How do I ...

respond to challenges in grazing mixed pastures?

The issue:	Managing for optimal perennial grass and legume growth and survival is not always achievable due to seasonal constraints and competing livestock demands. Sown perennial grasses and legumes also differ in their grazing requirements and, at times, can conflict with each other.
The impact:	Pastures under stress are slow to recover and become vulnerable to plant loss and weed invasion. Desirable grass or legume content is reduced if management is not balanced enough to meet all grazing requirements. Resowing pastures is expensive and risky.
The opportunity:	There are commonly occurring challenges in grazing mixed pastures. Knowing what actions to take to assist pasture recovery and balancing the grazing requirements of different species, helps restore productivity and maintain persistence.

The desired optimal pasture management is not always achievable and this is the grazing challenge. While these challenges can be unavoidable at times, producers can control what happens next via management.

Recognition of what to do following stressful periods for pastures and having flexible grazing systems which respond appropriately, help maintain a good balance of desired grasses and legumes.

This fact sheet describes the common challenges faced by producers and the grazing responses they can apply to help pasture recovery.

High demand on pastures during lambing is one grazing challenge.

The pillars to support a flexible grazing approach

Having the pillars of sound grazing management in place is necessary so the appropriate tactics can be more easily applied. A flexible, often paddock-specific, and seasonally responsive approach is required, especially if it also involves the use of herbicides and/or fodder production.

The pillars of management to support the productivity of desired pastures include:

- **Numbers:** Having the right animal demand or stocking rate to enable the appropriate grazing intensity. Too many animals make it difficult to achieve periods of spelling; too few animals result in pastures being overgrown, which in the long term, will reduce sub-clover content, tiller formation and tiller growth.
- **Timing:** Enterprise operations and interventions must match feed supply. Considerations include the buying and selling of animals, lambing and calving times, fodder conservation, herbicide manipulation and containment feeding.
- **Soil management:** Sown species have greater demands for nutrients than native grasses. Satisfying nutrient demands allows plants to grow more and compete better against weeds. Nitrogen also helps stimulate tillering.
- **Weed control:** Competition from other plants can have a significant influence on the abundance of desired pasture species. Prolific and rapidly growing annual grasses and broadleaf weeds compete for light, nutrients and soil moisture. Depletion or removal of these competitors provides greater potential to increase the proportion of desirable plants.
- **Dry-time strategies:** Having containment or sacrifice areas to confine large numbers of animals, minimises the risk of over-grazing and allows pasture recovery. They are also a convenient and efficient way of feeding livestock, rather than having to feed across multiple paddocks during feed shortages.

Grazing approaches

Applying different grazing approaches in response to seasonal conditions and livestock requirements is the key to good grazing management. Grazing method refers to the duration and intensity of grazing. Different methods result in different pasture responses, favouring some species over others. There are four main grazing methods:

- **Rotational grazing** involves a period of grazing followed by a period of spelling. For example, a four-paddock rotation may involve two weeks of grazing followed by six weeks of rest (approximately 40 days during the growing season and up to 70 days in summer). This favours perennial grasses over annual sub-clover and over time, sub-clover content will decline. Bringing clover back into pastures will require pastures to be grazed short to maximise leaf and, ultimately, flower production and seed set. Rotational grazing systems which involve longer rest periods in late winter and spring (greater than 40 days) when growing conditions are good, are likely to decrease feed quality by reducing sub-clover content further and increasing the proportion of dead leaves on the grasses. Long rest periods are appropriate for environments when moisture or cold temperatures constrain plant recovery.
- **Intensive rotational grazing** involves grazing for short periods (one to three days) followed by rest until the full complement of leaves per tiller has regrown to optimise growth. As a result, these systems are generally capable of running more livestock. However, they have higher labour requirements as stock have to be moved frequently, require more skill in managing and generally require more infrastructure to support small paddocks (three to five hectares).
- **Continuous grazing** (set stocking) is when animals are kept in the paddock for long periods of time and the pasture is rarely rested from grazing. This system keeps pasture short, favours growth of annual species over perennial grasses and over time, pastures become dominated with annual species such as sub-clover, broadleaf weeds (capeweed, erodium) and annual grasses. Perennial grass persistence and productivity will be reduced.
- **Tactical grazing** is where a combination of methods are used in a flexible approach which allows producers to better meet their pasture and livestock objectives.

