

PASTURE & GRAZING

Pastures are an essential component of agricultural properties throughout Southern Tasmania. They provide feed for livestock, incorporate atmospheric nitrogen into the soil (legume species), are an important break in cropping rotations and provide ground cover to protect soils from erosion.

There are a number of methods that can be used to improve pasture management, but important outcomes should include;

- Having adequate feed to meet livestock requirements
- Having good pasture quality to meet livestock requirements for energy, protein and fibre
- Controlling weed growth and establishment
- Controlling pasture pest populations
- Ensuring adequate ground cover to avoid soil loss through wind or water erosion
- Encouraging pasture species diversity to build more resilient pastures and to provide livestock with a wider range of nutrients
- Increasing water infiltration and decrease nutrient loss by reducing water runoff from bare ground
- Providing a fibrous root system which adds organic matter into your soil



MOST PASTURES ARE MADE UP OF A MIX OF GRASS AND LEGUME PASTURE SPECIES. THESE CAN INCLUDE THE FOLLOWING COMMON TASMANIAN PASTURE SPECIES;



Mixed pasture with grass and legume species.
Photo: S Folder

Grasses

annual ryegrass
perennial ryegrass
cocksfoot
tall fescue
phalaris
prairie grass (broome)

Perennial legumes

white clover
red clover
strawberry clover
caucasian clover
lucerne
birdsfoot trefoil
greater lotus

Perennial herbs

plantain
chicory

Annual legumes

sub clover
arrowleaf clover
persian clover
balansa Clover
biserrula

IMPORTANT POINTS TO CONSIDER IN MANAGING DIFFERENT PASTURE SPECIES

- Annual pasture species need to set seed in order to re-emerge the following season.
- Perennial grass species re-grow using tillers which grow from the base of the plant. Managing pastures in spring and autumn to avoid them growing too long is important as it allows sunlight to reach the base of the plant for setting up tiller establishment for the following season.
- Grasses provide good year round production and will provide more feed than legumes in late autumn, winter and early spring. They are also more tolerant to grazing.
- Legumes are important as they have higher levels of digestible protein, greater concentrations of calcium compared to grasses and significantly increase the nutritional value of pasture.
- Legume species have the ability to fix nitrogen from the atmosphere into the soil. They can provide at least 100kg /ha/year of nitrogen, which is essential for the growth of all pasture plants.

ANIMAL HEALTH CONSIDERATIONS FOR DIFFERENT PASTURE SPECIES

- In spring, legumes (eg. clovers and lucerne) can cause bloat in ruminant animals. It is important to regularly monitor livestock when grazing legume rich pastures. Bloat oil can be used to treat animals and pastures when conditions are bad.
- Some grass species can have animal health effects such as ryegrass staggers or phalaris toxicity.
- Ryegrass staggers is caused by an endophyte in the ryegrass. It can be more of a problem when pastures are short as new growth appears in late summer and autumn. Avoid stock management practices that encourage animals to graze close to the ground. Maintain a close watch on stock whenever feed is in short supply. Choose low endophyte species when renovating pastures.
- Phalaris toxicity can occur in young green shoots of phalaris based pastures. It is due to the presence of an alkaloid. It is more of a problem with sheep than cattle and can be managed by avoiding hungry stock grazing regenerating phalaris pasture after rain. It can be exacerbated by stress caused by frost or moisture stress.

PASTURE ASSESSMENT

Why assess pastures?

- To better match animal requirements and pasture production
- To know how much feed you have - how different classes of animals will perform & to allocate stock accordingly
- To reduce supplementary feeding
- To enable accurate feed budgeting
- To meet livestock production targets



Pasture species selection is region and site specific. Local agronomists can provide you advice on what pasture type is best suited to your property and enterprise.

PASTURE QUANTITY

Pasture quantity is described in kilograms of dry matter per hectare (kg DM /ha). The dry matter component of a pasture is the part from which animals derive their protein, energy and fibre needs.

