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Biomass yield and nutritive value of pigeon pea (*Cajanus cajan*) forage as affected by the coppicing regime and spatiotemporal storage

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Abstract

Limited feed availability and quality are major factors hampering livestock productivity in pasture-based livestock systems in West Africa. As such, continuous efforts are being made to identify plant species with high forage yields and nutritive value to bridge the long dry seasons in the sub-region. The present study evaluated the effect of three coppicing regimes (i.e., 0 %, 25 % and 50 % of branches coppiced) on forage and grain yield of pigeon pea, and the spatiotemporal storage effects on its nutritive value. The coppicing regimes were imposed on pigeon pea plants 12 weeks post-planting in a randomised complete block design over two years. At maturity (20 weeks post-planting), the grain and forage were harvested and weighed. The harvested forage was packed into sacks and preserved over a six-month period (November 2021 – April 2022) in three locations (i.e., storeroom, roof-top and tree fork), followed by chemical analysis. Over the two years, there was no significant difference in biomass yield at 20 weeks. The highest total biomass yield (pre-flowering + full maturity) was obtained at 50 % coppicing in the first and second years while producing the highest grain yield in the first year. The lowest biomass yield was recorded in the 0 % coppicing. In terms of nutritive value, the highest loss (-27 %) in crude protein (CP) was observed in forage stored on tree forks, while the lowest (-15 %) occurred in roof-top stored forages. In terms of the estimated metabolisable energy, a decrease was observed only in room-stored forages (-5.1 %), while an increase was observed for the other two storage options, with the highest observed in tree fork storage (+4.9). Therefore, harvesting 50 % of pigeon pea forage 12 weeks post-planting can promote forage biomass yield at full maturity. Our study suggests that storing pigeon pea forage on tree forks is the best option to preserve its nutritional quality over long periods of time.

Keywords: Coppicing regimes, forage storage, pigeon pea, ruminants, West Africa