

Understanding Nutrient and Water Dynamics under Perennial and Annual Pastures

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Because of the combined effects of drought, overgrazing and lower fertilizer inputs, many perennial pastures in the high rainfall zones have degraded to a state where they are dominated by annual species (Anon, 1992). This degradation has led to research being conducted under the Key Program on Temperate Pasture Sustainability which aims to understand how climate, soil, plant and animal factors contribute to the sustainability, or lack thereof, of pastures dominated by perennials and annuals. The northern site for this research involves collaborative research between a number of scientists from CSIRO and the University of New England.

Major 'pools and 'fluxes of nutrients and water on a range of pastures which vary from those dominated by perennials to those by annuals will be quantified. This study will also help us to develop and understand indicators of sustainable pastures which might be useful to graziers.

Methods

The intake and return of nutrients (particularly nitrogen) to the pasture including transfer, volatilisation, and leaching losses will be the focus of this study. The impact of animal selectivity on the degradation of per-

ennial and annual pastures will be studied using the alkane technique which enables the detection of plants eaten by identifying specific plant chemical compounds in the different pasture species and in the sheep dung. Pasture botanical composition and animal production will be also measured regularly as will soil moisture, infiltration and soil strength.

The results of nutrient and water studies will be used to develop and verify a model to predict the use and loss of nutrients and water under a wide range of conditions. In addition, a 30 year data set from neighbouring improved pastures will be used to study changes in botanical composition under the stresses of stocking rate and drought.

Acknowledgements

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Reference

Anon (1992). Preparation Report for Key Program in Pasture Sustainability. PDP Australia Pty Ltd. Meat Research Corporation.