



Making More From Sheep

MODULE 8

Turn Pasture into Product



A joint initiative of Australian Wool Innovation and Meat & Livestock Australia

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Turn Pasture into Product

What does this module do for you?

Grow More Pasture focused on understanding and increasing the amount of pasture that is available to drive an animal production enterprise.

In this module, your business objectives (see tool 1.2 in *Plan for Success*) will guide your tactics and strategies for matching feed supply to animal demand, managing any consequences and exploring opportunities when feed supply does not match enterprise demand.

The biggest driver of pasture utilisation is stocking rate, which, in turn, is the major driver of meat and wool turned off per hectare and, therefore, of profit.

The focus should be on optimising production per hectare rather than production per head.

The tools are designed to help you implement a grazing system that suits your personal and enterprise goals and your approach to risk. Tools include stock type/enterprise mix, stocking rate, grazing management, paddock subdivision and the timing of events such as lambing and stock sales/purchases.

This module will help you:

- Know your annual feed supply
- Know your annual feed demand from your livestock enterprise
- Match your annual feed supply to your annual feed demand and manage seasonal and other risks.

A key process for converting pasture into product is to measure, manage and monitor pasture supply, animal demand and risk. Instructions for measuring, managing and monitoring are included in the procedures and tools.

At its simplest, *Turn Pasture into Product* is about getting the best alignment between animal demand and pasture supply so as much of the pasture you grow as possible ends up as animal product without jeopardising the feedbase or natural resources. Increases in pasture utilisation must be made in ways that not only increase animal production but also reduce costs and account for natural resource management (NRM) risks (see procedure 5.1 in *Protect Your Farm's Natural Assets*).

Procedure 8.1

Know your feed supply



Background information



When are the best, worst and most unreliable periods for pasture growth on your farm? Knowing the answers to these questions will help you make the right strategic decisions for your sheep enterprise.

The first and most critical step is to more reliably predict pasture growth across the year. Once you understand how pasture growth varies, you can:

- Match animal requirements to pasture production (see procedure 8.3)
- Achieve more precise and cost-effective supplementary feeding (see procedure 11.1 in *Healthy and Contented Sheep*)
- Budget feed more accurately (see procedure 8.3), and
- Manipulate pasture production and composition to meet the needs of your enterprise.

Key decisions, critical actions and benchmarks

To better understand your feed supply, construct pasture supply curves for your property and assess the variability between years. This requires knowledge of your annual rainfall and its variability, temperature patterns and your pasture types.

Review annual rainfall patterns

Annual rainfall and its distribution influence pasture growth. To review your annual rainfall pattern, graph your own average, long-term rainfall figures, or to find long term rainfall information, visit the MLA Rainfall Outlook web site (www.mla.com.au/growthoutlooktool/) or the National Agricultural monitoring System (www.nams.gov.au/) or Climate On-line web page at the Bureau of Meteorology website (www.bom.gov.au/climate/data/).

If you use Climate On-line choose the “monthly statistics” option, then your state and closest town, and click the plot icon to graph your Decile 5 median rainfall as shown in figure 8.1.

What does the annual rainfall pattern look like in your district? Can your existing pastures use the rain whenever it falls? Could pasture types with growth patterns different to those of your current pasture types fill some seasonal feed gaps in response to rain?

AT A GLANCE



- Know your feed supply curve
- Understand the variability of your feed supply curve, within and between years
- Identify and quantify opportunities to change your feed supply curve

Determine your current pasture growth pattern

On any farm there may be several different pasture and feed sources (annual pasture, native or introduced perennial grass pastures, lucerne, grazing cereals, forage crops and crop stubbles) that can provide forage at different times of the year. Figure 8.2 shows the growth of lucerne and sub clover based pastures at Dubbo. Your total farm feed supply determines how well an enterprise and stocking rate will suit your growing season. However, it is important to also consider the quality of the pasture at different times of the year. For example, only a small area of lucerne might be required to grow out late winter born lambs in the Dubbo region.

There are several ways to use the pasture growth data. The first option is to plot on a graph similar to figure 8.2, the pasture growth of each of the main pasture types on your farm. This data together with information on the area of each pasture can be entered into the

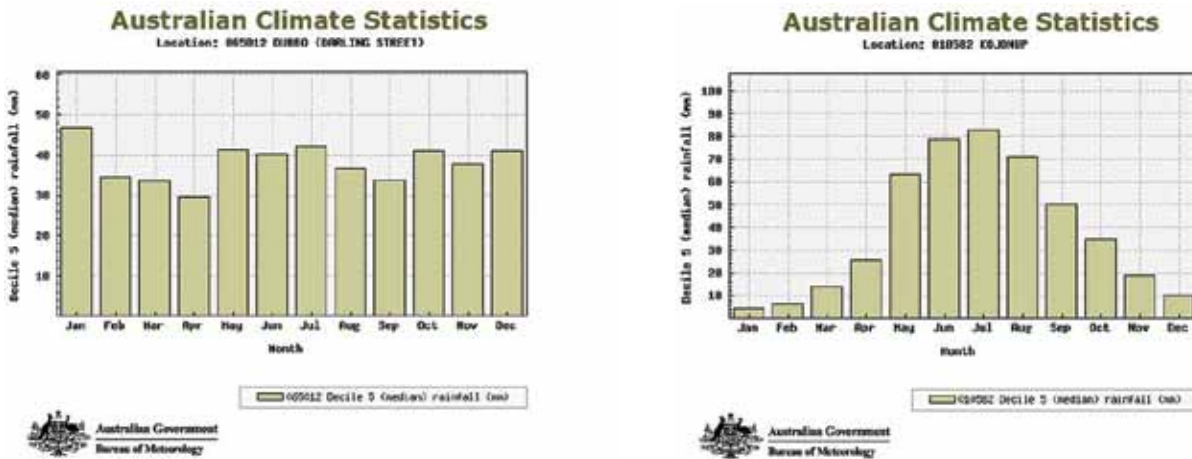


Figure 8.1 Median rainfall at Dubbo NSW (left) and Kojonup WA (right). Dubbo sheep producers could grow green feed almost all year round in response to rain, but this is much less likely at Kojonup with winter dominant rainfall.

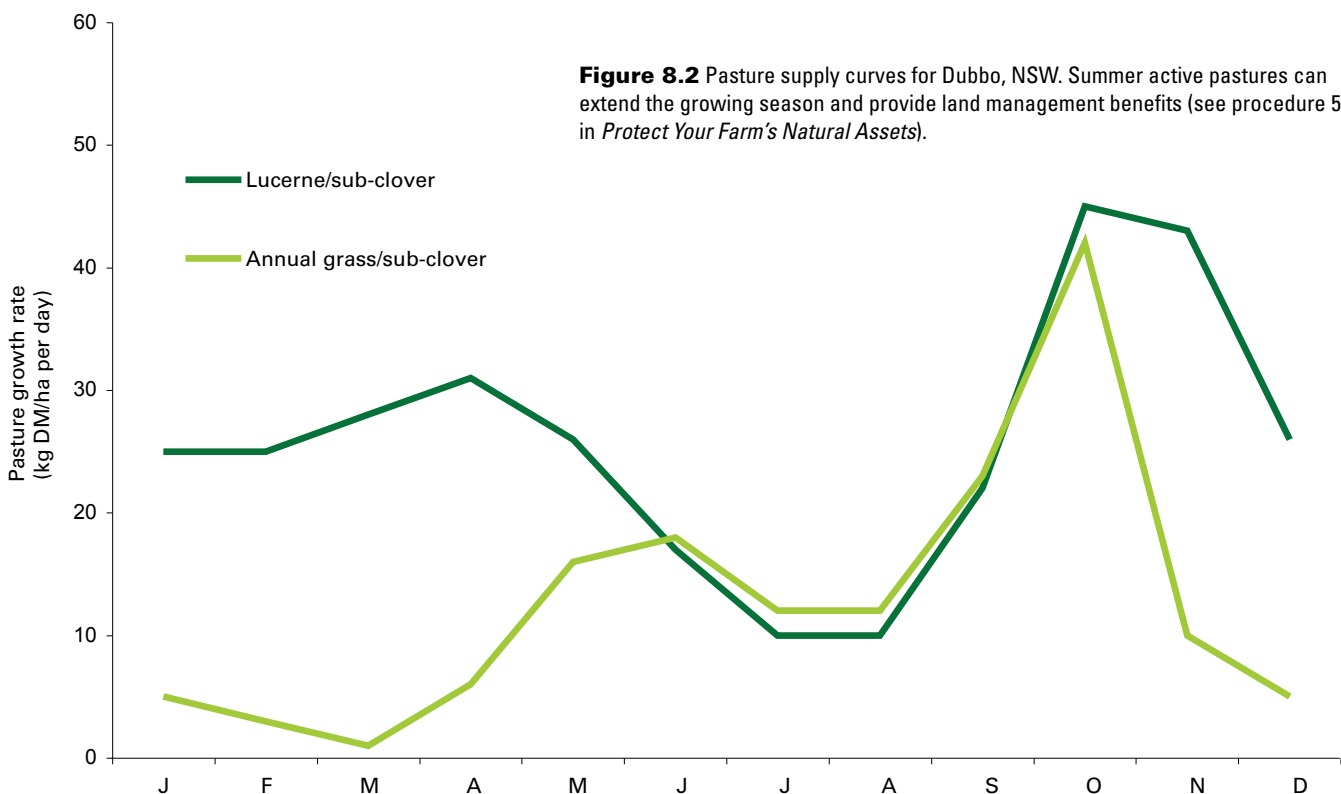
Feed Demand Calculator (see tool 8.3) to generate an overall supply curve for your farm. In addition, the tool allows you to trial different stocking rates, lambing times etc and determine pasture deficits or surpluses.

A second option is to manually work out the “average” pasture growth each month for your farm. See tool 8.2 for daily pasture growth estimates for common pastures by region. This is relatively easy where there are only 2-3 pasture types

on a farm. For example, assuming that the data in figure 2 is from a 1000 ha farm with 800 ha sub clover pasture and 200 ha of lucerne, the average growth in January is: (lucerne 25 kg/ha/day x 200 ha) + (sub clover 5 kg/ha/day x 800 ha) / 1000 ha = 9 kg/ha/day average farm pasture growth in January. The same calculation can be undertaken for each month to determine the average pasture supply across the farm in an average year.

A third thing to consider is the potential

to use alternative pastures or forage sources to fill feed gaps. For the farm shown in figure 2, what options are there to graze cereals or use pasture growth promotents in July? Is there potential to use more summer active pastures to overcome feed gaps in summer? Local state agency staff or agronomists can provide advice on species to fill feed gaps. Procedure 7.3 in Grow More Pasture also provides details of where to get information on pastures for different areas.



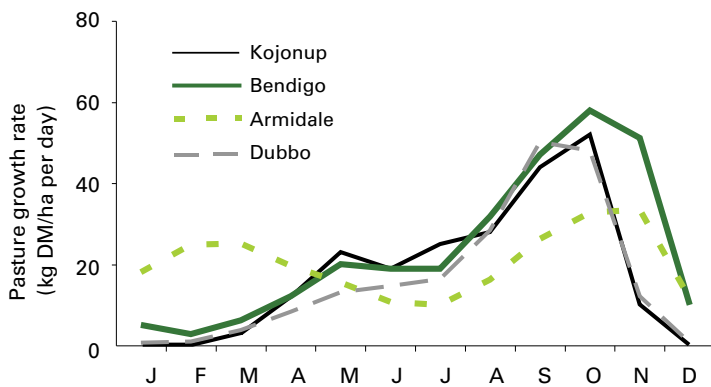


Figure 8.3 Average pasture growth curves (1965–2002) for four different environments. Kojonup, WA: annual pasture, good fertility; Bendigo, Vic: phalaris/sub clover pasture, good fertility; Armidale, NSW: native pasture (red grass)/sub clover, low fertility; Dubbo, NSW: annual pasture, moderate fertility (from GrassGro®).