Grazing approach – which one is best?

The ideal grazing approach is one which retains flexibility, but also adopts the most suitable tactics depending on the situation. This requires a producer/manager who can observe the right signs and respond in the right way. The key is to recognise what approaches to try to apply and what situations to try to avoid. This will change at different times of the year. Some suggested grazing approaches for favouring desirable species are listed in Table 1.

Table 1. Goals for grazing.

Period	Try to avoid	Try to achieve	Possible grazing approaches
Summer	Prolonged grazing when plants are potentially under heat and moisture stress.	Removal of reproductive tillers (if not attempting to recruit new seedlings).	Short periods of high-intensity grazing followed by long periods of rest. This may require: • boxing mobs together • reducing paddock size through temporary fencing • grazing paddocks with species which tolerate dry hot conditions better (tall fescue or phalaris) but then providing additional recovery time after the break • containment feeding.
	Grazing any unseasonal green pick, unless at least the two-leaf stage is reached.	Reduced ground cover (1,000kg/ha loose litter) to optimise hard seed breakdown in sub-clover.	
	Over-grazing which leads to large areas of bare ground.	A minimum of 70% ground cover in flat country and 90% in hill country.	
Autumn break	Grazing before grasses have reached the two-leaf stage.	A period of spelling to let new growth occur, especially to reach pasture targets (build a feed wedge), to meet animal demands when conditions of high leaf emergence are favourable, before cold temperatures restrict growth.	Maintain or start: • containment feeding in paddocks with more robust species (tall fescue, phalaris) or unimproved flat paddocks with soils with high clay content that have low erosion risk. Graze paddocks which have been spelled over summer first or select paddocks scheduled for sowing or unimproved pastures.
	Grazing before sub-clover has reached the three trifoliate leaf stage.	Adequate leaf area going into winter, to maximise light capture.	
	Early grazing of paddocks that have been grazed for long periods over summer.	Maximum period of recovery after the autumn break.	
Winter	Re-grazing before grasses have reached the two-leaf stage.	Spelling between grazing events, which allows replenishment of plant fuel reserves.	Extend the period of grazing in paddocks to match slowing leaf emergence. This may result in longer-than-ideal grazing period length, however the downside is more than offset by the benefits of spelling other paddocks and encouraging spring sub-clover growth.
	Allowing the grasses to get overgrown, which will hamper sub-clover growth.	Grazing pastures short (three to five centimetres) to encourage leaf development of sub-clover.	Reduce excessive growth by using herbicides (spray-grazing or winter cleaning) to remove undesirable weeds.
Spring	Exceeding the maximum number of live leaves for the dominant grass species, which wastes feed.	Maximise tiller or bud set. For perennial grasses: • do not exceed pasture height in excess of 3,000kg DM/ha or 12–14cm • allow seed heads to emerge on phalaris, tall fescue, perennial ryegrass and cocksfoot.	To maintain current pasture condition – increase grazing time and reduce spelling time to match leaf emergence rates, even if this means leaving higher residual pasture than in winter.
	Overgrown pasture, where light cannot penetrate to the base of the canopy.	Maximum sub-clover seed set by allowing light to reach the crown of sub-clover plants.	Reallocate paddocks for fodder conservation. • Perennial ryegrass is better suited for silage, as earlier cutting enables light to reach the base of the plant, stimulating tiller formation while moisture is still available. • Phalaris is better suited for hay, allowing seed head development before cutting. Or preserve paddock quality through herbicides (spray-topping) and to reduce annual weed seed set.

Possible challenges

Rarely do once-off unfavourable grazing practices cause a decline which cannot be reversed, except perhaps for continuous grazing during extended hot and dry periods which results in plant death. It is repeated, unfavourable grazing which can create problems.

