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MEAT & LIVESTOCK  
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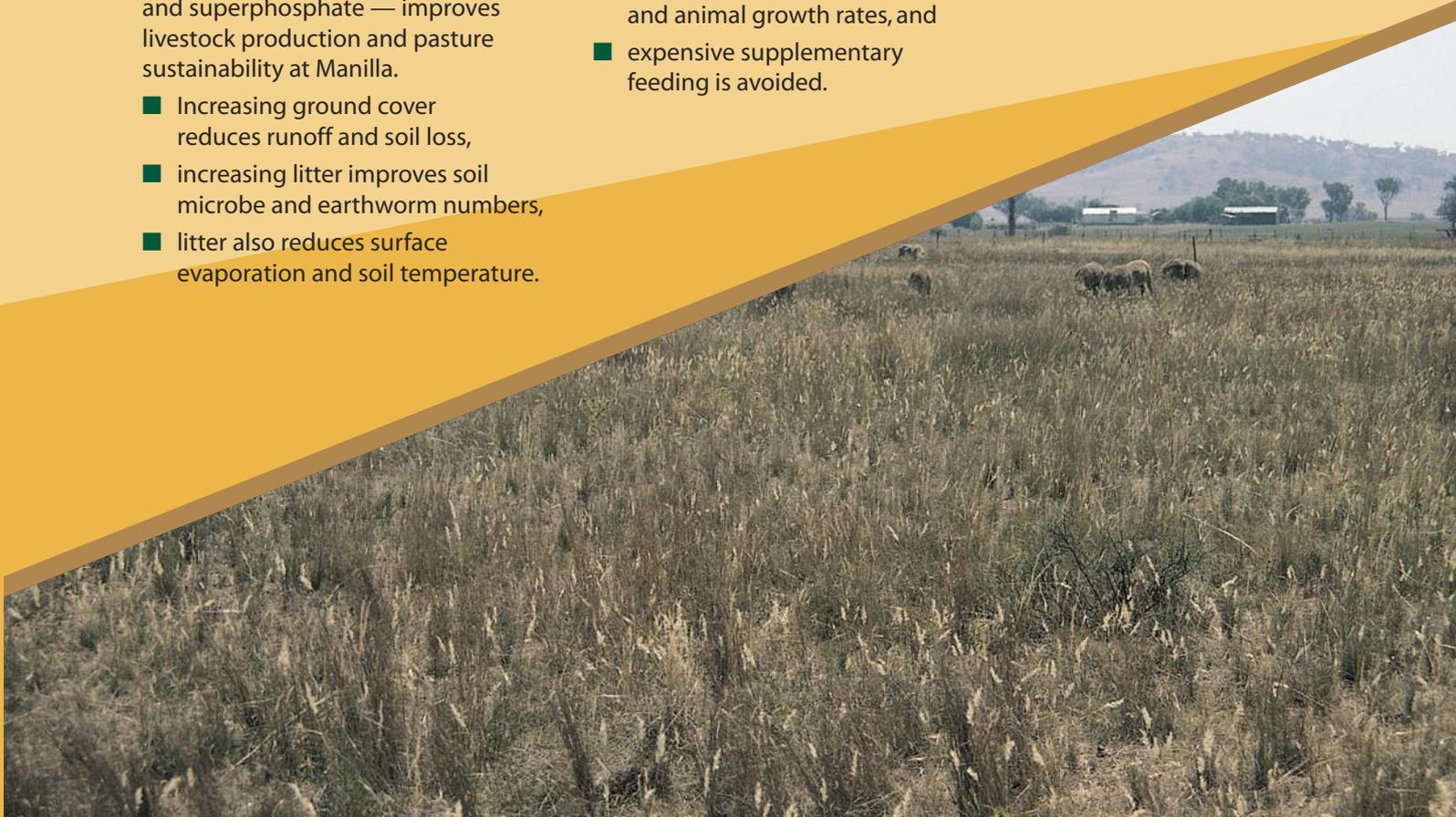
# Grazing Management for Native Pastures on the North West Slopes of NSW

Rotational grazing — and/or the introduction of subterranean clover and superphosphate — improves livestock production and pasture sustainability at Manilla.

- Increasing ground cover reduces runoff and soil loss,
- increasing litter improves soil microbe and earthworm numbers,
- litter also reduces surface evaporation and soil temperature.

The result is:

- Improved pasture production and animal growth rates, and
- expensive supplementary feeding is avoided.



# Experimental details *1997 to 2001*

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Two properties were involved — *Eloura* and *Springmount*, Manilla.

Average annual rainfall was 650mm.

The two soil types were a hard setting red and a brown cracking clay.

Main native grasses were wallaby grass and redgrass.



## Five grazing treatments were used:

- continuous grazing (four sheep/ha),
- continuous grazing (six sheep/ha),
- two paddock rotation (four weeks graze four weeks rest),
- four paddock rotation (four weeks graze 12 weeks rest), and
- continuous grazing with subterranean clover and superphosphate - "sub-and-super" (eight sheep/ha).

