Managing the feedbase- grasses & clovers

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Jessie Wettenhall, Southern Farming Systems

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Pasture recovery - When the pasture is compromised

Aim to:

- recognise the situation is less than desirable.
- know what impact this will have on our pasture.
- know how to respond.
- respond when possible.

Main topic areas

- Managing perennial grasses to:
  - allow perennial grass recovery,
  - maximise tiller set and/or seed set
  - keep plants alive over summer
- Managing sub clover seed set
- Prioritising paddocks
  - Identifying which will survive, which to sacrifice
  - How to use Pasture Paramedic to help prioritise paddocks
- Opportunities for a summer fodder crop

Managing perennial grasses

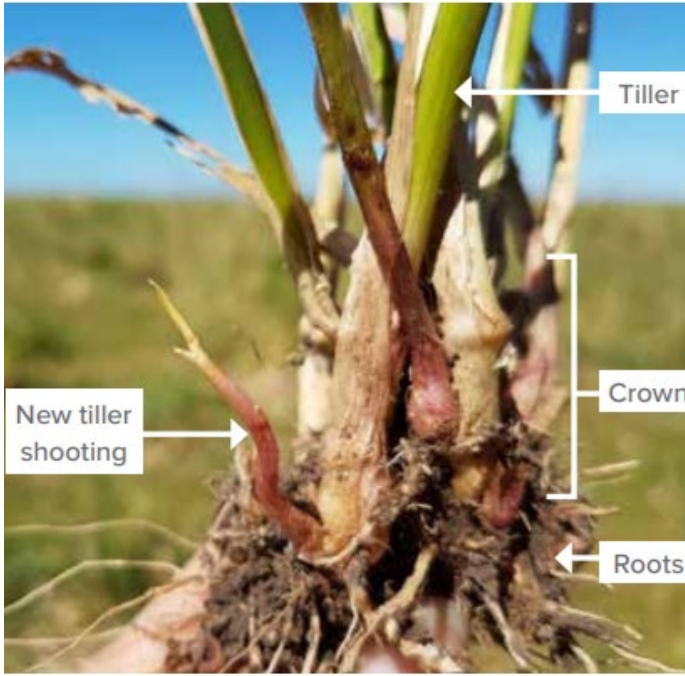
Tillers are constantly dying & need replacing to avoid pastures thinning out.

Two main ways grasses increase plant density:

- Grow new tillers
- Set seed

Grasses grow & spread mainly through tillers

- A plant is a collection of tillers.
- Each tiller has its own leaves, roots and growing point.
- All new tiller growth is initiated from the growing points located in the plant crown.
- Grasses use water-soluble carbohydrates stored in the tiller base for regrowth after grazing.



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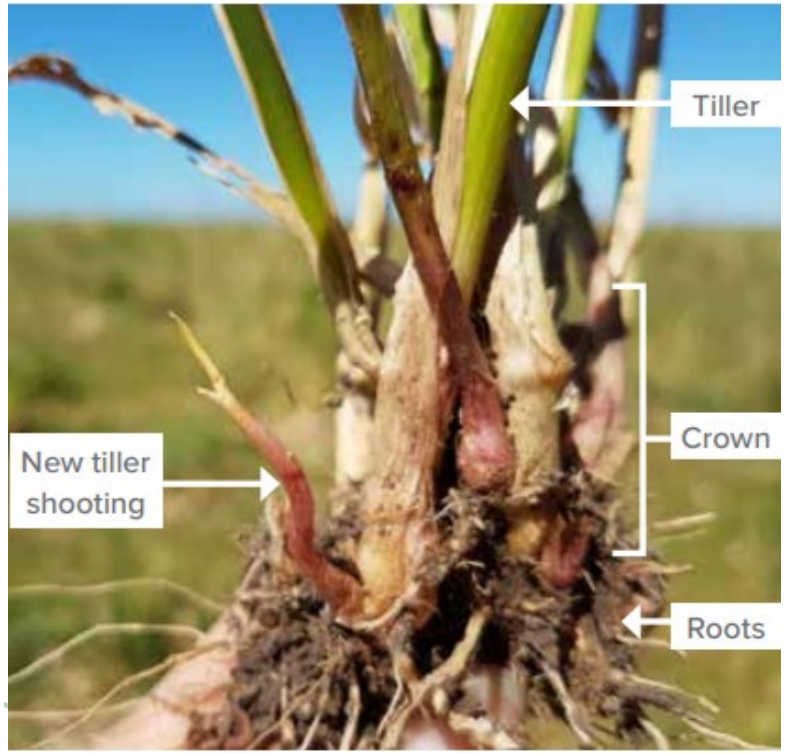
How hard can I graze?



Damaging the plant crown and growing points will cause a tiller to die.

Triggers for stock removal to avoid crown damage during the growing season is 500 to 800 kg DM/ha (1-2cm of dense green pasture).

Perennial ryegrass and cocksfoot growing points can be above ground compared to phalaris and some tall fescue varieties.

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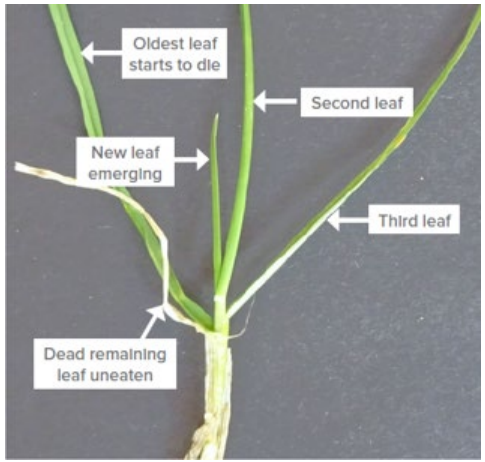
A tiller only supports a set number of live green leaves



Perennial ryegrass 3

Phalaris 4

Tall fescue 4
(Graze at 3 to keep quality)

Cocksfoot 4-5
(Graze at 4)

The number of actively growing leaves is a good indicator of when a plant is ready to graze:

* indicates the plant has replenished its plant reserves

* dry matter production is maximised.

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Plant carbohydrate reserves for regrowth

