GRASSLAND SOCIETY OF SOUTHERN AFRICA
47TH ANNUAL CONGRESS (16-20 JULY 2012)
Club Mykonos, Langebaan, Western Cape

How *Chromolaena odorata* affects phytodiversity, productivity and pastoral value of Guinean pastures in Benin (Western Africa)

Valentin Kindomihou, PhD
Faculty of Agronomic Sciences
University of Abomey Calavi, Benin

Advancing Rangeland Ecology and Pasture Management in Africa

Context & Objectives

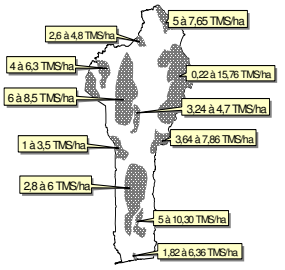


Fig.1. Distribution of major Pastures in Benin

In the **Guinean zone** of Benin, **grassland degradation** is often caused by the **encroachment of plants** that are **toxic to cattle.**

C. odorata main toxic weed species that dominate such degraded grasslands

A fire hazard in areas with prolonged dry season i.e. bimodal rainfall distribution.

Fig. 2. *C. odorata*

The present study aims

- to measure the level of **degradation of grasslands** invaded by ***C. odorata***;
- to evaluate whether **degradation** affects **floristic richness** in Benin.

Some parameters & calculation

Pastoral Value

$$PV = 0.25 \times r \times \sum TSC \times Is$$

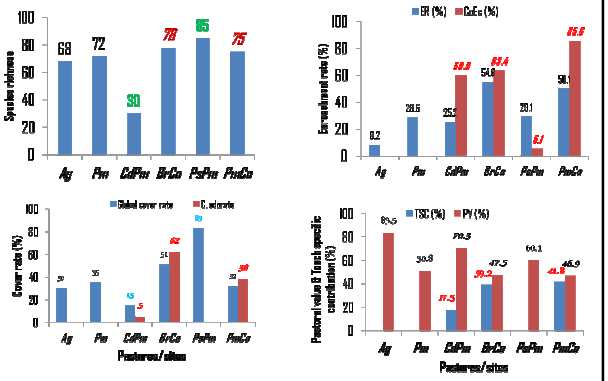
- r = cover rate (%)
- Is = quality index from 0 to 4
- TSC = Touch Specific Contribution
- TSC=[Fsi / (Fs_1+Fs_2+…+Fsi + …+ Fsp)] x 100
- Fsi = Species specific Frequency i
- Ce_i = Encroachment contribution = TSC_i/ER; TSCi=Touch Specific Contribution i;
- Ce = coefficient (Ce_i) of each miscellaneous species to the pasture enroachment.

Encroachment rate

$$ER = 1 - ROF/\sum Fsi$$

- ER = Pasture encroachment rate;
- ROF = relative optimal frequency from deleting the miscellaneous specific frequencies.
- $\sum$ Fsi = total sum of relative species frequencies

Results (2001-2002/2007-2008)



Results (following)

Table 1: Phytomass production of Guinean pastures in Benin

Pastures of	Types	Phytomass (t DM ha^{-1})			
		Gramineous	*C. odorata*	Other species	Total
Andropogon gayanus	Artificial	3.9 (62.9%)*	0 (0%)*	2.3 (37.1%)*	6.2
Cynodon dactylon & *Panicum maximum*	Artificial & degraded	2.9 (37.66%)*	0,9 (11.69%)*	3.9 (50.65%)*	7.7
Panicum maximum	Artificial	3.6 (41.38%)*	0.7 (8.05%)*	4.4 (50.57%)*	8.7
Paspalum scrobiculatum & *Panicum maximum*	Natural	2 (21.05%)*	0.1 (1.05%)*	7.4 (77.9%)*	9.5
Panicum maximum & *Chromolaena odorata*	Natural	3.1 (27.93%)*	1.4 (12.61%)*	6.6 (59.46%)*	11.1
Brachiaria ruziziensis & *Chromolaena odorata*	Artificial & degraded	2.7 (13.85%)*	0.6 (3.07%)*	16.2 (83.08%)*	19.5

(*) = percentage from the total Phytomass

Conclusion

Chromolaena odorata shows

- **Higher cover rates** in the **most degraded pastures**.
- **Decreasing touch specific contribution** from **natural to artificial pastures**.
- **Higher phytomass** in **natural** than in **artificial pastures**.
- The **higher the *C. odorata* phytomass**, the **lower the pastoral value** of a pasture.