Pasture 'rulers' or sticks are an easy way to measure pasture height which can then be converted into an estimate of the kg of green dry matter/ha using height density tables. The table demonstrates the difference in kilograms of dry matter per hectare (Kg DM/ ha) according to pasture height between a dense (typically sheep grazed) pasture and an open pasture. Green refers to new vegetative growth of the pasture as opposed to dry standing feed. For typical sheep pastures use the 'dense pasture column' for typical beef pastures use the 'moderately dense column'.

Height (cm)	Kg DM/ ha		
	Lightly Grazed 50% green	Moderately dense pasture 100% green	Dense pasture 100% green
1	250	400	500
2	500	700	800
3	600	1000	1100
4	800	1200	1400
5	1000	1400	1700
6	1150	1600	2000
7	1300	1750	2300
8	1450	1900	2600
9	1600	2000	2800
10	1700	2100	3000

SOURCE: *Prograze manual*



A pasture ruler, used to measure pasture quantity

Matching the pasture quantity available (kg DM/ha) with livestock requirements will enable you to determine grazing rotations for your pastures and to determine if supplementary feed is required. It is also a critical tool to ensure that the soil is protected from overgrazing and livestock targets are achieved.

PASTURE QUALITY

Pasture quality refers to the feed quality of the pasture, or the amount of energy and protein it contains.

Pasture quality is affected by the species composition of the pasture, pasture growth stage (fibre content) and the percentage of green versus dead matter in the pasture.

Pastures are generally at their highest feed quality in spring when they are actively

growing, in their vegetative growth stage (when fibre content is low) and when the legume content is high.

Once a pasture moves into the reproductive phase, begins to flower and send up its seed head (mid to late spring) the amount of fibre in the pasture increases and the feed quality declines.

A FEEDTEST can be used to measure pasture feed quality in a laboratory and will give you measures of energy, protein, fibre and digestibility of your pasture.

Feed testing can also be useful in determining the feed quality of hay and other supplementary feed products. The quality of different pastures and supplementary feeds can vary considerable, which in turn will influence the health and wellbeing of your livestock and overall farm productivity.

For more information on feed testing seek advice from an agricultural consultant or an accredited laboratory.

PASTURE GROWTH

The following elements are essential for pasture growth

SUNLIGHT

For plants to produce carbohydrates from sunlight through the process of photosynthesis.

WATER

Irrigating pastures at dry times of the year will increase the amount of pasture growth and provide more feed for livestock.

NUTRIENTS

Pasture plants derive most of their nutrients from the soil. Soil testing establishes what nutrients are potentially available to the plants. Plant sap tests are needed to determine what nutrients are actually taken up and are present in the plants. Data from both soil and sap tests can show whether there are deficiencies or over-supply of particular nutrients.