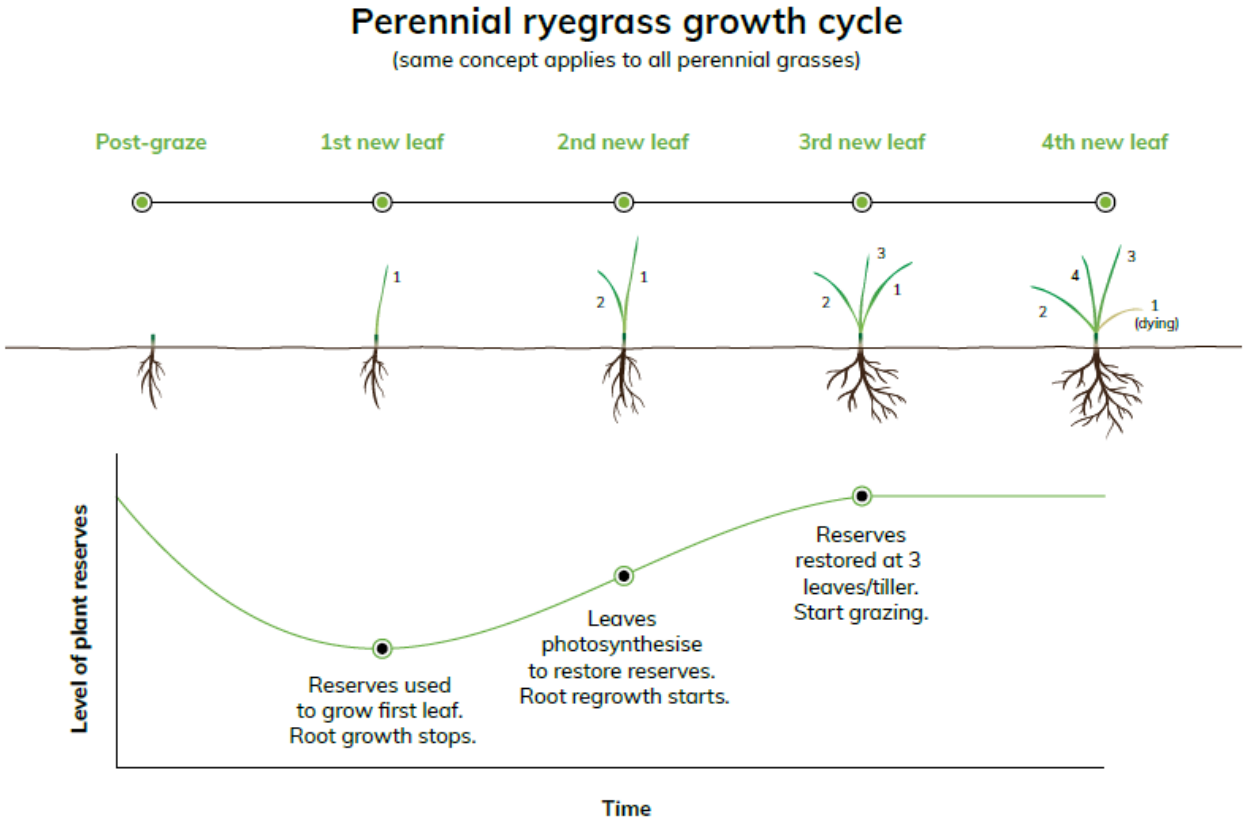

Figure 9. Stylised depiction of perennial ryegrass regrowth after grazing. (Adapted from Fulkerson and Donaghy[5])

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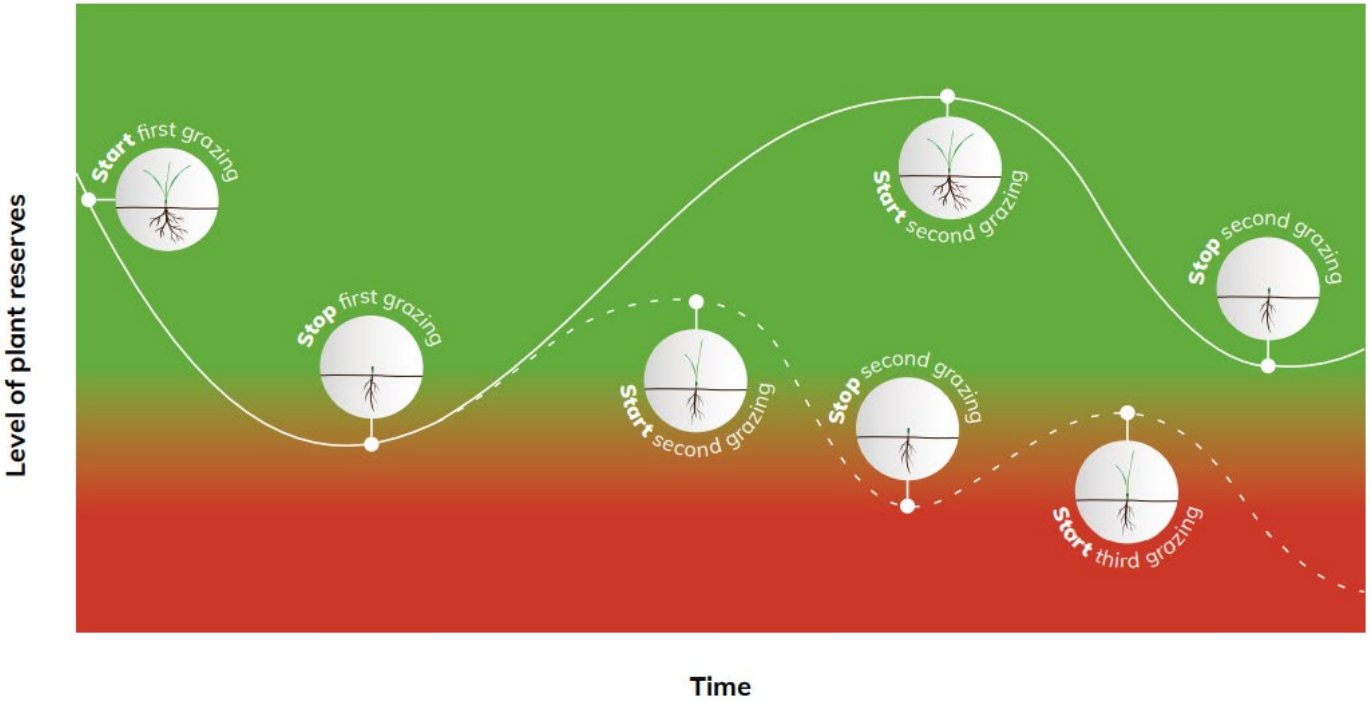
Repeated grazing depletes plant reserves



Repeated grazing threatens persistence rather than once off events

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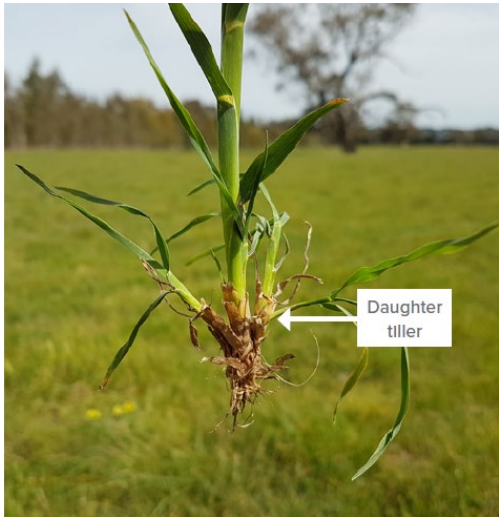
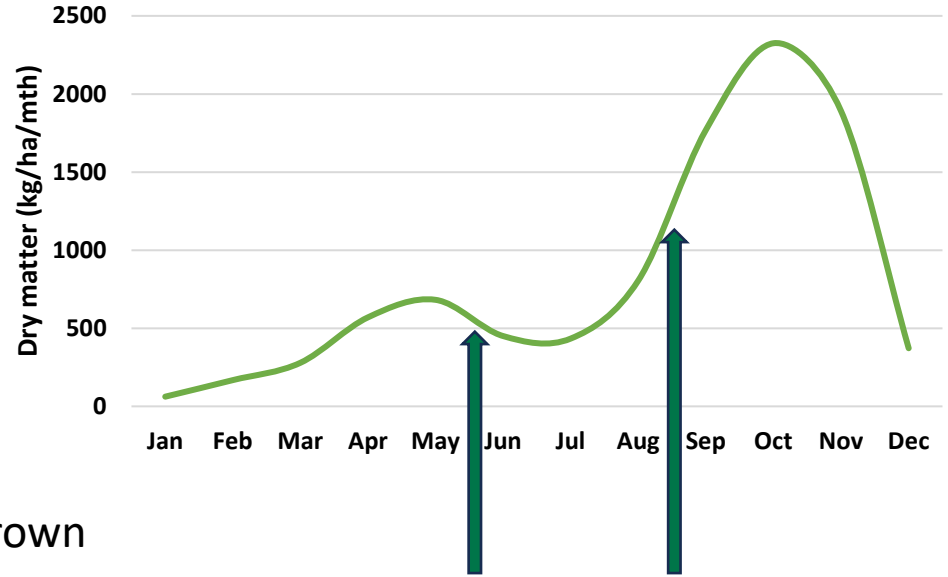
Tillering requirements – replacing tillers





