

Studies of plant biodiversity on properties grazing sheep on the North-West Slopes of New South Wales

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Abstract. This paper outlines a new study which will be undertaken as part of a post-graduate project by the University of New England. The study covers the biodiversity component of the northern New South Wales EverGraze project in the Namoi and Border Rivers–Gwydir Catchments. It aims to investigate the relationships between plant biodiversity, production and profit on sheep farms on the North-West Slopes of New South Wales.

Introduction

About 42 per cent of the land in the Namoi and Border Rivers–Gwydir Catchment Management Authorities (CMA) regions in northern New South Wales (NSW) is occupied by native grasslands. These are dominated by summer-growing perennial grasses which produce feed in summer, but are frost susceptible in winter (Williams 1979). Despite reasonably high annual rainfall (550–750 mm/year), much of the rainfall is ineffective because water infiltration rates into the soil are low, losses by

surface water run-off are high (Murphy *et al.* 2004a) and evapotranspiration rates are high in summer (Murphy *et al.* 2004b). Consequently, producers manage breeding and fattening operations by the sowing of improved pastures and forage crops, which can have problems associated with low ground cover, low growth in winter and low persistence (Scott *et al.* 2000). There are marked differences in the proportion of native and improved pastures on individual properties and there are a wide array of options and alternative enterprises for sheep, lamb and wool producers.

Study aims

This project will investigate, at a whole-farm scale, the relationship between production, profit and biodiversity, with the aim of increasing the adoption of farming practices that promote biodiversity outcomes, as well as addressing the profit and natural resource management goals of the EverGraze project in northern NSW (Lodge *et al.* 2008).

More specifically, the project aims to develop evidence-based best management practices and benchmarks for on-farm biodiversity, to which producers can compare their current practices. It aims to assess the profitability and risk of different farm enterprises and practices to determine the potential trade-offs and synergies associated with on-farm plant biodiversity conservation. To do this we will test the hypotheses that (1) the most productive pastures dominated by native species are a mixture of summer active perennial grasses and cool season or year-long palatable forage species (grasses, legumes and forbs), (2) these species are profitable due to a combination of reasonable productivity, low-input costs, low risk and persistence through drought, and that (3) management for conservation of undeveloped or less developed areas of farms has only a minor negative or possibly positive impact on farm profits (due to cessation of unrewarded expenditure on land of low agricultural capability).

Methods

The study will undertake floristic surveys on 20 commercial properties that have sheep enterprises across the region, sampling a range of soil, landscape, rainfall, enterprise and input variables. Vegetation of high biodiversity conservation significance will also be surveyed in nearby reference areas, matched with on-farm sites in terms of natural attributes. Statistical analysis and economic modelling will be conducted using the floristic surveys, existing floristic datasets and additional paddock and property scale information derived from the broader EverGraze project.

Expected outcomes

This project will provide producers and CMAs in the region with a greater understanding of the relationship between production, profit and biodiversity on farms with sheep enterprises, so that informed decisions about improving on-farm biodiversity outcomes can be made. The project will highlight the trade-offs and synergies that exist between biodiversity conservation and farm profit. Also, a biodiversity assessment tool for producers will be developed, based on the site attributes that are found to be the major determinants of on-farm ground storey vegetation.

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