

filling the feed gap

The Focus Farms are a joint initiative between the Murrumbidgee Grain & Graze and Best Management Practices for Dryland Cropping projects. Monthly monitoring of the Focus Farms is providing an overview of the feed production cycle on a whole farm basis and how this impacts on environmental indicators such as water use, ground cover and biodiversity.

The Focus Farm initiative has been funded by the National Action Plan for Salinity and Water Quality through the Murrumbidgee Catchment Management Authority (MCMA).

Focus Farms

Aim: To monitor whole farm feed production on mixed farming systems and the impact these have on natural resource management.

Method: Five Focus Farms were selected across the Murrumbidgee Catchment that were typical of mixed farms in their region. Locations include:

- Coolamon
- Euroley Bridge (Leeton)
- Sebastopol (Temora)
- Tarcutta
- Tootool (Lockhart)

On each farm, 5 paddocks representing typical components of a mixed farming enterprise were selected for monthly monitoring (Table 5a). The paddocks include:

- annual pasture
- perennial pasture (lucerne)
- native pasture/remnant vegetation
- grazing cereal
- grain only cereal (2005 only)

Monitoring activities on the Focus Farms can be divided into a number of components, including production and biodiversity as follows:

Table 5a - Paddock composition* & rainfall

Pdk type	Coolamon	Euroley Bridge	Sebastopol	Tarcutta	Tootool
annual pasture	sub-clover	sub-clover	sub-clover	sub-clover	sub-clover
perenn. pasture	lucerne /chicory	lucerne	lucerne	lucerne	lucerne
native pasture	k'roo grass, <i>stipa spp</i>	<i>danthonia, stipa spp</i>	<i>stipa spp</i>	red-grass	windmill grass, <i>stipa sp, juncus</i>
grazing cereal	wheat	wheat	wheat	wheat	wheat
2006 rainfall	203mm	218mm	176mm	257mm	196mm
2005 rainfall	445mm	448mm	613mm	611mm	534mm
average	502mm	413mm	542mm	665mm	469mm

*dominant species

Figure 5a - Seasonal progress: grazed wheat, Tootool '06



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5. Feed production and quality

Project collaborators:

Craig Muir (NSW DPI), Murrumbidgee Catchment Management Authority

To monitor feed production on a whole farm basis, Craig Muir (Project Officer, NSW DPI) has been collecting monthly data from each of the Focus Farms. 2006 was the 2nd year of data collection, including:

- dry matter
- pasture/crop growth rates
- feed quality
- ground cover
- soil moisture content
- stocking rates & rainfall (provided by farmers)

Results: Monitoring results from the Focus Farms are produced monthly in 'Focus Farm Facts', which are available at www.farmlink.com.au/gg.htm

Dry matter production

With 2 years' data now collected, feed curves have been created for each Focus Farm (Figures 5b - 5f) using the representative paddocks to identify feed surpluses and gaps across the whole farm. Whilst these are obviously driven by the 2005 and 2006 seasons, they do indicate typical periods of feed shortage experienced by mixed farming enterprises in this area. (Note that dry matter figures also reflect grazing intensity.)

Summer 2006

Dry matter carry-over into the 2006 summer was markedly higher than the previous year due to above average rainfall in spring. Although lucerne and/or wheat stubbles provided valuable grazing during this period, feed quality was poor due to decomposition of annual plant material and little green leaf from perennials*. With digestibility generally less than 50% and energy below 8 MJ/kg (minimum required for maintenance of a dry ewe), it would be expected that stock grazing these feed sources without supplementary feeding would begin to lose condition (see Coolamon feed quality, Figures 5g - 5i). As shown in Table