- Light reaching the plant crown
- Plant reserves are full
- Moisture
- Increased temperatures
- Available nitrogen

Peak times for tillering
Late autumn
Early spring

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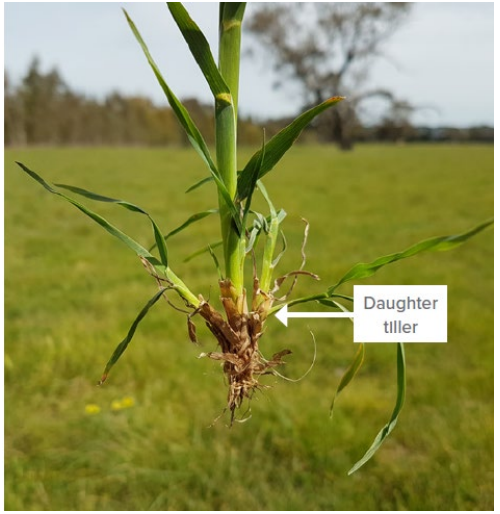
Tillering and implications for grazing management



- Avoid severe grazing in early spring -> it limits the supply of carbohydrates from the parent tiller to smaller dependent new daughter tillers.

- Avoid excessive herbage mass as this results in shading and prevention of light reaching the tiller base.

- Shading prevents small tillers from becoming bigger and independent, leading to tiller death.

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Set up summer survival during spring

If summer is hot and dry, no vegetative tillers survive,…….

…… so how do plants survive the stressful summer period?

Reproductive tillers are key to summer survival

Allow tillers to become reproductive (flower & form a seedhead) as they can:

- form **seed** and self-sow
- develop dormant **buds** at their tiller base

Dormant buds wont shoot until conditions are more suited to their survival (mild temperatures, moisture). It is critical for regrowth the next autumn.

Bud dormancy varies amongst species & cultivars

Partial dormancy:

- Most phalaris varieties break dormancy if there is moisture and summer temperatures are mild.
- Perennial ryegrass only remains dormant in the absence of rainfall.
- Perennial ryegrass survival is dependent on timing of rainfall - plants are more likely to survive if they break dormancy after the hottest part of summer.

Complete dormancy:

- Stay dormant irrespective of rainfall.
- E.g. Kasbah cocksfoot, Horizon phalaris, some winter active tall fescues (Mediterranean types).

Promotion of dormant buds

- Buds start to form once reproductive grass stems elongate.
- Buds are fully formed once seedheads are mature.
- Phalaris will have about **3** dormant buds per tiller.
- Plants normally run to seedhead in most seasons & so produce buds.
- Extra vigilance is needed in poor springs or in low rainfall areas (<500 mm) to ensure pastures are spelled for this to occur.

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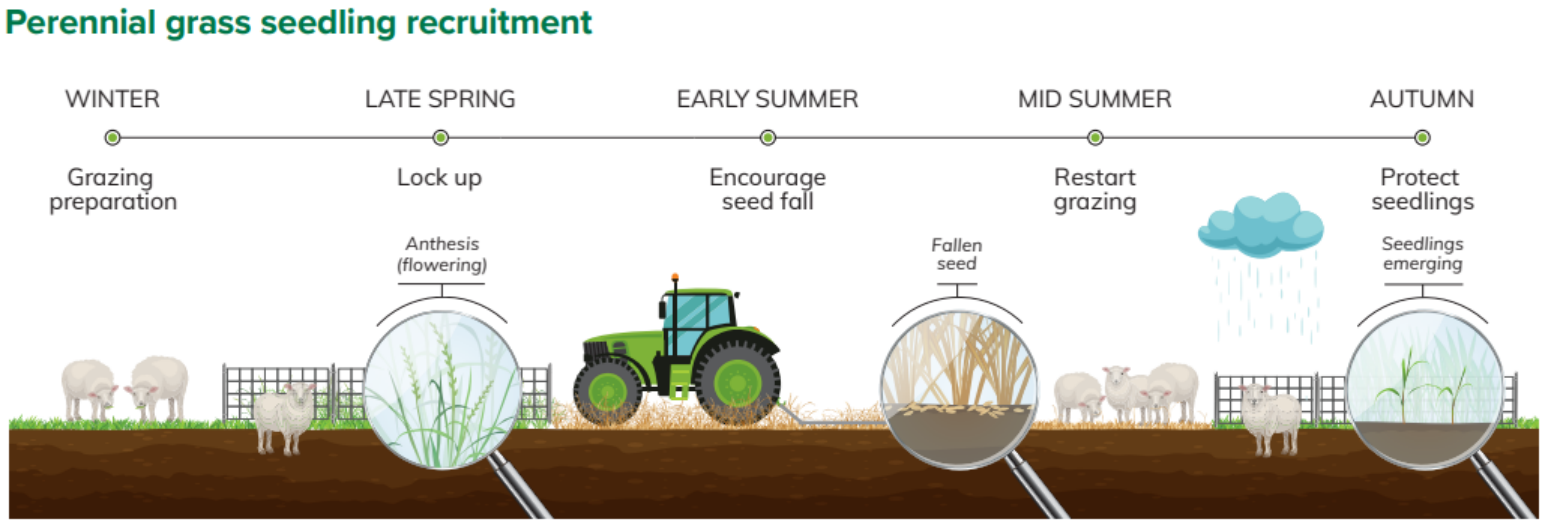
Seedling Recruitment - increase thinned out pastures

Great tactic to use in perennial ryegrass & cocksfoot pastures.

Factsheet: How do I optimise seedling recruitment to avoid resowing?



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Breaking dormancy - Managing the green pick

Graze when a full complement of leaves has emerged, signally carbohydrates are full.

Apply a single rapid grazing, followed by a long period of spelling.

Repeated grazing of green pick will continue to deplete the plant's fuel reserves. If the fuel reserves become too low, the grass will not have sufficient energy to initiate further regrowth and plant death occurs.

Managing sub-clover in the feedbase

Clover - an essential component of a stable and productive pasture

- A tonne of well-nodulated sub-clover dry matter (DM) can produce up to 20-25kg of nitrogen/ha/year. If it is well nodulated!
- Typically, 1 kg N/ha can grow an extra 5-10kg DM/ha. So, 60kg fixed N =300kg-600kg DM/ha
- Flush of N becomes available to grasses to help drive autumn production (unused N from spring carries over dry summers).
- Fills in gaps annual weeds would occupy or bare ground.
- Rokewood trials – over sowing clover into rundown phalaris grew an additional 1 t DM/ha over winter and early spring.

