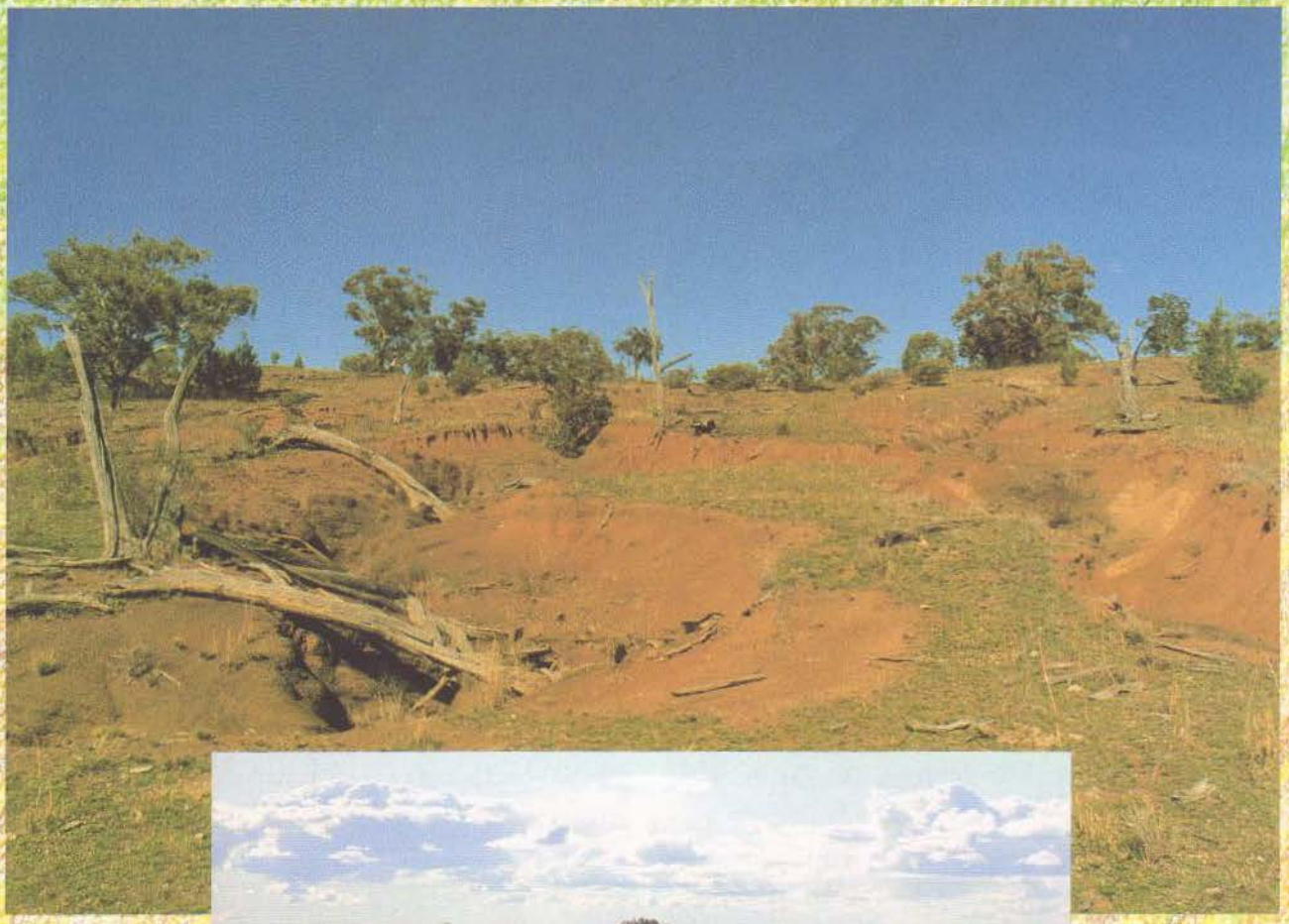
