

AUTUMN GRASS GROWTH - THE EFFECT OF REST INTERVAL

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ABSTRACT

The effect of closing dates (Experiment 1: August 1, August 14 and September 18) and grass regrowth interval (Experiment 2) on herbage yield in the autumn/winter and in the following spring were investigated on a previously grazed *Lolium perenne* sward. In Experiment 1, similar yields were obtained for the August 1 and August 14 closing. Yields decreased and the proportion of dead material increased from 0.19 to 0.61 between mid-October and late-December. In Experiment 2, dry matter yield increased linearly ($P < 0.05$) with rest interval up to 7 wks in swards closed in September. There was no significant yield advantage for rest intervals greater than 5-6 wks. It is concluded that accumulated autumn and spring yields showed increased DM production with the shorter regrowth intervals.

KEYWORDS

Autumn, Grass, Rest Interval, Quality, Spring

INTRODUCTION

Because of the seasonality of grass growth, the demand by grazing ruminants for grass in late autumn exceeds herbage supply, the consequence being a reduction in animal performance. If grass supply could be maintained in the autumn/winter period, better animal performance and a possible shortening of the winter period may occur. The practice of deferring the grazing of grass in August/September and later offering it to stock in October/December has been advocated as a means of extending the grazing season. Winter grass growth rates are typically 0 to 5 kg DM ha⁻¹ for a period of 12 to 15 wks in many parts of Ireland. The effects of autumn closing dates and of short and long grazing rest intervals on herbage yield and quality as well as their effects on sward productivity, were evaluated in the context of autumn grass growth and their effects on subsequent spring production. The objective of the study was to successfully transfer any surplus grass from the late summer into the autumn/winter period.

MATERIALS AND METHODS

In Experiment 1, three closing dates (August 1, August 14 and September 18) were laid out in a randomized complete block design with four replications. In Experiment 2, the latter closing date (Sept. 18) was used to further investigate the effects of regrowth intervals on herbage production. Treatments consisting of grass growth intervals ranging from 3 to 16 wks were laid out in plots measuring 6 x 10 m in a randomized complete block design. All treatments received 50 kg N ha⁻¹ on their respective closing dates. Following yield estimation, plots were grazed by beef animals (400 kg LW) to a residual sward height of 4 to 5 cm. In addition to determining pre-grazing yields, assessments were made of sward height, leaf area index, proportion of green and dead matter and tiller population. Post grazing sward height, yield and leaf area were also assessed. In spring (February), all plots received either 0, 25, 50 or 75 kg N ha⁻¹. Yields were determined in April, and assessments were again made for leaf area and tiller counts. The sward (*Lolium perenne* cv. Everest) sown in Autumn 1992, was cut for silage in May and later grazed in both 1993 and 1994. In 1995 the sward was rotationally grazed until the experiment began, having received a fertiliser N input of 100kg N ha⁻¹ in the earlier part of the year.

RESULTS AND DISCUSSION

The effects of closing date and harvest in the autumn on herbage DM production are summarized in Table 1. Maximum yields of 2500 to 3000 kg DM ha⁻¹ were obtained for swards closed on August 1 and August 14, yields decreased from mid-November onwards and by late December yields were only half of the maximum values. Higher proportions of dead material were observed in the earliest closed sward with proportions increasing from 0.19 to 0.61 and 0.13 to 0.57 from mid-October to late December for the August 1 and August 14 closing dates respectively. Sward closed on September 18 reached a peak yield (at 2095 kg DM ha⁻¹) 8 wks after closing. This yield was maintained for a further 3 to 4 wks and then decreased. Analysis of data shows that grass accumulation over the first 7 wks after September 18 was linear ($P < 0.001$).

Experiment 2 data comparing short and long regrowth intervals in the autumn and the following spring are shown in Table 2. In Experiment 2, the DM yields for a 6-wk regrowth were significantly higher (500kg DM ha⁻¹ $P < 0.05$) than for two 3-wk cycles. The yield advantage of 8, 9 or 10 wk cycles compared to multiples of shorter regrowth intervals failed to reach significance. For accumulated yields (autumn and spring) there was no significant advantage when comparing a 12-wk regrowth with two 6-wk cycles. In fact longer rest intervals produced significantly lower herbage output than multiples of shorter regrowth cycles. Nitrogen application in spring significantly increases herbage DM yields (from 940 to 1525 kg DM ha⁻¹). Greatest yield responses were associated with swards which had been managed under a repeated defoliation regime during the previous autumn.

Table 1Effect of closing and harvest date on herbage dry matter yields (kg DM ha⁻¹) and proportion of dead matter in the sward

Closing date		Harvest Date													s.e	
		11/10	18/10	25/10	01/11	08/11	15/11	22/11	29/11	06/12	13/12	20/12	27/12	04/01		11/01
August 1	yield		2162	2367	2282	2941	2570	2500	2015	2239	1593	1607	1622	1852	1303	148.5
	% dead		19	19	16	32	40	44	60	52	61	58	55	65	66	4.3
August 14	yield		1609	2014	2176	2528	2323	2389	1930	2020	1648	1790	1450	1740	1251	148.5
	% dead		13	18	18	23	28	28	47	57	56	49	47	62	65	4.3
September 18	yield	941	1375	1747	1868	2060	2095	1747	2089	1856	1185	1502	1458	1620	1086	140.1
	% dead	1	6	10	12	17	25	17	38	40	44	50	49	59	58	4.3

Table 2Comparison of long and short regrowth intervals on dry matter yields (kg DM ha⁻¹) in the autumn/winter period and in the following spring (September 18 closing date)

Long growth period (weeks after closing)	Multiples of short rotations	Yield of long rotation in the autumn	Difference in favour of long interval	Significance	Yield of long rotation in the spring	Difference in favour of long interval	Significance
6	2 x 3 week	1868	+494	*			
8	2 x 4 week	2095	+394	NS			
9	3 x 3 week	1747	+275	NS			
10	2 x 5 week	2089	+200	NS			
12	2 x 6 week	1185	-794	***	1114	-133	NS
12	3 x 4 week	1185	-990	***			
12	4 x 3 week	1185	-597	**			
14	2 x 7 week	1455	-671	**	1154	-528	***
15	3 x 5 week	1620	-583	*	774	-605	***
15	5 x 3 week	1620	-162	NS	774	-490	***
16	2 x 8 week	1086	-1104	***	769	-268	*
16	4 x 4 week	1086	-1089	***	769	-412	***
s.e.		156.3			145.6		

p<0.01= *, p<0.05= **, p<0.001=***

Figure 1

Effect of rest interval on total herbage production, proportion dead matter and sward DMD in swards closed September 18.

