

tips & tools

NATURAL RESOURCE MANAGEMENT



Managing ground cover to reduce run-off and water loss

Water is the key to successful agriculture and the health of our ecosystems. Better management of ground cover can reduce run-off and increase the rainfall available for plant growth resulting in possible increases in productivity.

Principles

Maintain ground cover – at least 70% on low slopes, and up to 100% on higher risk steep areas. This will reduce run-off water and soil loss leading to more rainfall infiltration and protection from high intensity storms.

Maximise rainfall use by pasture – manage surface run-off to maximise infiltration, increasing pasture growth. Less surface run-off also decreases soil surface evaporation. Soil organic matter levels improve and the risk of erosion decreases.

Fence off wet areas – exclude stock and protect pasture roots and soil from compaction and pugging, contributing less sediment and nutrients to run-off water.

Fence off gullies or active erosion sites – in some cases, regeneration may require earthworks as part of the restoration process.

Avoid making permanent wheel tracks on slopes – water can flow down these, starting the erosion process. This can also occur with livestock tracks.

Tactics

Autumn

Maintain 800kg DM/ha dry feed during autumn to ensure at least 70% ground cover (including both plants and litter). In steeper paddocks aim for 100% ground cover and around 1,000kg DM/ha dry feed. High litter levels may reduce sub-clover germination at the break, especially in phalaris based pastures.

Apply fertiliser early (up to a couple of months before the autumn break) ensuring available nutrients for active plant growth and seedling establishment. Target those paddocks with more responsive grasses and clover

Key benefit

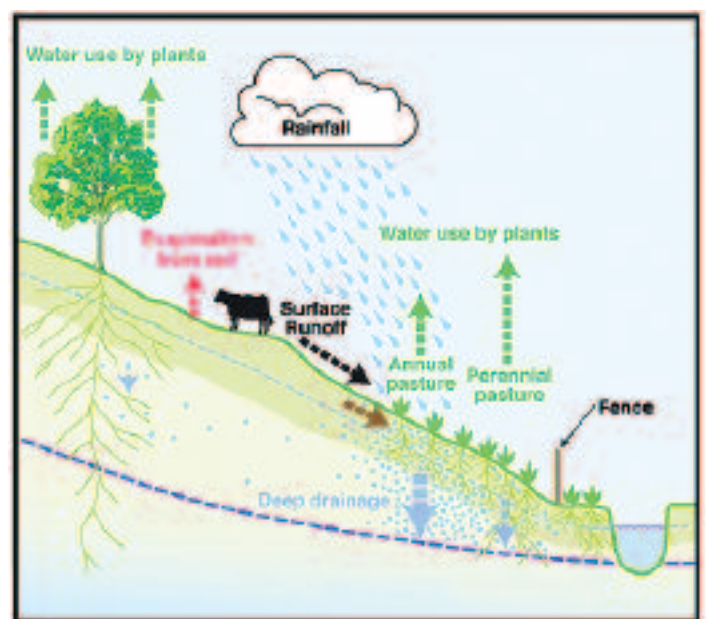
- Seasonal management of ground cover and rotational grazing can help avoid run-off, water loss and erosion.

species. Rest (using rotational grazing) for more rapid pasture growth after the break.

Winter

Rotationally graze to maximise growth and water use by winter-active pasture species. Keep pastures between 1,000kg and 1,500kg green DM/ha (3–5cm high).

Prevent grazing in wetter areas (particularly soaks) to avoid pugging, which can reduce water infiltration, damage pasture roots, and lower the potential for rapid pasture growth in spring.



Any rain that falls must eventually end up as transpiration (water use by plants), evaporation (from soil and litter), run-off (from the soil surface) or deep drainage (below the root zone).

Spring

Maximise plant growth and litter accumulation using tactical rotational grazing, keeping pastures between 1,500kg and 2,500kg green DM/ha (5–12cm). To increase litter levels in targeted paddocks, allow pasture to accumulate 3,000kg green DM/ha by late spring.

Aim to maintain the ground cover in early summer, reducing water loss through evaporation and extending the growing season.

Aim for two to three handfuls of litter per 0.1m² (one foot square), with a preference for actively decaying litter (not old and lifeless) and some surface litter remaining to protect the ground.

Summer

Maintain minimum ground cover (both plants and litter) of 70%, to manage run-off, reduce erosion from summer storms, minimise evaporation from bare soil and insulate the soil from temperature extremes.

As the slope steepens, increase ground cover targets to 100% to protect the soil and keep its surface soft and friable, allowing rainfall infiltration.

Any undecomposed pasture benefits from trampling, particularly in lower rainfall areas where decomposition by bacteria and fungi are limited by moisture.

Run-off facts

Managing ground cover (reducing run-off and soil erosion) can increase rainfall available for plant growth by 150mm per year.

Each 1mm of topsoil lost through sheet erosion is equivalent to around 9 tonnes of soil/ha. At a ground cover of only 40%, topsoil losses can be around 4mm per year. By comparison, at 70% ground cover, soil loss = 0.3mm per year. Although run-off water can remove soil and nutrients from pastures, good, clean run-off water is essential for surface water resources in catchments.

Phosphorus loss through run-off is generally low in regularly fertilised paddocks because they generally have increased ground cover and litter levels. Any run-off that causes erosion will contain higher levels of phosphorus. Native pasture catchments generally have lower soil phosphorus levels, but can be susceptible to overgrazing which often leads to higher run-off and erosion.

Perennial species maintain ground cover better during summer and autumn than annuals. Even if the majority of above-ground material is removed, plant roots and crowns continue to bind and protect the soil.

Management tips

Regularly assess the percentage ground cover, litter levels, 'hardness' of the soil surface and proportion of productive species (perennials and legumes) in grazing areas.

A combination of 70% groundcover with rotational grazing stimulates high green leaf and plant vigour and combines good plant production with sustainability.

Where high intensity summer storms are likely, aim for medium to high levels of litter (>2–3 handfuls per 0.1m²) to protect the soil surface.

Bare soils that lack adequate ground cover (often as a result of poor grazing management) are also susceptible to surface crusting and compaction, as well as soil erosion.

Native grasses such as kangaroo grass provide excellent ground cover due to their growth habits.

Glossary

Groundcover: The percentage of ground covered by plants (live or dead) and litter.

Litter: A combination of actively decaying and old, lifeless plant material on the soil surface.

Acknowledgments

PROGRAZE® and PROGRAZE Update course notes – segment on 'Production, profit and sustainability'
Kathy Junor, technical editor

Further information

This *Tips & Tools* is part of a series on grazing management that provides best practice pasture management information. The *Towards sustainable grazing* booklet can be purchased from MLA. Other relevant *Tips & Tools* can be found at www.mla.com.au under Information Centre.

For further assistance contact your local pasture or livestock advisor.



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