## Both continuously grazed unfertilised plots had:

- low ground cover and litter,
  - low soil microbe and earthworm numbers,
  - low herbage production,
  - high runoff and evaporation rates,
  - sheep that needed supplementary feeding.
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## Rotationally grazed plots compared with continuous grazing had:

- higher ground cover and litter,
  - high soil microbe and earthworm numbers,
  - higher herbage mass,
  - reduced runoff and evaporation,
  - animals that were not supplemented.
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## Sub-and-super plots compared with continuous grazing had:

- higher ground cover and litter levels,
  - increased numbers of soil microbes and earthworms,
  - higher herbage mass,
  - reduced runoff and evaporation,
  - higher animal growth rates and wool production,
  - more clover in winter and spring.
  - animals that were not supplemented.
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## Groundcover and runoff

Plants and litter combine to form ground cover. Ground cover must be maintained above 70% to reduce runoff and soil loss. Soil type also affects runoff and soil loss. The largest runoff was from the hard setting red soils.

## Litter

Detached plant material on the soil surface is litter. It has four very important roles:

- contributing to ground cover,
- reducing soil temperature fluctuations,
- decreasing evaporation losses by up to 50%, and
- providing food for soil micro-organisms and earthworms.

Litter quality is also important to the amount of soil fauna. At the Manilla sites:

Indicator species	Continuous grazing	Four paddock rotation	Sub-and-super
■ Soil micro-organisms (kg/ha)	160	480	720
■ Earthworms (number/ha)	200,000	750,000	1,100,000

## Pasture production

With both rotational grazing and sub-and-super there was an accumulation of total herbage mass. Hard setting red soils were more responsive to rainfall, leading to higher pasture growth.

By winter 2001, sub-and-super paddocks had an extra 1500kg/ha of dry matter and the rotationally grazed plots an extra 2000 to 2500kg/ha, compared to the best of the continuously grazed paddocks.

## Animal production

Sheep growth rates and wool production on rotationally grazed and continuous grazed treatments were similar. The rotation sheep did not have to be supplementary fed or sent for agistment.

In autumn 2001, sheep on sub-and-super were 5-9kg per head heavier than those continuously grazed at six sheep/ha and had averaged an extra 0.6kg of wool per head each year.

Ground cover effects on runoff —  
*Springmount 1998, total rainfall 717mm*

	Ground cover %	Runoff mm
■ 4 sheep/ha, 4 paddock rotation	90	0.6
■ 8 sheep/ha, Sub-and-super, continuous grazing	90	4.4
■ 6 sheep/ha, continuous grazing	45	63.1
■ 4 sheep/ha continuous grazing	50	18.8

## Economics

The average gross margin (GM) is calculated for 10 years based on clean wool prices for the 2000-01 selling season.

Grazing treatment	Wethers/ha (annual rate)	ELOURA		SPRINGMOUNT	
		Wool cut (kg/ha) (19.8 $\mu$ )	Av. GM \$/ha wool at 690c/kg	Wool cut (kg/ha) (19.5 $\mu$ )	Av. GM \$/ha wool at 713c/kg
Continuous	4	71	8 (10*)	40	-6 (10*)
Continuous	6	100	-29 (20*)	59	-57 (20*)
2 paddock rotation	4	65	36	41	19
4 paddock rotation	4	68	38	38	19
Sub-and-super	8	142	9 (8*)	101	27

*Wool cut (kg/ha) is the total for three years 1998-2000. Gross margin includes the extra costs of supplementary feeding, fertiliser, seed and application costs and extra stock. Capital investment costs such as fencing and water are not included for calculations on rotational grazing, since farm layouts and resources are variable and existing paddocks may be adequate. \* Numbers of weeks of supplementary feeding.*

Productivity from the rotationally grazed treatments was due to healthier pastures and better use of rainfall. This led to increased pasture production and a more even supply of feed throughout the year.

Fertilised native pastures also had healthier soils and better quality feed — although their gross margins were lower because wool fibre diameter was increased to about 20 $\mu$ . Breeding or fattening enterprises would be more profitable — or wool fibre diameter may be controlled by genetic selection.

## Conclusions

Continuous grazing and set stocking for long periods of time does not allow pastures to accumulate litter or maintain ground cover above 70%. Profitability is limited and the pasture and resource base is degraded.

Soil type and native grass species influences pasture response to rainfall and litter accumulation. In native

pastures with sub-and-super, the critical periods for the grazing manager are spring, summer and autumn. Avoid overgrazing in dry summers and in good years avoid rank growth in autumn. In good years graze heavily in spring to use green feed and promote flowering of sub. In unfertilised native pastures, aim to provide a supply of green forage from late autumn to early spring by encouraging winter growing species.

Managing a pasture system and the whole farm feed supply is a matter of balance. To be productive there are four main targets to aim for:

- Maintain ground cover above 70%.
- Have litter levels of 1500-3000kg/ha
- Rotationally graze instead of set stocking for long periods. This allows plants to grow before grazing and leaves pasture for litter accumulation.
- Have an adequate quantity and quality of forage for the type of stock that you graze.

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