Figure 5b - Feed Curve 2005 & 2006, Coolamon

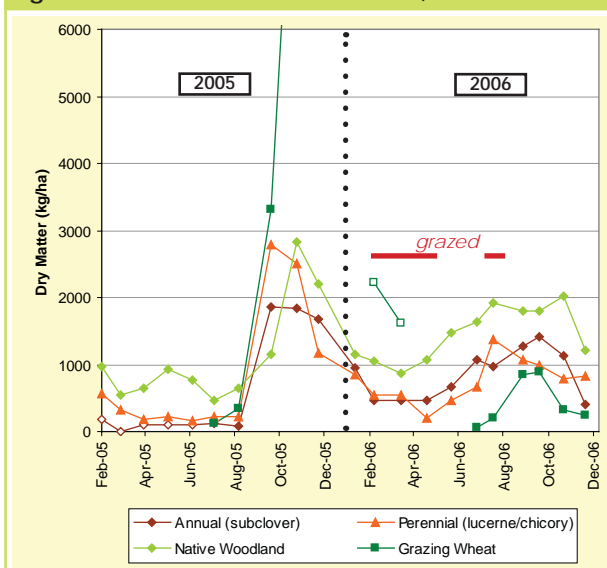


Figure 5c - Feed Curve 2005 & 2006, Euroley Bridge

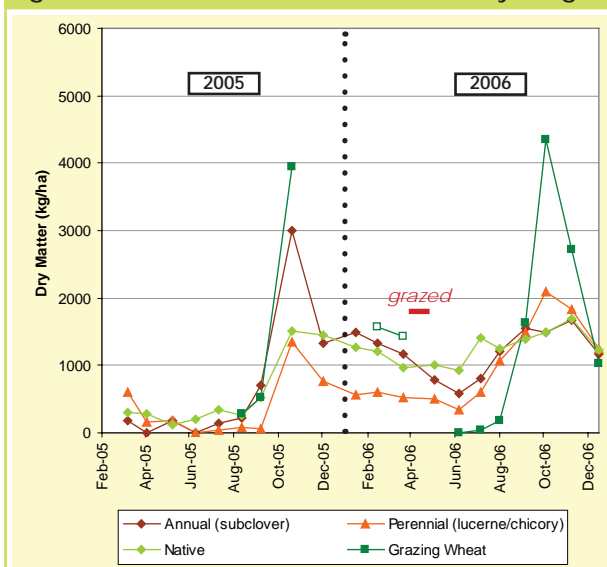
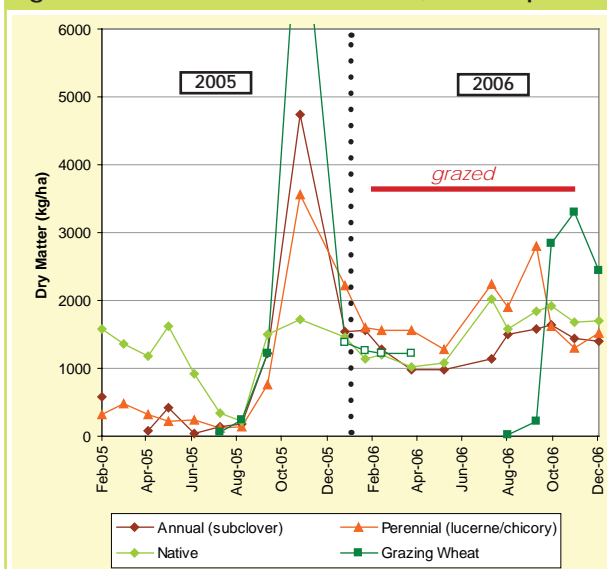


Figure 5d - Feed Curve 2005 & 2006, Sebastopol



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5b, stock grazing wheat stubbles and lucerne in February were supplementary fed.

*note that removal of leaf material through heavy grazing of lucerne would have resulted in feed quality testing lower than expected.

Autumn 2006

A typically dry period in the region, autumn 2006 received well below average rainfall. With stubbles now offering restricted grazing potential, stock were concentrated mainly on the annual pasture and lucerne paddocks, with native pastures providing some feed in early autumn. Supplementary feeding was still widespread due to continued poor feed quality.

Winter 2006

The 2006 season broke on the 10th June again, although compared to 2005, pasture growth seemed to respond more quickly due to warmer winter temperatures and greater leaf area. Grazing increased on annual, lucerne and native paddocks to take advantage of new growth from annual species and green shoots on perennials. Grazing wheats started to provide valuable feed from August. Feed quality improved significantly in response to new green growth.

