

Title: Seeding Year Yield and Forage Nutritive Value of Reduced Lignin and Conventional Alfalfa Varieties

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Reduced lignin alfalfa varieties have potential to provide increased management flexibility and to increase the feeding value of alfalfa for livestock animals. The objectives were to determine the seeding year yield and forage nutritive value of a reduced lignin alfalfa variety ('HarvXtra') and conventional varieties when subject to diverse cutting treatments. The experimental design was a randomized complete block with a split plot arrangement of treatments. Whole plots were four cutting treatments, which included 'Standard' (S; 60d + 30d + 30d), 'Standard + Fall' (SF; 60d + 30d + 30d + Fall), 'Standard + Delay' (SD; 60d + 37d + 37d), and 'Delay + Fall' (DF; 67d + 45d + Fall). Sub plots were four alfalfa varieties, which included '54R02', 'DKA43-22RR', 'HarvXtra', and 'WL355RR'. The experiment was seeded in late April of 2015 at two locations in Minnesota. At each harvest date, plots were first hand-sampled to determine plant maturity and forage nutritive value and then mechanically harvested and weighed to determine yield. Data was analyzed using the Proc Mixed procedure of SAS, with statistical significance set at $P \leq 0.05$. Cutting treatment by variety interactions were not significant; therefore, the main effects of cutting treatment and variety are reported separately. Yield is reported as seasonal cumulative yield, and forage nutritive values are reported for the second harvest. At Rochester, cutting treatments SF and DF had greater DM yields (≥ 6.8 mt/ha) than cutting treatment S (5.9 mt/ha). Yield for varieties 'DKA43-22RR' and '54R02' (≥ 6.8 mt/ha) were higher compared to 'HarvXtra' (6.1 mt/ha). At St. Paul, yields for cutting treatments SF and DF (9.8 mt/ha) were greater than SD and S (≤ 8.3 mt/ha). There was no difference in yield among varieties at St. Paul. At both locations, neutral detergent fiber (NDF) was greater for cutting treatment DF compared to all other cutting treatments, and crude protein (CP) content for cutting treatments S and SF was greater than for SD and DF. At Rochester, acid detergent fiber (ADF) was higher for the DF cutting treatment compared to all other cutting treatments. At St. Paul, the SD and DF cutting treatments had the greatest ADF concentrations. At both locations, NDF digestibility (NDFD) was higher for cutting treatments SF and S compared to DF. There were no differences in NDF or CP concentrations between alfalfa varieties at either location. At Rochester, all conventional alfalfa varieties had higher ADF concentrations ($\geq 34.6\%$) compared to 'HarvXtra' (32.5%). At St. Paul, concentrations of ADF were greater for '54R02' (32.1%) compared to 'HarvXtra' (29.7%). At both locations, 'HarvXtra' had greater NDFD (41.9%) compared to all other varieties (38.4%). Cutting treatments and alfalfa varieties affected both yield and forage nutritive values and should be considered when making management decisions.