How do I ...

know if my perennial grasses need rescuing?

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

A productive pasture will have around 50% desirable perennial grass in spring (see image 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 fact sheet 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 right. It also provides some principles behind the management factors and directs you to further information.

The requirements of the four common introduced temperate perennial grasses – perennial ryegrass *(Lolium perenne)*, phalaris *(Phalaris aquatica)*, tall fescue *(Lolium arundinacea)* and cocksfoot *(Dactylis glomerata)* are described, but the tactics can be applied to other desirable grasses. However, while grasses have commonalities, there can be management differences specific to the particular grass.

Thriving perennial ryegrass with good legume content.

Identifying the cause

This checklist has been developed to step you through the main interventions you need to get right to improve perennial grass content and production.

It has been created in order of the more common to the less common considerations. You simply need to answer yes, no, sometimes or not applicable (NA) to each question. 'Sometimes' means you are not always able to meet the consideration requirements.

If the answer is 'yes' or 'NA', continue to the next question. If the answer is 'no' or 'sometimes', then this is a likely focus area for improvement, however continue answering further questions as there may be other factors to consider.

Paddock consideration	Yes, no, sometimes or NA	Additional notes
SOIL CONDITION		
Is Olsen P at least 12mg/kg, Colwell P at least 35mg/kg (moderate category PBI* = 141–280) for introduced perennials? *PBI (phosphorus buffering index)		PBI ranges with Colwell P target values: PBI 35–70 (very low) – Colwell P 23mg/kg PBI 71–140 (low) – Colwell P 25mg/kg PBI 281–840 (high) – Colwell P 45mg/kg
		Native grasses are favoured by lower fertility levels. For moderate responsive native grasses with no more than Olsen P 12mg/kg (Colwell P less than 33mg/kg) or for low fertility native grasses, less than 8mg/kg (Colwell P less than 22mg/kg) in moderate PBI soils.
Is Colwell K at least 105mg/kg for sandy loam or 120mg/kg for clay loam?		Colwell K soil test interpretation is based on soil texture and the critical value increases with increasing clay content. Other Colwell K target values are: Sand – 95mg/kg Sandy clay loam – 110mg/kg
Is KCl sulphur at least 6mg/kg?		Can measure lower under dry conditions if little soil mineralisation has occurred.
Is soil pH ($CaCl_2$) at least 4.5 and exchangeable aluminium less than 10% for sensitive species, or less than 20% for acid-tolerant species?		Acid-sensitive species include most phalaris cultivars. Acid-tolerant species include perennial ryegrass, tall fescue and cocksfoot, and phalaris cultivars: Advanced AT$^{\Phi}$ and Landmaster.
Are nitrogen levels sufficient (at least 20% legume content in early spring with healthy nodules)?		Assessment of nodules is needed to check if legumes are fixing nitrogen. Three large (greater than 5mm) or 20 small pinkish nodules is evidence of adequate nitrogen fixation.
GRAZING – green pasture		
Does the period of spelling after grazing allow for regular regrowth of 3–4 leaves/tiller before re-grazing during vegetative growth?		In perennial ryegrass and tall fescue, allow regrowth of three leaves, and four in phalaris and cocksfoot. At times of rapid growth (e.g. early spring), tillers may appear to support more leaves. This is because the rate of new leaf emergence exceeds the visual appearance of older dying leaves.
Are vegetative pastures grazed for less than 14 days continuously (lambing/calving excluded)?		
Is some residual plant material left after grazing (height at least 2cm or 800kg dry matter (DM)/ha)?		

