Barley and Oat as Dryland Forages in the Northern Great Plains

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Research Summary

Oat (*Avena* spp.) is a popular, cool-season annual forage in cool semiarid regions. Barley (*Hordeum vulgare* L.) has produced equal or greater amounts of superior quality forage compared with oat in sub-humid regions. The importance of crop choice, cultivar type, and plant part on forage production were investigated in low soil-N environments in southwestern North Dakota. Barley and oat cultivars were compared for forage yield and quality during 1999 and 2000. The cereal cultivar treatments also were compared to intercrops of pea (*Pisum sativum* L. subsp. *sativum*) with barley and oat. Forage yield averaged 1.7 tons dry matter (DM) acre^{-1} for oat compared with 1.3 tons DM acre^{-1} for barley, while crude-protein concentration of oat forage averaged 6% compared with 9% for barley ($P < 0.05$). No difference in total forage nitrogen (N) yield occurred between barley and oat. Acid-detergent and neutral-detergent fiber concentrations averaged 4% lower for barley compared with oat forage. Calcium and phosphorus concentrations were 0.07% and 0.08% higher, respectively, for barley forage. Cultivar selection within each crop species generally did not affect forage yield or quality. The relative contributions of stem, inflorescence, leaf blade, and leaf sheath to forage yield were similar between small-grain crops and averaged 20, 44, 14, and 22%, respectively. Intercropping increased forage and N yield. These results support the hypothesis that forage yield is reduced but quality is enhanced when oat is replaced with barley in cool semiarid regions.

A summary of this study has been submitted for publication in a scientific journal and will be summarized in future press releases.