

EVALUATING FORAGE PRESERVATIVES AND INOCULANTS IN ALFALFA BERMUDAGRASS BALEAGE

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Introduction

- Forage preservatives and inoculants can be valuable tools in harvested forage systems.
- Southeastern producers are interested in utilizing forage preservatives and inoculants, which have not been widely evaluated in alfalfa bermudagrass baleage.
- Objective: To evaluate the use of a propionic acid forage preservative and *L. Buchneri* plus *P. Pentosaceus* combination forage inoculant on field dry down time and forage nutritive value of alfalfa bermudagrass mixtures when harvested as baleage.

Materials and Methods

Study Design

- Location: Tifton, Georgia in June and July 2022
- Experimental Design: RCBD with 4 replications
- Treatments: Preservative (P+), Inoculant (I+), Both (P+, I+), Neither (NP, NI)

Forage Management

- Three-year-old alfalfa-bermudagrass stand
- Third and Fourth cuttings
- Soil amendments applied based on soil test

Data Collection

- Propionic acid forage preservative was applied at mowing
- Forage inoculant was applied immediately prior to bale packaging
- **Two bale package methods** were evaluated:
 - 1) Individually wrapped large round bales sampled at 6 months post harvest
 - 2) Mini silos sampled at harvest (initial), 8-weeks, and 6-months post harvest
- Mini silos were made with forage collected in field before raking began
 - Mini silos utilized small plastic storage bags sealed into larger air-tight bags to mimic large bale fermentation.
- Forage samples were dried in a forced air oven and ground to pass a 1 mm screen in a cutter type mill, then in a cyclone type mill in preparation for nutritive value analysis.



Figure 1. a) Application of forage preservative at mowing, b) forage collection in field for mini silos, c) Individually wrapped large round bale, d) mini silo post-fermentation.

Analysis

- Nutritive value evaluated with NIRS using 2023 Haylage Equation
 - Crude Protein (CP)
 - Neutral Detergent Fiber (NDF)
 - Acid Detergent Fiber (ADF)
 - In-vitro true dry matter digestibility (IVTDMD48)
- Statistical Analysis conducted using SAS 9.4
 - PROC Mixed Statement
 - Fixed: Treatment and Sampling Date
 - Random: Block

Results

Table 1. Nutritive value of alfalfa-bermudagrass baleage treated with (P+, I+) or without (NP, NI) a propionic forage preservative and combination forage inoculant during June and July of 2022 in Tifton, GA.

Parameter, %	Treatments				SEM ¹
	NP, NI	P+	I+	P+, I+	
Initial					
CP	23.1	22.9	22.6	22.0	0.51
NDF	37.3	37.9	38.4	39.5	1.28
ADF	24.5	25.4	25.2	26.2	0.80
IVTDMD48	79.5	78.2	78.4	78.0	0.72
8-week					
CP	23.2	22.7	23.3	22.6	0.45
NDF	36.9	38.5	37.1	38.5	1.17
ADF	25.6	26.5	25.7	27.0	0.71
IVTDMD48	80.3	80.0	80.2	79.4	0.65
6-month					
CP	23.3	22.2	23.3	23.0	0.46
NDF	38.2	40.8	37.8	39.0	1.18
ADF	26.9	28.1	26.1	27.0	0.73
IVTDMD48	79.5	79.6	79.3	79.8	0.66

¹ SEM = standard error of mean

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Conclusions

- Regardless of propionic acid treatment at mowing, time to target moisture did not change in this baleage study.
- This preliminary data suggests that forage preservatives and inoculants do not improve forage quality in alfalfa bermudagrass baleage in the southeast; however, alfalfa bermudagrass mixtures can provide a high-quality stored forage resource for southeastern cattle producers.
- Utilizing mini silos allowed for monitoring of fermentation in real time and allowed for sample collection at multiple time points.

