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Agronomic characteristics of five native forage species and their preference by Djallonké sheep in Benin

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Abstract

In sub-Saharan Africa, cultivation of drought-resilient plant species can offer a promising solution to address forage shortage and quality due to climate change. This study aims to evaluate the agronomic characteristics of five native drought-resilient grasses, namely *Andropogon virginicus*, *Cenchrus biflorus*, *Brachiaria deflexa*, *Dactyloctenium aegyptium*, and *Panicum maximum*. Then, to evaluate the foraging preference of these species by sheep. The species were cultivated at the Agricultural Entrepreneurship Promotion Center in Kétou from July to November 2023 in 20 plots of 3 m × 3 m. The experimental design was a randomised complete block design with five (05) forage species as treatment and four (04) replications per treatment. The cultivated plants were compared based on their morphological traits: leaf appearance rate (LAR), phyllochron, leaf elongation rate (LER), number of leaves per tiller (NLT), and final leaf blade length (FLL), as well as their biomass production and nutritional value at 45 days (at stem elongation stage) and 90 days (at maturity stage). The voluntary intake and intake rate of each forage species by Djallonké sheep were assessed. *D. aegyptium* (LA: 24.44 cm; NLT: 6.73 cm) and *B. deflexa* (LA: 25.56 cm; NLT: 5.60 cm) showed the highest value ($p < 0.05$) of leaf appearance and number of leaves per tiller. *B. deflexa* had the highest ($p < 0.05$) number of leaves at different evaluation stages (145.53 leaves at 30 days; 305.28 leaves at 60 days) than the other species. Regarding biomass production at 45 days, *P. maximum* ([976.50] kg ha⁻¹) ranked first, and *A. virginicus* produced less ([58.50] kg ha⁻¹). Sheep preferred more *D. aegyptium* (intake: 48.92 g MS) and less *C. biflorus* (intake total: 31.13 gMS). The results showed that *D. aegyptium* and *B. deflexa* could be suitable for growing ruminants in a changing climate.

Keywords: *Andropogon virginicus*, *Brachiaria deflexa*, *Cenchrus biflorus*, climate change adaptation, *Dactyloctenium aegyptium*, sub-Saharan Africa