Paddock consideration	Yes, no, sometimes or NA	Additional notes
Do grasses grow reproductive stems in most years?		This is especially important for phalaris survival, as it develops dormant buds in the base of the reproductive tiller.
If the pasture contains perennial ryegrass or cocksfoot, are seedling recruitment tactics occasionally used?		Phalaris and tall fescue do not readily recruit seedlings in established pastures.
Do you avoid regularly cutting the paddock for hay?		Perennial ryegrass and cocksfoot can thin out due to cutting for hay because shading reduces new vegetative tiller development and seeds for potential seedling recruitment are removed. Lack of available moisture following cutting also prevents recovery. Phalaris can benefit from spelling with its production of dormant buds.
Are the grass crowns of cocksfoot and perennial ryegrass well anchored when first grazed after the autumn break?		A 'pinch and pull' test of the plant crown can be used to test pasture anchorage. Grasses are more susceptible to being pulled out in sandy soils.
GRAZING – dry pasture		
Is dry mature material reduced to 1,000kg DM/ha by the autumn break using heavy grazing followed by long periods of spelling?		1,000kg of DM/ha is equivalent to one to two handfuls of loose litter scraped up from a 0.1m^2 area.
Is new growth (green pick) in response to out-of-season summer rainfall only grazed for short periods followed by a long rest?		Perennial ryegrass and cocksfoot can green up after summer rainfall and be vulnerable to overgrazing unless it has regrown its full complement of live leaves; three or four respectively.
COMPETITIVE WEEDS		
Do competitive weeds make up less than 20% of pasture composition in the growing season?		Competitive weeds include high fertility broadleaf weeds (thistles, capeweed, erodium) or early germinating annual grasses (barley grass, silver grass, or brome grasses).
PESTS		
Is there minimal visual damage to leaves or roots in autumn/winter?		Look for dead patchy growth or areas slow to green up (suspect blackheaded pasture cockchafers, caterpillars) or areas where pasture is cut at root level and can be rolled up like a carpet (suspect redheaded pasture cockchafers).
ENVIRONMENT *		
Are the grass species or cultivars suited to the length of dry conditions they encounter?		Dry condition tolerance: phalaris (VH), tall fescue (H), cocksfoot (M), perennial ryegrass (L).
Are the grass species or cultivars suited to the length of waterlogging they encounter?		Waterlogging tolerance: phalaris (VH), tall fescue (H), perennial ryegrass (H), cocksfoot (L).
Are the grass species or cultivars suited to the soil acidity they encounter?		Soil acidity tolerance: cocksfoot (VH), perennial ryegrass (H), tall fescue (M), phalaris (L).

** Key for environmental considerations: VH = very high, H = high, M = medium, L = low.*

The next step

After completing the checklist, identify the considerations answered with ‘no’ or ‘sometimes’. These should be areas of further investigation and possible action.

Here are some areas to consider:

1. Nutrients and soil condition

The critical values of nutrients in the checklist are set at achieving at least 90% of maximum pasture production for the key introduced perennial grasses. If critical values fall below 80% of maximum pasture production, the loss of plants will start to occur.

Native grasses require lower fertility levels for persistence and examples of moderate fertility responsive native grasses are wallaby grass *(Rytidosperma caespitosum)* and weeping grass *(Microlaena stipoides)*. Low-fertility native grasses include spear grass *(Austrostipa* spp.*)*, poa tussock *(Poa labillardierei)* and windmill grass *(Chloris truncata)*.

Soil testing is required to determine what nutrients or soil conditions are affecting perennial grass production. These are most likely to be phosphorus (P), potassium (K) and/or sulphur (S). Prioritise paddocks for testing and subsequent fertilising. Priority paddocks should be those which have more desirable grasses and sub-clover and can be stocked at moderate to high stocking rates, so additional growth can be utilised.

P is commonly applied at or after the autumn break and is done regularly. S and K can be applied with P fertiliser blends or separately, depending on cost-effectiveness. Once deficiencies have been corrected, applying maintenance applications most years will be required.

Acidic soils are rectified with lime, generally applied every eight to 12 years depending on the soil pH and the soil acidification rate. Maintaining a soil pH of around pH ($CaCl_2$) 5.0 in the top 10 centimetres of soil removes most production constraints. Liming to keep soil pH ($CaCl_2$) above 5.5 creates enough alkalinity to not only treat the topsoil (0–10cm) but allows some alkalinity to move and treat soil acidity which may be present in the subsurface (10–20cm) and subsoil (20–30cm).

Soil acidity restricts phalaris pasture productivity. Adjacent plots, unlimed (left) and limed (right) show the increase in sub-clover content and herbage mass in phalaris pasture with starting pH ($CaCl_2$) 4.5, three years after liming.

