PROGRAZE™

Profitable, sustainable grazing

SEGMENT 8

PUTTING IT TOGETHER

In this segment you will learn:

- Of the need for planning in managing grazing systems.
- The difference between carrying capacity, stocking rate and stocking density.
- The difference between various grazing management systems.
- How Tactical Grazing can be used as the framework for your grazing system.

PUTTING IT TOGETHER

Preceding segments of PROGRAZE dealt with both theoretical and practical aspects of livestock production from pasture. In addition we examined aspects influencing pasture production, in particular the effect of grazing.

In this segment we concentrate more on bringing together the management issues of livestock and pasture with the focus more on the farm as a whole. In doing so it is important to recognise that there will be times when the needs of pastures and those of livestock will be in conflict. Hopefully these can be minimised to achieve the best long-term results. Also, we need to recognise when compromises have been made we need to put strategies in place, probably at a later time, to counter any adverse effects. An example may be a pasture that was grazed for longer, consuming regrowth and diminishing root reserves, than management would normally desire. It would be important this pasture be given, as soon as possible, the opportunity to replenish reserves which probably means allowing it to mature and flower.

The grazing system is complex. It involves the interaction of social, environmental, financial, marketing, pasture and livestock management issues. PROGRAZE has concentrated on a component of the system, that is, grazing management and the interaction between pastures and livestock. It is important the broader issues are not ignored.

While recognising the total grazing system is complex, that component which is grazing management, as Figure 8.1 indicates, has its own degree of complexity. It is difficult to imagine how this complexity can be addressed adequately unless there is a planned approach to grazing management.

PLANNING

Through PROGRAZE, it is likely you have been challenged to incorporate technology which presently is not part of what might be described as your normal management. These may be targeting 900 kg green DM/ha for the start of lambing or 1500 kg for cows at calving, spelling pastures at certain times of the year to ensure their long-term

Figure 8.1. A view of the grazing management complex.

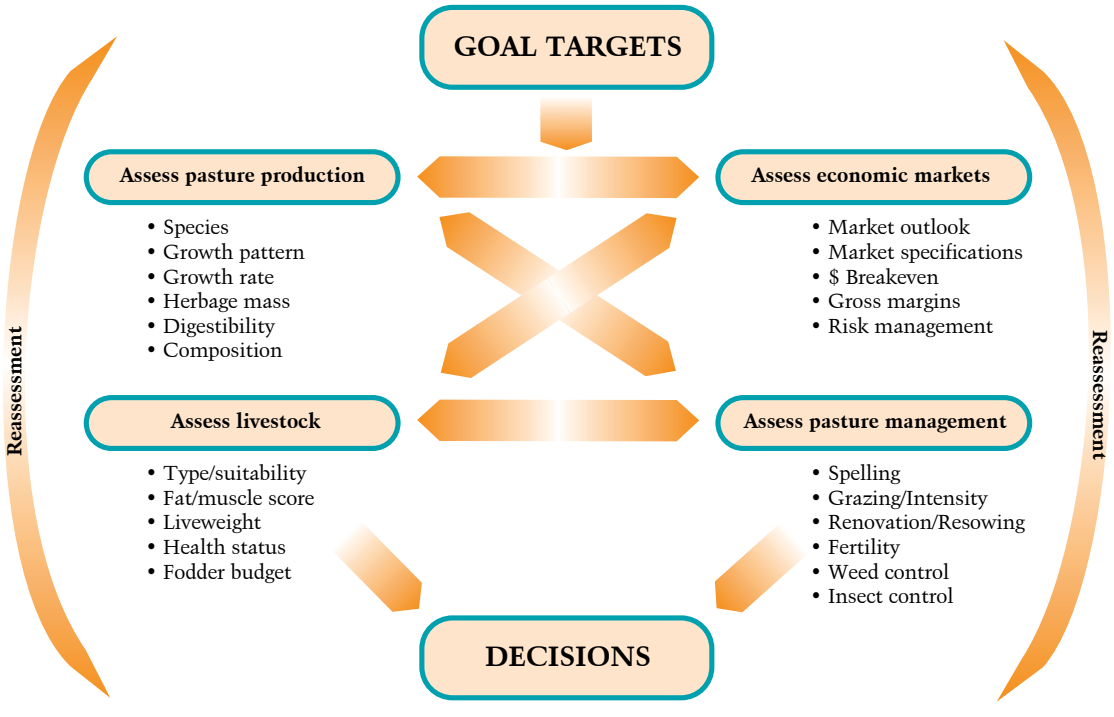


Table 8.1. An annual grazing plan of stock movements.

PADDOCK

MONTH	1	2	3	4	5	6	7	8
JAN	Ewes	Cows + Calves	Ewes	Ewes	Ewes	?	Heifers	Spray Topped pasture
FEB								Ewes
MAR					Rest	Heifers	Rest	Paddock sown to pasture
APR								
MAY	Rest	Cows	Rest		Weaner Calves			
JUN		Rest	Cows	Rest		Rest	Ewes - high density rotation	
JUL	Cows v Calves		Ewes high density					
AUG		Ewes v Lambs	?	Ewes v Lambs		Ewes Lambs till marking	?	
SEP							Rest	Grazing
OCT	Rest		Cows v Calves			Closed for Hay	Probably Hay	Rest - check establish-ment
NOV	Weaned Lambs	Ewes		Allow to seed	Heifers	?	?	
DEC						?	?	

productivity, grazing with cattle to set up 'safer' pastures for weaner sheep or setting up paddocks to achieve targeted weight gains in steers or lambs to meet specific markets. To effectively incorporate such technology into management, while limiting adverse effects, some planning is required. It will probably mean a formal planning process is required rather than trusting it totally to a mental approach.