Finally, with the assistance of your consultant or adviser, use tools such as the computer model GrassGro® to get more specific data for your pasture species, soil types and soil fertility levels and how changes to these will influence pasture growth and quality.

Determine variability in your pasture growth

Pasture supply varies from year to year and between different locations. The variability of pasture growth between years is an indicator of risk and affects the ability to set an optimal stocking rate target or the reliability of a particular time of year for lambing (see figures 8.3 and 8.4).

In figure 8.4, Decile 1 represents the one-in-ten bad years (only 10% of all pasture growth records would fall below this line). Decile 5 represents an “average” year (half of the recorded years were above and half were below this line), while Decile 9 represents the boom seasons (90% of all pasture growth records would fall below this line) – only 10% of recorded year’s pasture growth would be above this year.

The closer all three Decile lines are together in any one month, the less variability there is between years. In figure 8.3, the most reliable months are July–September at Kojonup. Autumn growth in annual pastures is variable at Kojonup, whilst spring is the most variable growth period for native pastures at Armidale.

To better understand your feed supply, construct pasture supply curves for your farm and assess the variability between years.

The simplest approach to constructing a pasture supply curve is to draw the growth curves for the main pasture types on a single graph.

Use the relevant tables in tool 8.2 to construct simple pasture supply curves for your farm. The estimates presented are only intended as a guide to help plan your annual feed availability. As an example, a pasture supply curve has been constructed for Dubbo NSW (figure 8.2) using the tables in tool 8.2.

On your whole-farm pasture supply curve, draw estimates of how much higher these lines might be above the average, in the 1-in-5 best years, and how much lower the lines might be than average, in the 1-in-5 worst years, using:

- ➔ Your experience, and/or that of your adviser
- ➔ The Climate on line web page at the Bureau of Meteorology website (www.bom.gov.au/climate/data) provides historical weather details. In this site click on “Weather & climate”, then “Monthly statistics”. Enter your location and select the nearest weather station to your location. Get the data and then select “All available” to see the Decile 1, Decile 5 and Decile 9 rainfall values.

➔ The data in tool 8.2.

Alternatively, use tool 8.1 to calculate an index of potential pasture growth, based on actual rainfall, indices of soil moisture, pasture growth for the past nine months, and an outlook for the next three months. Use this tool to get a ‘feel’

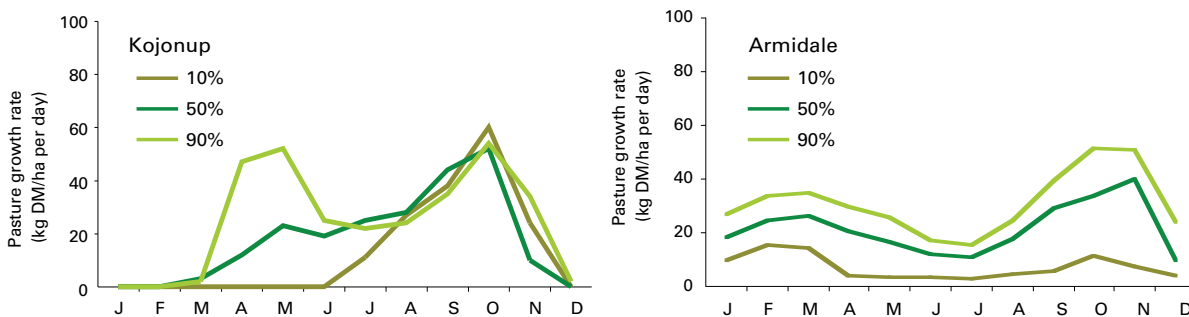


Figure 8.4 Variability in pasture growth rates for Kojonup, WA (annual pasture) (from DAFWA Woolpro sites and Pastures from Space) and Armidale, NSW (native redgrass/sub clover pasture) (from GrassGro®).

for when to expect pasture growth; to establish where the likely deficits will be; and to identify opportunities to include different pasture types in your enterprise.

Tool 8.3 (the MLA feed demand calculator), describes how best to match animal demand to your pasture supply, and minimise your exposure to risk from seasonal variability. The feed supply curve is generated as well as an inventory of stock demand across the year (all classes considering purchase, sale and lambing dates). Compare supply with demand to get a better understanding of when pasture will be in surplus or deficit and by how much. Use this information to set up your enterprises to better match available feed with animal demand.

Modify your pasture supply

Rainfall, temperature, soil moisture, soil type, fertility and pasture type combine to drive pasture growth. You can't change your annual rainfall without moving, but you can rethink your existing pasture types and management systems to suit your location and achieve your enterprise goals.

Module 7 **Grow More Pasture** contains procedures to alter your pasture supply curves by:

- Building and maintaining soil fertility (procedure 7.1)
- Grazing to keep the desirable species productive and dominant (procedure 7.2)
- Establishing new pastures (procedure 7.3).

Supply gaps by can be filled in several ways. Use different pasture species and forage crops to provide out of season pasture growth. Figure 8.2 shows how lucerne can fill a pasture supply gap over summer/autumn in areas that receive summer rainfall. Lucerne and other deep rooted, summer-active perennials such as chicory can also prevent potential dryland salinity problems and protect the soil (see procedure 5.3 in Protect Your Farm's Natural Assets).

Nitrogen fertilizer can be used to boost pasture growth in winter and spring and is often more cost effective than using supplements. See Tool 7.4 Guidelines for fertilizer applications for more information.

Growth promotants that contain Gibberellic acid can be used to boost growth of pastures in winter when levels of this naturally occurring plant hormone are low. However, the additional growth in winter may be at the expense of spring growth. A comparison of the use of a range of growth promotants can be seen at http://www.msfp.org.au/docs/research_42.pdf

Changes to grazing management can also increase pasture growth. Rotational grazing systems that allow higher pasture availability during autumn and winter can increase pasture growth rates by 10-20% compared to set stocked systems. For more information see "Tactical grazing to maximise pasture and animal productivity" available from the MLA website www.mla.com.au

Supplementary feeds can also be used to fill feed gaps and harvesting hay or silage can also use some of the excess pasture available in spring. Ensure that the supplements that you intend to use are adequate for the class of stock being fed. The Grazfeed program (www.hzn.com.au/grazfeed.php) or information

available through the Lifetime Ewe course can assist in making better use of supplements.

Utilise cereal crops

On mixed farming enterprises, crops can be another source of feed for livestock enterprises. A range of cereals can be utilized by livestock without impacting on profits or the crop. Across the southern states in the Grain & Graze project, benefits of grazing cereals to fill a feed gap are apparent. The Grain & Graze trial in Western Victoria (see signposts) showed grazing Yerong barley at the vegetative growth stages up to stem elongation:

- Had no adverse effect on eventual grain yield and even improved yield slightly
- Reduced stubble levels slightly, promising easier sowing in the following season
- Reduced the need to graze new or re-germinating legume pastures in early winter
- Gave 4-6 weeks grazing in the colder part of the year when pasture growth was slow
- Contributed 16% of the total feed requirement for the year.



A large range of cereals can be used by sheep without impacting on profits or the crop

It is your total farm feed supply curve and its variability that indicates how well an enterprise might be suited to your growing season. Revisit your annual livestock management calendar (see procedure 8.2) and your business plan (tool 1.3 in *Plan for Success*) now that you know your feed supply and how it varies within and between years. It may be possible to address livestock needs with the addition of other plant species to provide pasture of the quality and quantity required for the production goals (eg, growing out weaners, finishing lambs, etc). Alternatively, a more cost effective option is to revisit your enterprise structure (the number of breeders and trading stock carried), as well as reviewing your target market. For example, a better option in some locations without a summer feed supply, may be to sell lambs as stores, rather than taking them to heavier weights.

It is your total farm feed supply curve and its variability that indicates how well an enterprise might be suited to your growing season

Signposts



Read

Drought Publications – The AWI website has a series of publications on managing drought recovery. visit: www.wool.com/Publications.htm?cat=Drought.

MLA's More Beef from Pastures — the producer's manual: eight modules and practical tools to build a more profitable beef business. The principles presented relate to using animals to convert pasture to liveweight be they sheep, cattle or goats. Purchase a hard copy or CD version of the manual by:

- Calling: 1800 675 717
- Emailing: publications@mla.com.au
- Ordering on-line: <http://www.mla.com.au/publications>

MLA Tips & Tools: Using the MLA Rainfall to Pasture Growth Outlook Tool: describes how to use the MLA Rainfall to Pasture Growth Outlook Tool, a tool designed to help you understand how your pasture typically grows across the year, and how much this can vary between years. Get your free copy from MLA by:

- Calling: 1800 675 717
- Emailing: publications@mla.com.au
- Downloading from: <http://www.mla.com.au/tipsandtools>

Lifetime Ewe Course; this course provides details on management of ewes and managing feed gaps. Get more details from Rural Industries Skill Training www.rist.com.au phone 03 5573 0943

Grain & Graze Grazing Cereals: research results for grazing cereals in five regions across Victoria, WA, SA and NSW. Visit: www.grainandgraze.com.au/Research_Projects/Grazing_Cereals/index.aspx

Climate Data Online: provides a range of statistics, weather observations and other climate data for Australian locations. Visit: www.bom.gov.au/climate/data

View

The MLA Rainfall to Pasture Growth Outlook Tool: estimates pasture growth for different locations across southern Australia. Visit the website: www.mla.com.au/growthoutlooktool/

Climate On-line web page at the Bureau of Meteorology. Visit the website: www.bom.gov.au/climate/data

Pastures From Space: estimates weekly pasture growth rates and Feed on Offer. Pasture growth rates at the Shire level are free to access. Visit: www.pasturesfromspace.csiro.au

Attend

The MLA EDGE*network*[®] program is coordinated nationally and has a range of workshops to assist sheep producers. Contact can be made via:

- Phone: 1800 993 343
- Email: edgenetwork@mla.com.au
- Website: www.mla.com.au/edgenetwork



A paddock of red grass in February

Procedure 8.2

Know your animal demand



Background information



Now that pasture growth and variability are known (procedure 8.1), you need to estimate your annual animal demand for the enterprises in your business.

Flexibility with stock numbers during the year and between years is a key element of matching animal demand to pasture supply and managing risk. How flexible you can be with stock numbers will depend on your enterprise structure and goals, value of stock, disease risks if agisting or trading stock, and your willingness to conserve or purchase fodder and concentrates.

Key decisions, critical actions and benchmarks

Determine feed requirements for sheep classes

Most sheep producers run a range of sheep classes on the farm, and these classes will have different nutritional needs throughout the year. Describe your classes of sheep according to:

- Sex
- Liveweight and condition/fat score
- Stage in reproductive cycle and pregnancy status (empty, single, twin)
- Growth target: to gain or lose weight at a specified rate (kg/day).

Scanning and separating ewes based on condition score and pregnancy/lambing status enables better allocation of paddocks/pasture to sheep. It is more efficient to run 3-5 year old ewes together and draft on ewe condition and pregnancy status than age groups. Suggested drafting for these mature ewes are;

- Dry ewes
- Pregnant or lactating ewes single lambs, condition score >3
- Pregnant or lactating ewes, single lambs, condition score <3
- Pregnant or lactating ewes, twin lambs, condition score >3
- Pregnant or lactating ewes, twin lambs, condition score <3

Information in Table 8.1 or the Grazfeed program can then be used to match pasture resources to feed requirements.

AT A GLANCE



- Define the feed requirements for your classes of sheep
- Set condition score or liveweight targets for different stages of the year
- Identify opportunities to modify the annual animal demand curve and enterprise mix to suit your pasture supply curve
- More variable rainfall and pasture production between years requires more flexibility to manipulate stock numbers during and between years
- Set trigger points for action to cope with the yearly seasonal variation and more extreme drought conditions

Weaners and lactating ewes rearing twin lambs should get the best pastures, followed by single lambing ewes, pregnant ewes, hoggets, and then wethers and dry ewes.