Knowing how to adapt the grazing response to previous unfavourable grazing is important. The following examples illustrate some possible grazing scenarios, what an appropriate grazing response might be, and the reasons why (Table 2). Test your understanding by reading the scenario and decide what grazing response you would undertake and then check your answer with the grazing response recommended and the reasoning.

Table 2. Possible scenarios and appropriate grazing response.

Scenario	Your suggestion	Ideal grazing response	Reasoning
A paddock which has good shelter is used for an eight-week lambing period starting in July.		Provide a longer period of spelling post-grazing.	Plant reserves are likely to be depleted. To replenish these reserves wait until at least the full complement of live leaves per tiller have grown back before grazing (three for perennial ryegrass and tall fescue and four each for phalaris and cocksfoot).
A spray-grazing approach is applied to a paddock to remove capeweed.		Provide a longer period of spelling post-grazing.	Spray-grazing requires the removal of all capeweed leaf area post-spraying, to ensure the plant doesn't recover. This grazing approach will also deplete desirable grass reserves.
A phalaris paddock which has plants with small crown size needs to 'stool out'.		Avoid grazing while seed heads form but then graze to remove dead seed heads before the autumn break.	As phalaris forms reproductive tillers, dormant buds are created in the tiller base, which help the plant survive over dry summers. When dormancy is broken (through rainfall and mild temperatures), these buds shoot to provide new tillers. Radiation capture is inhibited by shading from dry litter and therefore assimilation of carbohydrates and leaf growth is reduced. Shading also reduces tillering which is needed to help the plants 'stool out'.
A perennial ryegrass paddock is 'locked up' for hay. After cutting there is inadequate moisture for regrowth.		Minimise summer grazing, avoid hay cutting again the following year.	The accumulated growth has reduced light reaching the crown of the perennial ryegrass, so development of new tillers has been reduced and so the pasture is likely to have thinned out.
A perennial ryegrass paddock has reduced plant density and seedling recruitment is considered.		Avoid grazing after flowering until seed shedding. Graze excess dry material in as short a time period as possible (i.e. use largest mobs). Spell after the autumn break.	Unless spelled, stock will eat seedheads and seeds will not survive digestion. Excessive dry material restricts light reaching the crown and the formation of new vegetative tillers. It also prevents hard seed breakdown of annual legumes. New seedlings need to be anchored before grazing to avoid being pulled out by livestock.
Spray-topping is applied to a paddock in spring to sterilise annual weed seeds.		Graze other paddocks first, but priority must then be given to the spray-topped paddock.	Many 'good' paddocks will require utilisation of mature feed which rapidly declines in feed value in late spring. Post spray-topping, feed quality and palatability is preserved for a short period due to a herbicide effect making the pasture more attractive to stock. Graze to remove any possible missed seedheads and make use of feed quality before the herbicide effect wears off (four to six weeks) or until heavy rain.