Nitrogen levels measured in a soil test should be used as a guide only, because of the often rapid fluctuation between the readily absorbed form (nitrate nitrogen), the less available form (ammonium nitrogen) and gaseous losses due to biological activity. As time progresses, the levels measured in a soil test may vary markedly from the current soil condition.

Assessing the nodulation of the legumes in a pasture is a useful indicator of the nitrogen likely to be delivered to the soil through plant fixation. For information on sub-clover assessment, refer to MLA fact sheets, *How do I determine why my sub-clover is underperforming?* and How do I assess effective nodulation in legume pastures?

Sub-clover has higher requirements for molybdenum than perennial grasses. Molybdenum is a trace element required in small quantities, so needs to be applied less frequently than macronutrients (e.g. P, K and S). Liming of acid soil will generally make molybdenum more available, so it is unadvisable to apply both products in the same year.

Tissue testing in spring is the most reliable way to determine if molybdenum is required. If needed, then apply molybdenum at a rate of 50 to 100 grams/ha every seven to 10 years. Excessive molybdenum application may induce a copper deficiency in livestock where marginal copper conditions exist. If the copper status of the soil is unknown, apply copper with molybdenum to safeguard livestock.

The MLA Profitable Grazing Systems (PGS) training package PayDirt can help producers to work through the complexity of making sound fertiliser and lime decisions.

If these treatments do not result in a perennial grass response after two years, then other underlying constraints may be present.

If a level of herbicide-resistant weeds is suspected (or confirmed through resistance testing), selective herbicides with the same mode of action should not be used. Alternating herbicide modes of action and using non-herbicide control methods will be effective in preventing herbicide-resistant weeds developing.

TOP TIP

Test it

Fertiliser or lime test strips are a fantastic visual indicator of which nutrient is impacting growth. It could be multiple nutrients, so a simple approach is to apply all nutrients to one strip and then individual nutrients are omitted from subsequent strips to see which has the biggest influence on plant response.[1]

Fertiliser test strip indicates a response to potassium (K) during winter in a perennial ryegrass pasture. Additional visual indicators of soil condition can be found at soil-poster-book-mobile.pdf **(**mla.com.au**)**

2. Grazing management – green pasture

Understanding the principles of grass growth and their implications for grazing management is important to appropriately respond to changing seasonal conditions, pasture composition and livestock demands.

- **Managing fuel reserves**

  When a plant is grazed, it uses its 'fuel reserves' (water-soluble carbohydrates) stored in tiller bases to regrow the first new leaf. Roots are also 'pruned' to supply reserves.

  New leaves capture sunlight and, through photosynthesis, produce new carbohydrates which replace previously used reserves. It is only when multiple leaves are regrown that the plant is fully replenished.

  Failure to adequately replenish these carbohydrates after grazing means the next grazing will suppress regrowth and further deplete the reserves. Doing this continually without periods of replenishment will reduce the plant's crown (basal area) and root system, making it more vulnerable to grazing and dry conditions. Prolonged cycles without adequate replenishment will eventually kill the plant.

- **Responding to varying rates of leaf emergence**

  The growth of new leaves after grazing is influenced by soil moisture and temperature. Warm temperature with adequate moisture maximises leaf emergence. If either or both are limited, then leaf emergence is slowed. Therefore, expect slower growth and a requirement for longer periods of spelling (to enable reserves to be replenished) under cold conditions and during dry periods over summer.