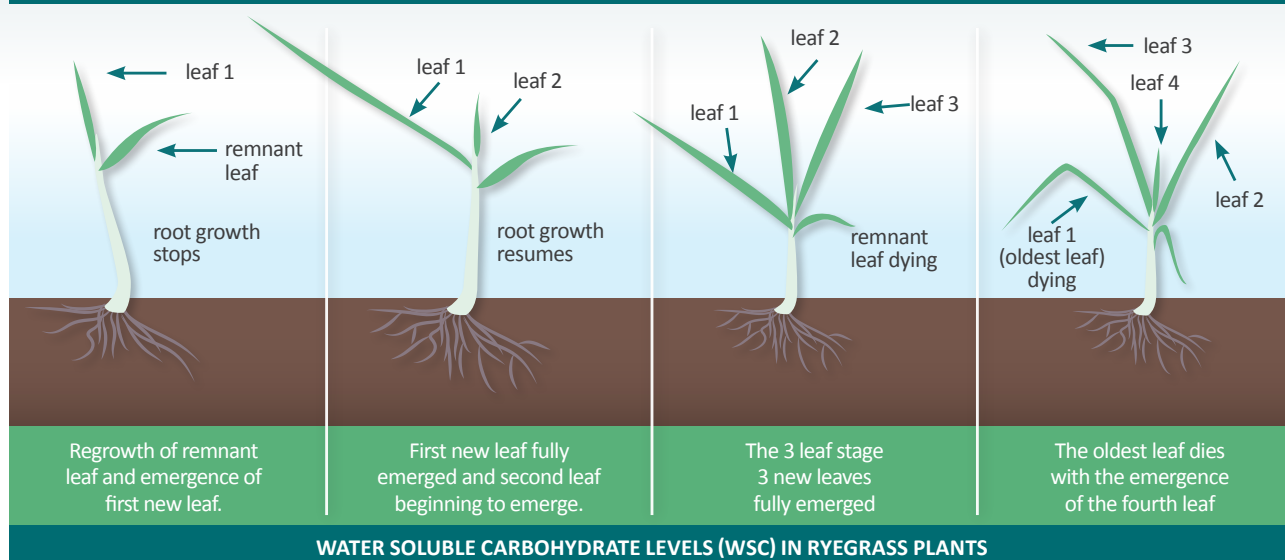
TEMPERATURE

Pastures will have faster growth in warmer temperatures and slower growth in cooler temperatures.

MANAGEMENT

Grazing, weed pressure and pest control in pastures will affect pasture growth potential.

STAGES OF GROWTH & GRAZING



WATER SOLUBLE CARBOHYDRATE LEVELS (WSC) IN RYEGRASS PLANTS

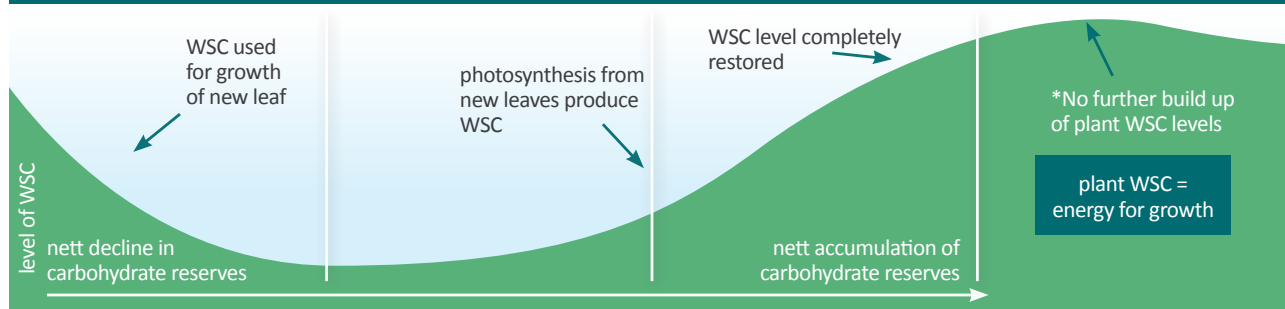


Figure 1. How a perennial ryegrass plant grows.

MODIFIED FROM: MLA More Beef From Pastures Manual

*However, while plants at the 4 leaf stage are no longer building WSC, the older leaves provide a good source of fibre for animals and when pushed into the soil surface by livestock will add beneficial organic matter to the soil, helping build soil carbon and in turn improving soil and pasture health.

GRAZING MANAGEMENT

Grazing management gives property managers the ability to manage when a pasture is grazed according to the best time for the plant and the animal.

The best time for grazing depends on the condition of the pasture, common practice is to graze when pasture grasses are at the 3 leaf stage when full photosynthetic potential of the plant is reached and when there is the most feed available for the livestock.

Pasture plants that are continually grazed at the one leaf stage do not have the opportunity to replenish root carbohydrate reserves required for re-growth. They will have smaller root systems and therefore a reduced ability to access water and nutrients from the soil than plants grazed at the 2 or 3 leaf stage (Figure 2).

Alternative grazing techniques such as Holistic Management® Planned Grazing focus on grazing at the 4 leaf stage, when dead leaf litter is formed. Feed for livestock is balanced with feed for the soil, as the dead plant material is trampled into the ground by grazing livestock. This process allows organic material and carbon to enter the soil, which in turn promotes nutrient cycling. The fundamental principle behind this management technique is to use livestock to improve the long-term health and resilience of pastures.