Estimate feed quality

Digestibility is a useful measure of pasture quality. Digestibility is:

- Directly related to the energy content-Metabolizable Energy (ME) of the pasture. Energy is needed by animals for body functions. Tool 7.6 in *Grow More*

Table 8.1 Minimum pasture supply benchmarks to maintain satisfactory production levels in sheep using herbage mass. For Feed on Offer, add 300kg DM/ha to the pasture targets (Source: PROGRAZE® manual)

Sheep Class		Pasture targets* (kg green DM/ha) to meet animal demand at three levels of pasture digestibility (%)		
		75% Digestible (mainly sown species, actively growing, 30% legume <10% dead)	68% Digestible (volunteer or native species, 15% legume, 20% dead)	60% Digestible (dried off pasture in early summer or mature volunteer/native species)
Dry sheep		400	600	1200
Pregnant ewes	Mid pregnancy	500	700	1700
	Last month	700	1200	Not suitable
Lactating ewes	Single lambs	1000	1700	Not suitable
	Twin lambs	1500	Not suitable	Not suitable
Growing weaned lambs (% of potential growth)	30% (75g/day) *	400	700	1700
	50% (125g/day)*	600	1000	Not suitable
	70% (175g/day)*	800	1700	Not suitable
	90% (225g/day)*	1600	Not suitable	Not suitable

* Predicted growth rates in brackets are based on a weaned 4-month old crossbred lamb of approximately 32kg from a ewe with a standard reference weight of 55kg

Pasture shows the relationship between the digestibility of temperate pastures and their energy content as they mature.

Energy content is:

→ Positively related to protein content. When digestibility is high, protein content will also be high, although pasture species vary in their protein content, eg, clovers are generally higher in protein than grasses.

→ Directly related to the rate of feed moving through an animal. Pastures with higher levels of digestibility move more rapidly through the digestive system, allowing for greater intake and so greater animal production.

Table 8.1 describes the pasture quality (digestibility) and quantity benchmarks required to meet production targets of various classes of livestock. Use the benchmarks in table 8.1 as “trigger points” to better match feed supply with animal demand and so improve the likelihood of meeting your production targets.

If the pasture targets in table 8.1 are not met, then animal production targets will not be met. A decision will be needed to accept a lower production level, change paddock, reduce stock numbers, or supplement to meet the energy and

protein requirements of the stock.

Tool 11.1 in *Healthy and Contented Sheep* lists the energy and protein requirements of a range of sheep classes. Tool 11.4 in *Healthy and Contented Sheep* can help you calculate the cost of energy and protein supplements to meet animal demand where pasture supply does not meet the benchmarks in table 8.1.

Estimate pasture mass

At priority stages of the year (eg, joining, two months before lambing, lambing and managing weaners), use table 8.1 to set pasture targets for different classes of stock.

Set targets for dead pasture at the end of the growing season. Using every kilogram of dry matter produced is not only unrealistic, it will quickly undermine the sustainability of your enterprise. Some pasture will always be trampled and fouled. A significant amount of pasture must remain uneaten to provide carry-over feed for stock, and maintain groundcover. Carry-over feed and groundcover are usually most critical over late summer/autumn, at the break of the season in southern regions and over summer in the north (see procedure 6.2 and tool 6.2 in *Healthy Soils*).

Monitoring pasture mass every 1-2 weeks lets you identify and fill any impending feed gaps, or feed excesses that can be used. Tool 7.6 in *Grow More Pasture* and the MLA Pasture Ruler (tool 8.6) contain information to help you assess pastures.

Set annual targets for livestock classes and pasture

Plan how you want the pastures and stock to look throughout the year. An example is shown in figure 8.5 for a winter rainfall area but the principle is the same for all environments.

Managing higher pasture utilisation is all about planning ahead (see figure 8.5.) Set targets, monitor, and have trigger points for action when things deviate from your plan.

Setting targets for pasture supply and animal demand through the year gives you the decision framework for taking action if stock condition or pasture mass deviate significantly from the plan.

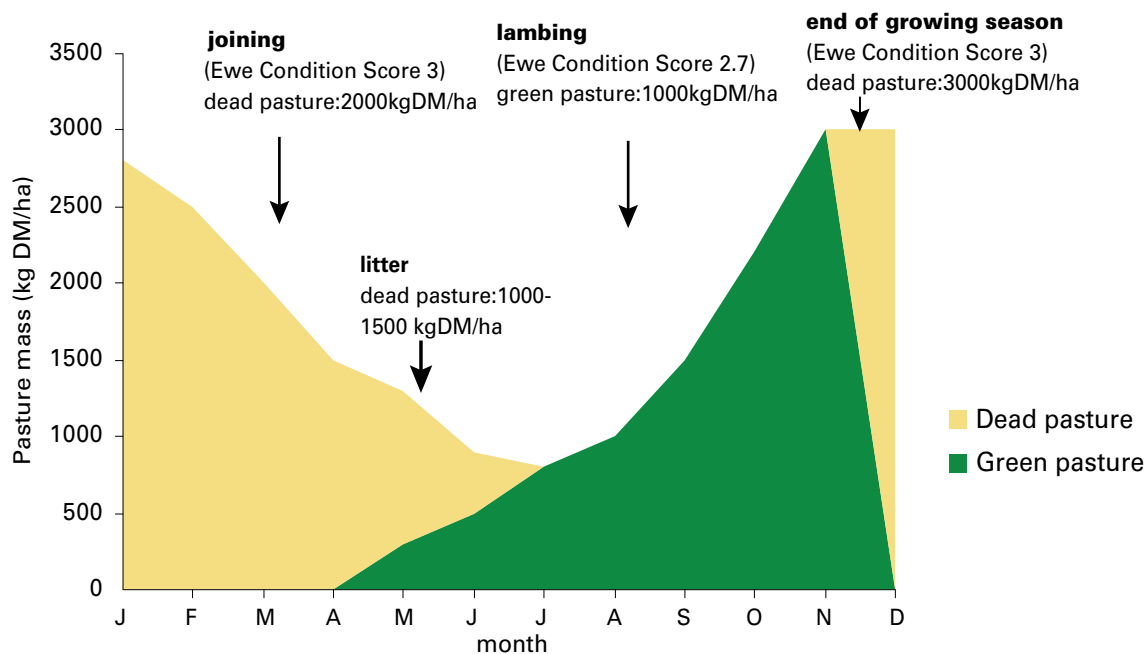


Figure 8.5 Managing the risk of increasing pasture utilisation is all about planning ahead. Set targets, monitor and have trigger points for action when things deviate from your plan. Example for northern Victoria.

Assess stock condition

Set condition score targets for mature stock and growth rate targets for lambs and weaners. Monitor stock at critical times during the year (eg, ewes at the end of spring, pre-joining and pre-lambing; rams pre-joining) to ensure you will meet your targets or can take appropriate action well before stock drop below their target score.

Condition scoring is described in tool 10.1 in *Wean More Lambs*. Target condition scores for different classes of sheep are shown in tool 11.2 in *Healthy and Contented Sheep*.

Set trigger points and plan to meet your targets

Trigger points spark action well before critical feed shortages. For example, if it hasn't rained by a certain date, or pasture availability drops below your targets, you might change your weaning time, sell stock, purchase grain for ewes and weaners, or plan to use nitrogen and rotational grazing in order to boost pasture availability leading up to lambing.

Setting targets is one thing. Putting a plan in place to meet those targets for animals and pasture is another, but it is achievable. This planning requires:

→ Identification of a pasture quality and quantity target on a particular date (a trigger point), eg, 1,500kg green DM/ha at 70% digestibility on 5 November (weaning)

→ A grazing plan to build feed reserves in the identified paddock, and ensure the required pasture will be available when needed. For example:

- Identify the November weaning paddocks at joining
- The grazing plan will allow autumn grazing of the weaning paddocks to manage weeds and encourage clover growth; a light grazing over winter, perhaps by cattle or wethers to reduce worm larvae; then a rest from mid spring to allow pasture to accumulate
- Given the pasture mass at the end of winter, you can calculate how much pasture will accumulate each month towards the target of 1,500kg green DM/ha by 5 November
- 400kg DM/ha at the end of winter + 30 days in September at 30kg DM/ha/day + 31 days in October at 45 kg DM/ha/day = 2,695kg DM/ha by the end of October
- 2,695kg DM/ha is well above the

November 5 target for the weaning paddocks. You may not need to lock up the paddock until the start of October (500kg DM/ha at the end of winter + 31 days at 45 kg DM/ha/day = 1,895kg DM/ha by 5 November).

- Plan paddock allocations using the benchmarks in table 8.1 to check that animal demand can be met by pasture supply
- Use feed budgeting (see procedure 8.3 then tool 8.4) for short and long term planning
- Take appropriate action once you have reviewed the situation at your trigger point. For example:
 - If stock meet your condition/fat score targets and the feed budget predicts you will have enough feed do nothing, but continue to monitor pasture supply
 - If stock meet your condition score targets, but the feed budget predicts that pasture supply will not meet their nutritional demands in three months' time, your options include:

- 1) Grow more pasture: put on nitrogen to boost pasture supply; assess availability of other paddocks for grazing
- 2) Consider the option of grazing crops
- 3) Reduce stocking rate: re-allocate stock to another paddock, draft off dry ewes, seek agistment for your sheep elsewhere, or sell some stock

→ If stock are below your condition score targets and you will have less than your target feed in three months' time, your options include:

- 1) Feed supplements now (see procedure 11.1 in *Healthy and Contented Sheep*) and grow more pasture (see procedure 7.1 in *Grow More Pasture*).
- 2) Reduce stocking rate
- 3) Accept a lower production level and potential damage to the pasture or soil base.

→ If stock meet target condition score and the feed budget predicts you will have a feed surplus in 3 months time:

- Can you agist or trade extra stock now, or conserve fodder later?

Monitor your plan

Revisit your targets for pasture quality and quantity and livestock condition/growth to ensure you make your decisions:

- Before feed runs out
- Before paddocks become bare and
- To meet all animal wellbeing requirements (see procedure 11.5 in *Healthy and Contented Sheep*).

De-stock paddocks before groundcover falls to levels that expose paddocks to erosion (see procedure 6.2 in *Healthy Soils*). Put stock into another paddock where there is still adequate cover or, if this is not an option, put them into a containment area for feeding (drought lot). De-stocking will also prevent overgrazing and death of perennial grasses and so minimise the need for resowing.

GrazFeed® can help you decide if the pasture in front of stock will meet their nutritional requirements. Being able to assess pasture objectively, in terms of quantity and quality is critical to making management decisions using GrazFeed®. PROGRAZE® can help you develop objective pasture assessment skills (see signposts).

Modify the annual animal demand curve

The primary objective is to fit the pasture supply curve to the animal demand curve. Five options are available:

- 1) Improving the proportion of pasture grown that is utilised for animal production (pasture utilisation). Higher pasture utilisation means having more stock on when surplus pasture is available, but not when supply is low. Increasing pasture utilisation does not have to mean increasing stocking rate all year round. As well, utilisation can be increased by pasture conservation for example, making silage to feed back to stock at a time when green pasture is limiting
- 2) Change your enterprise mix to better meet feed supply. A higher proportion of trading stock may present more options when feed becomes limiting. Use tool 8.3 to test 'what if' scenarios with varying proportions of ewes and wethers
- 3) Modify animal demand by changing the management calendar



Plan for your Merino flock to lamb 3-4 months before the end of the reliable growing season and prime lamb flocks, 4-5 months prior

- 4) Change pasture supply by using different pasture species, eg, summer active as well as winter active species. Tool 8.3 can be used to assess the change in feed supply and to explore livestock options required to capture the feed grown into product
- 5) Do all of the above.