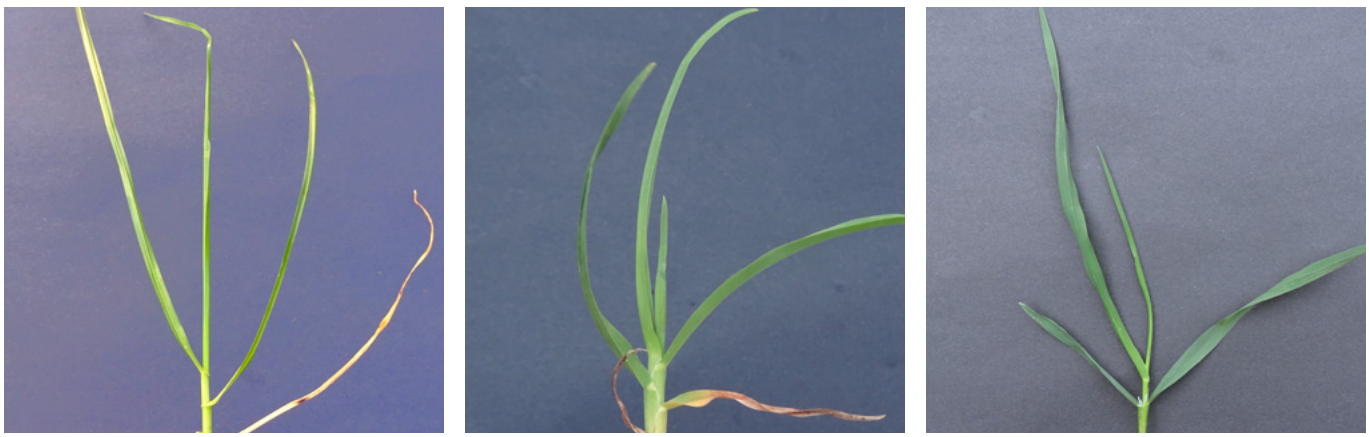
  If adequate soil moisture and temperature is present, then new leaf growth will start three to five days after grazing. Ideally livestock are removed before this time so they don't get the chance for a 'second bite' of the recovering plant. Often this is not possible, especially during lambing and calving, so an acceptable compromise needs to occur. Grazing for up to 14 days is considered acceptable, but if longer, extended periods of rest after grazing are required.

- **Managing grazing height**

  Leaving some residual herbage is important for both persistence and production. Grazing below 2cm of height will damage new growing points, remove carbohydrate reserves stored in the white area of the tiller base and reduce interception of sunlight. Only phalaris has growing points located below ground, which allows it greater protection from grazing damage compared to other species.

  While heavy grazing during spring can be used to maintain pasture quality and reduce weed seed set, it is detrimental to perennial grasses which need to survive hot dry summers. Allowing grasses to grow reproductive stems creates dormant buds to develop in the tiller base. In perennial ryegrass, winter-active tall fescue types and cocksfoot, the dormancy remains until heavy rainfall has occurred (although this varies with cultivar). Survival of these tillers increases if this rainfall occurs after the hottest and driest part of summer. In phalaris, the buds will not break dormancy in response to summer rainfall.

  Furthermore, allowing perennial ryegrass and cocksfoot seeds to mature and fall to the ground can encourage seedling recruitment and a replenishment of pasture density. The MLA fact sheet: How do I optimise seedling recruitment to avoid resowing? outlines the management needed to increase seedling recruitment.



Leaf stage shows 'grazing readiness'. Graze perennial ryegrass (left) and tall fescue (middle) at regrowth of three live leaves per tiller and phalaris (right) at four live leaves per tiller.

- **Hay making**

  Cutting pastures for hay or silage can cause perennial ryegrass and cocksfoot to thin out. Shading from excessive growth when the pasture is locked up restricts vegetative tillers from forming new daughter tillers. The older vegetative tillers will try and regrow after cutting but may run out of moisture, preventing full replenishment of fuel reserves. In contrast, phalaris benefits from being cut for hay, with the process of stem elongation (producing seed heads) encouraging the number and size of dormant buds.

  Hay making can also reduce sub-clover seed production and together with the removal of high amounts of herbage, lessens the nitrogen available to the grasses in the following autumn.

  Nutrient removal, particularly K, can reduce growth in the following autumn unless replaced with fertiliser.

- **Grazing after the break**

  It is common for the roots of temperate perennial grasses to die over summer. The plants regrow these roots when more than one leaf grows on a tiller and typically once the autumn break occurs.

  Cocksfoot is unusual, compared with other perennials, because it has a lower proportion of live roots prior to the autumn rains and a substantial new root system is not regenerated until it develops daughter tillers. This occurs about one month after initial rains. Therefore, cocksfoot plants are at greater risk of being pulled out by grazing stock just after the autumn break compared to other perennials.[2]

Avoid continuous grazing of green pick following out-of-season summer rainfall.