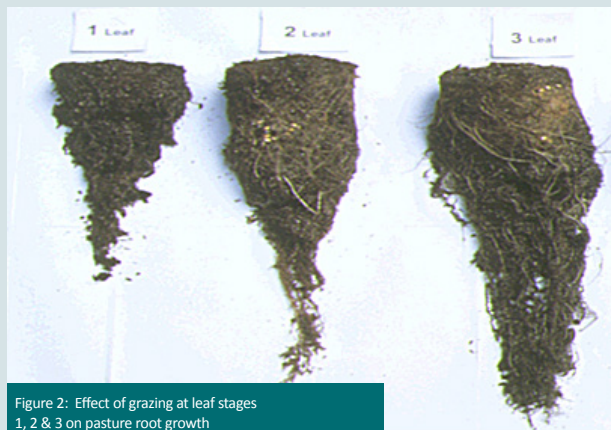


Figure 2: Effect of grazing at leaf stages 1, 2 & 3 on pasture root growth

There are a number of grazing systems that can be used on your property. Here are a few examples:

SET STOCKING

Livestock are usually grazed in the same area on the farm and there is minimal stock movement between paddocks through autumn and winter.

INTENSIVE ROTATIONAL GRAZING

Stock are moved frequently (every 1 to 3 days) through a large number of paddocks (eg. 15 – 30) on the farm.

SIMPLE ROTATIONAL GRAZING

Stock moved according to a set grazing schedule (5-14 days) through a small number of paddocks eg. (4-8 paddocks) on the farm.

HOLISTIC MANAGEMENT® PLANNED GRAZING

Stock are moved regularly through a large number of small paddocks based on regular assessment of pasture health and livestock performance, recently grazed paddocks are typically rested for long periods (6-9 months) on the farm.



Photo: S Folder.



Paddock ready for grazing (front)
Photo: S Folder.

SELECTIVE GRAZING

Livestock will selectively graze the pasture species that they prefer within a pasture.

Sheep have a greater ability to selectively graze than cattle. In a set stocking situation livestock can continually graze the new growth as it emerges (first leaf stage), in which case the pasture does not have the opportunity to replenish root carbohydrate reserves and may lead to weaker plants and less persistent pastures. Weed species that are less desirable to livestock will be given more opportunity to flourish under situations where selective grazing can occur.

CONSIDERATIONS FOR ROTATIONAL GRAZING

A simple rotational grazing system is proven to be a good way of managing pastures and controlling weeds. Setting your property up into several small paddocks is generally a good idea for all types of livestock.

The benefit of rotational grazing is that the pasture is given time to re-grow and replenish root reserves before the next grazing.

Rotationally grazed pastures have greater root mass and are therefore better able to access water and nutrients stored in the soils and lead to more healthy soils.

Many perennial pasture species favour rotational grazing and therefore these desirable species will flourish under rotational grazing systems.

Rotational grazing systems require a greater labour input than set stocking systems as stock need to be moved according to your rotation length.

It is essential to ensure that there is adequate stock water in all paddocks in your rotation to meet livestock requirements at all times of the year. Stock water requirements will be greater in the warmer months of summer when it is hot and pastures are free from dew.

Whilst the proven benefits of good rotational grazing are widely known, there are different schools of thought as to what types of rotational grazing techniques work best.

As a land owner it is important that you look at what your goals are for your property and to match these with your lifestyle to see what type of grazing technique works best for you. Regardless of the technique you decide to employ, it is essential that you have a grazing plan for your property.

Examples of different rotational grazing techniques previously mentioned include Holistic Management® Planned grazing and Time Based Rotational Grazing.

HOLISTIC MANAGEMENT® PLANNED GRAZING

Holistic Management® Planned Grazing commonly referred to as 'planned grazing' is a structured way of using animals to regenerate pasture, and to improve soil health and grazing profitability. This approach builds on the general principles of good rotational grazing described in this fact sheet and involves putting a large mob of animals into a small area for a short time (as little as a few hours), then remove them and letting the area recover (which can take from several months to over a year) before returning the animals again.

