

The effects of gut passage and dung fertilization on seedling establishment of *D. cinerea* and *A. nilotica* seeds

TJ Tjelele^{12*}, D Ward² & LE Dziba³

¹Agricultural Research Council - Animal Production Institute;

²School of Life Sciences, University of KwaZulu Natal; ³CSIR:

Natural Resources and the Environment

Introduction

- *Dichrostachys cinerea* and *Acacia* species pods form an important part of the diet of livestock
- Ingested seeds of these species pass through the gut of livestock

Introduction

- Seeds dispersed by animals may subsequently establish, facilitating rapid woody plant encroachment

Introduction

- Herbivores may reduce grass biomass, competition with trees and
- Increase seed germination of woody plants through seed scarification and dung fertilization

Objectives

- We studied seed germination, and recruitment of dispersed *D. cinerea* and *A. nilotica* seeds by cattle and goats under natural conditions.

Experimental animals

- 14 Bonsmara heifers and 14 indigenous goats
- 7 paddock of 0.5 ha, each paddock with 2 Bonsmara and 2 goats
- Each cow was gavaged 1500 *D. cinerea* and 1500 *A. nilotica* seeds
- Same with the goats

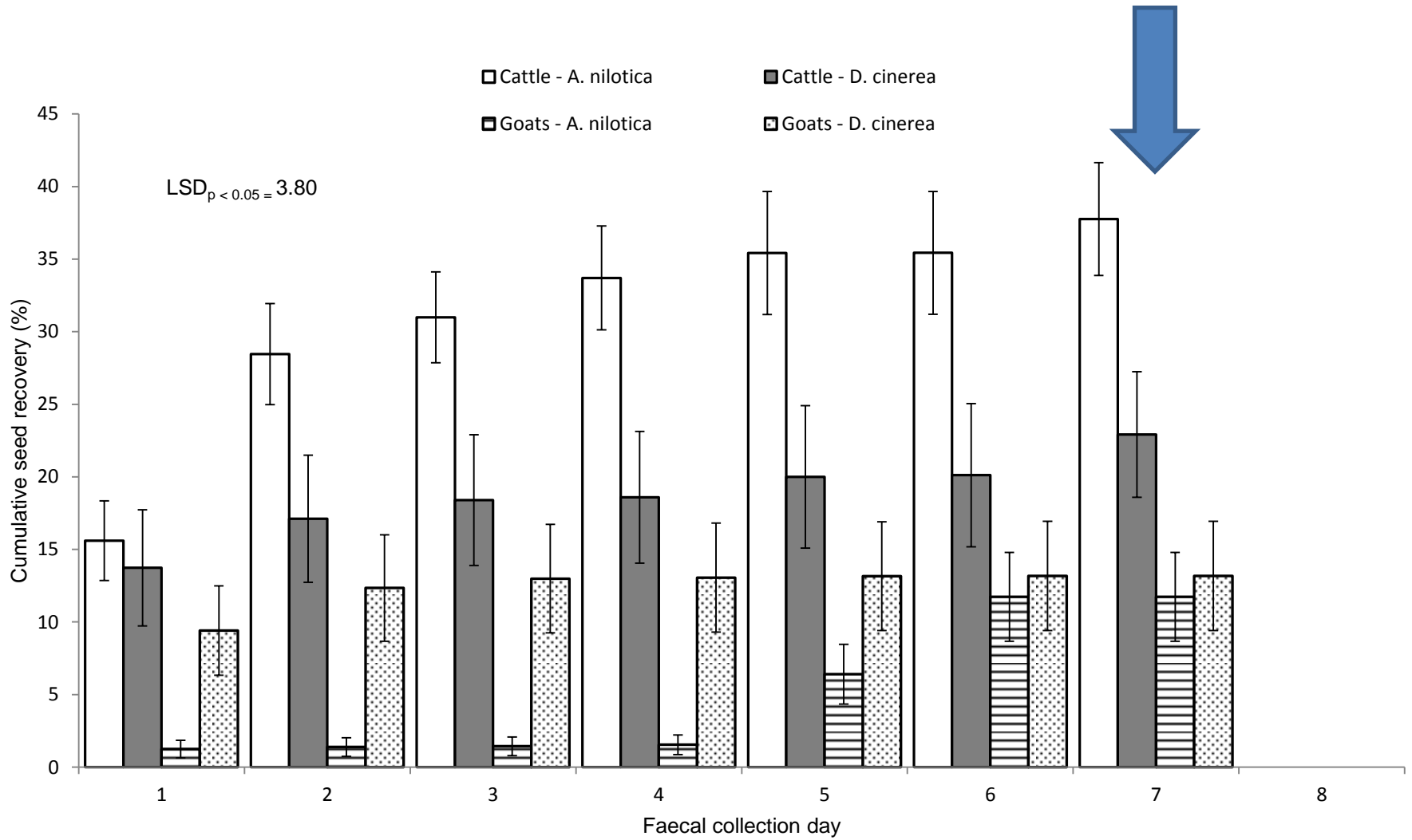
Seed germination

- Recovered seeds from **goats** and **cattle** during the **F3 days** and **L4 days** were subjected to the following planting methods:
 - 1) seeds placed on top of the soil with no dung,
 - 2) seeds buried 2 cm in the soil with no dung (ND),
 - 3) seeds buried 2 cm in the soil with dung (WD).