3. Grazing management – dry pasture

- **Dry feed removal**

  The removal of dead seed heads over summer is important to allow plant regrowth. Plants respond to light quality reaching their growing points by initiating tiller growth. Shading by dead plant material and old seed heads will limit tiller emergence in autumn. See the MLA fact sheet *How do I remove excess mature reproductive pasture?*

  Removal of excess dry material also helps break down the hard seed coat of sub-clover, maximising germination. The litter of many grasses leach toxins into the soil which also act to prevent growth of sub-clover. For further information see MLA fact sheet: *How do I maximise sub-clover establishment in existing pastures?*

- **Managing a green pick**

  If there is summer rain, perennial grasses which do not have dormancy traits will respond by trying to grow new leaves. Plants may not achieve their ideal number of new leaves before moisture becomes limited again, meaning plant reserves will be depleted.

  While it may be tempting to graze the green pick, this can be detrimental to most species, especially cocksfoot which responds quickly to summer rain. Leaf stage is useful to determine the plant's readiness for grazing.

  See the MLA fact sheet *How do I optimise perennial grass management in late spring and summer?* – a resource for advisors.

- **The grazing challenge**

  Seasonal constraints and livestock demand sometimes means we can't carry out best practice grazing management. The fact sheet *How do I respond to the challenges in grazing mixed pastures?* examines the challenges producers commonly face and possible responses to improve pasture recovery.

  For further detailed information, see *How do I get my perennial grasses to thrive and survive?* – a resource for advisors.

4. Weed control

Herbicide treatments can rapidly change pasture composition, but are rarely long-lasting unless the reasons for weed invasion can be addressed. However, some weeds are favoured by the same conditions required by sown desirable grasses, that is moderate to high fertility conditions and frequent grazing (e.g. barley grass and capeweed). For these weeds, regular interventions help keep them under control.

Correct weed identification is an important starting point in deciding how to best to manage weeds. The *Pasture Paramedic* technical manual (hard copy or online version) provides photos of distinguishing features which can be used in identification of common dominant weeds.

Appreciating the possible pros (e.g. contribution to the feedbase) and cons (e.g. competitiveness for resources, feed quality and animal health implications) is important in deciding whether to control a weed. Understanding of the weed's requirements, growth, life cycle and possible options for control improve management. Weed fast facts offers a source of information on growth, feed value and possible interventions for 15 common pasture weeds.

While grazing management is the cheapest way for producers to control weeds, it is not always effective for many competitive and well-adapted weeds. The MLA fact sheet How do I know if herbicide application will improve my pasture? helps producers weigh up the pros and cons of individual weeds within their farming system and provides a decision guide on whether or not to apply herbicide.

Competitive weeds like capeweed and barley grass require regular interventions to remove.

Photo by Alistair Crawford, ADAMA shows capeweed removal from perennial grass pasture.

More information on weed control tactics is available from the MLA southern weed control hub including:

- How do I winter clean pastures to remove annual grass weeds?
- How do I spray-top to reduce annual weeds in pastures?
- How do I spray-graze to remove broadleaf weeds?
- How can I use selective herbicides to safely remove common weeds from sown mixed pastures?
- How do I use hay and silage production to remove annual grasses?

Mowing barley grass before seed matures helps to remove it in paddocks which can't be grazed heavily in spring.

5. Pest control

Desirable grasses can be attacked by insect pests, leaving bare patches and reduced available feed. Principles of pest control involve accurate identification, monitoring of numbers or damage, and an understanding of their life cycle to implement appropriate insecticide or cultural treatments.

While sub-clover can have additional insect pests, damage to grasses is typically by cockchafer grubs, caterpillars and field crickets. Most of these pests live in the soil and come to the surface to feed on green pasture during the night. Redheaded pasture cockchafer larvae remain below ground feeding on roots, especially perennial ryegrass. Therefore, these pests are not readily visible by day and dead patches of pasture amongst green indicate their presence. Appearance of tunnels can also indicate the presence of blackheaded pasture cockchafers or caterpillar pests.