Sowing pastures species (option 4) is generally a costly option, but can be very beneficial to address natural resource issues (eg, to increase groundcover, reduce salinity), production outcomes (eg, growing weaners) or when targeting new markets (eg, heavy weight lambs). The primary focus is to make better use of what is currently growing.

Modifying animal demand by changing the annual livestock management calendar will help match existing animal demand to pasture supply. It may also highlight opportunities for increasing stocking rate, or a need to reduce stock numbers during periods of the year.

It is more important to match supply and demand within seasons than for the entire year. This ensures animal demand is met and pasture resources are not degraded by over or under utilisation.

Time of lambing

This is the most important decision in the management calendar. Lambs provide a major boost to animal demand that can be aligned to peak pasture supply to increase total production and reduce risk and costs.

Guidelines for the optimum time of lambing have been developed (see procedure 10.1 in *Wean More Lambs*) and can be related to the length of the growing season:

→ Self-replacing Merino flocks: lambing 3–4 months before the end of the reliable growing season is about the optimum. Lambing later allows more ewes to be run, but weaner management has to be excellent as they will be lighter when the feed quality falls. If the decision to lamb later is made, feeding supplements to weaners is more cost effective than

Set trigger points for action based on pasture and animal requirements by modifying the annual livestock management calendar

feeding pregnant or lactating ewes during the low pasture growth periods

→ Prime lamb flocks: lambing 4–5 months before the end of the reliable growing season gives a better result because it maximises the chance of finishing the lambs on pasture which is often the cheapest source of energy and protein.

The AWI Lifetime Wool project has ewe management guidelines, tools and tips and background research results with economic analyses for sheep producers across southern Australia (see signposts).

Many farms run sheep and cattle as well as a cropping enterprise. In such cases, the feed demands of the beef enterprise and the labour demands of the cropping program need to be factored in, which may alter the optimal time of lambing.

Stock sales and purchases

Aim to sell surplus stock (culls, cast for age) when the stock are still in good condition. Typically this will be late spring–early summer in the south and later in the north.

In a good year, delay stock sales to improve pasture utilisation and animal liveweight at sale. In a bad year, bring stock sales forward to reduce stocking rate and conserve feed for other stock. Similar flexibility can be applied to the timing of lamb sales and the target market, eg, feeder, finished or yearlings (see procedure 3.1 in *Market Focused Lamb and Sheepmeat Production*). Timing stock sales and purchases is a constant trade-off between current and expected future prices, and current and expected future feed supply.

Time of shearing

Decisions about timing of lambing and stock sales have an impact on shearing time. Timing of shearing can have important consequences for wool quality (see procedure 2.2 in *Market Focused Wool Production*), but it should be a secondary decision to time of lambing.



Use Lifetime Wool pasture photo standards to assess Feed on Offer in annual or mixed pastures (see signposts)

Signposts



Read

MLA Tips & Tools: Using the MLA Rainfall to Pasture Growth Outlook Tool: describes how to use the MLA Rainfall to Pasture Growth Outlook Tool (tool 8.3), to help you understand how your pasture grows across the year, and how much this can vary between years.

Improving pasture use with the MLA Pasture Ruler: explains how to use the MLA pasture ruler (tool 8.6) to estimate pasture mass (quantity) and quality and the performance you can expect from your grazing animals.

Get your free copies of these MLA Tips & Tools by:

- Calling: 1800 675 717
- Emailing: publications@mla.com.au
- Downloading from: <http://www.mla.com.au/tipsandtools>

Managing sheep in droughtlots, a best practice guide.

Managing fodder prices for drought, a guide to help sheep producers.

Which sheep do I keep? A guide to assist producers in droughts.

Order your free copies of these three publications from AWI by:

- Calling: 1800 070 099
- Downloading from: www.wool.com/Publications.ntm?cat=Drought

Drought feeding and management of sheep (2002): a practical guide on sheep feeding and management during a drought. Visit the Victorian DPI website at <http://new.dpi.vic.gov.au/home> and search for drought feeding.

MLA's More Beef from Pastures – the producer's manual: eight modules and practical tools to build a more profitable

beef business. The principles presented relate to using animals to convert pasture to liveweight be they sheep, cattle of goats. Purchase a hard copy or CD version of the manual by:

- Calling: 1800 675 717
- Emailing: publications@mla.com.au
- Ordering on-line: <http://www.mla.com.au/publications>

View

Lifetime Wool Regional Guidelines: a series of guidelines and recommendations for managing ewe flocks throughout the year. Visit the Lifetime Wool website: www.lifetimewool.com.au/guidelines.aspx

Lifetime Wool – Tools for Management: download or request feed budget tables based on Feed on Offer (FOO) for annual clover based pastures and mixed perennial and annual pastures. Visit the Lifetime Wool website at: www.lifetimewool.com.au/toolsmgt.aspx

GrazFeed®: a decision support software tool to help graziers improve the profitability of livestock production, through more efficient use of pastures and supplementary feeds. GrazFeed® can be purchased by contacting Horizon Agriculture on www.hzn.com.au/grazfeed.php

Attend

The MLA EDGE^{network}® program is coordinated nationally and has a range of workshops to assist sheep producers. Contact can be made via:

- Phone: 1800 993 343
- Email: edgenetwork@mla.com.au
- Website: www.mla.com.au/edgenetwork

Website link not working?

Go to the Making More From Sheep website:
www.makingmorefromsheep.com.au
and follow the links to updated signposts



Monitor pastures regularly to ensure you meet your production targets

Procedure 8.3

Match feed supply to animal demand and minimise risk



Background information



This procedure is about maximising pasture utilisation without compromising pasture cover at critical times. In short, how to make animal demand fit your pasture supply. Getting a good match between animal demand and pasture supply is the basis of turning pasture into product. However, further gains can be made by grazing method and paddock subdivision.

In environments where rainfall and pasture production are more variable between years, improving utilisation is difficult. Greater flexibility to manipulate stock numbers during the year and between years is needed. Monitor (between and within years) pasture supply and the number of stock carried.

Introduction

The maximum number of stock that can be carried all year is usually limited by pasture availability during the period of lowest feed supply. This is generally in the autumn and/or winter in both summer and winter rainfall zones. It is critical to get the time of lambing right to optimise the number of ewes that can be carried through the period of lowest feed supply (see procedure 8.2).

Matching feed supply to animal demand requires a flexible enterprise structure that allows you to bring in or sell off stock depending on conditions. This is particularly important to be able to respond and capitalise in “better years”. In this way, the annual stocking rate may not change but there will be larger seasonal differences. Focus on seasonal adjustment of stock numbers to suit the conditions.

The major risks associated with increasing stocking rate and pasture utilisation are:

- Poor persistence of desirable pasture species
- Bare paddocks
- Reduced stock health
- Damage to sensitive areas such as water courses and embankments
- More need for supplementary feeding and
- Increased impact from droughts.

AT A GLANCE



- Monitor stock and pastures and prepare feed budgets at least three months ahead to manage the balance between pasture supply and the nutritional demands of your sheep
- Focus on seasonal adjustment of stock numbers to suit the conditions
- Determine how evenly pasture is being grazed in your paddocks
- Consider low-cost options to achieve more even grazing by strategic rotational grazing, boxing of mobs or temporary subdivision

All of these risks are real but they can be managed using stock assessment, grazing management, feed budgeting, and by working towards a more flexible enterprise structure. The above risks will be reduced significantly if stock numbers are seasonally adjusted at pre-defined trigger points (stock condition, feed available, ground cover, etc).

Review the match between your pasture supply and animal demand curves then align these curves to minimise production, financial and environmental risk. Ask yourself:

- Am I lambing when my pasture supply is most reliable?
- Can I increase stock numbers during a one-in-five or one-in-ten year early break?
- Can I easily sell or find agistment for the livestock classes I carry through the months where pasture growth is not reliable?
- In general, how closely does the feed demand of my flock match my pasture growth?
- What options do I have for increasing feed supply in the slowest growth period, eg, supplementary feeding, deferred grazing, etc?
- Can I do anything to lengthen the periods of good pasture growth or move them forward or back?
- Do I store enough feed to cover bad seasons?
- Can I use cash reserves to cover bad seasons?

The tools that follow will help you measure, manage and monitor any mismatch between pasture supply and animal demand and minimise exposure to changing seasonal conditions, both within a year and between years.

They can help you make both strategic (ie, 1-5 years) and tactical (short term within the current year) decisions that relate to managing stocking rates, and answer the questions like: do you have enough stock, too few or too many?



Use feed budgets to find out if your pasture supply can meet the requirements of different classes of stock

Key decisions, critical actions and benchmarks

Stocking rate is the major determinant of pasture utilisation and profitability. A conservative stocking rate may be a sound, low risk choice for a sheep enterprise in a variable climate, but it may also be less profitable. Sustainable stocking rates are achieved when animal demand is actively managed to fit pasture supply.

Plan your feed year

A feed year plan recognises the range of stock classes, pastures and forage crops across your farm and brings all the annual decisions on pasture utilisation together in one plan. Tool 8.5 provides a feed year plan template, and contains an example plan for the Central West slopes of NSW.

Develop your own plan using the template in tool 8.5 to identify in advance when you will have high quality feed available on your farm.

Does pasture supply meet animal demand?

Use tool 8.3 (MLA feed demand calculator) to assess how well current animal demand matches your average pasture curve. You can calculate the percentage of pasture being utilised and liveweight produced per hectare, then test opportunities to better align feed supply and animal demand, eg, growing a winter active fescue, running more stock at peak pasture supply periods, changing your lambing date, etc.

You can have two grazing systems with the same pasture stocking rate and utilisation but the system that better aligns feed supply with animal demand will be more productive and less risky.

What animal factors can I change?

The 3 main ways that you can change animal requirements and better match feed demand with feed supply are:

- Overall farm stocking rate; consider regional benchmarks for stocking rates or seek advice from local advisors on what is a realistic overall stocking rate for your farm and locality given the pasture species, soils types and soil fertility.
- Time of lambing; during pregnancy, feed requirements of ewes doubles. At 30 days lactation, energy requirements of ewes rearing twin lambs are over 3 times that of dry ewes. Match mid lactation with peak pasture growth to better match feed supply and demand.
- Time of sale; when surplus stock are sold can markedly effect feed demand. For example, sale of cast for age ewes prior to summer-autumn. Lamb or wether sales can be varied depending on seasonal conditions.
- Reproductive rate; running ewe genotypes with a high twinning percentage can be a way of using peaks in spring feed supply. Feed demand of ewes rearing twins is 25% higher than for those with single lambs.

Complete regular feed budgets (measure and monitor)

Use feed budgets to see if you can meet your pasture supply targets (and nutritional demands) for different classes of stock with your current or proposed stocking rate. Feed budgets also answer more tactical (short-term) questions like:

- How long will a paddock last with a certain number of sheep in it?
- How many sheep can I graze in a paddock (for a certain length of time)?

Short term feed budgets (daily, weekly, fortnightly) ensure production requirements can be met for a given stock class. Use the pasture benchmarks in table 8.1 to identify the minimum

pasture supply and quality required by your sheep classes.

Calculate a feed budget three months ahead when planning your lambing or weaning paddocks, or for stock marketing (forward contracts).

Doing a feed budget for lambing lets you know if there will be 1,500 kg DM/ha available for lactating ewes, or if you should be taking some action now to meet the nutritional demands from your stock.

Tool 8.4 sets out how to calculate three-month and shorter term feed budgets on paper. It includes examples to help guide your feed budget calculations.