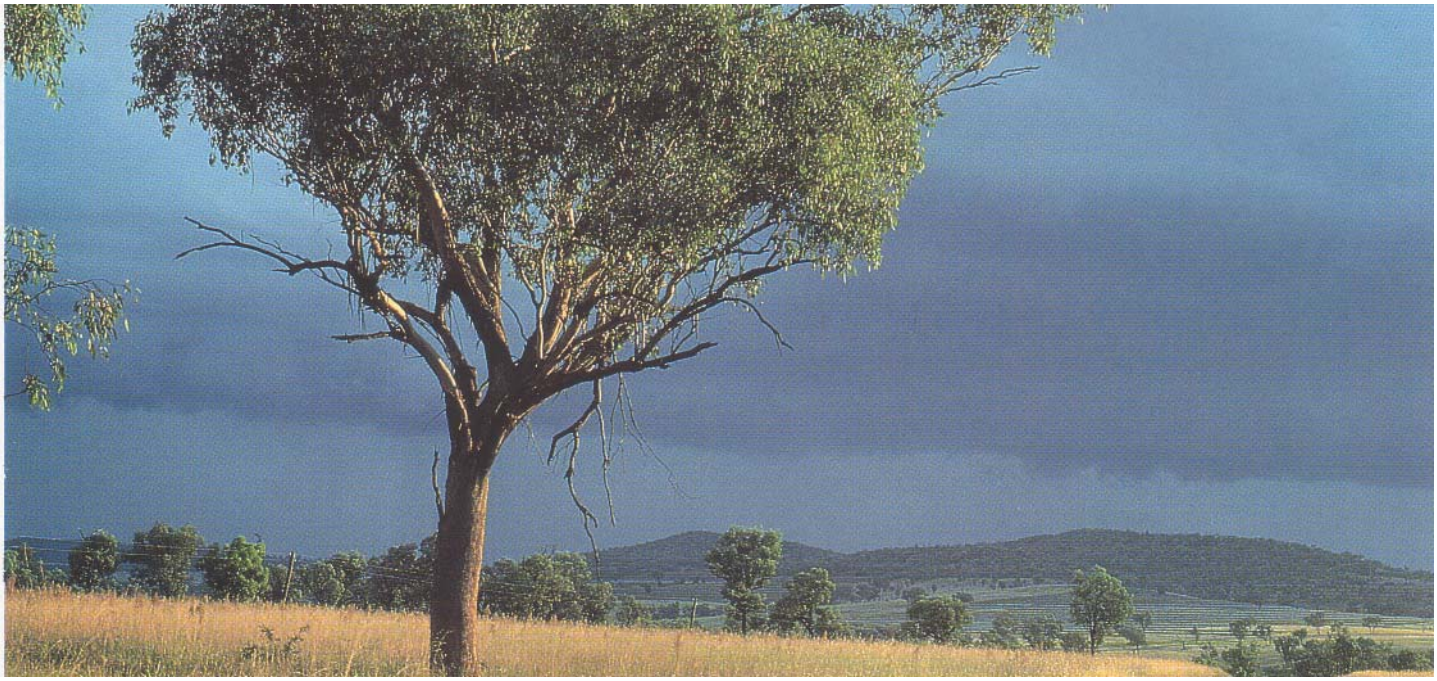
LAND & WATER CONSERVATION