To identify pests, dig up soil in the affected area. Autumn and winter are usually the best times. Note the appearance of tunnels and location of plant damage to aid insect identification. Identification is important for correct treatment and to avoid impacting beneficial species like dung beetles.

Blackheaded field cricket shelter down cracks in the soil.

Armyworm is identified by the three long stripes along the length of its back. Photo by Alan Melville

Underground grass grub develops into moths, sometimes known as the ghost or swift moth, and has a greyish-green body. Photo by Josh Brown

Blackheaded pasture cockchafer larvae. Head capsule is shiny brown to black within hours of hatching. In contrast, redheaded cockchafer have a red-brownish head capsule. Cockchafers develop into black beetles. Photo courtesy SARDI, the research division of the Department of Primary Industries and Regions (PIRSA)

Pasture tunnel moth larvae are distinguishable by their slender body (matchstick width 2–3mm), black shiny head in contrast to body and sparse, stout hairs. Photo by Andrew Weeks, Cesar Australia

Cutworm larva is distinctly plump, has a greasy appearance and dark head. It develops into a moth e.g. Bogong moth. Photo by Andrew Weeks, Cesar Australia

Knowing the enemy

PestNotes developed by Cesar Australia and the South Australian Research and Development Institute (SARDI) contain useful identification and management information on common insect pests.
Go to: https://cesaraustralia.com/pestnotes

Herbage manipulation can be applied in areas where pests are considered a problem. These are timed before and after egg laying or larval deposits to disrupt the breeding cycle.

Black field crickets *(Teleogryllus commodus)* and blackheaded pasture cockchafer *(Adoryphorus couloni)* prefer to lay eggs on bare ground – keeping 100% pasture cover acts as a deterrent. Also, keeping pasture short after egg laying can expose eggs and larvae to detrimental temperature or moisture stresses. Blackheaded pasture cockchafers lay eggs in January and black field crickets in autumn, into moist soil.

In contrast, redheaded pasture cockchafers have a two-year life cycle and prefer to lay eggs from August to December in dense pasture. Therefore, keeping pastures grazed short over two consecutive springs will lessen their presence.

Caterpillar pests include armyworm *(Leucania convecta* and *Persectania* spp.*)*, underground grass grub *(Oncopera fasciculatus)*, corbie (found in Tasmania only) and winter corbie *(Oncopera* spp.*)*, pasture tunnel moth *(Philobota productella)* and cutworm *(Agrostis* spp.*)*.

Caterpillar damage. Photo by Josh Brown

6. Right plant for the right location

If all impacting factors have been considered and the grass species isn't persisting or hasn't persisted despite numerous resowing attempts, then it is highly likely the natural environment is not suited to the species sown.

Examination of the growing environment is necessary to choose species more likely to tolerate local conditions. More information on plant stress and plant selection to tolerate stresses can be found at How do I get my perennial grasses to thrive and survive? – a resource for advisors and How do I optimise perennial grass management in late spring and summer? – a resource for advisors.

The most common environmental challenges are:

- **Species is not suited to growing season length**

  Flowering time (anthesis) of different grasses can vary by up to six weeks. While selecting long-season grasses makes sense to increase production in wet summer environments, they are unlikely to survive in drier situations. Allowing perennial grasses to flower within the growing season performs two functions that help with its survival. Firstly, it can help assist summer survival by laying down buds which shoot in autumn. Secondly, allowing seeding and seedling recruitment is a strategy which can be used where grasses tend to thin out due to hot and dry summers. This is most applicable to perennial ryegrass, which has poorer drought tolerance compared to phalaris, tall fescue and cocksfoot.

- **Soils with limited water-holding capacity**

  Soils with shallow topsoil have limited water-holding capacity and ability to store water for use by plants if it doesn't rain. North and west-facing slopes are also subject to drier conditions than south or east-facing slopes. Therefore, plants with greater drought tolerance are required.

- **Waterlogging**

  Plants require oxygen around their roots to function. When the soil is waterlogged, porous spaces are filled with water, oxygen is expelled and gases like carbon dioxide and ethylene increase.

