

Diet Quality Modifies Germination of *Dichrostachys cinerea* and *Acacia nilotica* Seeds Fed to Ruminants

Julius Tjelele,^{1,2} David Ward,² and Luthando Dziba³

¹Researcher, Agricultural Research Council, Animal Production Institute, Irene 0062, South Africa;

²Professor of Plant Ecology, School of Life Sciences, University of Kwa-Zulu Natal, Scottsville 3209, South Africa; and

³Principal Researcher, CSIR: Natural Resources and the Environment, Pretoria 0001, South Africa.

Abstract

The pods of many woody plants form an important part of the diet of livestock during the dry season due to their high nutritive value. However, the dispersal of seeds that remain intact and can potentially germinate after excretion is of particular concern when animals consume seeds of encroaching or invasive woody plants. The objectives of this study were to determine the effects of animal species in two experiments (experiment 1: goats, sheep; experiment 2: goats, cattle), diet quality (*Medicago sativa* hay, *Digitaria eriantha* hay) and seed characteristics (size, hardness) on the effectiveness of animal seed dispersal and germination of *Dichrostachys cinerea* and *Acacia nilotica* seeds. Owing to a limitation on the availability of seeds, the two experiments were done separately at different times. Each animal in both experiments received 1 000 *A. nilotica* seeds and 1 000 *D. cinerea* seeds mixed with either a low-quality diet (*D. eriantha* hay) or a high-quality diet (*M. sativa* hay). In experiment 1, we found a significant interaction effect of animal species (goats, sheep), diet (high-quality hay, low-quality hay), and seed species (*A. nilotica* seeds, *D. cinerea* seeds) on germination ($P, 0.0001$). There was also a higher seed recovery ($P, 0.009$) when animals were offered high-quality hay (47.4%–64.65) compared to low-quality hay (30.2%–63.24). In experiment 2, animal species affected seed recovery ($P, 0.0325$; goats 32.0%–66.44; cattle 50.3%–64.27) and germination percentage ($P, 0.055$; goats 14.1%–61.48; cattle 9.3%–60.94). The diet quality fed to the animals may affect dispersal and germination. However, animal species and seed characteristics also had important effects on germination of *D. cinerea* and *A. nilotica* seeds. Thus, all three of these factors play a major role in dissemination of viable seeds.