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Legume Benefits

Provides high quality feed during the growing season

Feed test results for sub-clover plants and burr sampled in September and January

Sample	DM (%)	Crude Protein (%)	Digestibility of DM (%)	Metabolisable energy (MJ/kg DM)
Vegetative sub-clover - **early September**	20.1	31.1	76.4	11.5
Mature sub-clover plants (no burr) - **January**	92.0	19.7	36.6	4.7

More clover – more animal production

On a comparative dry matter basis to grasses, clover increases feed intake by having a faster rate of passage through the rumen.

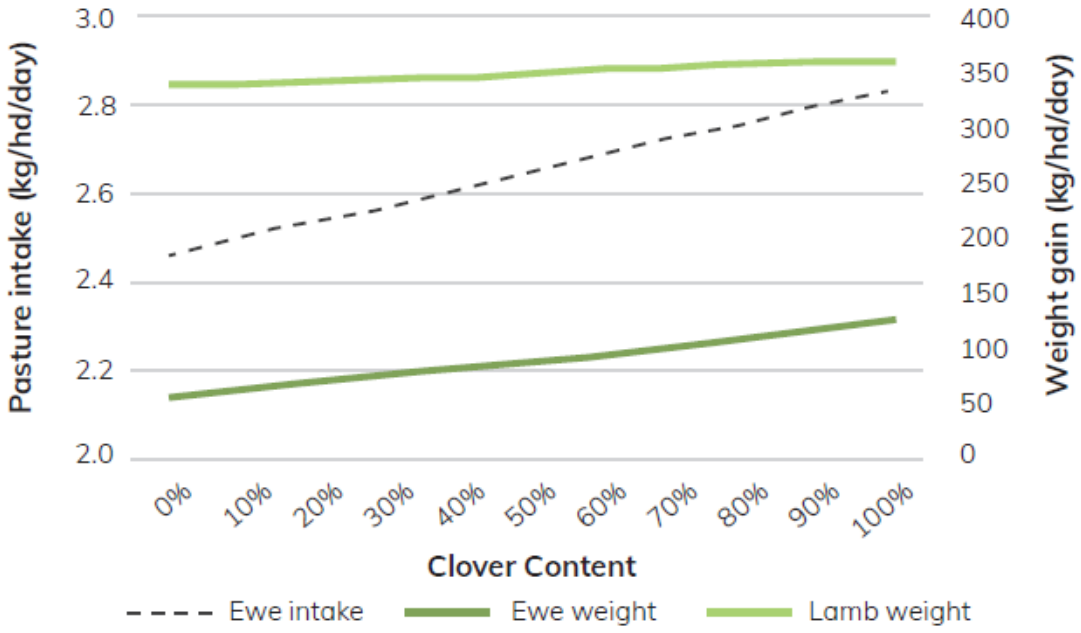

Figure 3: **Increase in pasture intake and subsequent liveweight gain at increasing clover levels** (First cross ewe, 60 kg with single lamb 30 days from lambing on a constant 1500 kg DM/ha at 75% digestibility).

Source: Pasture Paramedic manual

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Targets: How much clover do I need?

30 to 40% clover measure in late winter to early spring

Annual plant

Seedbank of 200-300 kg/ha of seed in the soil.

- A pasture with adequate sub-clover relies on successful germination of 20 to 30kg/ha of seed (30-45 plants in a square foot area (0.1m^2).
- Typical pasture produces about 135 kg/ha/year.

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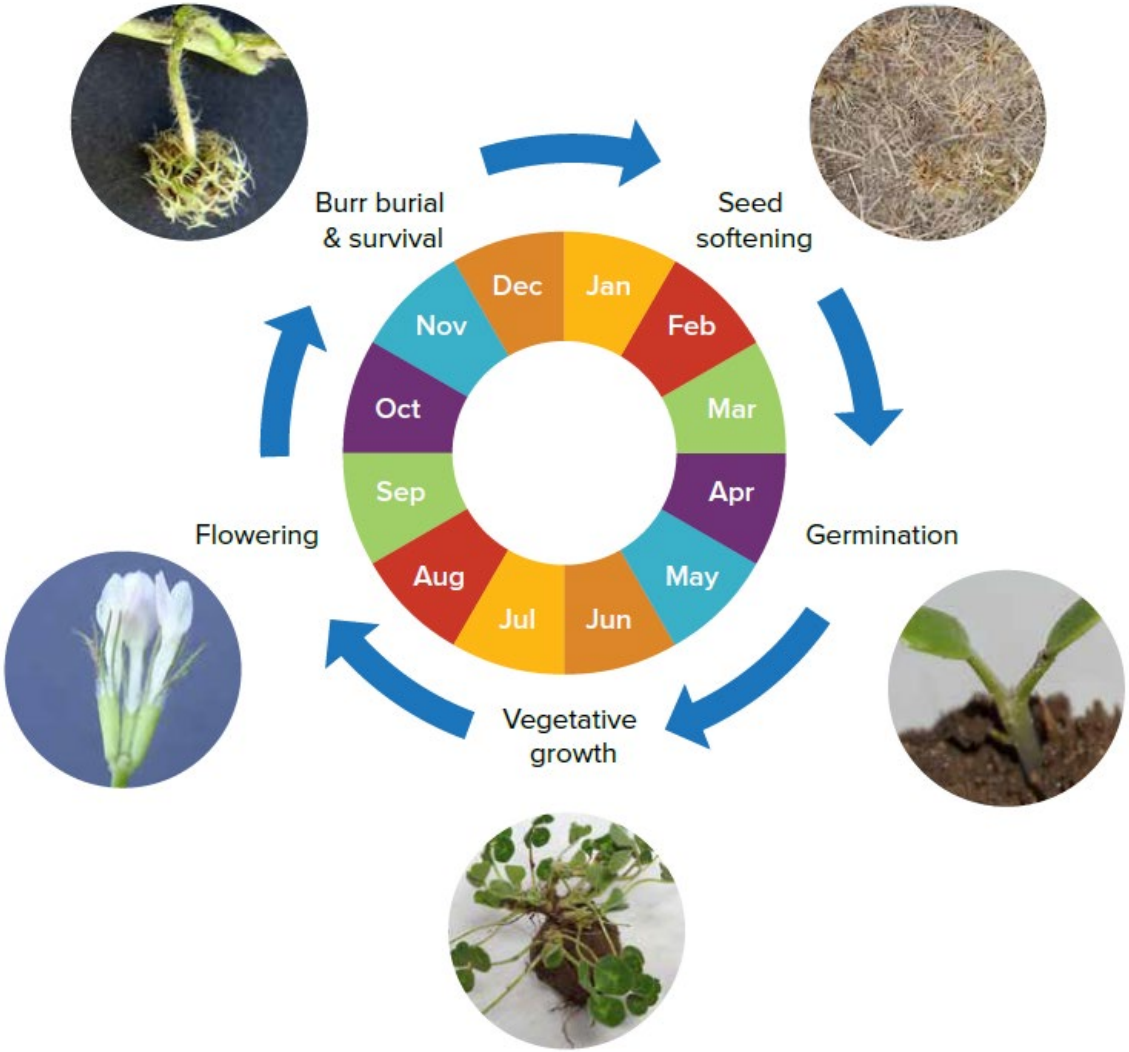
Five stages of sub clover life cycle that a producer can influence