Spring 2006

Unfortunately the response to the breaking rains in June was temporary, with lack of spring rainfall preventing the typical 'spring flush' of growth. Feed on offer tended to plateau out over this period with green feed in the pasture paddocks peaking around September/October. All paddocks were stocked to take advantage of remaining green feed, although this declined quickly with no new growth. Lack of rainfall prevented the lucerne and summer active species in some of the native pastures from responding as expected to provide valuable feed. Combined with a reduction in feed quality by November (Figures 5g - 5i), supplementary feeding would have again been required to prevent stock from losing condition.

Figure 5e - Feed Curve 2005 & 2006, Tarcutta

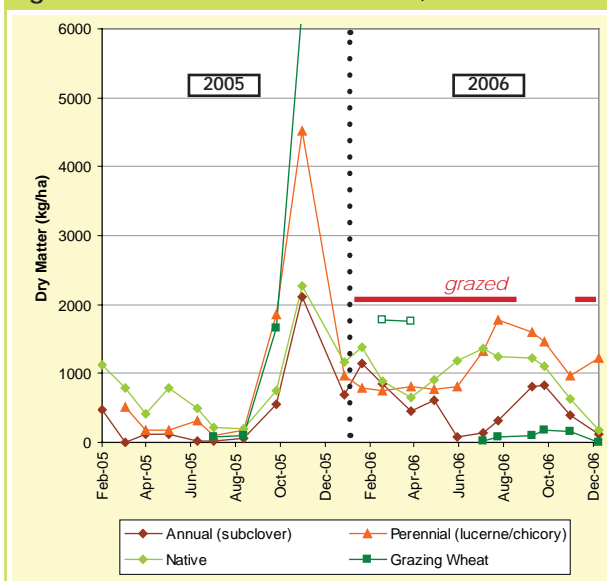


Figure 5f - Feed Curve 2005 & 2006, Tootool

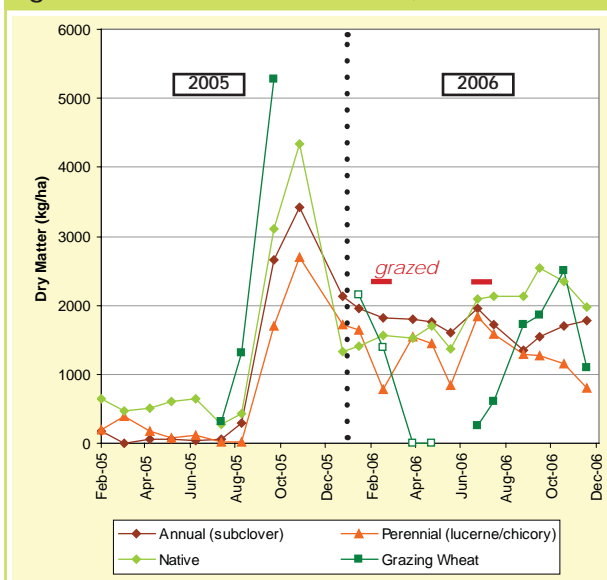


Table 5b - Stocking Pattern, 2006

Pdk type	Annual	Lucerne	Native	Grazing wheat/oats
Jan	✓✓	✓✓✓	✓✓	✓✓✓✓
Feb	✓✓	✓✓✓✓	✓✓	✓✓
Mar	✓✓	✓✓✓	✓✓✓	✓
Apr	✓✓✓	✓✓✓	✓✓	✓✓
May	✓✓✓	✓✓	✓	✓
Jun	✓✓✓✓	✓✓	✓✓✓	
Jul	✓✓✓✓	✓✓✓✓	✓✓✓✓	
Aug	✓✓✓✓	✓✓✓✓	✓✓✓	✓✓✓
Sep	✓✓✓✓	✓✓	✓✓	✓✓
Oct	✓✓✓✓	✓✓✓✓	✓✓✓	✓✓
Nov	✓✓✓✓	✓	✓✓✓✓	✓
Dec	✓✓✓✓	✓	✓✓✓	✓

✓'s indicate number paddocks grazed during that month.
 ✓ indicates supplementary feeding provided.

