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Effect of cutting interval on yield and quality of three brachiaria hybrids in Thailand

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Introduction

In field trials in Thailand, *Brachiaria* hybrid cv. Mulato II produced significantly more green leaf, particularly during the dry season, than other brachiaria grasses (Hare et al. 2009). Cultivar Cayman produced more dry matter (DM) than Mulato II in 1 of 3 wet seasons, and line BRO2/1794 produced similar DM yields to Mulato II (Pizarro et al. 2013). The objective of this field study was to determine the effects of varying cutting intervals on growth and forage quality of hybrid brachiaria grasses in Thailand.

Materials and Methods

This study was conducted on the Ubon Ratchathani University farm in the eastern part of NE Thailand, on 3-year-old plots used for seed production studies in 2009 and 2010 (Bouathong et al. 2011). The trial was a randomized complete block design, with 2 cultivars (Mulato II and Cayman) and the line BRO2/1794, 4 cutting intervals (30, 45, 60, 90 days) and 4 replications. Plots were cut to 5 cm above ground level on May 24, 2011, and 200 kg/ha NPK (15:15:15) was applied. Thereafter, the same amount of fertilizer was applied every 45 days until November 18, 2011, when the study ended. Traits evaluated included dry matter (DM) yields and concentrations of crude protein (CP), acid detergent fiber (ADF) and neutral detergent fiber (NDF) of both leaves and stems.

Results

Increasing cutting interval significantly increased both stem and total DM yields and reduced the percentage of leaf, but had no effect on leaf DM production (Table 1). Mulato II produced significantly less stem but more leaf DM than Cayman and BRO2/1794. BRO2/1794 produced more stem and lower percentage of leaf than Mulato II and Cayman.

Mulato II produced significantly more leaf DM than Cayman at 30, 45 and 90-day cutting intervals and more than BRO2/1794 at all 4 cutting intervals, and had a greater percentage of leaf than Cayman and BRO2/1794. Cayman had a greater percentage of leaf than BRO2/1794 at all 4 cutting intervals (Table 1).

Increasing cutting interval significantly reduced CP concentrations and increased ADF and NDF concentrations in stems and leaves (Table 2). Cayman and BRO2/1794 had higher stem CP levels than Mulato II at 30 and 45-day cutting intervals and both had lower levels than Mulato II at the 60-day cutting interval. BRO2/1794 had lower leaf CP levels than both Cayman and Mulato II at most cutting intervals. Overall, Mulato II had higher leaf ADF and stem and leaf NDF levels than both Cayman and BRO2/1794 at most cutting intervals (Table 2).

Discussion and Conclusion

The significantly higher leaf DM production and percentage of green leaf and significantly lower stem DM

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production of Mulato II than Cayman and BRO2/1794 at all cutting intervals support the conclusion of Argel et al. (2006) that high production of green leaves makes Mulato II an extremely attractive forage for livestock. Mulato II would seem to offer advantages over the other 2 hybrids for sowing in Thailand. Based on the data in this study, an optimum cutting interval for the genotypes tested would involve a compromise between quantity and quality. Cutting at 30-day intervals would produce CP levels 3−4 percentage points higher than cutting at 45- and 60-day intervals, but DM production would be 20% lower than cutting at the longer intervals. Extending cutting intervals to 90 days would greatly increase DM production but CP concentrations in leaf would be down to maintenance levels for non-lactating and non-reproducing animals. The appropriate cutting interval will depend on the usage to which the forage is put and what combination of yield and quality is desired.

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Table 1. Effects of cutting interval on stem and leaf dry matter production and percentage of leaf of 3 hybrid brachiaria genotypes.

Cultivar/Line	Cutting interval (days)			
	30	45	60	90
		Total dry matter (kg/ha)		
Mulato II	11238	13240	12932	18500
Cayman	10840	12824	13944	21197
BRO2/1794	10246	12944	14108	19786
LSD (P<0.05)		1862		
		Stem dry matter (kg/ha)		
Mulato II	2371	3840	4372	8552
Cayman	2954	5048	6227	13441
BRO2/1794	3298	6058	8335	14345
LSD (P<0.05)		1144		
		Leaf dry matter (kg/ha)		
Mulato II	8867	9400	8560	9948
Cayman	7886	7766	7717	7756
BRO2/1794	6948	6886	5773	5441
LSD (P<0.05)		944		
		Leaf %		
Mulato II	78.9	71.0	66.2	53.9
Cayman	72.7	60.7	55.5	36.5
BRO2/1794	67.8	53.2	40.9	27.6
LSD (P<0.05)		2.6		

Table 2. Effects of cutting interval on mean crude protein (CP), acid detergent fiber (ADF) and neutral detergent fiber (NDF) concentrations in stem and leaf of 3 hybrid brachiaria genotypes.

Cultivar	Cutting interval (days)			
	30	45	60	90
		Stem CP (%)		
Mulato II	8.8	4.7	5.4	2.8
Cayman	9.4	5.5	4.8	2.5
BRO2/1794	9.2	5.4	4.7	2.7
LSD (P<0.05)		0.38		
		Leaf CP (%)		
Mulato II	12.6	9.4	9.5	7.1
Cayman	13.2	9.9	8.9	7.2
BRO2/1794	12.2	9.2	8.8	6.7
LSD (P<0.05)		0.37		
		Stem ADF (%)		
Mulato II	34.6	35.1	39.1	44.2
Cayman	34.9	37.3	39.4	43.6
BRO2/1794	33.4	34.4	41.2	44.2
LSD (P<0.05)		0.42		
		Leaf ADF (%)		
Mulato II	27.8	28.7	31.3	31.6
Cayman	26.2	27.4	29.3	30.1
BRO2/1794	26.6	27.3	28.8	29.2
LSD (P<0.05)		0.33		
		Stem NDF (%)		
Mulato II	62.2	68.2	69.0	74.3
Cayman	61.4	65.2	68.3	70.5
BRO2/1794	61.2	65.6	70.9	71.7
LSD (P<0.05)		0.55		
		Leaf NDF (%)		
Mulato II	55.5	59.0	60.8	63.3
Cayman	51.9	55.5	57.4	58.0
BRO2/1794	53.0	57.4	57.0	58.4
LSD (P<0.05)		0.39		

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