Productivity of Cool-Season Perennial Pastures Under Cattle Grazing Initiated at Three Dates in Spring Following Moderate and Heavy Fall Defoliation

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Introduction and objectives. Initiating grazing early, and grazing stockpiled forage late, are approaches to extending the grazing season in order to minimize costs of winter hay feeding. Impacts of initiating spring grazing at different times on subsequent pasture growth are not well-defined. Understanding the impacts of fall and early spring grazing on annual herbage production could help managers make grazing management decisions. Our objective was to compare total-season herbage production when spring grazing was initiated at early, intermediate, and late dates following moderate and heavy defoliation of stockpiled pastures during fall.

Methods. Experimental units were on silt loam soils at the WVU Reedsville Experiment Farm in northern WV (530 m elevation; 39° 30’ N, 79° 50’ W). Mixed pastures contained orchardgrass (*Dactylis glomerata*), tall fescue (*Schedonorus phoenix*), Kentucky bluegrass (*Poa pratensis*), timothy (*Phleum pratense*), smooth bromegrass (*Bromus inermis*), and red (*Trifolium pratense*) and white clover (*T. repens*). Stockpiled herbage dry matter was assigned to beef heifers at allowances of 0.035 (low) or 0.07 (high) of body weight day^{-1} during November and December, 2009 (Fig. 1), after which hay was fed on pasture. Low and high herbage allowances (HA) left low and moderate levels of post-grazing residue, respectively. Rotational stocking was initiated in spring on April 9 (early) , 19 (mid), and 29 (late). Treatments were grazed twice to a 4-6 cm stubble height, followed by hay harvests on June 24 and August 12 (Figs. 2-4). Fall regrowth was measured on October 20. Herbage mass and utilization were determined with rising plate meter readings taken before and after grazing and by mechanically harvesting hay plots in summer.

Results and conclusions. Total-season herbage utilization ranged from 10,842-12,943 kg DM ha^{-1} among treatments, and increased with later dates of initiation of spring grazing (Table 1). Most of this effect occurred during the two grazing cycles but there was a reversal in the first hay harvest in late June, probably because hay plots following earlier grazing regrew for longer periods. Differing severities of grazing associated with fall HA treatments impacted herbage utilization in the subsequent growing season only at first hay harvest, when there was more production from plots that had been grazed more heavily during fall. This effect extended to total-season herbage utilization. There was no interaction of previous stockpiled HA treatment with date of initiation of spring grazing. These results from one year suggest that under the conditions of our study, date of initiation of spring grazing has more impact on subsequent seasonal herbage production than does previous fall grazing severity.

Figure 1. Low herbage allowance on stockpiled pasture, December 4, 2009.

Figure 2. Early grazing initiation treatment, April 9, 2010.

Figure 3. Early, mid, and late grazing initiation treatments, April 14, 2010.

Figure 4. Hay plot in late grazing initiation treatment, June 24, 2010.

Table 1. Herbage utilization when grazing was initiated at three spring dates following moderate and heavy fall defoliation of stockpiled pasture.

Treatment (HA = previous stockpiled herbage allowance)	**Grazing 1**	**Grazing 2**	**Hay clip 1**	**Hay clip 2**	**Fall regrowth**	**Season total**
	---------- Kg DM ha^{-1} ----------					
Low stockpiled HA	2327	4107	3275	1754	3080	12,142
High stockpiled HA	2598	3826	2393	1647	3080	11,145
P	*0.23*	*0.18*	*0.01*	*0.62*	-	*0.05*
Early grazing initiation	1679	3514	3530	1439	3080	10,842
Mid grazing initiation	2154	3926	2717	1668	3080	11,145
Late grazing initiation	3555	4460	2255	1993	3080	12,943
P	*<0.01*	*<0.01*	*0.01*	*0.15*	-	*<0.01*
P, HA x grazing initiation date	*0.22*	*0.90*	*0.46*	*0.92*	-	*0.24*