Manage the grazing system to control stock intake

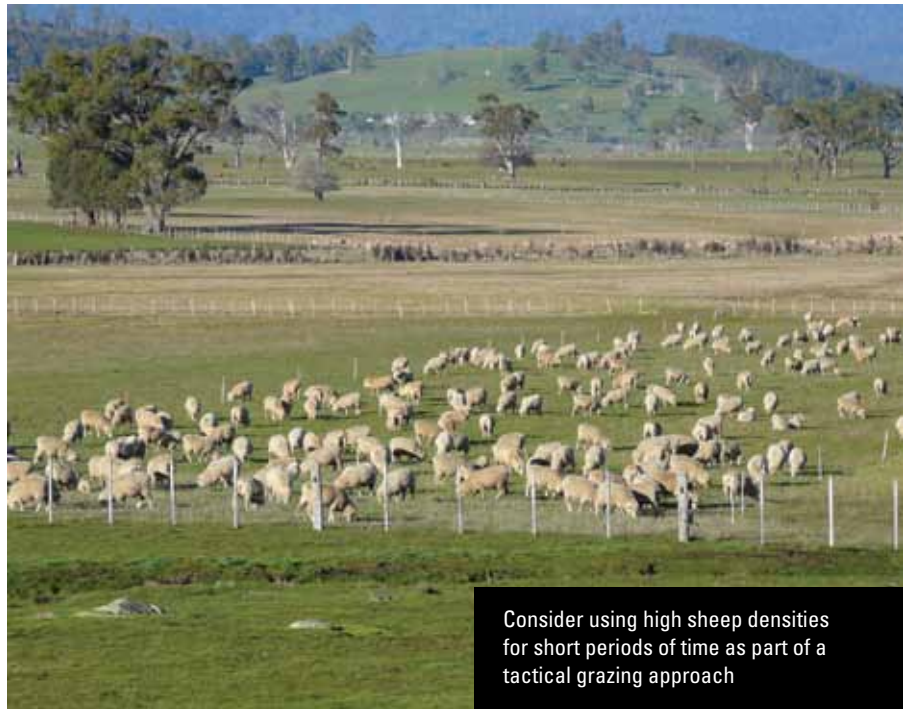
Stock intake and performance can be managed by grazing. Allocate a certain amount of pasture to stock, on a daily or weekly basis to:

→ Ration intake: transfer feed from autumn to winter, when pasture growth rates slow down, in order, for example, to build up a feed wedge for lambing. Stock must either be above target condition when rationed (autumn), or fed supplements to maintain condition. It may also be desirable to ration the intake of pregnant ewes if higher than condition score 3.5 to limit lambing difficulty. This is best done in mid pregnancy to avoid metabolic diseases

→ Increase intake: rationing intake by some classes of stock to create an opportunity to allocate higher quantities of pasture to other classes, such as weaners. Preferential allocation of green feed to priority stock on a regular basis also gives a better measure of pasture growth rates and feed consumption.

It is often desirable to increase the intake of pregnant ewes or ewes rearing twin lambs. These stock can be given preference for the highest quality grazed ahead of the stock with lower feed requirements, ie dry ewes or those with single lambs.

Add or remove paddocks from the grazing rotation to increase or decrease paddock rest periods. If pasture growth rates are fast, speed up the rotation by moving stock on quickly. Fast moves during periods of fast pasture growth give



Consider using high sheep densities for short periods of time as part of a tactical grazing approach

livestock access to the best feed before it goes rank or hays off. Remove paddocks from the grazing sequence in spring and consider fodder conservation options. When pasture growth is slow, slow the rotation down, then reduce stock numbers or supplement stock to allow time for pastures in rested paddocks to re-grow before grazing.

Regularly monitor pasture and animal condition. Monitoring helps you track changes in pasture quantity and quality or animal demand to ensure pasture and animal production targets are met. Tool 7.6 in *Grow More Pasture* contains pasture monitoring tools. Tool 10.1 in *Wean More Lambs* contains condition scoring guidelines for sheep.

Manage the grazing system to maintain optimum pasture levels

Not detecting a change in pasture quantity and quality or animal demand

will increase the risk of missing pasture and animal production targets. Regular monitoring of pasture and animal condition is critical to success because:

→ An increase in predicted pasture growth leading to higher pasture mass and total pasture energy supply may be wasted if additional pasture is not utilised

→ A decrease in predicted pasture growth, or unplanned events that decrease pasture availability may lead to declining pasture mass, lowered intake by animals and eventually overgrazing

→ Repeated overgrazing without adequate rest can reduce ground cover, damage soil and reduce the ability of the pasture to “bounce back” with rain, rest or fertiliser.

Implement tactical grazing

Tactical grazing focuses on applying grazing techniques that best meet the animal, pasture and environment targets at the time. Consider:

→ Set stocking at a conservative stock density to maximise the intake of quality pasture by lactating ewes

→ Rotationally grazing perennial pastures to ensure persistence

→ Using high density, short duration rotations to ration intake or control weeds.

Review the grazing management guidelines in tool 7.5 in *Grow More Pasture*.

Are paddocks unevenly grazed?

If you can see obvious signs of patch grazing in paddocks (eg, bare hilltops, sheep camps and rank grass in other parts), then utilisation can be improved. The issue of uneven grazing often has to be dealt with before stocking rate is increased. Running more stock will increase pasture utilisation, but any areas that are already overgrazed will be grazed even harder.

→ Fence paddocks to land class to reduce the variability within them. Land classes are based on soil type, slope, aspect and land-use (see tool 6.1 in the *Healthy Soils*)

→ Reduce selective grazing by either reducing paddock size and/or using bigger mobs to graze the paddock in a rotation. ‘Boxing up’ existing mobs and using existing paddocks for rotational grazing is the cheapest way to get started on evening up utilisation within paddocks.

Uniformity of pasture utilisation is affected by:

→ Paddock size: smaller paddocks are generally grazed more evenly than large paddocks, but there is no ‘rule of thumb’ for optimum paddock size as it depends on flock size, the livestock production system and other factors (such as cropping requirements)

→ Paddock uniformity: flat paddocks will be grazed more evenly than hilly paddocks, north-facing slopes will be grazed harder than south-facing slopes, saline areas will be preferentially grazed, etc

→ Grazing method: using large mobs of stock for short periods in a paddock will reduce the opportunity for selective grazing by stock and result in more even utilisation, but may lower performance per animal

→ Type of stock: sheep are more selective grazers than cattle and they tend to create

bigger camp areas. Cattle can be used to complement sheep grazing

→ Watering points: pasture utilisation will tend to be highest close to watering points. This is especially noticeable in large paddocks with a single watering point.

Compared with set-stocking, implementing a more intensive rotational grazing system will give more precise control of stock intake and more even pasture utilisation. Tool 8.7 outlines a method for getting started with rotational grazing and is further developed in the MLA Tips & Tools “Getting started in simple time-based rotational grazing”. Intensive rotational grazing systems can help you implement a simple four paddock rotation (see signposts).

Increase pasture utilisation on part of your property

When trying to increase pasture utilisation, start off with one or two paddocks as a trial, to practise pasture and stock assessment skills and feed budgeting. It may be the better land classes, or paddocks where there are obvious signs of poor utilisation (too much dead pasture, low legume content).

It is often best to make incremental lifts towards your stocking rate target, which will allow you to increase confidence

and build skills. For example, you might decide to increase the stocking rate in winter by 10% this year, based on analysis of the average pasture supply curve and the amount of dead pasture left in paddocks. One option could be to retain an older age group of ewes or more wethers, rather than purchasing stock if the risk of introducing disease is a concern.

Plan for drought

Determine what constitutes a ‘drought’ or a dry year for you in your environment. For example, it may be a failed spring followed by a failed autumn.

Set trigger points for action. That is, “If certain weather conditions occur, I will take this particular action now” (sell some stock, for example).

Be ready for a drought/dry year. This will include keeping adequate feed reserves, having containment areas/drought lots, and a plan to determine which stock will be sold and which will be kept and fed in the drought lot. Decisions about which stock to keep or sell will depend on their value at the time, the probable cost of feeding, the value of any production that would be gained if they are kept and their future replacement value, should that be necessary. There are a number of publications and tools which can help you prepare such a plan (see signposts).



Signposts



Read

Go to the Sheep CRC website (www.sheepcrc.com.au) Practical Wisdom Notes and download the series on “Profitability of sheep enterprises in southern Australia” and “Lambing at the right time in southern Australia”.

Towards Sustainable Grazing – the Professional Producer’s Guide: a collation of proven best practices for modern grazing enterprises in southern Australia. Order your copy from MLA by:

- Calling: 1800 675 717
- Emailing: publications@mla.com.au
- Ordering on-line: www.mla.com.au/publications

MLA Tips & Tools:

Tactical grazing to maximise whole farm pasture and animal productivity

Get the best out of set stocking

Getting started in simple time based rotational grazing

Intensive rotational grazing

Get your free copies of these MLA Tips & Tools by:

- Calling: 1800 675 717
- Emailing: publications@mla.com.au
- Downloading from: <http://www.mla.com.au/tipsandtools>

Be ready for drought by keeping feed or cash reserves, having a drought lot and a plan to determine which stock will be kept and fed in a drought.

Attend

Stockplan@: a workshop to help sheep (and cattle) producers explore management options in the preliminary stages and during drought. To find out more, visit the NSW DPI website: www.dpi.nsw.gov.au and use the search facility to find Stockplan.

The MLA EDGENetwork® program is coordinated nationally and has a range of workshops to assist sheep producers. Contact can be made via:

- Phone: 1800 993 343
- Email: edgenetwork@mla.com.au
- Website: www.mla.com.au/edgenetwork

View

EverGraze Feed Budget and Rotation

Planner: tool helps to plan rotational grazing systems by determining appropriate stocking rates, calculating pasture growth rates and setting grazing periods. The tool uses Microsoft Excel. You may need to change your security settings to ensure the macros work, or choose “enable macros” if prompted. Visit <http://www.evergraze.com.au/tools.htm>



Website link not working?

Go to the Making More From Sheep website:

www.makingmorefromsheep.com.au

and follow the links to updated signposts





Tool 8.1

MLA rainfall to pasture growth outlook tool

Developed with leading beef and sheep producers by MLA and the Bureau of Rural Sciences (BRS), the Rainfall to Pasture Growth Outlook Tool shows actual rainfall and indices of soil moisture and pasture growth for the past nine months and an outlook for the next three months for more than 3,300 locations across southern Australia. More importantly (because the Outlook tool has little or no predictive power), the tool displays median pasture growth indices for each week of the year based on historical rainfall and temperature records and the variation about that median point for each week of the year. The curves that result essentially show the pattern of pasture growth for a 'moderate' year, as compared to an 'excellent' or very poor year.

To create your free account and start using the Rainfall to Pasture Growth Outlook tool, follow the instructions below:

1. Create an account

Go to the website: www.mla.com.au/growthoutlooktool/

Go to the Rainfall to pasture growth outlook tool and select the 'create account' button.

Everyone, including MLA members, needs to create an account. You cannot login automatically using your MLA login.

2. Getting started

Once you're logged in, go to 'Getting Started' to find out more about what this tool can do and how you can make the most of the rainfall, soil moisture and pasture growth outlook graphs available.

How the tool can help

The Rainfall to Pasture Growth Outlook tool takes the guess-work out of strategically planning the least risky time periods for a number of very important decisions, including:

- What classes of stock should I have on the property at different times of year?
- When should I be lambing?
- When should I wean?
- When should I aim to sell - lambs or surplus sheep?
- What pasture growth patterns could I have?
- How risky is spending money on pasture improvement?

Note: Because the tool covers such a diverse range of soil and pasture types across southern Australia, it provides an index of potential pasture growth, not a prediction of actual growth. The pasture growth index should be interpreted in light of local knowledge as to species, soil type, fertiliser history and aspect.

Further information

MLA Tips & Tools: Using the MLA Rainfall to Pasture Growth Outlook Tool: Get your free copy of this MLA Tip & Tool by:

- Calling: 1800 675 717
- Emailing: publications@mla.com.au
- Downloading from: <http://www.mla.com.au/tipsandtools>



Tool 8.2

Daily pasture growth estimates

This tool allows you to determine your average pasture supply, and likely variability, based on data collected in trials across southern Australia.