Planned grazing has the potential to significantly reduce costs while improving the land's ability to respond to seasonal and climate changes; international and mainland trials show that it can be extremely effective. NRM South is currently trialling the technique in southern Tasmania. For more information on Planned Grazing, please refer to NRM South's Guide to Planned Grazing or contact NRM South directly.

www.nrmsouth.org.au

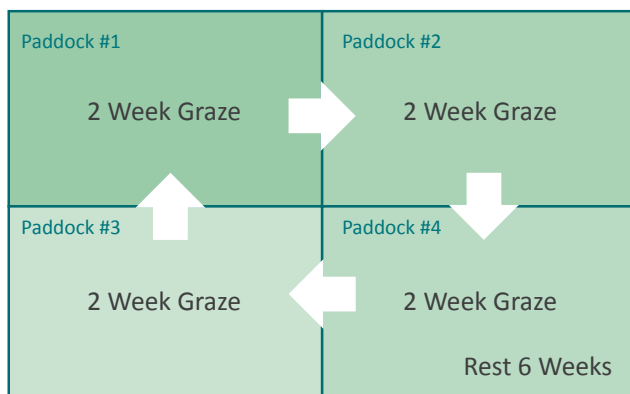


Time Based Rotational Grazing

Meat and livestock Australia recommend a rotation length that is managed so that pastures are grazed at the three leaf stage and when there is adequate pasture quantity to meet livestock requirements for a set period of time.

Time Based Rotations (4 Paddocks)

DURING MODERATE GROWTH



DURING FAST GROWTH (SPRING)

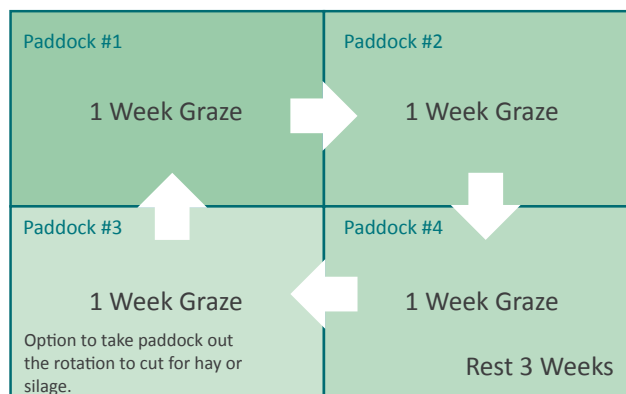


Figure 3: Simple Time Based Rotations (4 paddocks)

SOURCE: Meat & Livestock Australia
Tips & Tools, Getting started on a simple time based rotation

PASTURE PESTS

Watch out for pasture pests such as red legged earth mite and lucerne flea which will feed on pasture leaves in the spring and autumn.

Pasture grubs such as black headed cockchafer, red headed cockchafer and corbie grubs will feed on pasture roots and are often detected by bare patches in your pasture in the autumn

and winter months. Grubs can be found in the soil of affected pastures.

Pasture pests can be controlled using an integrated pest management approach by applying a range of methods including application of selective sprays (chemical control), cultural control and biological control. Cultural methods can include selecting pest resistant cultivars when re-sowing, not letting pastures grow long in summer as it will be less attractive to corbie moths laying eggs and use

of soil cultivation to expose grubs and disrupt their life cycle. Biological control involves the use of natural enemies that prey on pasture pests. Most are naturally occurring so it is important to monitor for beneficial pest insects as well as pest ones. If using chemical controls make sure that you get advice on sprays that will target pests and not affect beneficial insect populations (selective insecticides).



Red legged earth mite damage on clover leaves.

PASTURE WEEDS

Weeds will compete with pasture plants for space, light, water and nutrients and therefore it is important to manage weeds as they can significantly reduce the production and persistence of your pastures.

Some weeds can also be toxic to grazing livestock and therefore should be controlled immediately eg. Ragwort, Foxgloves and Patterson's Curse.

Good grazing management (use of rotational grazing) can be very effective in controlling pasture weeds. Spray grazing is a technique that can be effective for controlling weeds such as cape weed. It involves the application of a low dose of herbicide to bring the sugars into the leaves and make the plant very palatable to stock. This is then followed by heaving stocking to graze out the weeds.

Seek the advice of a local agronomist when deciding on herbicide programs for your pastures.

FURTHER INFORMATION

For more information please refer to NRM South's Healthy Farming & Environment Reference Guide: <http://www.nrmsouth.org.au/>