

# Perennial pasture options presented

**T**he upcoming *Prospects Statement – Prospects for profitable perennials in mixed farming systems* provides an overview of the perennial pasture options investigated to date.

A decade ago, lucerne was the main perennial legume option available for most of the medium-to-low rainfall regions of southern Australia. Wide-reaching benefits include its ability to lower water tables with its deep-rooting system. However, lucerne has proven to have limitations – it is intolerant of acid soils, waterlogging and soil salinity, and requires some summer rainfall.

A search for perennial legumes with similar deep-rooting systems would provide further options for the agro-ecological zones where lucerne is unsuccessful. Ideally a suite of perennial options is required that would fit the ecological niches currently filled by annual legumes. White clover is the only other perennial legume currently adopted extensively in southern Australia. However, its use is restricted to permanent grazing regions receiving more than 700 mm of annual rainfall, as it does not persist in lower rainfall regions due to a lack of drought tolerance.

## The grass may be greener

More perennial grass options are available including the temperate grasses, such as perennial ryegrass, tall fescue, phalaris and cocksfoot, the sub-tropical grasses, such as kikuyu and Rhodes grass and the halophytic grasses, tall wheatgrass and puccinellia, which are suited to saltland pasture areas of southern Australia. There may be a weed risk associated with the use of tall wheatgrass in Victoria.

The temperate grasses are restricted to the medium-to-high rainfall regions of southern Australia and, other than temperate types of tall fescue, are shallow-rooted and contribute little to water table lowering.

The sub-tropical grasses have more summer activity, therefore contributing more to water use during out of season rains. Other than kikuyu and Rhodes grass their use has generally been restricted to the summer-dominant rainfall zones of Australia, although research is currently underway on expanding their use into winter-dominant rainfall zones with some summer rain or with a shallow or perched non-saline water table.

In discharge areas, with waterlogging and soil salinity constraints to production,

the options available are also limited. Puccinellia and tall wheatgrass are tolerant of both soil salinity and waterlogging and will grow successfully, but there is a lack of perennial and annual legume options available. The annual legume balansa clover is productive on waterlogged soils, but is not as salt tolerant as originally thought, particularly during germination. *Melilotis siculis* is well suited to saline and waterlogged environments. However, the search is on to find a hardy rhizobia to match (see story on page 10).

Strawberry clover is also tolerant of waterlogging, but not salt tolerant. Identifying new salt- and waterlogging-legumes that can increase levels of nitrogen in the soil for companion grass species, increasing their nutritive value to livestock, is a high priority.

Perennial legumes also have an advantage over annual legumes as they provide out-of-season feed, increase carrying capacity and reduce the need for supplementary feed during autumn.

Salt-tolerant shrubs, such as saltbush, lower the water table in these environments and can provide a supplement of anti-oxidants, such as vitamin E (see story on page 7). ↘

## Researchers ever-ready to investigate

**T**he initiation of two national projects will see a strong perennial research presence in the Victorian, South Australian and New South Wales low rainfall zones during the coming years.

*EverCrop*® led by Dr Rick Llewellyn and Dr Mike Robertson, CSIRO Sustainable Ecosystems, aim to generate data and develop models to assess the impact of incorporating perennials into existing cropping systems.

The projects are part of the larger FFI CRC program – *Future Cropping Systems*, which is exploring options for new cropping systems with sufficient perennial component to be resilient to the multiple challenges posed by declining terms of trade, salinity and climate variability.

Project activities in the low rainfall zones of the tri-state areas will be led by Patricia Hill (CSIRO Sustainable Ecosystems) and will explore how perennial pasture options fit within the context of soil and cropping constraints that exist in the local environments.

“Our aims are to consider how perennials might be used to address production, environmental, economic and seasonal risk aspects of cropping systems,” Patricia said.

“The *EverCrop*® Decide component will develop decision support tools to assist local farmers to put perennials in the right places in farm systems for maximum profit and environmental benefit.”

### Focal sites

Research and extension staff will combine their skills to address local knowledge and adoptions constraints to growing perennials successfully across the region at two ‘focal sites’ at Werrimull (Vic) and Waikerie (SA).

“At these sites, local farmers and consultants will be invited to guide the research that takes place,” Patricia said.

“Other research is also planned around the region, so we can collect enough data to develop models for simulating perennial pasture growth and to assess the whole-farm economic benefit of incorporating perennials into the system.”



ABOVE: Project activities will be undertaken across low rainfall zones of the tri-state area shown above. (Source: CSIRO)

The activities will also include spatial analysis of the areas suitable for growing saltbush, assessing performance across a range of soil types, determining the biophysical constraints of fodder shrub species production, options for enhancing lucerne establishment success, and perennial pasture establishment and growth. ↘

### More information

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