Evaluation of the Productivity and Grazing Capacity of Cool Season Grasses

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Introduction Pasture forage is an important part of beef production systems in western Canada and producers require adapted species that are high yielding and provide good nutritional quality .Small plot evaluation of forages uses mowing or clipping to simulate grazing events ; however ,these treatments lack animal effects such as pulling ,treading ,manure and urine deposition and short stubble heights (Thompson *et al* . 2003) .Thus ,forage varieties need to be evaluated for livestock performance and stand persistence under grazed conditions before they are recommended for use in grazing operations .This study compared hybrid bromegrass ,crested wheatgrass and tall fescue for yield and animal grazing days (AGD) over 3 seasons (2005-2007) .

Materials and methods The study was conducted at the Termuende Research Ranch ,Lanigan ,Saskatchewan ,Canada .The study site was a 6 .4 ha pasture situated on a mixed Orthic Black soil . In 2003 ,crested wheatgrass (CWG) (*Agropyron cristatum* (L .) Gaertn .) cv . Goliath ,hybrid bromegrass (HBG) (*B .riparius* Rehm .X *B .inermis* Leyss) cv . AC Knowles and tall fescue (TF) (*Festuca arundinacea* Schreb .) cv . Courtney were established in 2 .0 .8 ha replicate paddocks and compared to a long established stand of CWG (control pasture) over 3 years .Each year steers were randomly allocated to pastures when growth was approximately 20 cm high .Quadrats (0 .25 m^2) were taken to determine cumulative dry matter yield (CDMY) . Statistics were completed using SAS Mixed Model and means were separated using the least significant difference multiple range test when $P<0.05$.

Results In 2005 all pastures were grazed only once ,however in 2006 and 2007 sufficient re-growth allowed for two grazing periods for most species (Table 1) .In 2005 Goliath CWG yielded 3X greater ($P<0.05$) than control .However in 2006 and 2007 ,HBG and TF yielded 83 and 30% greater than control ,respectively .In P1 each year ,AGD were greater than in P2 which may be due to lower forage quantity in P2 .CWG ,HBG and TF had greater AGD ($P<0.05$) each year compared to control pastures ,indicating the potential of these grasses as pasture species for beef producers .

Table 1 *Yield and grazing days of forage species .*

	Control	CWG	HBG	TF	SEM[z]	
Cumulative dry matter yield (kg ha^{-1})						
2005	2485*b*	7515*a*	3136*b*	3932*ab*	727 .4	
2006(P1)[y]		3744	3293	4381	4887	884 .8
(P2)		0*b*	2504*a*	2484*a*	0*b*	187 .6
Total	3744	5798	6863	4887	798 .8	
2007(P1)		4281	5985	6878	5931	545 .4
(P2)		3172	3234	2660	3745	300 .0
Total	7453	9219	9538	9676	812 .3	
Animal grazing days (d ha^{-1})						
2005	78*b*	215*a*	252*a*	232*a*	14 .3	
2006(P1)		148*d*	215*bc*	254*bc*	235*bc*	19 .7
(P2)		0*c*	84*a*	49*ab*	78*a*	10 .5
Total	148*c*	299*ab*	303*ab*	313*ab*	24 .8	
2007(P1)		84*c*	140*b*	240*a*	280*a*	15 .1
(P2)		64*b*	112*a*	104*a*	64*b*	10 .2
Total	148*b*	252*a*	344*a*	344*a*	17 .6	

[z] SEM = standard error of the mean . [y] P1 = grazing period 1 ; P2 = grazing period 2 *a-d* Least square means in the same row with different letters differ at $P < 0.05$.

Conclusions Results indicate these varieties under grazed conditions had superior CDMY and AGD compared to control and may be well suited to season-long grazing .Similar yields but greater grazing days for HBG and TF suggests these varieties will perform better than CWG over several years .