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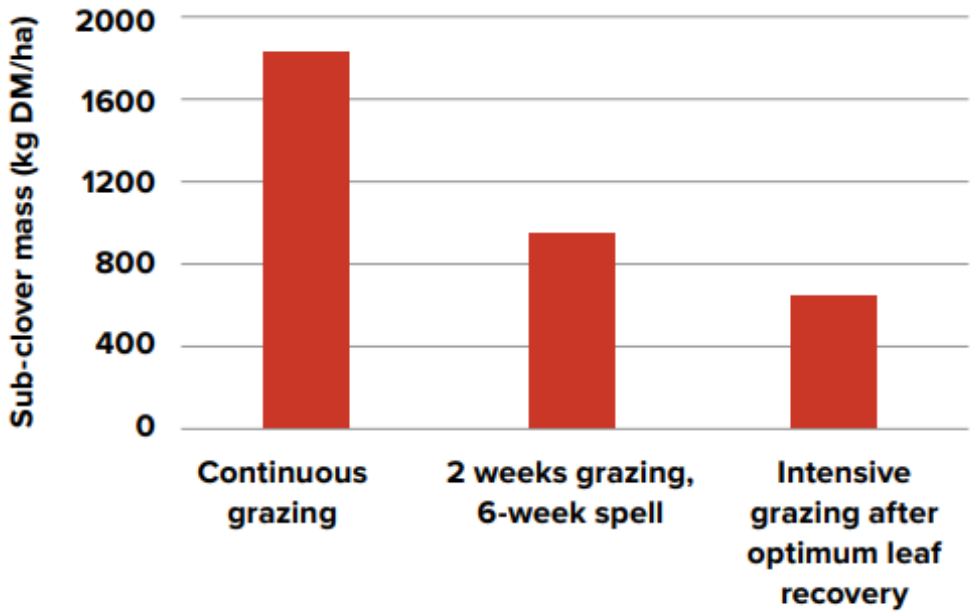
Vegetative growth during early spring

Broadford grazing trial

Figure 1: Sub-clover mass (October 2001) under three winter grazing regimes.



Source: Department of Primary Industries, Victoria

Vegetative growth during spring

Aim: To stimulate leaf production
by allowing light to hit the crown through heavy grazing.

Why: Every leaf site can produce a flower.

Grazing targets:
If wanting to lift sub-clover content, keep herbage at 1000 kg DM/ha or 3cm height.

Compromise: In a good year if the seed bank is adequate, & you want to maximise desirable grass growth, then keep pasture a bit taller 1200-1400 kg DM/ha (approximately 5cm).

Flowering

Aim: To maximise flower development into seeds.

Grazing target:
Maintain 2000 kg DM/ha (8-9 cm) to encourage burr to get to ground.

With the appearance of flowers (5%) ease off grazing pressure.

Compromise:
Because burrs develop at different times you can eat off some flowers.

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Burr burial and seed survival

Aim: To protect seed by allowing burr burial.

Grazing aims:

Avoid lax grazing, which allows the burr to get caught in the residue and decreases the amount of burr burial.

Avoid grazing surface burr.

Antas

Brachycalicinum sub types look to hide seed with their very long flower stems and *subterranean* and *yannicum* types actively bury seed

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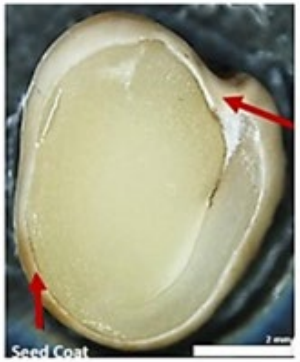
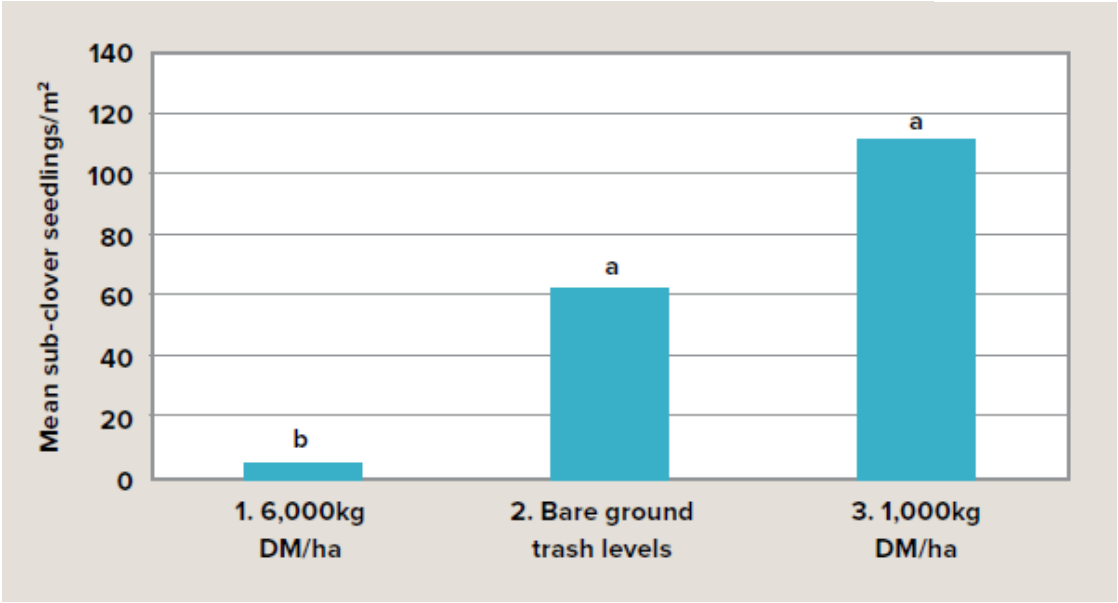
Seed softening– breaking down the hard seed coat

How: Fluctuating soil temperatures

Note: Cultivars differ in the amount of hard seed they produce (5% to 60%)



Lincoln University



Germination

Aim: 200-300 seedlings/m^2 = 3 seedlings per palm size = 40% sub content.

Grazing target:

Ideally wait until the sub has 3 true leaves, this can take 3 to 6 weeks.

Compromises:

Wait until at least the spade leaf has formed.

Don’t always graze the same paddocks first.

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Summary

Get burr to ground by grazing but avoid eating it

Have 1 to 2 handfuls of litter by autumn break

Lighten grazing with the appearance of flowers

Heavily graze to maximise leaf production

Graze when 3 true leaves appear

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Opportunities for a summer fodder crop

Failures are costly - what can you do to minimise risk?

- Sow if there is > 50 mm of subsoil moisture
  - Risk of failure is high if the subsoil is dry and intermittent rainfall germinates the seed but then dry conditions follow.
  - Moisture in the first 2-4cm of soil allows germination.
  - Determine soil moisture using a nearby soil moisture probe or dig a hole.
- If the soil is powdery and dry within the top 30cm, then delay sowing until good rainfall.
- You can sow dry, but success will be dependent on summer rain.
  - Consider reducing upfront costs.
  - Pick paddocks that are most likely to grow a productive crop.
  - Reduce area sown.

What management can you do to maximise establishment success in a dry season?

Don't sow too early!

- Forage brassicas will end up vernalising in cold conditions, which can become toxic to grazing animals.
- In the western district sow early September but only with forage rape. Leafy or bulb turnips and Pallaton brassica require soil temps at least 12 degrees+
- Warm season grasses, millet & sorghum - 16 degrees+
- Soil temperatures > 10 degrees are required for germination of most species (optimum >14 degrees).

Average soil temperatures for Hamilton, Vic

Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
19°C	20°C	17°C	13°C	11°C	9°C	7°C	8°C	10°C	12°C	14°C	17°C

What management can you do to maximise establishment success in a dry season?

