

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

Mary Danse Salifu¹, Emmanuel Afirifa Tenakwa¹, Shadrack Cudjoe¹, Zibilim Imoro², Christian Bateki Adjogo³, Terry Ansah¹

¹University for Development Studies, Animal Science, Ghana

²University for Development Studies, Biodiversity Conservation and Management, Ghana

³University of Kassel and Georg-August-Universität Göttingen, Animal Husbandry in the Tropics and Subtropics, Germany



Introduction

- Limited feed availability and quality hampers livestock productivity in pasture-based systems of West Africa.
- Several efforts are underway to identify plant management strategies which promote high forage biomass yields and nutritive value.

Objective

- To investigate the effect of three coppicing regimes on fodder and grain yields of pigeon pea, and how spatiotemporal storage affected fodder quality

Methods

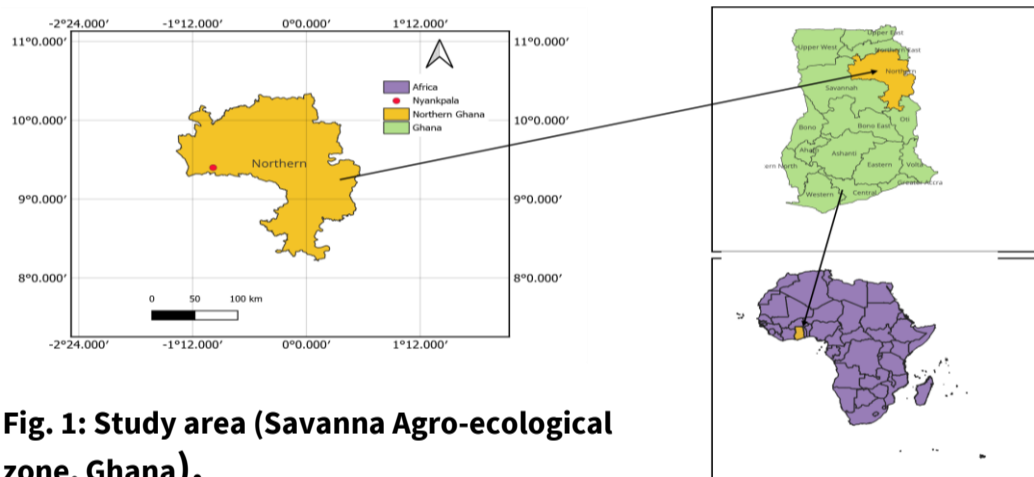


Fig. 1: Study area (Savanna Agro-ecological zone, Ghana).

- Rainfall 1000 mm to 1100 mm
- Temperature: 15 °C and 42 °C.

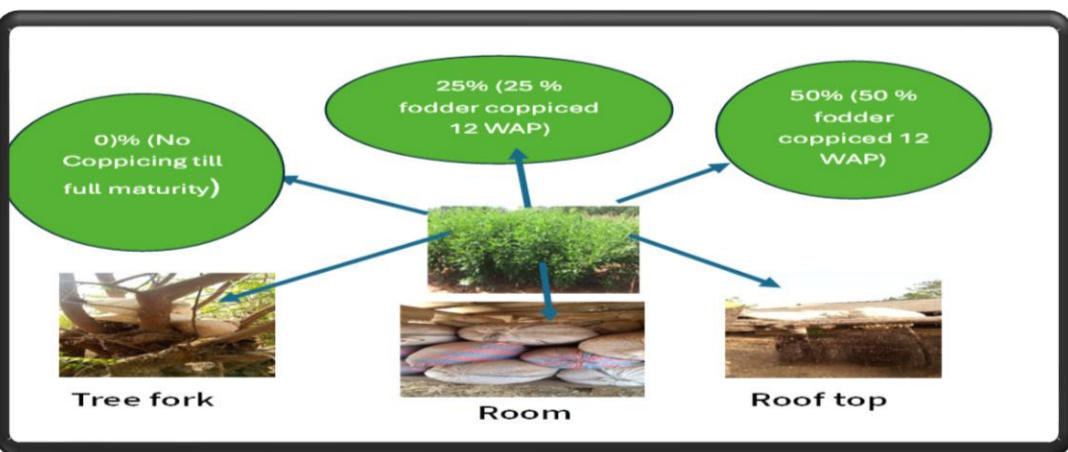


Fig 2: Treatments

- Pigeon was cultivated over five months.
- Coppicing : 0%, 25% and 50%.
- Storage: Tree fork, Room and Roof top.
- The study was designed as a randomized complete block design.
- The data was analysed as one-way and two-way ANOVA for coppicing and spatiotemporal storage trials respectively.