The mid-monthly estimates of pasture growth rates (kg DM/ha/day) following are for average seasonal conditions for a range of localities and regions across the high rainfall and wheat–sheep zones of Australia. They are from State PROGRAZE® manuals, available from your State Department of Agriculture/Primary Industries, and based on a combination of research results, growth predictions and practical experience. Although there is a large variation in rainfall pattern and feed supply within any year, when put together these monthly values reflect pasture growth in a ‘typical’ year for the locality or region without reference to growth in the previous month.

These estimates assist with calculations for short to medium term decision making in sheep enterprises and assist with the calculations in feed budgets.

Assumptions

The following assumptions are made for the pasture growth information unless otherwise stated in the values for a particular region:

- Pastures are of moderate to high density
- Pastures or pasture mixes with a good balance of legumes, grown on suitable soils
- Soil has good moisture holding capacity, such as a clay loam
- Pasture is maintained in an active growth phase during the growing season
- Pastures are well managed and fertilised to avoid nutrient deficiencies
- Estimates are the average for each month.

The following variables need to be considered and adjusted against the expected local, district or regional patterns, and practical experience:

- Climate (rainfall and temperature)
- Soil type and variability
- Pasture species
- Fertiliser (nutrient) requirements
- Grazing management.

Source: Information was originally compiled for MLA’s More Beef from Pastures manual and the PROGRAZE® Manuals, developed cooperatively with State Agriculture/Primary Industries Departments in NSW, Victoria, Tasmania, South Australia and Western Australia.

New South Wales – pasture growth rate patterns

Source: NSW PROGRAZE® Notes, Appendix 4

- Any pasture with sub clover are assumed to have fertilizer applied yearly
- Grass only pastures have no fertilizer
- Growth rates are for set stocked paddocks

Northern Tablelands

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Fescue/white and sub clover	58	57	51	28	12	9	9	11	23	38	51	59
Phalaris white/sub clover	26	30	36	34	13	9	9	11	22	37	49	51
Red grass dominant pasture*	33	33	29	9	2	1	1	1	7	27	33	34
Microlaena white/sub-clover	39	36	29	18	8	3	3	7	19	33	40	44
Perennial rye/white and sub-clover	20	28	38	34	13	9	9	11	23	43	47	35

*Quality of red grass (with low leaf to stem ratio and rapid maturity) may not be adequate to meet livestock production targets. It is estimated no fertilizer is applied to these pastures.

The predicted growth rate could vary markedly between good and poor growing seasons.

	Good growing season	Poor growing season (Not drought)
Spring	30% above	40% below
Summer	30% above	40% below
Autumn	75%+ above	60%+ below
Winter	30% above	40% below

Central Tablelands

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Temperate perennial grass* + sub-clover	15	12	16	20	20	10	6	10	27	61	69	45
<i>Microlaena/Austrodanthonia</i> grass + sub-clover	19	15	19	22	19	7	5	8	18	52	62	51
<i>Microlaena/Austrodanthonia</i> grass	15	14	19	21	15	3	3	3	9	34	51	32
Summer grass# /sub-clover	24	10	15	16	12	7	4	8	28	38	25	23
Summer grass#	24	10	14	14	2	2	2	2	2	4	16	23
Annual grass/sub-clover	0	0	2	6	12	11	9	17	45	74	10	0

*Phalaris, cocksfoot, fescue or perennial ryegrass based with at least 20% clover

Mainly frost sensitive grasses such as red grass

The predicted growth rate could vary markedly between good and poor growing seasons.

	Good growing season	Poor growing season
Spring	50% above	40% below
Summer	100%+ above	70% below
Autumn	65% above	60%+ below
Winter	40% above	60%+ below

Southern Tablelands

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Perennial and annual grass* and clover + fertiliser 1-in-2 or 3 years	7	5	7	15	13	8	7	12	32	45	60	10
<i>Microlaena, Austrodanthonia</i> ,# clover + fertiliser 1-in-2 or 3 years	16	14	10	8	10	7	7	12	15	30	30	18
Red grass, kangaroo grass, no fertiliser applied	10	6	3	3	2	1	1	1	7	15	21	20
Introduced perennial grass and clover + annual fertiliser	10	10	15	26	20	12	10	15	45	75	55	20

*Established perennial pasture (30% introduced grass, ie, phalaris; 20% native perennial grass; 20% annual clover; and 20% annual grass).

Microlaena and *Austrodanthonia* grass 50% pasture, 25% clover and 25% annual grass.

The predicted growth rate could vary markedly between good and poor growing seasons.

	Good growing season	Poor growing season
Spring	80% above	40% below
Summer	80% above	40% below
Autumn	100% above	30% below
Winter	80% above	60% below

North West Slopes and Upper Hunter

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Phalaris/sub-clover	8	12	16	17	14	13	14	20	34	43	32	10
Summer grass dominant*	35	29	17	6	2	2	2	2	3	8	17	27
<i>Austrodanthonia</i> /sub-clover	19	16	11	7	5	5	7	12	24	28	22	18
Lucerne	30	29	26	21	15	10	10	14	25	40	34	31
Sub-clover dominant	0	1	1	3	4	5	6	11	28	38	28	3
Medic dominant	0	2	2	3	5	4	4	7	27	38	15	0
Tropical grass only#	48	43	32	17	3	2	2	3	4	18	34	48

*Mainly frost sensitive grasses such as red grass.

#Mix of bambatsi panic and purple pigeon grass with less than 5% sub-clover or medic.

The predicted growth rate could vary markedly between good and poor growing seasons.

	Good growing season	Poor growing season
Spring	50% above	50% below
Summer	100% above	50% below
Autumn	100% above	60% below
Winter	30% above	50% below

Central West Slopes

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Temperate perennial grass* + sub-clover	7	5	8	10	14	16	10	20	30	50	41	17
Sub-clover	0	0	0	2	7	10	10	15	30	27	10	0
Summer grass	20	24	9	2	2	2	2	2	2	3	11	25
Lucerne/sub-clover	25	25	28	31	26	17	10	10	22	45	43	26
Lucerne	25	25	28	31	24	13	9	9	18	45	43	26
Annual grass/sub-clover	5	3	1	6	16	18	12	20	23	42	10	5
Tropical grass only#	35	34	24	8	3	2	2	2	2	8	24	35

*Phalaris, cocksfoot, fescue or perennial ryegrass based with at least 20% clover

#Mix of bambatsi panic and purple pigeon grass with less than 5% sub clover or medic

The predicted growth rate could vary markedly between good and poor growing seasons.

	Good growing season	Poor growing season
Spring	70% above	80% below
Summer	100%+ above	80% below
Autumn	100%+ above	60%+ below
Winter	70% above	60% below

South West Slopes

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Phalaris/sub-clover	5	7	16	25	24	14	16	26	47	64	43	12
Cocksfoot/sub-clover	9	8	16	25	24	14	16	26	47	64	43	15
Lucerne/sub-clover	12	10	17	28	26	14	11	25	49	69	54	21
Annual grass/sub-clover	3	4	10	23	24	14	10	25	45	64	35	7
Native grass*, no fertiliser	8	6	5	11	10	4	3	3	7	15	23	13
Native grass + fertiliser	11	9	11	15	14	6	5	7	17	35	26	14

*Quality of red grass (with low leaf to stem ratio and rapid maturity) may not be adequate to meet livestock production targets.

The predicted growth rate could vary markedly between good and poor growing seasons.

	Good growing season	Poor growing season
Spring	30% above	60% below
Summer	200% above	70% below
Autumn	30% above	60% below
Winter	80% above	20% below

North Coast

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Naturalised pasture*	25	30	25	10	3	0	0	0	3	5	9	15
Naturalised/clover + fertiliser	30	35	30	15	8	6	5	6	10	15	20	25
Kikuyu dominant	34	54	50	30	16	10	3	2	8	18	25	30
Kikuyu + nitrogen	80	128	146	100	45	15	3	4	14	30	40	60
Setaria/rhodes grass + clover	30	55	45	25	6	2	2	4	8	20	28	30
Forage ryegrass + nitrogen	0	0	0	30	40	30	30	30	28	10	8	5

* Dominated by carpet grass and with no introduced legumes.

The predicted growth rate could vary markedly between good and poor growing seasons.

	Good growing season	Poor growing season
Spring	70% above	60% below
Summer	60% above	60% below
Autumn	120% above	90% below
Winter	150% above	70% below

Mid North Coast and Lower Hunter

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Naturalised pasture*	17	25	23	9	2	0	0	0	2	4	8	9
Naturalised/clover + fertiliser	20	29	27	12	4	2.5	2.5	2.5	6	9.5	12	12
Kikuyu dominant	27	45	50	33	16	6	2	3	11	10	10	12
Paspalum	23	33	32	16	5	5	5	5	10	15	15	15
Setaria	29	38	44	23	8	5	5	5	10	11	11	13
Forage ryegrass + nitrogen	0	0	0	5	20	36	35	40	40	25	0	0

* Dominated by carpet grass and with no introduced legumes.

The predicted growth rate could vary markedly between good and poor growing seasons.

	Good growing season	Poor growing season
Spring	145% above	73% below
Summer	114% above	46% below
Autumn	70% above	80% below
Winter	89% above	67% below

Western Victoria – Hamilton

The data is from measurements undertaken between 1990-96 from pastures on well drained soils. For low lying clay soils, winter growth might be 10-20% lower with higher growth rates (20-30 kg DM/ha/day) in December - January.

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Pasture perennial ryegrass or phalaris, sub clover and some volunteer annuals, fertilized every year P 20 kg/ha	5	0	0	9	17	22	23	38	72	105	81	26
Mainly volunteer annuals silver grass, barley grass and sub clover, fertilized every 2nd year P 10 kg/ha	5	0	0	13	17	22	22	27	54	81	75	10

Western Victoria – Balmoral

The data is from measurements undertaken in the 1990's from pastures on typical red gum plains country.

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Pasture perennial ryegrass and phalaris, sub clover and volunteer annuals. Fertilized every year P 20 kg/ha	0	0	0	9	13	16	19	31	56	89	60	7
Mainly volunteer annuals, silver grass, barley grass and sub clover, 20 -30% onion grass, fertilized every 2nd year P 10 kg/ha	0	0	0	13	23	23	19	32	43	58	45	2

Central West Victoria – Ballarat

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Good pasture	0	0	15	20	30	20	20	35	50	90	100	90
Poor pasture (Bent grass based)	30	0	0	5	10	5	5	20	40	60	70	60

North East Victoria – Rutherglen

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Average pasture	0	0	0	0	30	20	20	35	70	80	20	0

Average pasture = moderately dense annual grass/sub-clover/annual weed based pasture.

Gippsland Victoria – Ellinbank

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Good pasture	18	10	19	20	18	16	10	20	55	80	70	59

Moderately dense pasture with good balance of rye grass and clover, annual fertilizer applications.

Gippsland Victoria – Maffra

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Average dryland pasture	5	5	0	20	17	10	2	15	30	38	30	2

Average pasture = moderately dense pasture.

Tasmania – Pasture growth rate patterns

Source: Department of Primary Industries and Water, Tasmania

Pasture composition

These growth rates are for a typical pasture mix of perennial ryegrass and cocksfoot with white and red clover in the high rainfall areas, grading to sub clover in the lower rainfall areas. The measurements were taken over 4 years (1992–1995) at trial sites.