Drill seed rather than cultivate and no broadcasting seed:

- Direct drilling conserves moisture.
- Generally heavier clay soils need a well-prepared seed bed but cultivating dry soil will create a cloddy seedbed which affects sowing depth.
- Roll paddocks if soil is dry to help get good seed-to-soil contact when it does rain.

Be careful with N fertiliser

- Sowing with MAP or DAP helps develop the roots for quicker establishment.
- In very dry conditions avoid sowing seed with nitrogen fertiliser.
- Top dress with nitrogen later if rain occurs.
- To avoid nitrogen fertiliser loss of up to 20%, you need 5 to 10mm of rainfall to wash the fertiliser into the soil.

Sow at the lower end of the recommended seeding rates

With limited moisture, plants will likely compete, and additional dry matter production may not be realised.

What management considerations are there in a dry season?

Strip graze is best: helps reduce trampling and wastage of feed. Works best with cattle.

Keep some leaf area (solar panels) for regrowth: If crops can be grazed multiple times, then graze to keep 5 cm of leaf area to enable quick regrowth.

What management considerations are there in a dry season?

Introduce stock gradually:

- Need time for rumen adjustment.
- Allow access to straw/hay and clean water.
- Most issues are experienced when the first 25% of crops are grazed.
- 1 to 3 week adjustment period
- Brassica intake for beef cattle should be 70% of the diet and 90-100% for sheep.
- Livestock will tend to avoid brassicas at first.
    - Producers sometimes mix brassicas with millet, to allow stock to graze millet while slowly adjusting to brassicas.

Photo: Rokewood 2022, randomized trial of 7 different forage Brassicas. Sheep preferentially grazed Sub Zero plots (Hybrid forage brassica x leafy turnip) and overgrazed these plots before grazing others.

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What management considerations are there in a dry season?

<u>Be mindful of toxicities:</u>

- Brassicas may accumulate nitrate-N when grown under stress (e.g. high temperatures and limited available water), particularly if N fertiliser is applied - causing nitrate toxicity.
- Forage brassicas - delay grazing until leaves mature indicated by purple colouration on leaf margins
- Sorghum - delay grazing until plants are at least 75 to 100cm tall (waist height) to dilute prussic acid.

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Considerations of what to sow

When the feed is needed and for how long

- Check maturity - when it can first be grazed.
- Multiple or single grazing.
- Warm grass crops have temperature requirements that delay sowing.

Quality & quantity of feed produced

- Warm grass crops have lower nutritive value than brassicas.
- At the Rokewood demo site, average production: 5t DM/ha for forage Brassicas, turnip 4.1t DM/ha, millet 6t/ha and sorghum 10-12t DM/ha in 2023.
- Growing 8t DM/ha or above is considered a good productive forage crop.

Ease of management

- Potential toxicities or animal health issues
- Stock adjustment.
- Termination ease and transition into pasture

Brassica forage crop options and notes

Crop	Sowing Time	Establish-ment method	Time to First grazing	Number of grazing	Additional roles and application
Rapes (Brassica napus)	Sep on	Direct drill	8-12 weeks	2 - 4	Eg. Winifred, Mainstar, SF Greenland Either terminate and resow in the following autumn or take through to be the following winter with its regrowth ability but it's toxic at flowering. However, oversowing with annual ryegrass, will dilute out brassicas and provide further grazing opportunities over spring.
Bulb Turnips (Brassica campestris)	Sep on	Full Cultivation	12-14 weeks	1	E.g. Green Globe, Barkant, Australian Purple top. Creates a bare paddock ready for resowing. Turnips are sensitive to lack of soil moisture. Newer varieties have two-thirds of the bulb above the ground.
Leafy Turnips (Brassica spp)	Sep on	Full Cultivation	6 – 12 weeks	2-4	E.g. Pasja II, Hunter, Appin, SF Pacer
Swedes (Brassica napus ssp. Napobrassica)	Aug/Sep	Full Cultivation	20 – 24 weeks	1	E.g. Domain Available for grazing in late autumn/winter.
Kale (Brassica oleracea)	Aug/Sep	Direct Drill	18 – 24 weeks	1	E.g. Regal, Sovereign, Kestral Available for grazing in late autumn/winter.
Pallaton Raphno® Brassica oleracea (kale) x Raphanus sativus (radish)	Sep on	Direct Drill	8 weeks	4 - 6	Pallaton Raphno® is sold by the hectare and is sown at a rate of 8 kg/ha at a cost of $285 for 8kg/ha of seed but can provide multiple grazings.

Sorghum and Millet options and notes

Crop	Sowing Time	Establishment method	Time to First Grazing	No of Grazing	Additional roles and application
Sorghum (Sorghum spp) or sweet sorghum (Sorghum vulgare)	Dec on	Direct Drill	6 to 12 weeks	1-2	Calorific, Flourish, SSS (Super Sweet Sudan) Can regrow if moisture, but need to be careful that prussic acid is not an issue if plants don't regrow to at least 75cm. Having supplement blocks containing sulphur available will reduce the risk of prussic acid poisoning. Test for Prussic acid levels. Lower quality. Sweet sorghum x Sudan grass hybrids have lower prussic acid contents. Can also be used for hay or silage. No insect pests. Tall crop, may not be suitable for young sheep? High tolerance to water stress
Millet	Dec on	Direct Drill	6+ weeks	1	Doesn't have the toxicity issues of sorghum. Can be sown with Brassicas to reduce feed adjustment of weaners onto Brassicas. No insect pests. High tolerance to water stress

Nutritive quality of different summer forages

Crop	Metabolisable Energy (MJ ME/kg DM)	Crude Protein	Digestibility
Reproductive mature pasture	7	10%	55%
Forage Brassicas	12	16%	80%
Turnips Leaf Turnips Bulb	13 14	16% 15%	85%
Sorghum	9	11%	65%
Millet	9	10%	65%

Pasture Paramedic

Useful for knowing how to respond.

Useful for prioritising paddocks

Assessing which paddocks have not survived

Helps answer are their desirable species to fill the gaps?

[Pasture Paramedic (youtube.com)]

Use the code to access the online Pasture Paramedic booklet in the field.

Very helpful for plant species id.

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Late winter/early spring

Sown grass %: 10-30% = Score 2
Sown clover %: >40% = Score 4
Dominant weed: High grazing = Score 3

Total Score: 9

Score	Suggested decision
Greater than 10	Current management suitable
6 to 10	Consider pasture manipulation
Less than 6	Consider resowing or oversowing

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Late summer/early autumn example

Ground cover: >70% = Score 3
Dry material: 1-2 handfuls of litter = Score 4
Live sown perennial grasses: >3 = Score 7

Total Score = 14

Late Summer/ Early Autumn	Suggested decision
Greater than 11	No need to treat
7 to 11	Consider pasture manipulation
Less than 7	Consider resowing

Working out the cause – diagnostic resources

How do I determine why my sub-clover is underperforming?

The issue:	Many sub-clover pastures fail to perform for a range of reasons. In situations, producers remain either unaware of lost production or t is underperforming but are not sure why.
The impact:	Producers are missing the opportunity to maximise livestock produ improving their feedbase. Resources are wasted attempting to imp without identifying the cause of underperformance.
The opportunity:	Producers can better meet livestock condition targets and create r and resilient pastures by identifying and addressing the factors lim sub-clover growth.

