

# Grazing behaviour of Dorper sheep and farmed goats and their implications for natural resource management in western NSW

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## Introduction

The introduction of exotic herbivores into the semi-arid and arid zones of Australia resulted in dramatic change in the native vegetation (e.g. Noble and Tongway 1986; Friedel *et al.* 1990). Overgrazing and trampling reduced ground cover and changed species composition from dominance by perennial grasses and shrubs to dominance by annual species over extensive areas (e.g. Gunn 1986), or assisted the encroachment of woody species (Wilcox and Cunningham 1994).

It is particularly in this context that the recent introduction of new sheep breeds, reputedly hardier than traditional Merinos, and the increasing trend to farming or re-domestication of feral goats, poses serious questions for the ecological sustainability of the region. This ongoing project aims to combine information from laboratory experiments, field studies and producer experience to develop practical management strategies that are supportive of regional and national ground cover targets aimed at reducing wind erosion and maintaining biodiversity values. We report the preliminary results and recommend management strategies.

## Method

A review of literature was undertaken to collate relevant information on the biology and grazing behaviour of Dorper and goats and their likely impact on the rangelands. Producer forums were convened to collate practical knowledge relating to grazing and watering behaviour, diet selection and vital rates (fertility, fecundity, *etc.*) for Dorspers and goats.

Three paddocks in each of eight locations covering a range of vegetation types were selected in which Merinos, Dorspers and farmed goats could be observed within reasonable proximity. Ground cover, botanical composition, standing biomass and shrub cover were measured along 25 transects in each paddock.

An animal house experiment was undertaken to compare nutrient digestibility and rumen microbiology in Merinos, Dorper and goats. Fresh dung collected from grid sampling points were matched with plant parts collected from the same paddocks using DNA bar-coding in an attempt to define diet selection.

## Results and discussion

Field and laboratory studies are still in progress and no results are available at the time of writing. However, some key issues have emerged from discussions with landholders and from the review of literature. These issues involve both opportunities and risks. Opportunities include:

- Dorper sheep and goats consume a wider variety of vegetation than is normally consumed by Merinos such as Cannonball (*Sclerolaena paradoxa*), Bindweed (*Convolvulus arvensis* L.), Wild Turnip (*Brassica* spp.), Annual Daisy (*Bellis annua* L.) as well as browse species such as Hopbush (*Dodonea viscosa* subsp. *spatulata* and subsp. *Angustissima*) and Emu bush (*Eremophila* spp.) thereby reducing pressure on key species such as native perennial grasses;
- Dorper enterprises are generally more flexible and stocking rates can be adjusted quickly depending on the seasonal conditions as they can be marketed at a young age;
- Well managed goats may facilitate rangeland regeneration as they are 'softer' on country than sheep due to their highly flexible diet;
- Dry leaves fallen under shrubs can also be an important source of feed under drought conditions; and,
- Goats can be a significant source of income.

On the risk side, the capacity of Dorspers to harvest sufficient nutrients over a smaller area could potentially concentrate grazing on a reduced area resulting in overgrazing in some parts of the paddock. Furthermore, major adverse consequences for rangeland condition can be expected if seasonal or market conditions result in an imbalance between population growth and off-take, resulting in high levels of grazing pressure. While this is true of all livestock production systems the capacity of the Dorper and goats to survive and reproduce under a wide range of seasonal conditions makes this problem potentially more serious.

The risk of population explosion is particularly high

for goats as numbers may be difficult to control for several reasons. First, they have a remarkable capacity to reproduce despite low feed availability. Second, the reproductive process is generally uncontrolled. Finally, although goats can maintain reproduction under poor seasonal conditions the growth rate of young animals may restrict turnoff because of the market preference for animals above 24 kg live weight.

It is therefore important that graziers have well planned strategies to ensure that the risk of any such imbalance is reduced. These strategies might include:

- Stocking at a lower rate (75 to 80%) than would be practised with Merinos of comparable DSE rating;
- Use of seasonal risk management tools such as trigger points (Hacker *et al.* 2006) or forward projections based on a DDH/100mm benchmark and rolling annual rainfall totals (Hacker and Smith 2007) (DDH/100 mm – DSE days per ha per 100mm of annual rainfall);
- Establishment of on-property feed lots, or development of alliances with off-property finishers, to ensure that turn off can be maintained under all seasonal conditions; and
- Restricted joining of females or heavier culling of older age groups under poor seasonal conditions.

## Conclusions

To avoid overgrazing and degradation associated with a change to Dorper sheep or domesticated goat enterprises, well planned strategies are required to ensure that the risk of imbalance between population growth and off-take is minimised.

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