North West – 900mm rainfall (Elliot Research Station)

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Trial site measurements	25	9	5	14	9	8	8	7	19	54	51	35

North Central – 700mm rainfall (Cressy Research Station)

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Trial site measurements	14	5	2	8	6	7	6	6	31	65	46	22

Southern Midlands – 500 mm rainfall (Jericho)

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Barley grass sub clover pasture with annual fertilizer P&K	0	0	0	3	3	3	3	5	15	45	35	15
Cocksfoot, phalaris and clover with annual fertilizer P&K	7	1	2	8	7	6	4	6	16	36	47	20

South Australia – Pasture growth rate patterns

Source: South Australia PROGRAZE® Notes, Appendix D

Mount Gambier

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Phalaris, annual grass, sub-clover – high fertility	3	3	8	17	28	27	32	59	106	108	69	17
Phalaris, annual grass, sub-clover – low fertility	2	2	6	11	18	17	18	37	76	79	48	13

Lucindale

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Phalaris, annual grass, capeweed, sub-clover	1	3	3	11	25	25	26	42	82	69	32	6

Keith

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Phalaris, annual grass, capeweed, sub-clover – high fertility	0	0	0	10	15	20	18	28	67	64	39	0
Phalaris, annual grass, capeweed, sub-clover – low fertility	0	0	0	3	8	9	8	12	34	46	33	0

Adelaide Hills (dryland)

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Perennial grass, sub-clover	0	0	0	10	30	15	15	30	60	65	20	10

Fleurieu Peninsula

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Perennial grass, sub-clover – good	0	0	0	30	25	25	25	35	55	60	35	10
Perennial grass, sub-clover – average	0	0	0	10	20	20	20	30	45	50	30	5
Perennial grass, sub-clover – poor	0	0	0	0	15	15	15	25	35	40	25	0

Kangaroo Island (Parndana)

Estimated daily pasture growth rate (mid-month) of specific pasture types (kg DM/ha/day)

Pasture type	J	F	M	A	M	J	J	A	S	O	N	D
Annual grass, sub-clover – high fertility	0	0	0	3	9	21	26	35	50	91	44	0
Annual grass, sub-clover – low fertility	0	0	0	1	4	11	14	19	31	63	35	0

Western Australia – Pasture growth rate patterns

Source: Western Australia PROGRAZE® Notes, Appendix E.

West Midlands

Estimated daily pasture growth rate (mid-month) in kg DM/ha/day

Pasture type – annual grass, sub-clover and annual weeds	J	F	M	A	M	J	J	A	S	O	N	D
Dandaragan	0	0	0	2	15	26	28	36	57	51	10	0
Gingin	0	0	0	3	19	28	29	36	55	51	11	0
Irwin	0	0	0	1	16	30	35	39	44	37	0	0
Moora	0	0	0	1	7	13	17	28	44	32	7	0
Three Springs	0	0	0	1	6	12	17	29	36	17	8	0

Central

Pasture growth rates are for average sub clover annual grass and broadleaf weed pastures with maintenance fertilizers

Estimated daily pasture growth rate (mid-month) in kg DM/ha/day

Pasture type – annual grass, sub-clover and annual weeds	J	F	M	A	M	J	J	A	S	O	N	D
Northam	0	0	0	2	12	6	15	29	60	24	0	0

Southern

Pasture growth rates are for average sub clover annual grass and broadleaf weed pastures with maintenance fertilizers

Estimated daily pasture growth rate (mid-month) in kg DM/ha/day

Pasture type – annual grass, sub-clover and annual weeds	J	F	M	A	M	J	J	A	S	O	N	D
Busselton	0	0	0	6	23	26	28	37	53	58	42	0
Boyup Brook	0	0	0	4	13	17	20	31	37	34	26	0
Katanning	0	0	0	1	11	15	16	28	51	45	5	0
Lake Grace	0	0	0	2	6	11	13	26	45	34	5	0
Narrogin	0	0	0	1	7	12	14	26	50	36	5	0
Plantagenet / Mt Barker	0	0	0	8	21	23	20	25	45	58	16	0

South East

Pasture growth rates are for average sub clover annual grass and broadleaf weed pastures with maintenance fertilizers

Estimated daily pasture growth rate (mid-month) in kg DM/ha/day

Pasture type – annual grass, sub-clover and annual weeds	J	F	M	A	M	J	J	A	S	O	N	D
Ravensthorpe	0	0	0	5	10	13	17	29	52	40	16	0
Esperance	0	0	0	7	12	16	18	29	47	35	16	0



Tool 8.3

MLA feed demand calculator

The MLA feed demand calculator is a computer based Excel spreadsheet tool that calculates, for each month of the year, the total feed demand of all livestock on a property. Producers can then compare monthly demands with the likely supply of pasture.

Use this tool to show:

- How much of the available pasture livestock are consuming
- The size of the pasture shortage or surplus at various times of the year
- Kilograms of liveweight produced per hectare.

The tool can be used to test various scenarios for varying the feed supply curve, or animal demand curve. Impacts of management actions such as the following can be investigated:

- What if I increased available pasture by sowing lucerne?
- What if we lambled one month earlier?
- What if I bought an extra 1,000 wethers?
- What if I retained more ewes?

By testing various scenarios, you can plan:

- When it is possible to increase stocking rate to use more pasture
- When stocking rate may need to be reduced, or supplement fed to livestock, to avoid overgrazing pastures
- Ways to change the structure of the flock to better balance feed demand and pasture supply, and optimise the weight of wool, lamb or sheepmeat produced whilst managing the risk of overgrazing.

To obtain a free copy of the MLA feed demand calculator, phone MLA Publications on 1800 675 717 or download at www.mla.com.au



A sample screen from the MLA feed demand calculator



Tool 8.4

Feed budgeting template

There are some simple, short-term feed budgets you can calculate manually, without the need for a computer. Some examples are given below.

To fill in the budget template, you will need to:

- Measure the pasture mass (kg green DM/ha) in the paddock you have allocated to the stock to get your starting point (tool 8.6)
- Estimate pasture quality (tool 8.6 or tool 7.6 in *Grow More Pasture*)
- Determine the estimated intake of livestock from the table on page 35
- Look up typical pasture growth rates for your pasture type and soil fertility (see tool 8.2)
- Define the minimum target pasture mass (kg green DM/ha) for the class of stock (see procedure 8.2 or the MLA Pasture ruler).

To convert pasture mass to Feed on Offer (FOO), add 300kg/ha.

Q1: How many lactating ewes with twins can I put in a 40ha paddock for a 42 day lambing, while ensuring the minimum to meet stock requirements is maintained?

Pasture available:

Present pasture mass (tool 8.6):	1,700 kg green DM/ha
Less required minimum pasture mass (kg green DM/ha)*:	1,500 kg green DM/ha
Available pasture:	200kg green DM/ha
Plus pasture growth (42 days lambing x 40 kg green DM/ha/day):	1,680kg green DM/ha

Total Available Pasture: 1,880kg green DM/ha

Livestock Requirements

Ewe intake 2.9 kg green DM/head/day x 42 days**+ spoilage of 15%	140kg green DM/head					
No. of ewes per hectare:	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="border-bottom: 1px solid black;">Total available pasture</td> <td style="border-bottom: 1px solid black; text-align: right;">1,880</td> <td rowspan="2" style="padding-left: 20px;">= 13.4 ewes/ha</td> </tr> <tr> <td>Livestock requirements</td> <td style="text-align: right;">140</td> </tr> </table>	Total available pasture	1,880	= 13.4 ewes/ha	Livestock requirements	140
Total available pasture	1,880	= 13.4 ewes/ha				
Livestock requirements	140					

Stocking rate 13.4 ewes/ha x 40ha = approximately 536 ewes for the paddock

*The minimum pasture mass is 1,500kg green DM/ha to ensure that nutrient needs of these lactating ewes with twins are met (see procedure 8.2).

** Intake estimate from the table on page 35 (pasture digestibility 70%)

Q2: How long will a 16ha paddock last stocked with 400 pregnant ewes ensuring pasture is kept above a minimum level to meet livestock requirements?

Pasture available:

Present pasture mass:	1,000 kg green DM/ha
Less required minimum pasture mass:	700 kg green DM/ha
Available pasture:	300kg green DM/ha
Daily growth rate of pasture*:	27kg DM/ha/day

Livestock requirements

Stocking density (400 ewes divided by 16ha):	25 ewes/ha
Livestock requirements** (1.2 kg green DM/head/day x 25 ewes/ha + spoilage of 15%):	35kg DM/ha/day

Results

These calculations indicate a net pasture loss of 8kg green DM/ha/day (ewes are consuming 35kg green DM/ha/day which is 8kg greater than the pasture growth rate of 27kg green DM/ha/day).

Therefore, available pasture is declining at the rate of 8kg DM/ha/day.

How long will the paddock last (300kg DM/ha divided by 8kg green DM/ha/day)? About 38 days

When calculating short term (1-5 days) feed budgets, except in spring, pasture growth may be ignored.

* From tool 8.2

** Intake estimate from the table on page 35 (pasture digestibility 70%)

Stocking rate calculator

A stocking rate calculator can be downloaded from <http://www.mla.com.au/> using the search function. This calculator automates the process shown below.

Q3: Will I have enough pasture for my 50kg early pregnant Merino ewes to meet their nutritional requirements over 3 months given I have an average of 500 kg DM/ha (green) in my 40ha paddock now?

3 month feed budget

To fill in the budget template below, you will need to:

- Estimate pasture mass (kg green DM/ha) in the paddocks you have allocated to the stock to get your starting point
- Look up typical pasture growth rates for your pasture type and soil fertility (see tool 8.2)
- Estimate pasture quality (see tool 7.6 in *Grow More Pasture*)
- Look up the minimum pasture mass required (kg DM/ha) for the class of stock to meet their requirements (see tool 8.5)
- Determine the estimated intake of livestock for each month from the table on page 35
- Look up the target condition/fat score for the class of stock in question (see tool 3.3 in *Market Focused Lamb and Sheepmeat Production* and tool 10.1 in *Wean More Lambs*)
- Account for a spoilage factor due to trampling, dung and urine. A figure of 15% is used here.

Step 1: Calculate available pasture as per step 1 above

Present pasture mass:	500 kg green DM/ha	(A) _____
Less required minimum pasture mass:	500 kg green DM/ha	(B) _____
Available pasture (A-B)	0 kg green DM/ha	(C) _____

Plus growth for the period

Growth rate per day x number of days

June: 17 kg DM/ha/day x 30 days 510 kg green DM/ha +

July: 16 kg DM/ha/day x 31 days 496 kg green DM/ha +

August: 26 kg DM/ha/day x 31 days 806 kg green DM/ha =

Growth for the period 1,812 kg green DM/ha (G) _____

Total available pasture for 92 days (C+G) 1,812 kg green DM/ha (H) _____

Step 2 Livestock requirements (from the table on page 35)

(Intake per day + 15% spoilage) x No. of days

(0.9kg + 0.3kg spoilage) x 92 days 110 kg green DM/head (I) _____

Stock density that will achieve desired outcome (H ÷ I) 17 head/ha (J) _____

Step 3: Number of stock in the paddock to achieve desired outcome

J x paddock area (ha)

17head/ha x 40 ha 680 ewes in the paddock.

In the above example 680 ewes in the 40 ha paddock would ensure that pasture requirements for the early pregnant ewes are always met during pregnancy.



Predicted daily intake of pasture by ewes at varying quality and quantity available.

