

# The Rangeland Journal

The effects of passage through the gut of goats and cattle, and the application of dung as a fertiliser on seedling establishment of *Dichrostachys cinerea* and *Acacia nilotica*

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## Abstract

Seed pods of *Dichrostachys cinerea* and *Acacia nilotica* have higher nutritive value than grasses and other browse plants during the dry season and form an important part of the diet of livestock. Seeds of *Acacia* may be destroyed during passage through the digestive tract of herbivores whereas seeds of other browse species can remain viable even after mechanical (chewing) and chemical (digestive) scarification. The seedling emergence, seedling establishment and recruitment of *D. cinerea* and *A. nilotica* seeds, dispersed by cattle and goats, were measured under natural conditions in the wet and dry seasons following sowing in the dry season. Seeds retrieved from goats and cattle, during the first 3 days and the last 4 days of the recovery period, and control seeds were subjected to the following planting methods: (1) seeds placed on top of the soil with no dung, (2) seeds buried to a depth of 2 cm in the soil with no dung, and (3) seeds buried to a depth of 2 cm in the soil with dung, in the wet and dry seasons. Significantly more *A. nilotica* and *D. cinerea* seeds were retrieved from cattle ( $40.0 \pm 3.6\%$  and  $25.7 \pm 3.9\%$ , respectively), than goats ( $11.7 \pm 3.1\%$  and  $13.2 \pm 3.8\%$ , respectively). There were significant interactions among animal species, seed-recovery day, planting and season for percentage seedling recruitment. Seedlings from seeds retrieved from goats ( $12.0 \pm 0.06\%$ ) had a significantly higher recruitment rate than from seeds retrieved from cattle ( $7.6 \pm 0.05\%$ ) and control seeds (i.e. no passage through the gut) ( $4.1 \pm 0.02\%$ ). Seedling recruitment rate was higher from seeds recovered from animals in the last 4 days of the recovery period and from *D. cinerea* than *A. nilotica*. The planting method of seeds buried to a depth of 2 cm in the soil with no dung had the highest seedling recruitment rate. We conclude that both goats and cattle may facilitate woody plant encroachment by enhancing seedling emergence.