THE COVER EQUATION

How much is enough?



GROUND COVER IS WORTH KEEPING COUNT OF



Good ground cover is important

Good ground cover is the most effective way of minimising rainfall runoff and reducing erosion.

Research by the Soil Conservation Service (incorporated in the Department of Conservation and Land Management, CaLM) at Scone, Cowra and Gunnedah has shown how ground cover, runoff and erosion are linked.

The message from this work is simple. To minimise runoff, and hence reduce erosion, land managers should aim for at least 70% ground cover on their paddocks.

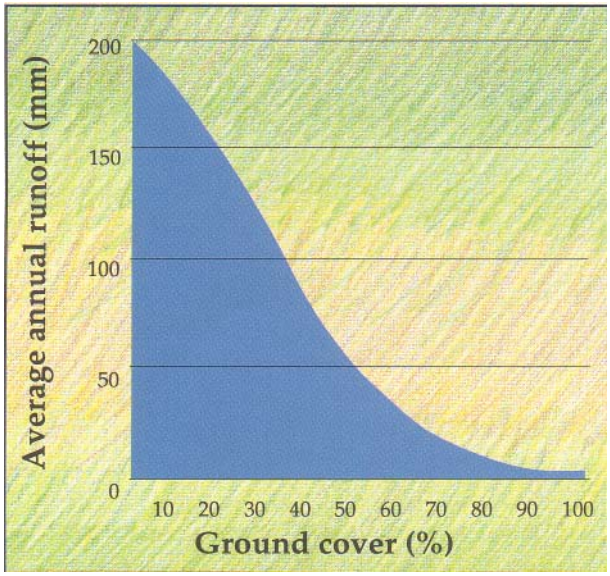
While good ground cover will reap clear benefits, when combined with better management of our soils, pasture and stock, it will also help to optimise returns and sustain agricultural production.

What is ground cover?

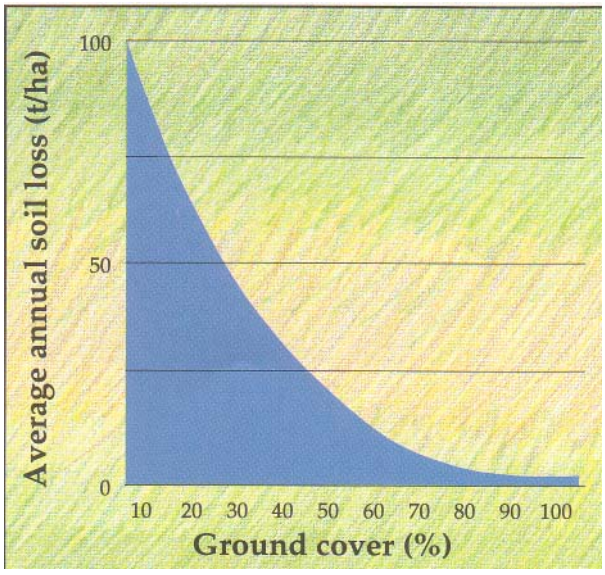
Ground cover, expressed as a percentage value, is all plant material that covers the ground including: crops, stubble, pasture plants and their residues, leaf litter, bark and twigs.

The amount of ground cover is influenced by on-farm factors, such as management, and by external factors, such as climate. As far as practicable, land managers should work within these constraints to maintain at least 70% ground cover.

What happens with different amounts of cover?



How much of YOUR soil is being carried away each year?



What are the benefits of good cover?

Better use of water

With more than 70% cover, most of the rainfall will soak into the soil and be available for plant growth. Naturally, good pasture management will mean that suitable plants can use this available moisture. However, with sparse ground cover, up to a third of the year's rainfall (on average) and up to 85% of individual storm events can runoff into creeks and streams.

Given that water is the most limiting factor in agricultural production in Australia, this amount of runoff can drastically reduce potential plant growth, production and, therefore, income.

Better use of fertilisers

Soil nutrients, particularly superphosphate, are concentrated in the top few centimetres of the soil. Therefore, even the loss of 1 millimetre of soil can remove a large proportion of recently applied fertiliser, like superphosphate. When this happens, both the fertiliser and cost of application is wasted and there is no benefit for plant production. Only the blue green algae in streams and rivers benefits.

Organic matter

Organic matter is important in nutrient recycling, increasing the availability of plant nutrients, improving moisture availability and soil stability, and in maintaining a healthy living soil.

Organic matter from leaf drop and animal dung is the first casualty of runoff. Being light, it is quickly transported into creeks where it is of no value to the soil, plants and animal investments on the hillslope.

Soil depth

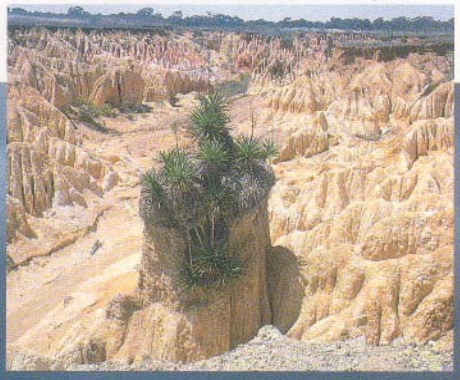
The "thicker" the soil, the greater its capacity to store water and nutrients.

