Forage Research In Texas, 1986

Effects of Fall Harvesting Schedules on Bermudagrass Production During Succeeding Years

T. S. HARRIS, C. G. BROWN, W. G. WATT, AND A. S. MANGAROO

Summary

Dry matter yields of bermudagrasses were found to decrease typically by 25 percent each spring and summer as monthly harvesting during each previous fall was continued from August to November. Late fall harvesting, regardless of frequency, impeded winter tolerance development and yields. Nitrogen fertilization increased yields, and enhanced stand maintenance and weed control, but like harvesting schedules, had no significant effects on in vitro digestibility.

Introduction

A considerable amount of winter-kill occurs in bermudagrass stands in Texas when sub-freezing temperatures persist even for a few hours. Winter-kill delays and reduces spring production, and generally creates conditions for weed invasion and stand decline. Early cessation and infrequent fall harvesting were proposed as factors to evaluate for their effects on enhancing the ability of bermudagrasses to develop increased winter hardiness.

Procedure

In April 1982, a field study was initiated at Prairie View A&M University to assess the effects of different fall harvesting schedules on the development of winter tolerance in bermudagrasses (1). Callie bermudagrass (very susceptible to winter-kill) and Coastal (most widely used improved variety) were selected for the study. Six different fall harvesting schedules were selected and applied each year beginning in late summer. These fall harvesting schedule treatments, detailed in Table 1, may be grouped into two categories. The first category consists of: A—no harvesting after an August cutting; B—fall harvested in September only; C—fall harvested in September and October; and D—fall harvested in September, October, and November. The second category consists of taking only one fall harvest during E—October, or F—November, after an August cutting. A seventh plot was used along with those containing these treatments and used for various studies. These seven treatments were applied to randomized sub-plots, where three levels of soil applied nitrogen; 100, 200, and 400 lb N/A and a check with no added nitrogen comprised the main plot treatments. Four blocks, each containing a replication of the study, were split to accommodate the two varieties.

TABLE 1. SCHEDULE OF FALL HARVESTING SCHEDULE TREATMENTS APPLIED EACH YEAR AFTER AUGUST

Fall harvesting schedule treatment				
Ref no.	[1]Month of fall harvest			Comments
	Sept.	Oct.	Nov.	
A	—	—	—	Not harvested after Aug.
B	X	—	—	Fall harvested during Sept. only.
C	X	X	—	Fall harvested during Sept. and Oct.
D	X	X	X	Fall harvested monthly through Nov.
E	—	X	—	One late fall harvest in Oct.
F	—	—	X	One late fall harvest in Nov.

[1]"X" = Harvest taken during indicated month.
"—" = Harvest not taken during indicated month.

TABLE 2. MEAN DRY MATTER YIELDS HARVESTED EACH YEAR THROUGH JULY AFTER APPLICATION OF SIX DIFFERENT FALL HARVESTING SCHEDULE TREATMENTS

Fall harvesting schedule treatment				[2]Mean dry matter yields harvested each succeeding year through July			
Ref no.	Month of fall harvest			1983	1984	1985	Mean 83-85
	Sept.	Oct.	Nov.	Pounds per Acre			
A	—[1]	—	—	8,272 a	4,381 a	5,416 ab	5,416
B	X[2]	—	—	7,230 b	4,327 a	5,514 a	5,690
C	X	X	—	7,037 b	3,801 b	5,041 ab	5,291
D	X	X	X	6,477 c	3,515 c	4,622 b	4,871
E	—	X	—	7,266 b	3,926 b	5,344 ab	5,512
F	—	—	X	7,132 b	3,712 b	4,871 b	5,238

[1]"X" = Harvest taken during indicated month.
"—" = Harvest not taken during indicated month.
[2]Yields within a column followed by the same letter are not different at the 0.05 level (DMRT). Mean values of 64 observations, including 4 replications, 4 nitrogen levels, 2 varieties and 2 harvest dates.

KEYWORDS: Bermudagrasses/yields/in vitro digestibility/winter hardiness.

Results and Discussion

During each year of the study, fall harvesting schedules were found to significantly affect the development of winter hardiness in both Callie and Coastal bermudagrass. Yields during each year (1983, 1984, and 1985), following the application of fall harvesting schedule treatments, were significantly influenced by differences in winter tolerance development resulting from these treatments. Table 2 shows that yields through July each year decreased as monthly harvesting was continued after August during each previous fall. For example, mean yields for both varieties in 1983 through July decreased from 8,272 lb/A under Schedule A where no fall harvesting was done after August 1982, to 7,230, 7,037, and 6,477 lb/A as monthly fall harvesting was continued through September, October, and November, respectively (Schedules B, C, and D). Schedule A which prescribed no harvesting after an August cutting each year provided for the highest amount of winter tolerance development which typically resulted in the highest yield compared to the other treatments. Schedule D which prescribed harvesting monthly from August through November provided the lowest amount of winter tolerance development and the lowest yields. Schedules E and F produced results which were intermediate to those of Schedules A and F in their effects on hardiness and yields. These treatments did not differ from each other and indicate that late fall harvesting tended to be less obstructive to winter hardiness development when harvest frequency is decreased.

Yields under all harvesting schedule treatments increased with increasing nitrogen fertilizer application. Nitrogen was also found to be important for stand maintenance and weed control, but like fall harvesting schedule, had no significant effects on in vitro digestibility.

Literature Cited

1. Harris, T. S., L. Gordon, and V. L. Jones. 1984. Effects of fall clipping on bermudagrass yields the following year. *In* Forage Research in Texas (1984). Texas Agr. Exp. Sta. Publication CPR-4253.