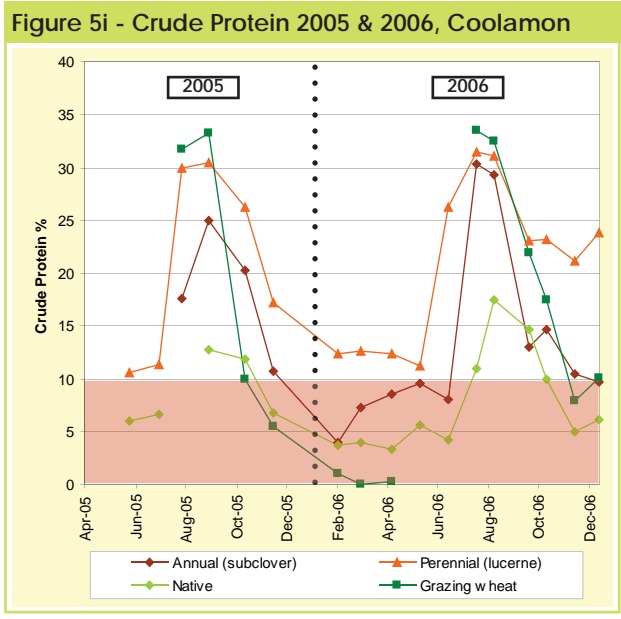
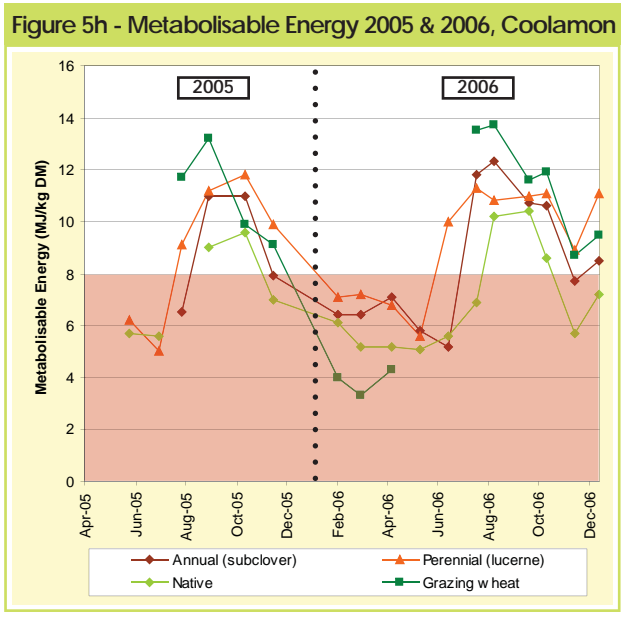
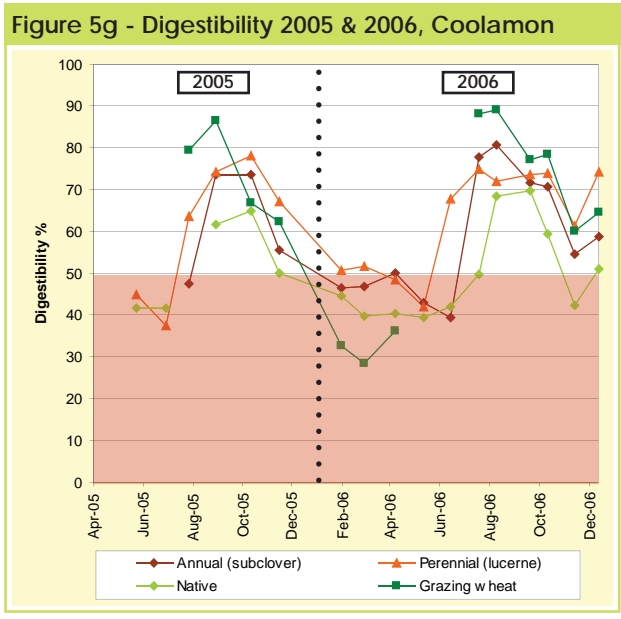
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Ground cover
 'Increasing duration of groundcover levels above 70% (50% for sandy loams), by at least 1 month a year for land used for agricultural production' is a major target in the Murrumbidgee catchment.