While ever rainfall is adequate, soil moisture storage and availability are not issues. However, during dry spells and droughts, water availability can prove crucial to maintaining productivity and income and even survival.

Ground cover is an important component of sustainable production. Good management is the key to good ground cover.

Fertiliser application is expensive – don't lose it

Organic matter is valuable – it is easily removed



Topsoil grows better plants – it is expensive to replace

Critical times for pasture management

While good management is vital to overall farm operations, this priority is even more critical at certain times of the year.

Erosion risk is related to rainfall amount and intensity and therefore varies with season and whether your property is located in a summer or winter dominant rainfall zone. Good management of pastures and animals can ensure adequate cover, and erosion protection, when heavy rainfall is expected.

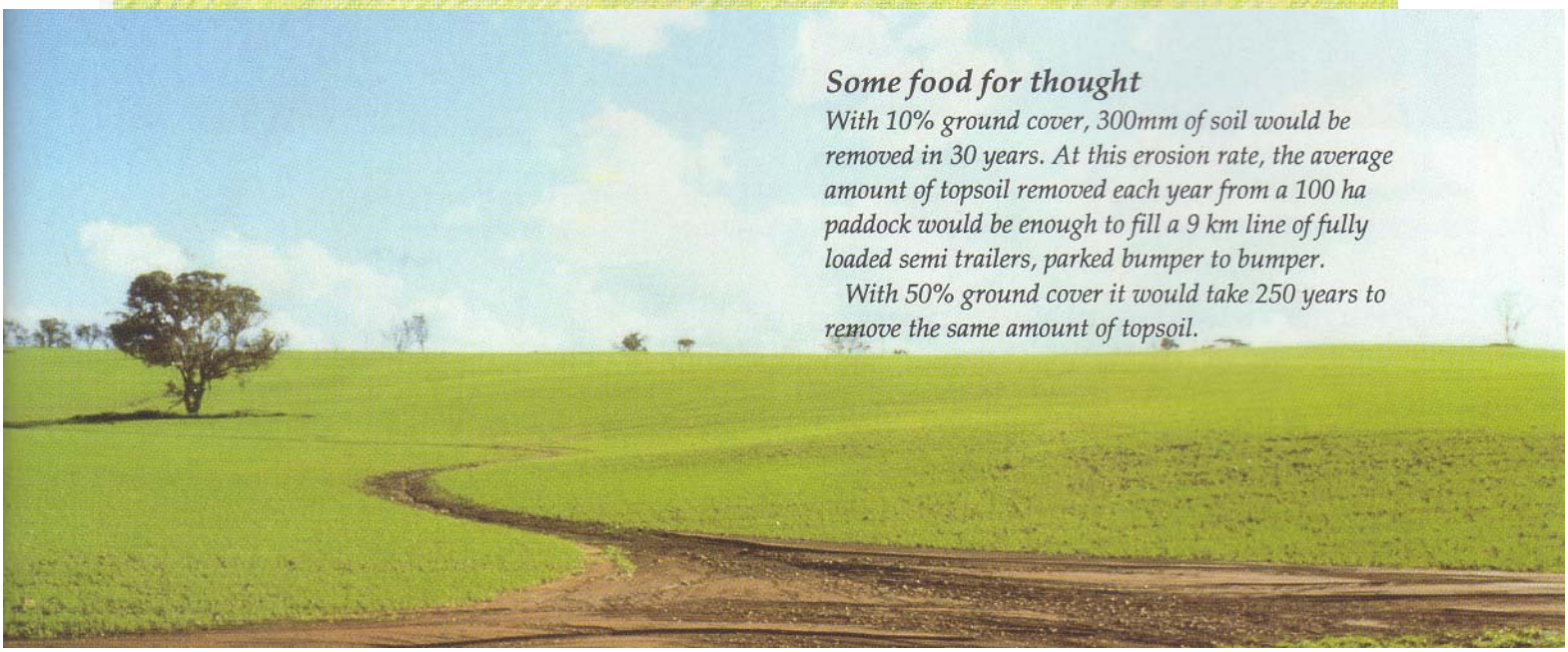
During drought times, maintaining 70% ground cover can be difficult but is achievable. With prior planning and effective grazing strategies during the dry spell, ground cover can be kept at an acceptable level.