Results & Discussion

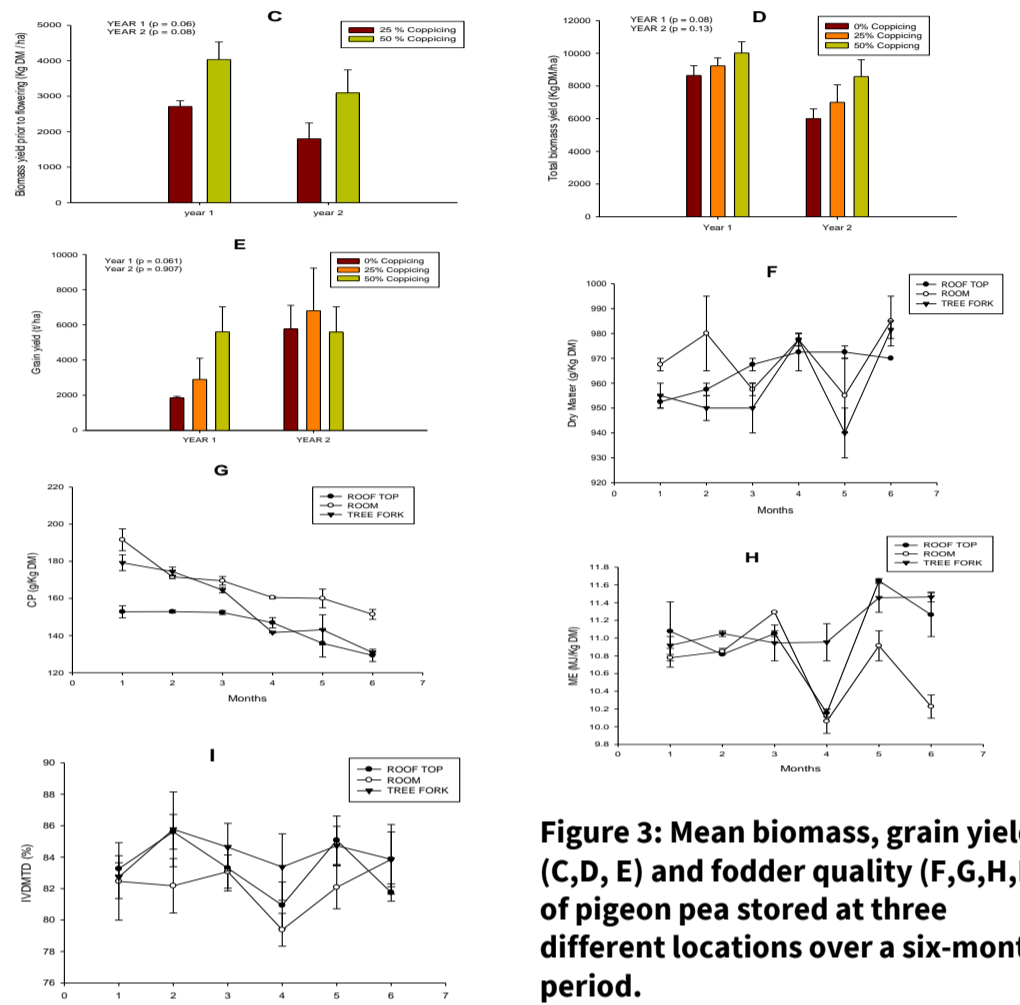


Figure 3: Mean biomass, grain yield (C,D, E) and fodder quality (F,G,H,I) of pigeon pea stored at three different locations over a six-month period.

- 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 fodder stored on tree forks, while the lowest (-15%) occurred in roof top stored forages.
- In terms of the estimated metabolizable 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).

Take home message

- Harvesting 50% of pigeon pea fodder 12 weeks after planting increases biomass yield and is associated with a higher grain yield at full pod maturity
- Storing pigeon pea fodder on tree forks is the best option to preserve its nutritional quality over long periods of time

Contact: Prof. Dr. Ansah Terry
tansah@uds.edu.gh,
<https://www.uds.edu.gh/staff/tansah-42762>



UNIVERSITÄT KASSEL
 ORGANIC AGRICULTURAL SCIENCES

GEORG-AUGUST-UNIVERSITÄT
 GÖTTINGEN



Tropentag 2024
 Vienna