Defining Small Grain Forage Production (Preliminary Results)

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With a grant from the ND State Board of Agricultural Research and Education (SBARE), a collaborative project between the Dickinson RE Center of North Dakota State University and the Department of Agricultural Studies of Dickinson State University is trying to characterize small grain forage production at the producer level in western ND.

Forage samples were collected from producers in 12 different counties in the fall of 2002. Producers were asked to complete a questionnaire regarding each sample submitted. Samples were then submitted to a commercial laboratory for chemical analysis of crude protein (CP) and acid (ADF) and neutral (NDF) detergent fiber. Total digestible nutrients (TDN) and relative feed value (RFV) were calculated using standard equations. Out of 110 total samples submitted, there were 30 that were either oat (18) or barley (12). These species were singled out of the database because oat and barley make up the bulk of the small grain forage produced in the state.

In general, producers of small grain forage used some type of fertilization (80%), a swather to cut (90%) and a round baler to harvest forage (89%). Only a small proportion of producers used either weed (27%) or pest (0%) control.

Cutting time was most commonly described as all day (62%), followed by late morning and afternoon (31%). Stage of development differed between forage species. In general, soft dough was the most commonly reported stage of development at harvest (33%); however, while barley was most frequently cut at this stage (42 vs 27% for barley and oat, respectively), oat was more frequently cut earlier at either a milk or early heading stage of development (8 vs 33%).

Estimates of dry matter yield and CP concentration were not different between forage species (Table 1). This is in difference to previous work in ND that suggests oat to be higher yielding and barley to have higher CP concentrations. Differences in average stage of development at harvest might have confounded this comparison. Nonetheless, these results do illustrate the observation that not all carefully controlled research results are necessarily observed in the field.

Surprisingly, concentrations of ADF and NDF were higher in oat than in barley. These increased fiber concentrations resulted in a lower TDN concentration and RFV for oat. Although not totally expected, we have noticed this difference in other cool season forage studies. Many have suggested that the forage quality of barley may be superior to oat using CP as the criterion. These data may uphold the notion of higher quality, but may suggest that energy concentration differences may be the more reliable characteristic.

In summary, production characteristics of small grain forage were quite similar between oat and barley, with the exception of stage of development at harvest. At the producer level, dry matter yield and CP concentration did not differ between oat and barley forage. However, differences in fiber and energy concentrations do suggest some advantage to barley over oat forage.

As school starts this month, we plan to continue forage collection in this study. However, we will attempt to focus more of our attention to small grains to increase the size of this database. Producers interested in learning more about the study and possibly submitting samples are encouraged to contact us in Dickinson (701-483-2348 or chip.poland @ndsu.nodak.edu) for a brochure.

Table 1. Dry matter yield (ton DM/ac) and forage composition (% DM) of oat and barley forage.

Item	Oat	Barley
Yield	1.18	1.24
CP	11.0	12.0
ADF*	36.1	31.1
NDF*	58.1	51.6
TDN*	60.8	66.1
RFV*	98.5	119.9

* Forage species differ (P<.05).