Putting theory into practice

Since the mid 1980's, Dr Alex Costin (ex CSIRO and SCS) has successfully adopted a unique grazing plan on his property in southern NSW.

This system identifies three land units of different erodibility, based on slope and soil type.

UNIT CLASS	SLOPE	SOIL TEXTURE	SOIL INFILTRATION	SOIL ERODIBILITY	COMMENTS
1	Steep hills	Fine	Low	High	Cover is not allowed to fall below 70%
II	Rolling hills, short to medium slope length	Coarse	High	Moderate	Cover can fall below 70% when the risk is low
III	Flat and ill defined	Medium	Moderate	Moderate	During dry times stock are progressively brought to unit III country. Drainage lines are protected. Although water may pond and even runoff, erosion damage is minimised.



Some food for thought

With 10% ground cover, 300mm of soil would be removed in 30 years. At this erosion rate, the average amount of topsoil removed each year from a 100 ha paddock would be enough to fill a 9 km line of fully loaded semi trailers, parked bumper to bumper.

With 50% ground cover it would take 250 years to remove the same amount of topsoil.

Knowing how much cover you have

The step point and wire point methods are two ways of estimating how much cover you have.

1. Step point method

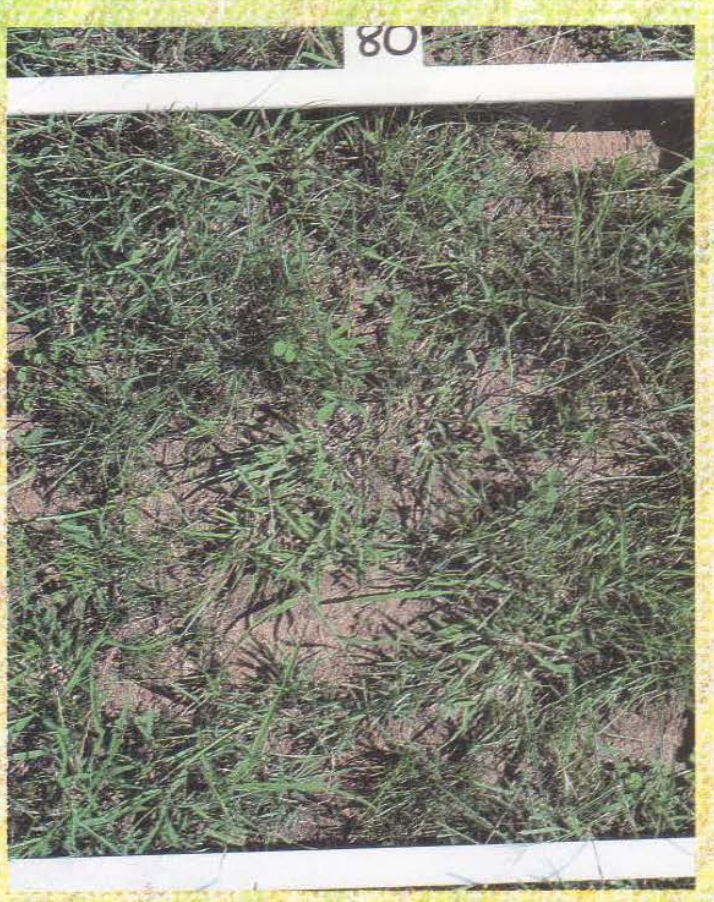
- Make a 1mm wide mark on the toe of each boot.
- Walk across the paddock, in **a straight line,** taking equally spaced steps.
- At each step, record the occurrence of bare ground or cover, **directly below the mark.**
- Take at least 100 recordings, preferably 200.

