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Impact of Forage Management on Yield and Nutritional Quality of Cultivated Forages in North-Eastern Cambodia

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Abstract

Increasing beef prices present smallholders ready to intensify cattle production in the Ratanakiri Province, Northeast Cambodia, with an opportunity to enhance their livelihoods. One intensification approach, which also reduces pressure on increasingly scarce grazing resources, is to cultivate forages on-farm and use these to feed fenced livestock. The objective of this study was to evaluate if weeding and manuring of farm-grown forages have the potential to increase their yield and nutritional quality.

Above-ground biomass yields of cultivated forages (*Brachiaria ruziziensis*, *B. ruziziensis* × *B. decumbens* × *B. brizantha* (*B.* hybrid), *Panicum maximum*, *Paspalum atratum*, *Stylosanthes guianensis*) in Lumphat district (E 106°96', N 13°57') were monthly determined destructively during the rainy season between June and September 2015. Forage grasses and *S. guianensis* were cut at 6 ± 4 cm and 15 ± 7 cm above ground level, respectively. Samples of forages (n = 41) were analysed for their nutrient concentrations. On 20 smallholdings, forage plots of 0.01 ha were weeded monthly, manured with on average 0.24 t N ha⁻¹ month⁻¹, and compared to 0.01 ha non-managed plots.

Maximum yields were measured in *P. maximum* and *P. atratum* (3.6 ± 1.5 t dry matter (DM) ha⁻¹ month⁻¹), whereas *B. ruziziensis* had the lowest (1.1 ± 0.6 t DM ha⁻¹ month⁻¹; *p* < 0.01). The highest response to management was found in *P. maximum* and *B.* hybrid with an average increase of 0.8 t DM ha⁻¹ month⁻¹ compared to non-managed forages (*p* < 0.01). Maximum crude protein concentrations were found in *S. guianensis* (128 ± 8 g kg⁻¹ DM), followed by *B.* hybrid (98 ± 12 g kg⁻¹ DM), *P. atratum* displaying the lowest concentrations (65 ± 8 g kg⁻¹ DM; *p* < 0.01). Neutral detergent fiber concentrations were highest in *B. ruziziensis* (668 ± 16 g kg⁻¹ DM; *p* < 0.01).

Managing the forages affected their yields more than their nutritional quality. However, selecting suitably adapted forage species rather than intensifying the management of less well-adapted ones may achieve the yields and nutrition necessary to improve cattle productivity. In this context, *S. guianensis* and *B.* hybrid had the best potential to supplement rations for ruminants.

Keywords: Above-ground biomass yields, nutritional quality, smallholders