Livestock category	Herbage Mass (kg DM/ha) [†]															
	500				1000				1500							
	Pasture digestibility %				Pasture digestibility %				Pasture digestibility %							
	40	50	60	70	80	40	50	60	70	80	40	50	60	70	80	
	kg/ hd/d	kg/ hd/d	kg/ hd/d	kg/ hd/d	kg/ hd/d	kg/ hd/d	kg/ hd/d	kg/ hd/d	kg/ hd/d	kg/ hd/d	kg/ hd/d	kg/ hd/d	kg/ hd/d	kg/ hd/d	kg/ hd/d	
40kg ewe condition score 3																
Dry or pregnant	0.2	0.4	0.6	0.7	0.9	0.3	0.5	0.8	1.0	1.1	0.4	0.5	0.8	1.1	1.2	
Lactating:																
singles*	0.4	0.7	0.9	1.2	1.4	0.6	0.8	1.3	1.6	1.8	0.7	0.9	1.4	1.7	1.9	
twins*	0.5	0.8	1.0	1.3	1.5	0.7	0.9	1.5	1.8	1.9	0.8	1.0	1.7	2.0	2.1	
50kg ewe condition score 3																
Dry or pregnant	0.3	0.5	0.7	0.9	1.2	0.4	0.6	1.0	1.2	1.3	0.6	0.7	1.1	1.3	1.4	
Lactating:																
singles*	0.5	0.9	1.1	1.4	1.9	0.8	1.0	1.6	1.9	2.1	0.9	1.0	1.7	2.0	2.2	
twins*	0.6	1.0	1.3	1.6	2.0	0.9	1.1	1.9	2.2	2.3	1.0	1.1	2.1	2.4	2.5	
60kg ewe condition score 3																
Dry or pregnant	0.4	0.7	0.8	1.0	1.5	0.5	0.7	1.2	1.4	1.6	0.7	0.8	1.3	1.6	1.7	
Lactating:																
singles*	0.6	1.1	1.4	1.7	2.2	0.9	1.2	1.9	2.2	2.5	1.2	1.4	2.1	2.4	2.6	
twins*	0.7	1.2	1.6	1.9	2.4	1.0	1.3	2.2	2.7	2.9	1.3	1.5	2.5	2.9	3.1	
70kg ewe condition score 3																
Dry or pregnant	0.4	0.8	1.0	1.2	1.7	0.6	0.8	1.4	1.7	1.9	0.8	0.9	1.5	1.8	1.9	
Lactating:																
singles*	0.7	1.3	1.6	1.9	2.6	1.0	1.3	2.2	2.6	2.9	1.3	1.4	2.4	2.8	2.9	
twins*	0.8	1.4	1.8	2.1	2.8	1.1	1.4	2.6	3.1	3.4	1.4	1.5	2.9	3.4	3.6	

[†] To convert Herbage Mass to Feed on Offer (FOO), add 300 kg DM/ha. See also signposts in procedure 8.2

* For lactating ewes, an allowance has been made for the pasture intake of their lambs **Source:** PROGRAZE® manual



Central NSW Example of a Feed Year Plan:

A range of pasture and forage crops capable of achieving 75% of maximum liveweight gain given best practise management of pasture and livestock – Central West slopes of NSW (from PROGRAZE® manual)

Pastures	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Native summer grasses												
Summer grass/sub clover												
Phalaris/sub-clover												
Lucerne												
Chicory												
Annual rye/sub-clover												
Lucerne/sub-clover												
Perennial rye/sub-clover												
Cocksfoot/sub-clover												
Forage Crops												
Japanese/shirhoe millet												
Oats (grain recovery)												
Oats (full grazing)												
Brassicas – spring sown												
Cowpeas												
Hybrid forage sorghum/Sudan												
Lab Lab												

High quality sheep and cattle feed, capable of achieving at least 75% of potential liveweight gain:

High quality sheep feed, capable of achieving at least 75% of potential liveweight gain:

Feed inadequate in quality and/or quantity to reliably provide for high growth rates in either sheep or cattle:

Source NSW PROGRAZE® manual

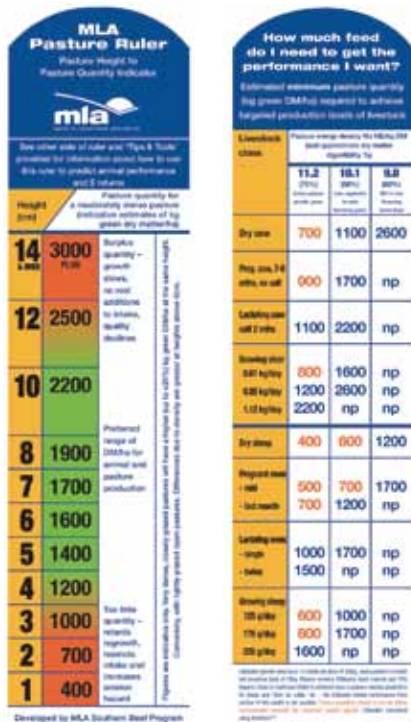


Tool 8.6

Pasture rulers, sticks and meters

A number of paddock aids are available to help assess pasture mass (quantity) ranging from the MLA Pasture Ruler and the PROGRAZE® stick to commercially available pasture meters. They include:

- Cut, dry and weigh pasture from a known area (see PROGRAZE® manual)
- Pasture rulers or sticks that measure height and equate to pasture mass — calibrated to read green dry matter when 100% green, and capable of conversion to dry matter, using PROGRAZE® information. These aids are simple to use and very cheap. Pasture benchmarks are marked on the ruler to allow a quick assessment of whether prevailing pasture conditions (quality and quantity) are meeting the needs of the livestock (see image below). These tools are not suitable for annual pastures that are tightly grazed or have variable compositions. Use the Lifetime Wool Feed on Offer pasture photo standards for these pasture types (see signposts in procedure 8.2)



- Read MLA Tips & Tools **Improving pasture use with the MLA Pasture Ruler** (see signposts under procedure 8.2)
- Rising plate meters that measure total dry matter: most sophisticated models will store and average readings over a number of paddocks
- Electronic probes that measure green dry matter: may collect additional manual input, such as phenology descriptors, store and average readings over a number of paddocks and download direct to office computers
- Remote sensing (Pastures from Space) of pastures is available in Mediterranean environments but is not yet calibrated for perennial pastures
- For more information on use of pasture meters and measurement of pasture mass see tool 7.6 in **Grow More Pasture**.
- The Lifetime Ewe Management course has a photo gallery of different pastures to help estimate pasture mass. A hardcopy booklet is also available. Go to the Tools section on the Lifetime Wool website www.lifetimewool.com.au

For a copy of the MLA Pasture ruler phone 1800 675 717.



Tool 8.7

Getting started in simple rotational grazing

A rotational grazing system can improve pasture production, utilisation and persistence. Moving stock around a small number of paddocks, grazing each for a fixed time, is an easy way to get started. This simple approach can be introduced to trial the system and build confidence.

Tactics

To start a simple 4-paddock rotation:

- Combine animals from 4 paddocks into one mob, or subdivide a single paddock into 4 smaller paddocks with temporary electric fences
- Rotate stock around the 4 paddocks in a general program of 2-week grazing and 6-week rest
- Managers of native pastures have successfully used 2-paddock rotations (4 week graze; 4-week rest) and four-paddock rotation (4 week graze; 12 week rest)
- To get a rotational grazing system underway after the autumn break may require stock to be fed in a sacrifice paddock or feedlot to allow the pasture to reach 800-1000 kg/ha and grow more quickly. Depending on seasonal conditions and location, this may take 3-4 weeks. The rotational grazing system can then start perhaps with 1 week grazing on each paddock gradually increasing to reach 2 weeks grazing, 6 week rest over winter.
- Stock may need to be moved weekly in spring (1 week graze; 3 week rest) to keep pastures in the growth phase for as long as possible. One paddock can be shut out of the rotation for silage, to enable hay or growth in the other 3 paddocks to be managed more efficiently
- After a trial period, modifications can be made to the system.

Further information is contained in the MLA Tip and Tool: **Getting started in simple time-based rotational grazing**. Get your free copy by:

- Calling: 1800 675 717
- Emailing: publications@mla.com.au
- Downloading from: <http://www.mla.com.au/tipsandtools>

EverGraze has developed new calculator to help plan rotational grazing systems, determine appropriate stocking rates, determine how long your paddocks will last and calculate the most economical ration for your stock. To download a copy of the tool, go to www.evergraze.com.au and look under the Information tab.

Management tips

Setting up

- Keep costs low at first. Use as much of the existing fencing infrastructure and watering systems on the property as possible.

When to start

- Any time of the year except during lambing. The break of season often provides an ideal time to defer grazing some paddocks to allow pastures to start growing.

Livestock

- Start the rotation with mature dry stock (Merino wethers or steers). These will be less affected by any feed restrictions occur. Alternatively, steers can be run with heifers, or sheep and cattle grazed together to make up the grazing mobs.

Water

- Sufficient supply of high quality water must be considered if implementing a rotational grazing system. If mob sizes are 3-4 times greater than previously, pipe lines and troughs must be adequate to provide access to the increased number of stock. Laneways can be used to provide water points to several paddocks. NSW Department of Industry and Investment have a comprehensive guide to farm water supply for stock and domestic use. Go to <http://www.dpi.nsw.gov.au/> choose the search function and search for Farm Water Book. It can be ordered online for \$24.00
- Access to water may not be as important for dry stock during winter, when pasture often contains over 75% moisture and stock may drink little water.

Fences

- Use electric fencing to keep cost to a minimum.

Measure and monitor

- Ongoing assessment of pastures and animals is best management practice in any grazing system.
- The pasture should be monitored to estimate the amount of pasture remaining when livestock are moved. This provides an indication of the degree of under or over-grazing.

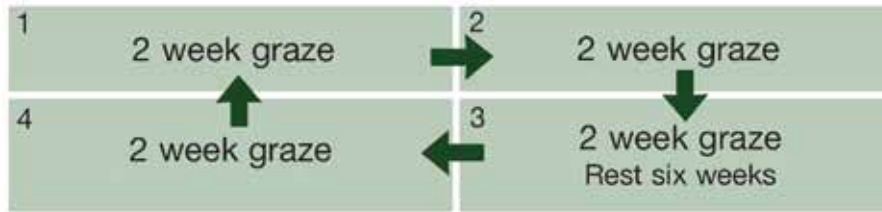
Go slow

- Simple trialing can be a key to risk management success. The first year can be used to train stock, set-up a routine and build confidence in the management routine.
- Seek advice from someone with practical experience during the start-up phase.

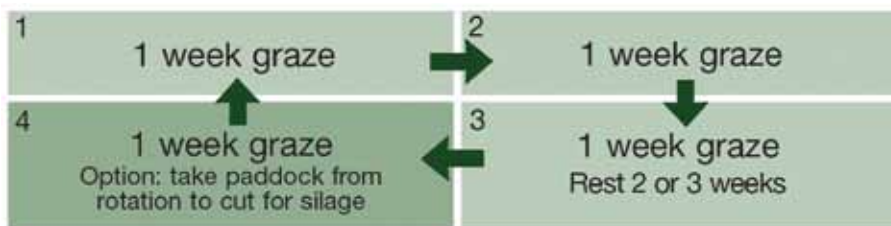
What can go wrong

- When stock over-graze a paddock, they damage the pasture base.
- If there is not sufficient rest period for regrowth between grazing, total pasture production can be seriously reduced. Rest periods should be at least 3 weeks for rapidly growing pasture, and 6 weeks at other times. Reduce stock numbers by selling excess stock or feeding stock in a containment area
- Have a management plan to cover late autumn breaks, wet, cold winters, dry springs, and drought.

Four-paddock rotation during moderate pasture growth



Four-paddock rotation during fast growth (in spring)



Source: MLA Tip & Tool Getting started with simple timebased rotation grazing

The speed of the rotation should reflect the rate of pasture growth. After the autumn break, use a sacrifice paddock or feedlot to allow pasture to bulk up. During winter a slow rotation (2 weeks grazing 6 weeks spell) is appropriate with supplements used if the paddock feed is insufficient to meet animal requirements. In spring, speed up the rotation (1 weeks grazing 3 weeks spell) to ensure that the pasture is eaten before it becomes rank and unpalatable. Alternatively, drop a paddock out of the rotation and conserve as hay or silage to speed up the rotation.

For the most up-to-date Making More from Sheep information, including web signposts, products, publications and events, visit www.makingmorefromsheep.com.au

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