SOUTH DAKOTA-Nutritional Quality of Silage Produced from a Mixed Cropping System

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Feed represents the largest cost of producing meat and milk. In addition, forages represent a large portion of the ration. Therefore, if the nutritional quality and digestibility of forages could be enhanced and improved to meet the nutrient requirements of livestock production, then the risk greatly improves to achieve and/or maintain a profitable livestock operation.

Corn & Soybean Mixed Crop Plot - 35 days

Corn & Soybean Mixed Crop Plot - 70 days

The production of a forage blend produced through the mixing of corn and soybeans at planting has the potential to yield greater quantities of digestible nutrients to meet the nutrient requirements of livestock. The study objectives were to evaluate two different seed corn hybrids (organic certified - Masters Choice 5300 and MasterGraze) with two soybean varieties (organic normal - Viking 2265 and vining soybean line) at four different seeding ratios (65:35, 45:55, 55:45, and 35:65) on silage and nutrient yields. The study was conducted in a field plot setting laid out using a randomized complete block design having a 2x2x4 factorial arrangement of treatments with three replicates. MasterGraze treatments were harvested at 101 days and MC 5300 treatments were harvested at 116 days after planting during the 2015 growing season. Corn hybrids and associated soybean treatments were hand-harvested, weighed, and processed as silage using a chipper/shredder, inoculated, packed into mini-silos, weighed, and ensiled for 90 days at ambient temperature. After 90 days, mini-silos were re-weighed, opened, and sub-samples collected and sent to a commercial laboratory for measurement of nutrient composition and digestibility. Data were analyzed statistically using a RCBD analysis and results are presented as least square means.

Biomass yields of corn and soybean mixed crops for the 2015 growing season were outstanding, averaging 34.1 tons/acre. Yields of selected nutrients are presented in Figure 1. Yields of dry matter (DM) and digestible dry matter (DDM) were greater for MC 5300 with either soybean variety compared to the MasterGraze. In regards to soybean variety, Viking 2265 and vining soybean were similar in terms of DM and nutrient yields. In contrast to our previous study, yields of crude protein were similar across treatments. An interesting observation was the similar yields of digestible neutral detergent fiber (DNDF), also known as digestible fiber. For lactating dairy cows, this can be the most expensive nutrient to supply. Study results demonstrate that mixed cropping of corn and soybean can produce a highly digestible nutrient dense forage blend increasing livestock nutrient supply while reducing the need to purchase nutrients.

Figure 1. Silage yields of selected nutrients produced by the mixed cropping of two seed corn hybrids and two soybean varieties grown using organic production system.