Ground cover levels on the Focus Farms were generally quite high considering the season (Figures 5m - 5q, following page). Annual and native pasture paddocks tended to remain above the 70% threshold throughout the year, except at Tarcutta where the annual paddock was grazed as a sacrifice paddock. Lucerne paddocks were typically variable, particularly as there was little opportunity for annual species to fill the gaps between lucerne plants. Ground cover was poorest in the grazing wheat paddocks where lack of rainfall meant paddocks struggled to accumulate dry matter. Stubble cover from the previous year's crop also generally fell short of the 70% benchmark by late summer.

Acknowledgements: all Focus Farm co-operators, Robert Scriven (MCMA), Sheila de Lange (MCMA), Guy McMullen (NSW DPI), Nigel Phillips (NSW DPI), Alison Bowman (NSW DPI), Greg Condon (Grassroots Agronomy).



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Figure 5j - Grazed wheat, Coolamon - Oct '06



900kg DM/ha, 32% ground cover, 78% digestible, 17.4% crude protein, 11.9% met. energy

Figure 5m - Ground cover 2005 & 2006, Coolamon

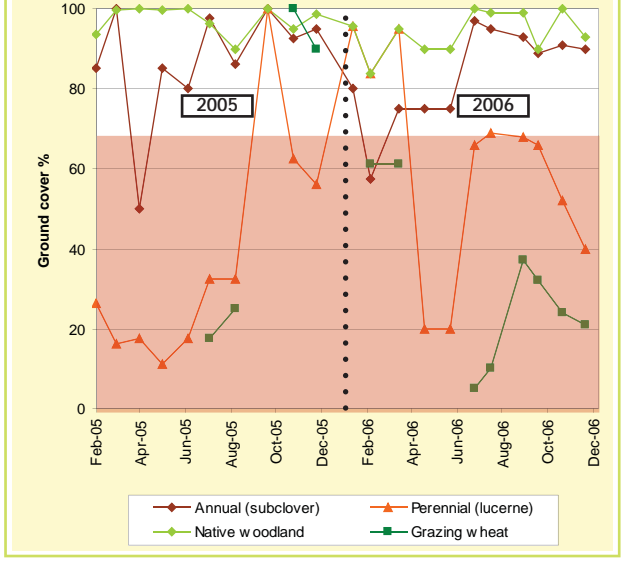


Figure 5k - Native paddock, Euroley Bridge - Oct '06



1500kg DM/ha, 91% ground cover, 55% digestible, 9.6% crude protein, 7.8% met. energy

Figure 5n - Ground cover 2005 & 2006, Euroley Bridge

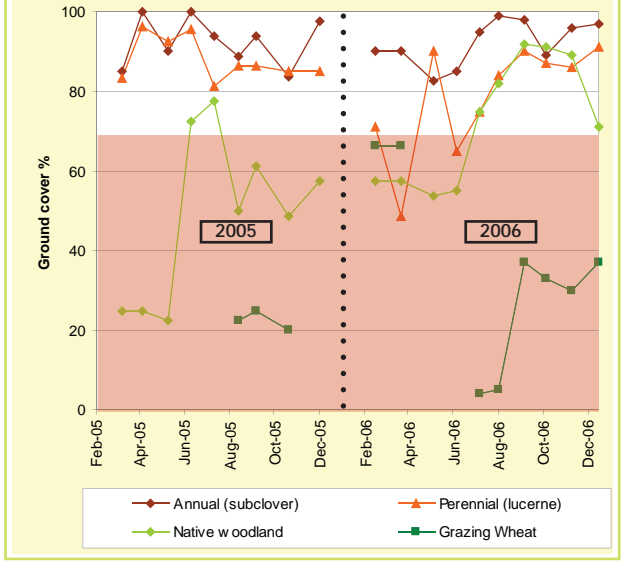
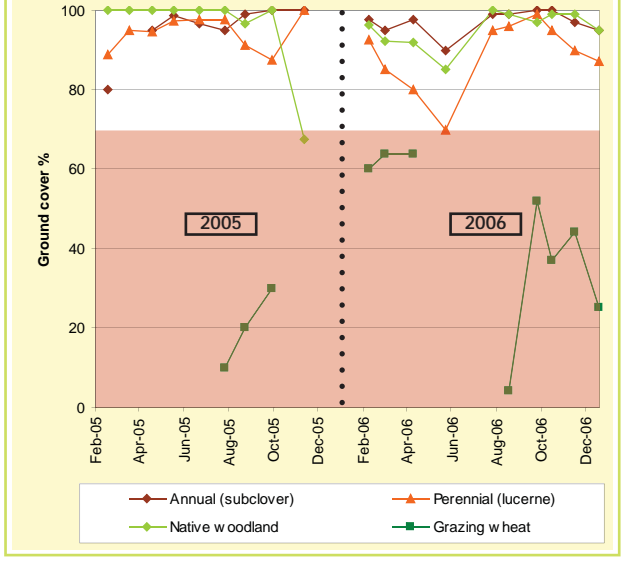


