

Perennial Cool-Season Grasses For Eastern South Dakota

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Since the increase in communication through the internet, widely distributed magazines, and regional grassland conferences, producers have access to information on a much wider scale than in the past. Producers often learn about forage species grown in other regions and inquire about the performance and adaptability in their locale. Due to global climate change, forage species adapted to different climates may become relevant to local producers experiencing a shift in climate that may make these species more suitable than previously thought. For example, grass species such as timothy or orchardgrass are more adapted to higher precipitation regions such as in the eastern U.S. and not widely grown in the Great Plains, compared to smooth brome grass or the wheatgrasses. Since the eastern Great Plains is a transition between the wetter environments of the east and drier regions of the west, producers in this region may be interested in a wider array of species depending on future climate shifts.

A hay trial was conducted at South Dakota State University near Brookings, SD. In 2005, the field was planted to 6 introduced cool-season grass species; 'Manske' intermediate wheatgrass, 'Pennlate' orchardgrass, 'Climax' timothy, 'Fleet' meadow brome grass, 'Lincoln' smooth brome grass, and 'AC Knowles' hybrid brome grass. Each species was planted into 1.5 acre plots measuring 90' x 745' and replicated 4 times (see photo).

In 2008 and 2009, each species and replication was cut for hay in early July and baled in round bales. Bales were loaded on wagons and weighed to the nearest 10 pounds. Prior to the bales being removed from the field, forage samples were collected using a bale corer from one random bale from each species and replicate. Acid detergent fiber (ADF), neutral detergent fiber (NDF), and crude protein (CP) were determined in a commercial lab. Intermediate wheatgrass had the highest yield followed by meadow brome grass, hybrid brome grass, smooth brome grass, timothy, and orchardgrass. Orchardgrass remained vegetative and did not produce many reproductive stems; hence, it did not yield as much as the other species. Timothy was intermediate in yield compared to the others. Fiber concentrations were lowest for orchardgrass because it had more leaf material than stem compared to the other species. CP was also higher for orchardgrass than the other species.

Intermediate wheatgrass and meadow brome grass are well adapted to the northern Great Plains, whereas timothy and orchardgrass traditionally grow further east. Hybrid brome grass had intermediate characteristics of smooth brome grass and meadow brome grass.

It is unclear why orchardgrass remained largely vegetative compared to the other grasses. Forage agronomists from eastern states do not observe this same growth behavior. It is speculated that perhaps the climate of the northeastern Great Plains might adversely affect tillers that go through induction in the fall and that those tillers may not survive the winter.

This cool-season grass hay trial showed that all species have comparable forage quality except for orchardgrass. Yield tends to be greatest for the regionally adapted species and less for the other species. If the northeastern Great Plains experiences a climate change similar to existing conditions further east, species such as timothy and orchardgrass could likely be grown more widely in South Dakota.



Table 1. Yield, acid detergent fiber (ADF), neutral detergent fiber (NDF), and crude protein (CP) of unfertilized intermediate wheatgrass (IW), orchardgrass (OG), timothy (T), meadow brome grass (MB), smooth brome grass (SB), and hybrid brome grass (HB) cut for hay during the second week in July averaged over two years in Brookings, SD.

Variable	Species					
	IW	OG	T	MB	SB	HB
Yield, lb/ac	5830 a	2900 c	4200 bc	5350 ab	4730 ab	4910 ab
ADF, %	43.6 b	39.7 e	42.5 c	44.5 ab	41.3 d	45.1 a
NDF, %	68.8 a	61.8 e	65.2 cd	66.6 bc	64.6 d	67.1 b
CP, %	6.7 b	8.0 a	6.6 b	6.4 b	6.4 b	6.5 b

Averages within a row with the same letter are not significantly different at $P < 0.10$.