no-till drill at a seeding rate of 25 lb/ac on 14-inch rows on November 27, 2017. Prior to planting, bermudagrass was clipped to a 2-inch stubble and chemically frosted with glyphosate. The design is a randomized complete block design with four replications. Thirty-six plots (5 x 15 ft) will be established to evaluate influence of harvest frequency (2, 4, and 6 weeks) and harvest height (2, 4, and 6 inch) on alfalfa-bermudagrass mixed sward yield, persistence, stand density, botanical composition, and nutritive value. Treatments represent common grazing practices on perennial warm-season grass pastures in the Southeast.

Data collection will begin in spring 2018 once alfalfa maturity has reached mid-bloom stage (25 % of plants have flowers) to improve root development. Measurements collected will include pre- and post-grazing herbage mass (yield), vegetative cover, botanical composition, forage nutritive value, alfalfa stand density and persistence, and change in these canopy characteristics over time. Data collections will occur pre- and post-harvest.

Vegetative cover (% of ground covered by actively growing forage) will be collected pre-harvest by visually estimating the percent stand of each component (alfalfa, bermudagrass, weeds and/or bare area) using a forage quadrat (Figure 3). Within quadrat material will be harvested via hand clipping and material collected for botanical composition. Material will be hand separated into botanical components (alfalfa, bermudagrass, weeds and dead material) and individual component weights will be collected to estimate component yield. These values will be used to determine how the stand composition changes during the growing season.

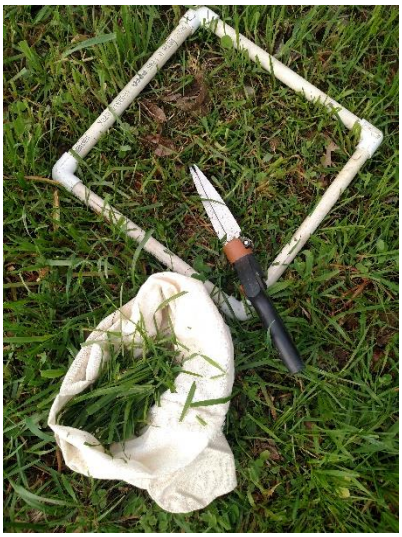

Figure 3. Forage quadrat for botanical composition sampling

Forage yield will be measured via simulated grazing by cutting a strip from the center of each plot to either 2, 4, or 6 inches, respectively. A subsample will be collected from each strip to determine forage production and nutritive values.

Alfalfa stand density and persistence will be rated three times (after the first, mid-point and final harvests) of the season by counting the number of alfalfa plants within three 0.3 ft^2 quadrats placed at random locations within the plot.

Expected Outcomes

- Information obtained from these evaluations will begin to define alfalfa grazing metrics that can be implemented into rotational grazing of alfalfa-bermudagrass mixed swards in the Southeast.
- The goals of this project are to increase awareness of alfalfa utilization in the Southeast and the associated opportunities for livestock and forage producers in bermudagrass dominant locations.
- Adoption of the use of alfalfa in bermudagrass systems may contribute towards a year-round grazing management system, through effective utilization of higher quality forage combinations and decreased dependence on costly fertilizer and feed inputs.