What makes a good sub-clover pasture?

A productive pasture will have around 40% sub-clover content in spring. A sub-clover c consistently less than this over several years would suggest something is limiting growt

There are many possible reasons for poor sub-clover growth, so it is important to make diagnosis. This guide is designed to help identify what might be limiting sub-clover gro common and less common reasons. Diagnosis involves visual observations, some testi field confirmation.

A spring pasture with more than 40% sub-clover content

How do I ...
know if my perennial grasses need rescuing?

The issue:	Sown perennial pastures thin out over time for a range of potential production and providing opportunity for weeds pastures is expensive and can be risky.
The impact:	Reduced desirable grass content opens the pasture up to can add further stress to a pasture on the decline. Eventua loses productivity and persistence.
The opportunity:	There are interventions to improve desirable perennial gra what they are and what you can do to get them right, can grass content and strengthen the pasture.

A productive pasture will have around 50% desirable perennial grass in spring (below) and 40% sub-clover content (the remaining 10% is volunteer pasture species and, sometimes, weeds). A perennial grass content consistently less than 30% in spring suggests something is limiting growth.

There are many possible reasons for poor desirable perennial grass growth or persistence. This factsheet contains a checklist of management factors you need to get right to achieve strong and resilient pastures. This can help you rule in or out the possible reasons why the perennial grass in a paddock might be failing to thrive

and focus on what to get rig principles behind the manag you to further information.

The requirements of the fou temperate perennial grasses (*Lolium perenne*), phalaris (*P* tall fescue (*Lolium arundinac* (*Dactylis glomerata*) are des can be applied to other des while grasses have common management differences sp grass.

Thriving perennial ryegrass with good legume content.

VISUAL INDICATORS OF SOIL CONDITION PART I

What do you see and when?	What could this indicate?	What test can I do to confirm?
  **Dark green patches with greater growth of grass or clover, paler green in other areas.** Best time to look is late winter and early spring.	Pale green areas deficient in nitrogen, potassium, phosphorus or sulphur. Dark green areas are urine patches or manure pats. Urine contains high amounts of nitrogen and potassium and some sulphur. Dung affected areas also contain phosphorus. **Selective grazing** Stock avoid pasture near dung while odour remains (up to 3 months).	• Soil testing with reference to potassium, nitrogen and sulphur. Avoid sampling the dark green areas. • Test strips of potassium, nitrogen and sulphur fertiliser.  *Pictured: Nitrogen response (left) with 25kg/ha applied in May. Photo Lisa Wenn Ag Consulting*
 **Yellowing or pale green colour in pastures.** Seen in late winter to spring.	Deficiency in potassium, nitrogen or sulphur or trace elements such as molybdenum. Waterlogging, resulting in transient nitrogen loss. Maturing or flowering winter grass (*Poa annua*) Dying plants caused by red-headed cockchafer pruning plant roots.   *Pictured: Winter grass (above) and Onion grass (Romulea rosea) (below) infected with yellow brown spots caused by Helminthosporium fungus.*	• Soil test, with reference to phosphorus, potassium and sulphur. Tissue test for micronutrients, with attention to molybdenum. • Abundance of low fertility weeds and absence of high fertility weeds. • Test strips of nitrogen and / or potassium, sulphur and molybdenum fertiliser.  *Pictured: Potassium response in test strips.*
 **Grass dominant pasture with little or no legume and slow growth.** Best seen late winter to mid spring.	Possible phosphorus or molybdenum deficiency. Low soil pH (soil acidity). Inappropriate sub-clover management, such as leaving too much dry material at the autumn break, long rotations encouraging grass dominance or cutting hay in later maturing clovers.	• Soil test, with reference to phosphorus, pH and aluminium. • Plant tissue test for molybdenum. • The dry material litter test in late summer/early autumn. *Pictured: Amount of loose litter in late summer. Ideally one to two handfuls in 0.1m² quadrat promotes hard seed breakdown of sub-clover.* 

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Resources to help implement actions and make them long lasting

How do I ...
get perennial grasses to thrive and survive?

A RESOURCE FOR ADVISORS

The issue:	Pasture p… grasses t… just as de…
The impact:	Under-gra… growth ar… of pasture… time, redu…
The opportunity:	Understar… emergenc… We can cr… persistenc…

Four introduced temperate perenni… backbone of pastures in southern A… ryegrass *(Lolium perenne)*, phalaris … cocksfoot *(Dactylis glomerata)* and … *(Lolium arundinacea*, previously kno… *arundinacea)*. Being perennial, plan… one year to the next providing prod… compared to relying on annual germ…

How do I ...
respond to challenges in grazing mixed pastures?

The issue:	Managing for optimal perennial g… not always achievable due to sea… demands. Sown perennial grasse… requirements and, at times, can c…
The impact:	Pastures under stress are slow to… and weed invasion. Desirable gra… is not balanced enough to meet … expensive and risky.
The opportunity:	There are commonly occurring ch… what actions to take to assist pas… requirements of different species… 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

How do I optimise seedling recruitment to avoid resowing?

The issue:	Sown perennial pastures thin out over time, reducing productivity and providing an opportunity for weeds to increase. Resowing pastures is expensive and risky.
The impact:	Reduced desirable grass content increases the opportunity for weed invasion that can add further stress to an already declining pasture. Eventually the sown pasture loses both productivity and persistence.
The opportunity:	There are strategies that can be used every few years to encourage seedling recruitment in perennial ryegrass and cocksfoot, resulting in new plants without having to resow.

Seeding is part of the natural life cycle of perennial grasses, but allowing plants to mature and drop seed is not essential for their survival. However, encouraging optimal seeding is a strategy for some perennial grasses which tend to thin out due to hot and dry summers.[1]

There are a number of ways producers can encourage seedling recruitment in their pastures and here we look at how seedling recruitment can be managed.

How do I ...
manage grazing to maximise sub-clover seed set?

The issue:	Repeated inad… sub-clover pas…
The impact:	Poor performin… productivity is …
The opportunity:	Grazing manag… optimal seed s…

How do I ...
optimise sub-clover based pastures?

The issue:	
The impact:	
The opportunity:	

Sub-clover is an esse…
- Well nodulated sul…
  - One tonne of sub…
- Sub-clover mainta…
  - In the vegetative … energy content al…
  - Even though the …
  - The seed and bu…

Table 1: Feed test results f…

Sample
Vegetative sub-clover – …
Mature sub-clover (no bu…
Sub-clover seed within b…

How do I ...
manage grazing to maximise sub-clover seed set?

The issue:	Repeated inadequate seed set in sub-clover pastures results in depleted sub-clover pasture production.
The impact:	Poor performing pastures and pastures which fail to persist mean livestock productivity is decreased and a strong return from those pastures is not seen.
The opportunity:	Grazing management strategies are simple and easy to implement to ensure optimal seed set and persistent productive pastures.

A pasture with a 40% sub-clover content relies on having at least 200kg/ha of sub-clover seed in the soil. While only 10–20% of this seed needs to germinate each year to achieve optimal sub-clover density, repeat years of inadequate seed set will rapidly deplete the seed bank and subsequent pasture production.

Fortunately sub-clover has an amazing capacity to produce seed and, under the right conditions, a single plant can produce more than 100 seeds. Grazing management has a major influence on the amount of seed produced and is an important tool to maximise production.

While sub-clover's prostrate growth means the plant is well adapted to frequent heavy grazing, it does make it susceptible to shading, particularly by upright-growing grasses.