Monitoring of seed germination & survival

- Seeds were planted in May 2011, the beginning of the dry season
- The time when animals consume and disperse seeds of different woody plant species
- Continued until July 2012

Results



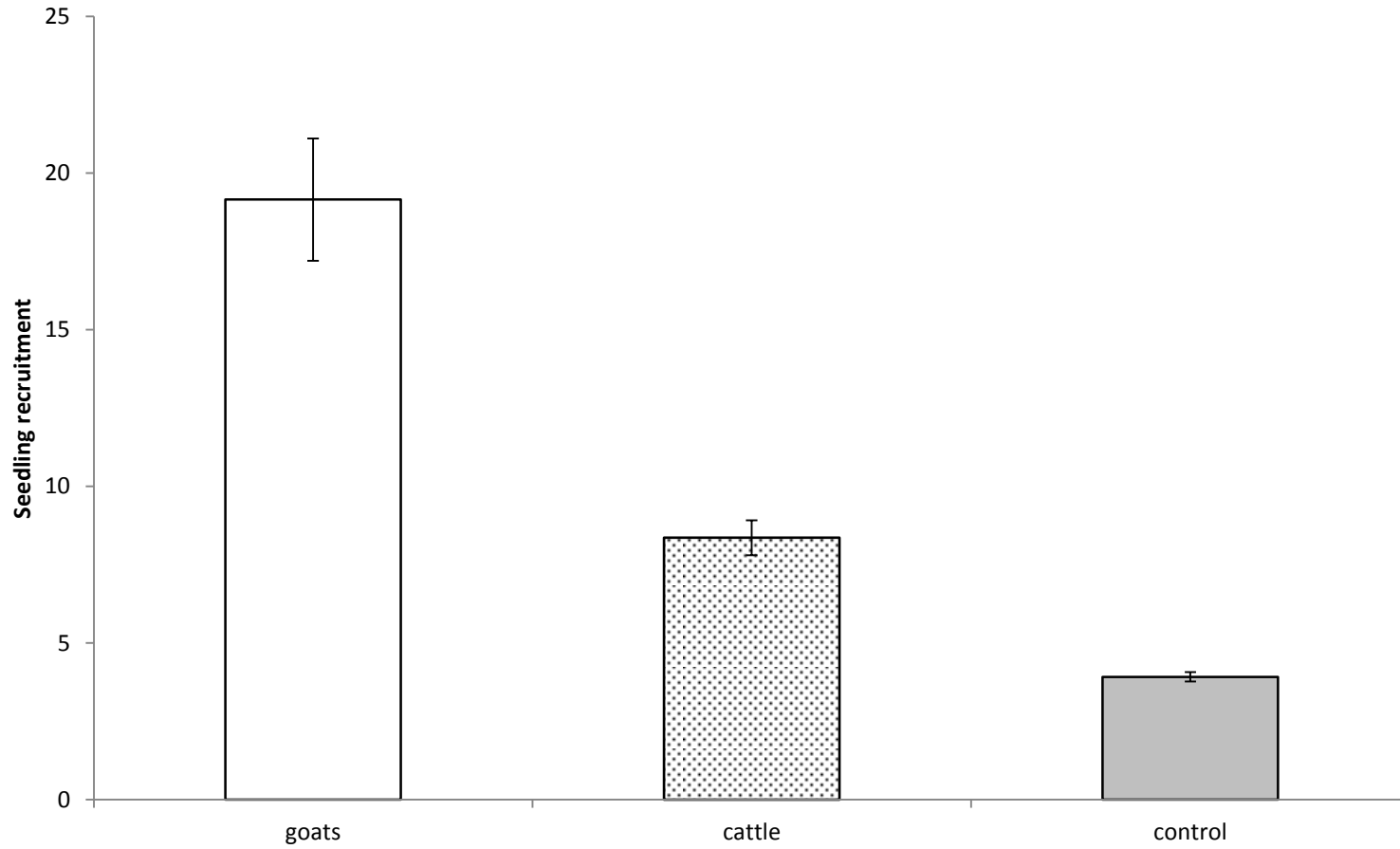
Results

- Significant interaction effect of **animal species** , **seed recovery day**, **planting methods/germination treatments** and **season** (dry and wet) on percentage seed germination & seedling recruitment

Germination and recruitment

- Seeds planted on the L4 days, without dung, during the wet season germinated & recruited

Results



Conclusion

- More seeds can potentially germinate and recruit following seed ingestion by goats than cattle and untreated seeds
- Goats and cattle may facilitate woody plant encroachment by enhancing seed germination

Acknowledgements

- National Research Foundation (NRF)
- International Foundation for Science (IFS)
- Agricultural Research Council (ARC)