

EFFECTS OF RESOURCE MANIPULATION ON COPPICE RESPONSE OF HARVESTED *Terminalia sericea*

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INTRODUCTION

- ✦ Growth & regrowth of trees after a disturbance depends on moisture & nutrient availability.
- ✦ In dystrophic savannas, availability of these resources is limited.
- ✦ Lack of information on coppicing dynamics of savanna trees, including environmental factors that may enhance or hinder coppice production.

OBJECTIVE

- ✦ To investigate the effect of moisture and nutrient availability on the coppice response of harvested *Terminalia sericea* trees

- ✦ **STUDY SPECIES:** *Terminalia sericea*
 - + Common species in dystrophic savannas
 - + Often occurs in mono-specific clumps
 - + Popular fuel wood species
 - + Known to coppice vigorously



METHODS

✦ EXPERIMENTAL DESIGN

- Wits Rural Facility, central Lowveld, *Granite Lowveld* savanna
- A 3x3 factorial experiment (3 water x 3 nutrient levels) replicated in 3 sites (dominated by *T. sericea*)
- Three sites x 9 treatments plots x 10 trees per plot = 270 trees
- Trees were harvested using a chain-saw at 25cm above ground level

TREATMENTS

Water

- Long-term (± 20 years) rainfall data for the Wits Rural Facility was used to calculate mean monthly rainfall for the study area
- Mean monthly rainfall was used as baseline for water supplementation treatments (0.5x and 1x monthly mean added)
- Water supplementation was applied weekly (treatment/4) to 30 cm radius around base of tree using containers

Nutrients

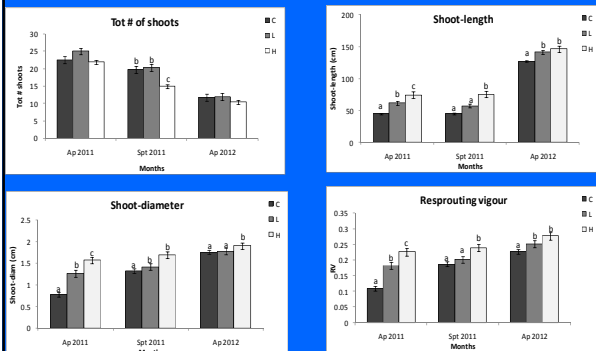
- ✦ Used 4:3:4:1 (N, P, K, Zn) blended commercial fertilizer, mixed according to 120 g/kgN and 90 g/kgP (N in the form of ammonium nitrate & P in ammonium phosphate)
- ✦ Two treatments: 80kg/ha & 40 kg/ha of fertilizer applied in October 2010 & 2011
- ✦ Fertilizer was applied by hand in the 30cm radius around base of tree = 18.7 g/tree and 9.7 g/tree respectively

MEASUREMENTS TAKEN

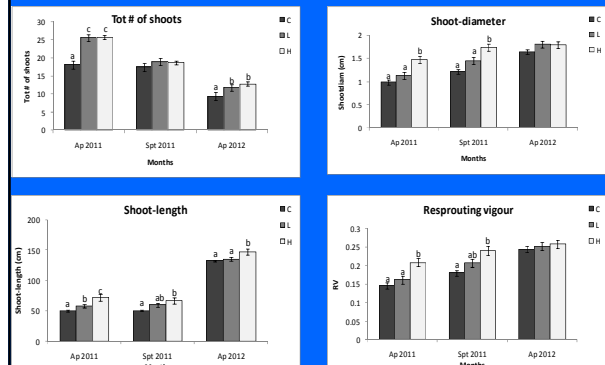
- Stump diameter at the beginning and end of the study
- On each stump: # of shoots, largest shoot was marked & monitored
- Shoot diameter & length (monthly)
- Resprouting vigour (RV) calculated as shoot diameter relative to original stump diameter
- 1x mean monthly rainfall or 80 kg/ha nutrient addition = H (High)
- 0.5x mean monthly rainfall or 40 kg/ha nutrient addition = L (Low)
- No water or No nutrient addition = C (Control)

RESULTS

Water treatment effects



Nutrient treatment effects



Water

- # of shoots decreased due to addition after more than a year of addition.
- Shoot-diameter, shoot-length & resprouting vigour (RV) increased linearly due to addition.

DISCUSSION

- Study demonstrated that adding nutrients & water improves the resprouting of harvested trees in terms of shoot growth.
- However, this effect was greatest in the initial growth season after harvesting, diminishing with time.
- The results provide insights into the possible influences of changing nutrient & water availability on coppice, whether due to external factors (e.g. climate change) or manipulated for management purposes.

Nutrients

- Significant increases in # of shoots were noted in the wet seasons only.
- Shoot-length & shoot-diameter increased linearly due to addition.
- RV increased linearly up to a year after addition, then showed no significant differences.

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