2. Wire point method

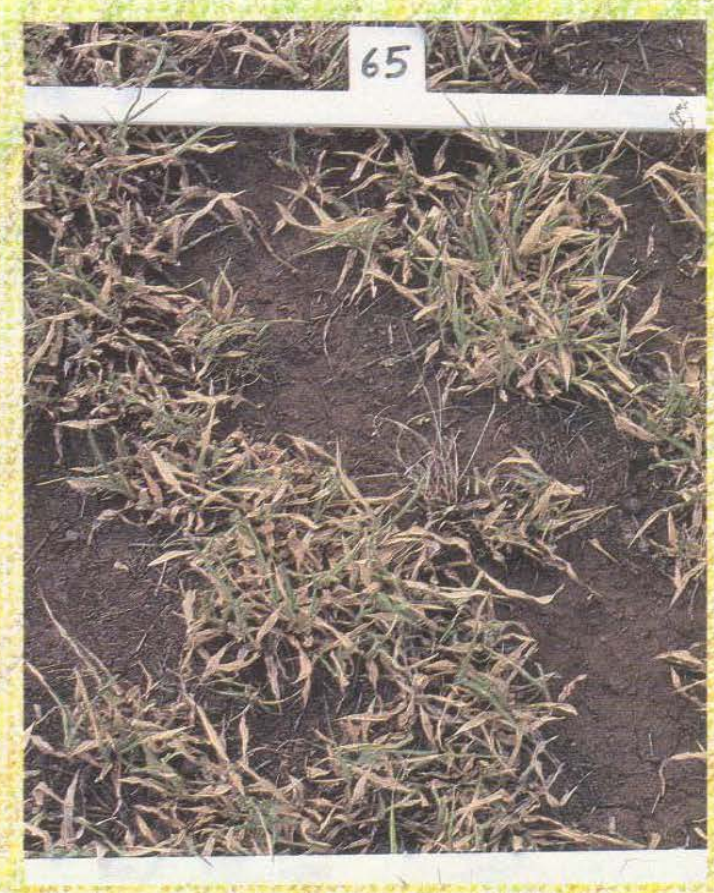
- Walk across the paddock in a straight line.
- At each step, hold a 1 metre length of fencing wire vertically to the ground from the outstretched hand (without looking). Record the type of contact - bare soil or cover - for between 100 and 200 recordings.

For both methods it is important to choose a transect before you arrive so you do not subconsciously choose a better part of the paddock.

NOW record your results.



80% cover: small patches of bare ground are surrounded by vegetation which mostly absorbs any runoff and sediment



65% cover: larger patches of bare ground are linking up, the vegetation is less able to absorb any runoff and sediment