Scenario	Your suggestion	Ideal grazing response	Reasoning
Paddocks have become grass dominant with current grazing and more sub-clover is desired.		Graze the pasture short over late winter and early spring.	The seed bank of sub-clover may have become depleted. Keeping pastures short enables light to reach the crown of the sub-clover plant and stimulates leaf production. Flowers and leaves grow from the same point on a runner. The more leaves produced, the more flowers, and, therefore, more seeds formed which are available for germination.
Feed demand is high following a post-autumn break but sown grasses have not regrown their full complement of leaves and sub-clover is still a seedling.		Graze if plants are anchored and grasses have grown back a minimum of two leaves per tiller and sub-clover plants have produced the spade leaf. Once grazed, allow grasses to regrow their full complement of leaves.	Livestock can pull out whole plants when grazing at the autumn break, as root growth has declined over dry summer conditions. Plants initiate root growth with the emergence of the second live tiller leaf, and in sub-clover the emergence of the spade leaf allows the lower stem (hypocotyl) to be pulled underground, helping to anchor the plant. If plants are not well anchored, seek to contain and supplementary feed stock in sacrifice paddocks or confinement areas until annual legumes have produced three trifoliate leaves and grasses have regrown their full complement of leaves. This allows plants to be well anchored, restore fuel reserves and maximise sunlight capture and therefore plant growth.
A new pasture has been sown but weeds are competing heavily with it. The sown plants are well anchored.		Graze using high stock numbers for a short time period (three days or less), then spell.	Some weeds grow quickly and can shade or smother the slower growing sown plants. Grazing opens the pasture up and allows more light to reach leaves and crowns to encourage grasses to grow faster and tiller and 'stool out', and clovers to grow more leaves. High grazing pressure reduces stock selectivity and forces them to eat weeds. Spelling and allowing flowering helps maximise plant size, replenish carbohydrate stores and form buds that help plants survive their first summer.
Old, dry, reproductive tillers remain on perennial grasses in mid-summer.		Graze to remove productive seed heads (possibly with supplementation).	Excessive dry material can slow pasture growth rate at the autumn break. Dry mature feed will be deficient in both energy and crude protein and stock may benefit from supplementation in the absence of green plants. Provision of protein can increase intake of dry feed by providing gut bacteria with nitrogen which is needed to digest feed.
In spring, heavy grazing is used on pastures to reduce annual grass weeds from setting seed.		Graze until annual weeds have finished flowering, then spell.	Annual grasses will flower earlier than sown grasses enabling them to be eaten first, but their quality will be rapidly falling, making them unattractive to grazing stock, hence heavy stocking will be needed. Flowering helps perennial grass survive dry summers by producing dormant buds. The level of bud dormancy varies amongst plant species and cultivars and is an important survival characteristic to help plants endure the stressful summer period.
Out-of-season summer rainfall has caused the emergence of 'green pick', but only two green leaves per tiller have emerged and you need the feed.		Apply a single, rapid grazing, followed by a long period of spelling.	Repeated grazing of green pick will continue to deplete the plants' fuel reserves. If the fuel reserves become too low, the grass will not have sufficient energy to initiate further regrowth and plant death occurs.

Scenario	Your suggestion	Ideal grazing response	Reasoning
All paddocks require a rest from grazing but there is nowhere to put stock.		Box similar mobs and start rotational grazing with supplementary feeding if required. Avoid always starting a rotation with the same paddock. Alternatively, place similar stock classes into a sacrifice paddock or into stock containment and supplementary feed.	Continual grazing will reduce plant growth and over time deplete fuel reserves which will threaten the plant's persistence.

More information

Go to mla.com.au/extension-training-and-tools/feedbase-hub/ for a range of tools and fact sheets including:

Grazing management of grasses:

- How do I know if my perennial grasses need rescuing?
- How do I get perennial grasses to thrive and survive? A resource for advisors
- How do I optimise perennial grass management in late spring and summer? A resource for advisors
- How do I optimise seedling recruitment to avoid resowing?
- How do I remove excess mature reproductive pasture?

Grazing management of sub-clovers:

- How do I determine why my sub-clover is underperforming?
- How do I optimise sub-clover based pastures?
- How do I maximise sub-clover establishment in existing pastures?
- How do I manage grazing to maximise sub-clover seed set?

Animal demand to match feed supply:

- The Feed Demand Calculator is an interactive tool to graphically represent feed supply and animal demand: Feed Demand Calculator
- This feedbase planning and budgeting tool can help you plan your rotational grazing systems, determine appropriate stocking rates, calculate your pasture growth rates and determine how long your paddocks will last: MLA Feedbase Planning and Budgeting Tool
- More Beef from Pastures: Module 3 Pasture Utilisation
- MLA seasonal hubs provide a suite of resources, tips and tools to support your on-farm decision making during autumn, spring and summer: Seasonal hubs

Favourable soil conditions:

- MLA healthy soils hub Kicking off with healthy, fertile soils
- Making more from sheep: Module 7: Grow More Pasture (makingmorefromsheep.com.au)
- How do I manage soil health to grow good sub-clover?

Control of weeds:

- See control options in Southern weed control hub

Containment or sacrifice areas:

- Summer hub for southern producers

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