Trials conducted at Broadford in Victoria demonstrated the grazing effect (Figure 1).

Figure 1: Sub-clover mass (October 2001) under three winter grazing regimes.

Winter sub-clover growth

Optimising sub-clover seed set starts in winter. The aim over winter and early spring is to maximise leaf production, as this maximises potential flowering

Weed resources to help implement actions

Found at bottom of [Weed control hub | Meat & Livestock Australia (mla.com.au)]

MEAT & LIVESTOCK AUSTRALIA

How do I know if herbicide application will improve my pasture?

The issue:	Weeds can reduce pasture productivity, but controlling weeds with herbicide the answers and requires careful management to
	rasses and clovers enables a pasture to reach its tend its persistence.
	cost, high-benefit tactic to improve the productivity y under the right conditions.

osition of a pasture, either through direct action or tively removing or suppressing unwanted plants roviding an opportunity for those species to increase nagement can deliver significant gains in the quantity

How do I spray-graze to remove broadleaf weeds?

The issue:	Annual broadleaf weeds, if present, reduce the value of sub-clover based pastures for livestock production. Spray-grazing is an effective tactic to reduce weeds, but only if the herbicide and grazing interventions are well managed.
The impact:	Spray-grazing can increase the composition and contribution of desirable grasses and sub-clovers, making the pasture more productive.
The opportunity:	If spray-grazing is carried out correctly, it can lift livestock productivity, while becoming a valuable weed management tool.

What is spray-grazing?

As the name suggests, spray-grazing involves the combination of herbicides and grazing. The technique sees a sub-lethal rate of a phenoxy herbicide applied to broadleaf plants at rosette stage, followed by intensive grazing. The combined action of herbicide and grazing kills or severely retards the weeds, preventing seed setting and allowing more desirable species to flourish.

How do I use hay and silage production to remove annual grasses?

The issue:	Annual grasses with short seed viability compete with pastures, reducing productivity and quality. One control technique is cutting pastures for hay and silage, but it needs to be correctly managed to optimise effectiveness.
The impact:	Cutting hay and silage can reduce seed set in annual grasses and increase the percentage of desirable grasses and avers, making the pasture more productive and improving livestock enterprise performance.
The opportunity:	If hay and silage production are optimised, it can extend the productive life of an established pasture.

Why consider making hay and silage to reduce weeds?

Fodder conservation can reduce carryover weed seeds in a pasture. While the primary reason for making hay or silage is usually to conserve fodder, attention to annual weed seed production in the lead-up to and during hay or silage making can help 'clean up' a pasture.

Disrupting viable seed production is effective on annual plants with a short seed life such as silver, brome and barley grasses, annual ryegrass and capeweed. Disrupting seed set for just one year can dramatically reduce their presence in the following year.

How do I spray-top to reduce annual weeds in pastures?

The issue:	Growth from annual grasses can be considerable, especially during autumn and winter, but is not without downsides, including impacted legume growth and production of sharp seed heads that can be detrimental to livestock. Spray-topping with herbicide is an effective tactic to reduce annual grasses, but its success is dependent on even seed head emergence and timing of application.
The impact:	Spray-topping helps lower the annual grass seedbank, resulting in less seed available to germinate and compete with perennial grasses and sub-clovers. With the right follow-up management, spray-topping can support increased populations of desirable grasses and sub-clover.
The opportunity:	Effective spray-topping can improve our perennial grass and sub-clover content, extend the productive life of a sown pasture and reduce seed injuries to stock.

What is spray-topping?

Spray-topping uses a sublethal dose of herbicide to sterilise seed while it is being formed. Disrupting a plant's ability to set viable seed dramatically reduces seed carryover. As a result, there is less seed t year.

merous trials have he herbicides ping is commonly kisting pasture

How do I winter clean pastures to remove annual grass weeds?

The issue:	When left uncontrolled, populations of annual grass weeds reduce the quality and productivity of sub-clover based pastures and, eventually, out-compete desirable species. Winter cleaning is an effective tactic to reduce annual grass weeds with short seed viability.
The impact:	Winter cleaning can inc grasses and sub-clover
The opportunity:	If winter cleaning is suc perennial and sub-clo and improving livestock

What is winter cleaning?

Winter cleaning is a herbicide application tec grass, from established mixed grass/sub-clo absorbed through the roots when plants are mature plants by applying a second herbicid

Removal or suppression of the annual grasse to populate.

How do I ...

use selective herbicides to safely remove common weeds from sown mixed pastures?

The issue:	Weeds can invade sown clover/grass pastures, competing for moisture and nutrients over time. Selective herbicides provide additional weed control options to the more common control techniques of spray-grazing, winter cleaning and spray-topping. However, with many herbicides on the market, knowing which herbicides are tough on weeds but safe on desirable species can be confusing.
The impact:	Weeds reduce the productivity of the desirable species and while some selective herbicides can kill them, others may cause unacceptable damage, reduce available feed and open the pasture up to further weed invasion.
The opportunity:	Selective herbicides offer more management options, to extend the productive life of a sown clover/grass, provided label directions are followed and the pasture is managed to minimise pasture damage.

There are three common and safe herbicide application techniques to control weeds in pastures.

These are:

- spray-grazing
- spray-topping, or
- winter cleaning (with simazine and paraquat).

More information on these fact sheets is available from MLA web site (see links on the last page of this fact sheet).

Selective herbicides offer a fourth option for controlling common weeds, especially in newly sown pastures or to provide diversity in the chemical groups used.

The success of selective herbicides depends on their ability to kill the target weeds such as barley grass, silver grass, soft brome grass, capeweed, thistles and erodium while minimising damage to desirable species, such as phalaris, perennial ryegrass, cocksfoot, tall fescue and sub-clover.

Prioritising paddocks for resowing or sacrificing

Spring - Use Pasture Paramedic guide to check grass content – if perennial grasses less than 10% unlikely to survive over summer.

If crowns obvious, take plant counts in spring and resow if you have:

- Less than 5-7 phalaris plants/m^2
- Less than 8-10 perennial ryegrass plants/m^2

Wait until autumn and use Pasture Paramedic and assess plant numbers.

Be aware perennial ryegrass and cocksfoot seedlings could germinate post-break.

MEAT & LIVESTOCK AUSTRALIA

SFS Southern Forming Systems

Likelihood of species survival

Annual pastures -if they haven't been able to set during spring

Perennial ryegrass

Perennial ryegrass with Spanish or African genetics

Victorian perennial ryegrass – staggered flowering, so more likely to set seed.

Cocksfoot

Tall fescue (winter)

Grazing tolerant phalaris

Australian phalaris pastures – likely to recover, even containment areas.

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Southern Forming Systems

Potential paddocks to sacrifice for grazing or resowing

- Paddocks lacking perennial grass species.
- Paddocks with difficult to control weeds eg bent or fog grass.
- Not paddocks with erodible soils (slopes, light texture soils)
- Old Australian phalaris pastures – likely to recover, so useful for containment feeding.
- Larger paddocks >20ha planned for subdivision (More difficult to manage, don't tend to carry as many stock).
- Low soil fertility paddocks, with low fertility weeds (as can't grow as much).
- Paddocks not renovated in last 7 years (as may not have got money back)
- Species that you regret sowing (eg Fescues).
- Annual grass weed paddocks (reasonable success if stop seed set).
- Rocky paddocks if they haven't been sown down.