AGRONOMIC CHARACTERISTICS OF FIVE NATIVE FORAGE SPECIES AND THEIR PREFERENCE BY DJALLONKE SHEEP IN BENIN

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Introduction

- In sub-Saharan Africa, forage shortages have remained the main obstacle to ruminant livestock farming, especially during the dry season when forage deficits are exacerbated.
- Using drought-resilient plant species can offer a promising solution to address this issue.

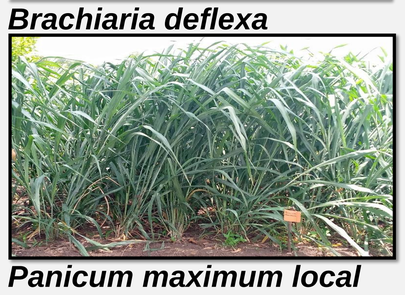
Objective

- Evaluate the agronomic characteristics of five native drought-resilient grasses, namely *Andropogon virginicus, Cenchrus biflorus, Brachiaria deflexa, Dactyloctenium aegyptium, and Panicum maximum*.
- Evaluate the foraging preference of these species by sheep.

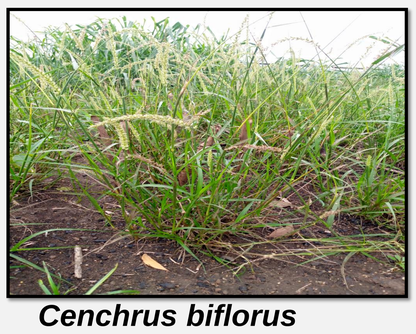
Andropogon virginicus

Brachiaria deflexa

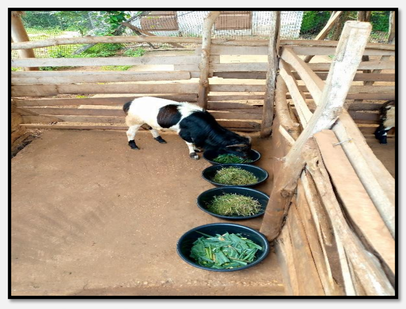
Dactylotenium aegyptiumn



Panicum maximum local



Cenchrus biflorus



Cafetaria test

Table 1. THI in the study area

	THI	Seuil de stress
Juillet	81,11	THI > Moderate heat stress
Aout	81,28	THI > Moderate heat stress
Septembre	83,45	THI > Moderate heat stress
Octobre	82,64	THI > Moderate heat stress

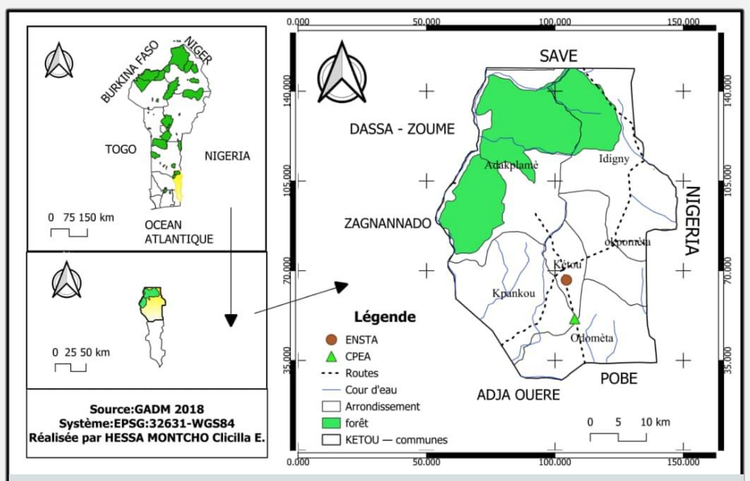


Fig 1. Study area

Methodology

The study was conducted in Benin, at the CPEA research center, located at 7°20' latitude Nord et 2°38' longitude Est.

The experimental design was a complete random block with five treatments (species) and four replications, corresponding to 20 experimental units.

