

## Effect of Species and Varietal Type on Yield and Nutritional Quality of Small Grain Forage<sup>1</sup>

W. Poland<sup>2</sup>, H. Peterson<sup>3</sup>, R. Ashley<sup>2</sup> and L. Tisor<sup>2</sup>  
Cooperative Extension Service, North Dakota State University, <sup>2</sup>Dickinson and <sup>3</sup>Beach

**ABSTRACT:** Small grains are popular annual forages in the Great Plains. Oat (*Avena sativa*.) is the most popular, cool-season annual forage grown in the Northern Plains. However, barley (*Hordeum vulgare* L.) has been shown to produce equal or greater amounts of superior quality forage when compared to oat in sub-humid regions. The effects of forage species (oat [OAT] or barley [BAR]) and type (forage or grain) on forage yield and quality were evaluated in each of two years. Ten varieties were evaluated in 2002 (5 OAT, 3 forage barley [BRF] and 2 grain barley [BFG]) and 12 in 2003 (6 OAT, 2 BRF and 4 BRG). In 2002, CP concentration (13.5 and 12.0%;  $P = .02$ ) was greater in BRG than BRF. Concentrations of ADF, NDF, TDN (estimated from ADF) and IVDMD and yields of DM, CP or IVDMD did not differ between barley types ( $P > .15$ ). Concentrations of CP (12.7 and 11.5%;  $P = .01$ ) and IVDMD (66.6 and 58.6%;  $P = .01$ ) and yields of DM (2749 and 1854 kg/ha;  $P < .01$ ), CP (355 and 209 kg/ha;  $P < .01$ ) and IVDMD (1856 and 1069 kg/ha;  $P < .01$ ) were greater in BAR than OAT. Concentrations of ADF, NDF and TDN did not differ ( $P > .5$ ) between BAR and OAT. In 2003, forage type did not affect ( $P > .14$ ) any yield or quality parameter. Concentrations of ADF (40.7 and 42.3%;  $P = .01$ ), NDF (60.5 and 63.9%;  $P < .01$ ) and TDN (57.2 and 56.0%;  $P = .01$ ) were reduced, and IVDMD (59.7 and 55.1%;  $P < .01$ ), increased in BAR compared to OAT. CP concentration and yields of DM, CP and IVDMD were not affected ( $P > .3$ ) by forage species. In both years, the ratio of IVDMD to TDN did not differ between forage types ( $P > .7$ ), but was greater in BAR than OAT (1.01 and .93;  $P < .01$ ). These data suggest that forage type barley varieties are not superior to grain type varieties in forage production. However, barley forage is of superior quality, and may produce as much or more forage, when compared to oat in the Northern Plains.

Key Words: Oat, Barley, Annual Forage

*The full paper was published in the Western Section, American Society of Animal Science Proceedings Vol. 55, 2004.*