Figure 5l - Lucerne paddock, Sebastopol - Sep '06



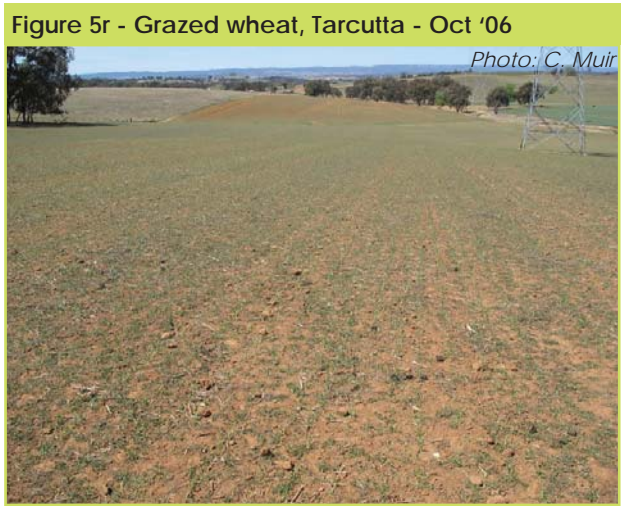
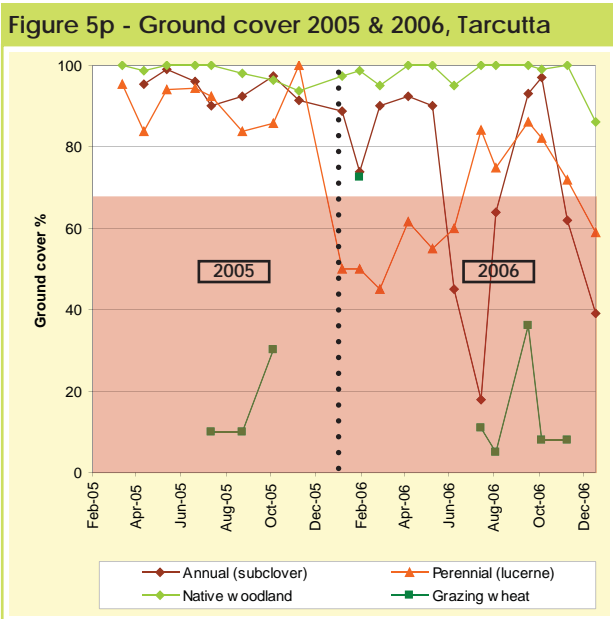
2800kg DM/ha, 99% ground cover, 76% digestible, 22.5% crude protein, 11.5% met. energy