- For morphological data collection, fifteen plants were randomly selected in each experimental unit.
- 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).
- The biomass production at 45 days (at stem elongation stage) and 90 days (at maturity stage) was evaluated.
- A cafetaria test was conducted to assess the preference by sheep of the cultivated forage species.

Results

Morphological parameters of the native species

- *Panicum maximum* ranked first in terms of rangeland restoration potential, demonstrating the highest values for leaf elongation rate (113,27cm) and final blade length (67,96 cm).
- *Dactylotenium aegyptium* and *Brachiaria deflexa* showed the highest values for the appearance rate (24,44 of tiller leaves ; 25,56 of tiller leaves), but *Panicum* had low appearance rates (8,00 of tiller leaves).
- A significant difference ($P < 0.05$) was observed between forage species at 45 days for biomass production, while it was not significant ($P > 0.05$) at 90 days.

Table 2: Morphological parameter of the five forage species

Paramètres	*B .deflexa*	*D.aegyptium*	*P. maximum*	P
TEF	$6,11^{d}±3,72$	$14,91^{b, c}±10,63$	$113,27^{a}±56,48$	P<0,001
TAF	$25,56^{a}±14,5$	$24,44^{a}±14,70$	$8,00^{c}±8,68$	P<0,001
LFL	$3,67^{d}±2,23$	$8,94^{b, c}±6,38$	$67,96^{a}±33,89$	P<0,001

Table 3: Biomass production (kgDM/ha) of cultivated species (45/90 days)

Espèces	A 45 jours	A 90 jours
Andropogon virginicus	$58,50^{b}±26,21$	$170,00^{a}±129,87$
Brachiria deflexa	$426,00^{a,b}±418,37$	$230,00^{a}±18,26$
Cenchrus biflorus	$205,75^{b}±195,54$	$152,50^{a}±23,63$
Dactylotenium aegyptium	$265,00^{b}±342,39$	$195,00^{a}±30,00$
Panicum maximum	$976,50^{a}±47,35$	$245,00^{a}±19,21$
Erreur standard	57,73	13,72

Foraging behavior of sheep

- Ingestion per visit followed the same trend as ingestion per bite, with *Dactylotenium aegyptium and Brachiaria deflexa* being significantly different from the other species,
- which, compared to Panicum maximum, were less ingested.These two species were visited and ingested more by the animals.

Table 4: Ingestion per visit and ingestion per bite

Espèce	Ingestion per visit	Bite mass
Brachiaria deflexa	$10,54^{a, b}±5,69$	$9,88^{a, b}±5,26$
Dactylotenium aegyptium	$14,92^{a}±9,53$	$13,75^{a}±9,1$
Panicum maximum	$8,67^{b}±3,6$	$7,38^{b}±3,51$
Moyenne	10,79	9,71
Sig	P < 0,001	P < 0,001

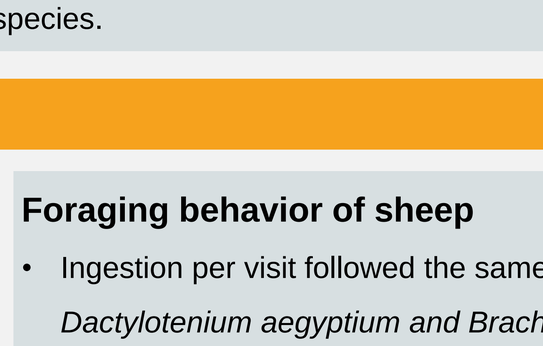


Fig 2. Intake over 10 minutes slots

- *Dactylotenium aegyptium* was the most consumed (38.67 g) in the first 10 min, followed by *Panicum maximum* (32.88 g),
- In the second 10 min, *Brachiaria deflexa* (23.88 g) *and Cenchrus biflorus* (12.52 g) were mostly ingested.

Conclusion

Dactylotenium aegyptium and Brachiaria deflexa presented better results in terms of morphology and had similar results in biomass production to *Panicum maximum.*

Perspectives

- Future studies could focus on evaluating the performance of animals fed diets containing these species as a substitute for Panicum maximum.