

Impact of Microbial Inoculants on the Quality and Fermentation Stability of Alfalfa Round-Bale Baleage

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The increasing popularity of interseeding alfalfa into perennial warm-season grasses such as bermudagrass and bahiagrass has created a need for more research involving this system in the southern USA. A study was conducted to measure the efficacy of microbial inoculants in improving the fermentation and nutritive value of bahiagrass/alfalfa baleage on a farm scale. The study was conducted in New Hebron, MS on a 25-ac field of 'Argentine' bahiagrass. 'Bulldog 805' alfalfa was inter-seeded at a rate of 20 lb PLS/ac. Treatments included a control and five inoculant treatments (Pioneer 11H50, Pioneer 1174, Pioneer 11G22, SiloSolve MC, and SiloKing) applied at the manufacture recommended rates. Treatments were applied during the second and third harvests in 2016 and 2017 when there was a more equal ratio of alfalfa and bahiagrass. Six large round bales (4'x5') were treated with each inoculant and wrapped with 8 layers of UV-treated plastic. Temperature micro-sensors were inserted in to the bale and data collected for 21 d. Forage samples were taken 18 and 24 inches deep at 0, 7, 14, 21 and 112 d after ensiling. Samples were analyzed for pH and nutritive value. The average DM during 2016 at each harvest was 31.3 (H1) and 56.4% (H2), respectively. There was an inoculant treatment effect for pH and CP during the harvest 1 (H1) and 2 (H2) in 2016. The pH was lower in H2 and CP was higher for all treatments in H1 compared to H2. During the H1 and H2 in 2017, there was an inoculant effect for moisture content ($P < 0.0001/P < 0.001$) and CP ($P < 0.0001/P = 0.0200$). There also a date x treatment effect for pH during 2017 ($P = 0.0309/P = 0.0362$). The average DM during 2017 at each harvest was 34.01 (H1) and 61.22% (H2), respectively. Data indicated a stable pH at 7 d post-ensiling along with a temperature equilibration.