



**Project Number:** 05N116-01

**Project Start Date:** 1/1/2007

**Project Completion Date:** 31/12/2008

## Project Description

There is a strong presumption that perennial pastures will have a positive impact on catchment hydrology by reducing salinity risk associated with rising groundwater, as well as other benefits such as nutrient recycling, soil stabilisation and biodiversity improvement. This project will evaluate these presumptions so that future adoption of perennials can be based on factual grounds and not speculation.

A neutron moisture meter will be used to measure in-situ water at several perennial pasture trial sites in the NAR over time. The data generated by this monitoring will be 'value added' by feeding the information into a series of hydrological models such as 'AgET', 'Catcher' and 'APSIM', ultimately providing a guide to the total impact over time of differing degrees of perennial pastures on catchment hydrology. The economic model 'STEP' will be used in conjunction with the hydrological models above to conduct economic analysis on the transitional costs associated with these systems over time on an individual farm basis.

Regular soil sampling will be carried out at various trial sites throughout the NAR, as well as monitoring and sampling of shallow water tables through piezometers, to examine nutrient loss to the environment with perennial pastures compared to annuals crops and pastures. Monitoring for wind and water erosion will also be conducted, including photo reference points, to capture change over time in erosion risk across the whole farm after perennial pasture systems are introduced.

Risk assessments and herbicide trials will be conducted on the perennials pastures; as well as monitoring their encroachment into adjacent remnant vegetation, including the factors that lead to encroachment and ways to manage it. Regular ecological monitoring will also be carried out at several perennial sites to monitor changes in beneficial and pest insect species populations, including their interactions with adjacent remnant vegetation and crops. Additional ecological monitoring which benchmarks the distribution and abundance of various indicator species, along with landscape and habitat function analysis, will be undertaken as part of a national approach required by the Grain and Graze program. Monitoring of any 'down slope' effects associated with the introductions of perennials, such as reducing the incidence of waterlogging in remnant vegetation, will also be conducted in the project.

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The combination of outputs of the hydrological and economic models, as well as soil condition and biodiversity analysis will then enable a comprehensive assessment of the impacts of introducing perennial pastures at a farm and catchment level. This information will be captured in a series of detailed case studies which portray changes in economic, environmental and social aspects of broad-acre farming systems in response to the introduction of perennial pastures. The outcomes delivered and information generated by the project will facilitate the transition to more sustainable broad-acre agricultural systems, as well as greatly assist appropriate strategic decision making, policy development and investment in the area of perennials.

**Delivery Organisation:** Department of Agriculture and Food

**Total IP2 Funding:** \$342,161

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