Ground rules for maintaining cover

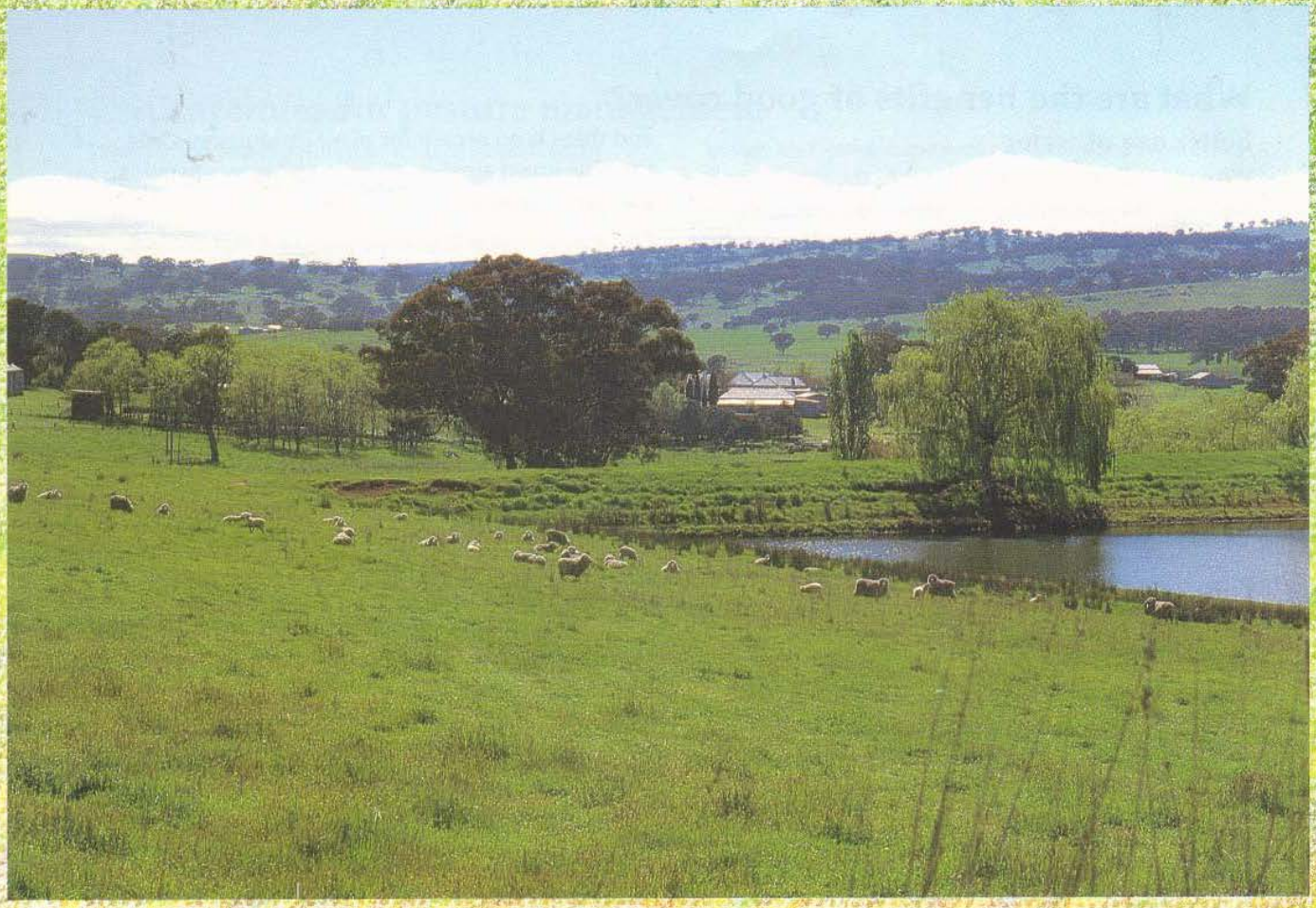
Minimum cover values for individual properties can vary according to soil type, vegetation, topography and climate. Generally, more cover will be needed in the following situations.

Soils: Where water intake is restricted by poor infiltration and shallow soil, erodibility is increased.

Topography and landform: Where overland flow is concentrated.

Climate: Where rainfall amounts and intensities are high.

Vegetation: Where tussocky species can divert flow and during summer in annual subterranean clover/ rye grass based pastures where decaying litter can be easily moved by overland flow.



Develop an action plan

- Become familiar with different methods for assessing % ground cover and test them out. (The photos might help). Choose the one that best suits you and USE IT.
- Admittedly, maintaining good ground cover isn't always easy. While each property is different, all land managers should try to aim for 70% cover or more; the best insurance against erosion.
- Time operations that reduce the amount of ground cover, such as burning, to coincide with the season of most gentle rain. For instance, spring and summer burning, in summer dominant rainfall areas, can cause massive erosion.
- Research shows that if half of a catchment is completely bare and the other half vegetated, erosion will still be influenced by the bare half. This same principle applies to individual paddocks. If some parts of your paddocks are well covered but other parts are bare, erosion can still be serious on the bare patches.
- Consider ground cover when making management decisions and encourage other landholders in your catchment to focus on % cover as well.
- Form a Landcare group to address erosion and other issues in your catchment.

For more information

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Produced by Research Officer, Des Lang and Research Liaison Officer, Michelle Holmes. Department of Land and Water Conservation (formerly the Department of Calm and DWR).
Funded by National Landcare Program (NLP).
Design by Media Graphics (06) 295 8064.
Reprinted June 1995.