Figure 5o - Ground cover 2005 & 2006, Sebastopol

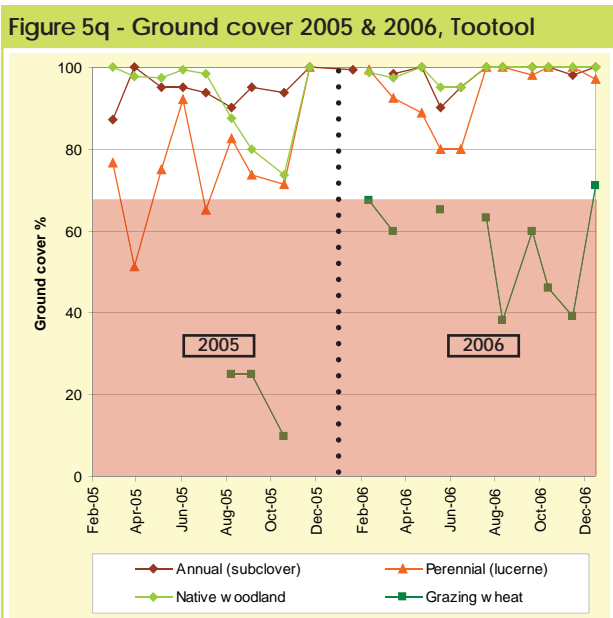


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170kg DM/ha, 8% ground cover, 74% digestible, 19.4% crude protein, 11.1% met. energy



1400kg DM/ha, 100% ground cover, 75% digestible, 18.6% crude protein, 11.2% met. energy

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6. Biodiversity

Project collaborators:

Sheila de Lange¹, Cassie West¹
(¹Murrumbidgee CMA)

Biodiversity is being monitored on each of the 5 Focus Farms by Sheila de Lange (Murrumbidgee CMA) as part of the National Biodiversity in Grain & Graze project. This project aims to determine the extent to which on-farm biodiversity is influenced by land use management, including cropping, grazing and non-productive or remnant vegetation areas, as well as by factors such as climate, soil type and topography. The data being collected includes:

- types of invertebrates (eg. spiders, ants & beetles) as indicators of environmental condition
- vegetation assessment (plant species and their abundance, ground cover, etc)
- soil microbial activity
- bird species
- soil characteristics

Results: Biodiversity sampling commenced at the beginning of April 2006 and will continue through to the end of 2007. Although most monitoring results are being collated nationally and are not yet available, results of the 2006 bird survey (conducted in autumn, winter and spring) have been compiled.

The surveys were conducted across 4 types of land use on each farm including cropping, pasture phase (lucerne), permanent pasture and remnant vegetation. Nearby (off-farm) areas of remnant vegetation were also surveyed for reference points.

- Areas of remnant vegetation on 3 of the 5 Focus Farms supported populations of the *Superb Parrot* (Figure 6a), *Brown Treecreeper* (Figure 6b) or *Grey-crowned Babbler* (Figure 6c), all of which are listed as vulnerable in NSW.
- Bird numbers were much higher in the remnant vegetation areas (both on-farm and nearby) than in the cropping or pasture paddocks (Figure 6d).

Figure 6a - Superb parrot (l: male, r: female)



Figure 6b - Brown Treecreeper



Figure 6c - Grey-crowned Babbler



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- However the off-farm remnant vegetation areas were of better quality and supported higher bird numbers than on-farm remnant areas. Off-farm areas consisted of an overstorey (eg. Eucalyptus), extensive mid-storey (eg. wattles, bursaria), native ground cover (eg. spear grasses) and fallen timber, all of which are essential habitat components for a variety of bird species. In comparison, although on-farm remnant areas had an overstorey of Eucalyptus trees, they often had less fallen timber and mid-storey, with a large proportion of exotic ground cover.
- Remnant quality was also found to affect the presence and diversity of small bird species (eg. *Striated Pardalote*, *Weebill* and *Red-capped Robin*), which rely on mid-storey plants, ground cover and fallen timber.
- The off-farm areas of remnant vegetation were also generally larger than the on-farm areas, meaning they could support higher species numbers.
- Connectivity of remnant areas is also important for birds to live, feed and breed in. The on-farm sites were generally more isolated than the off-farm sites which were connected to other patches of vegetation in the landscape. Connecting on-farm remnant vegetation to areas such as roadsides or neighbouring patches will increase the area and diversity of vegetation. Corridors of native vegetation at least 30m wide have been found to be optimum for encouraging bird species diversity.
- A total of 73 native bird species were recorded in the 2006 survey, compared with just 3 exotic bird species (*Common Starling*, *House Sparrow* and *Common Blackbird*). Lack of competition from exotic species means there is potential to rapidly increase native bird numbers and diversity through revegetation.

Source: Fact Sheet 1 - 'Bringing Back Birds: Focus Farm Bird Surveys 2006', S. de Lange & C. West (Murrumbidgee CMA)