  Stress and a subsequent reduction in growth due to waterlogging occurs after 14 days. It is more pronounced in cocksfoot (up to 56%) and tall fescue (up to 38%). Tiller development is also

A severe case of waterlogged pasture with pugging damage.

affected after 21 days of continual exposure.[3] Perennial ryegrass, phalaris and tall fescue adapt to short periods of waterlogging (up to 14 days), whereas cocksfoot will not. Cocksfoot will not tolerate waterlogging and is better suited to well-drained soils.

A secondary effect of grazing waterlogged soils is pugging. When a soil is saturated, it loses its strength, causing separation of clay particles and softening of the cements which hold the clay particles together.[4] The soil loses its strength to support the weight of grazing livestock, especially heavy animals. A single pugging event with cattle has been shown to reduce ryegrass tiller density by as much as 52% through crushing and bruising of the plants.[5]

- **Subsoil acidity**

  Perennial grasses in dry environments rely on roots to access deep moisture to keep them alive through summer. High soil aluminium associated with subsoil acidity prunes the roots, preventing access to deeper soil moisture. Grasses with aluminium sensitivity will either have impaired root function or reduce growth into the affected soil area. Subsoil acidity has been a cause of failed phalaris persistence. Cultivars with higher aluminium tolerance have been bred to tolerate much greater exchangeable aluminium. Plant breeding helps extend species choice in naturally occurring acid subsoils. However, farming-induced acidity should be avoided with regular liming to maintain the soil asset, as severe acidity (less than pH 4.0) can cause permanent soil structural changes.

- **Salinity stress**

  High saline water tables (less than two metres below soil surface) can create soil with high salt content. Soil tests can indicate the presence of salinity through electrical conductivity (EC). EC measures free salts in the soil solution. Sometimes salt content can be high from recent fertiliser applications, particularly potassium and not from the presence of sodium chloride due to high groundwater tables. Salinity is easily identified in late spring (See: Visual indicators of soil condition – Part I soil poster).

  In a routine soil test, EC (1:5) values indicating a soil may be saline are: clay >0.2dS/m, clay loam >0.15dS/m or loam >0.12dS/m.

  As salt levels increase, common desirable grasses start to decline and are replaced with more salt tolerant species. Summer-active tall fescue is moderately salt tolerant and will survive if salt levels do not cause salt scalds or bare ground. Tall wheat grass *(Thinopyrum ponticum)* is a more salt tolerant perennial grass, although it can have environmental weed status in some areas due to its ability to spread into wetlands.

References

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4. Agriculture Victoria (2020). Soil strength. In Victoria resources online. Online (verified March 2022) http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/soilhealth_soil_strength
5. Nie ZN, Ward GN and Michael AT (2001). Long-term effects of pugging on soil and pasture in SW Victoria In: Proceedings of the 10th Australian Agronomy Conference, January 2001, Hobart, Tasmania.

More information

For additional support, undertake one of the many coaching opportunities available through Profitable Grazing Systems (PGS) training packages. For example: PayDirt – Getting the best bang for your fertiliser buck. Further information on MLA PGS training packages is available at: https://www.mla.com.au/extension-training-and-tools/profitable-grazing-systems/

MLA fact sheets available from MLA:

How do I identify sub-clover cultivars?

How do I assess effective nodulation in legume pastures?

How do I optimise seedling recruitment to avoid resowing?

How do I maximise sub-clover establishment in existing pastures?

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

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

How do I spray-graze to remove broadleaf weeds?

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

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

A range of resources and tools for managing productive pastures are available from MLA. Go to:

MLA Feedbase Hub https://www.mla.com.au/extension-training-and-tools/feedbase-hub/

MLA Weed Control Hub https://www.mla.com.au/extension-training-and-tools/feedbase-hub/weed-control/

MLA Legumes Hub https://www.mla.com.au/extension-training-and-tools/feedbase-hub/legumes-hub/

Authors

Lisa Miller and Jess Brogden, Southern Farming Systems and Cam Nicholson, Nicon Rural Services.

MEAT & LIVESTOCK AUSTRALIA

Meat & Livestock Australia
Level 1, 40 Mount Street
North Sydney NSW 2060
Ph: 02 9463 9333
mla.com.au