

Influence of Balanced Application of N, P and S Fertilizers on Forage Yield, Quality and Nutrient Uptake of Timothy in Northeastern Saskatchewan

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Abstract: Timothy (*Phleum pratense* L.) hay provides another opportunity for crop diversification in the Parkland region of Canadian prairies. A field experiment was conducted from 2005 to 2007 on a Dark Gray Luvisol (Typic Cryoboralf) loam soil at Star City in northeastern Saskatchewan to determine the influence of balanced application of N, P and S fertilizers in different combinations on forage dry matter yield (DMY), quality and nutrient uptake of timothy. All fertilizers were broadcast on the surface in mid to late April every year. Harvesting was done at 10% flowering stage, because the target customers are interested in high fibre content, not in high protein content, and hence only one cut was done each year. In all 3 years, there was little increase in DMY and nutrient uptake with P, S or PS application compared to the unfertilized control. The DMY increased moderately when N was applied alone. There was substantial further increase in DMY when N was applied in combination with P or S, but the highest DMY was attained when all three nutrients were applied together. Compared to the unfertilized control, protein content in forage increased when N was applied, and it decreased when N was applied in combination with P and S due to dilution effect from increased forage yield. In conclusion, the findings suggest that balanced application of N, P and S is essential for optimum forage yield and quality of timothy.