The key to efficient grazing management is effective planning. Planning is likely to exist at a number of levels. There is what could be called a *strategic plan* which, taking into account the overall farm and enterprise objectives provides a framework for the year's operation (see Table 8.1). In your plan set specific targets for paddocks or periods, e.g. 900 kg green for singles and 1300 kg green for twins at the start of lambing. Use colours to indicate paddocks where water supply is a problem in summer or the part of your farm where ground cover is most critical. For market targets record the weight and fat you are aiming for. Being specific in your targets helps when you have to make decisions, as the seasonal conditions unfold.

Then there is what might be called the *medium term plan* which is linked to the strategic plan but about developing the specific strategies needed to achieve the farm and enterprise objectives. The medium term planning process could have a time frame of 3 to 4 months. This is where fodder budgets are a useful tool.

Finally, there are the day-to-day decisions required to implement the strategies. Some modification of the strategy may be required at this point due to circumstances that exist at the time. Base your decisions on the pasture benchmarks, Segment 2 tables 2.1, 2.2 or 2.3 plus pasture and animal assessments.

In developing grazing plans knowledge of the requirements of your pastures and livestock are critical. Grazing plans need to be flexible to allow for the inevitable variations of weather, stock prices, worms etc. Implementation of grazing plans relies on sound pasture and livestock assessment skills.

PROGRAZE PLUS

If you are interested in adopting a whole farm planning process PROGRAZE Plus is likely to suit your requirements. PROGRAZE Plus is directed towards the development of individual whole farm grazing plans. While whole farm, the basic units dealt with are the paddocks and mobs of stock on your farm.

The development of whole farm grazing plans may be considered as a strategic planning process. But if you decide to undertake the course, and as you become increasingly familiar with the process, you will recognise PROGRAZE Plus also has the potential of providing valuable support for short term or tactical decision making.

Grazing plans developed within PROGRAZE Plus use fodder budgets as a means of assessing the plan's likely success. PROPlus is the computer program developed for this purpose. PROPlus is provided to all participants.

The benefits of PROGRAZE Plus are that it provides a process or frame work which allows individual graziers to develop and assess whole farm grazing plans.

PROGRAZE Plus, encourages users to implement pasture and grazing management technology appropriate to their farm – technology which may have been part of PROGRAZE but not exclusively so. It will allow participants to explore the implications of pasture/livestock grazing management decisions, on available pasture in each paddock and on the farm as a whole.

By way of example, it allows an examination of the effect on pasture availability across paddocks and farm of you implementing a policy of say; resting certain paddocks for pasture management reasons, for worm control or for building feed supplies for lambing or calving. It helps to identify whether the predicted available pasture in individual paddocks is likely to meet production or market targets for livestock grazing those paddocks. It allows one to assess the effect of introducing an alternate feed source e.g. a paddock of grazing oats or improved pasture, or a change to livestock management, e.g. changing the time of calving or lambing.

The purpose of the PROGRAZE Plus course is to have individual participants develop their own grazing plan, but more importantly, to become sufficiently familiar with the process, and at least some of its benefits, that will ensure it is constantly used in the future to develop planned pasture and grazing management decisions. Once familiar with PROGRAZE Plus, you will find it to be extremely flexible and can fit effectively to your management approach.

PROGRAZE Plus is available from Tocal college as an on line course which you complete at your own pace. Contact the college for details.

GRAZING MANAGEMENT

Issues surrounding carrying capacity, stocking rate and stocking density are critical factors influencing the short and long-term success of grazing enterprises.

Carrying capacity

Carrying capacity is a measure of a farm's capacity to carry livestock. It is usually measured in DSE's/hectare. Carrying capacity is largely influenced by the productivity of the farm's pastures. Pasture production will be influenced by the soils (depth, fertility, structure, water holding capacity) in which they grow, by their botanical composition, the presence or absence of insects or disease, by climatic conditions and to some extent, grazing management.

Management can significantly influence carrying capacity through pasture species selection, strategic fertiliser use, weed control and grazing management. Strategies that increase farm carrying capacity are linked closely to those which increase pasture production and these are likely to lead to more environmentally friendly systems.

Pastures of these systems are likely to be denser providing better ground cover and so the benefits of soil protection, reduced run-off and cleaner run-off water. They use more soil water, particularly if deep rooted perennials are a component of pastures, reducing deep drainage and so the risk of acidity and salinity.

Particularly as a result of climate, the farm's carrying capacity is not a constant. Grazing management should reflect the variation in carrying capacity.

Carrying capacity varies by season and within season. Seasonal variation is strongly influenced by temperature and the pattern of rainfall. For example, winter temperatures limit pasture production in much of the temperate areas of the State. Summer temperatures have a similar effect, but the summer rainfall experienced in the northern areas generally results in higher pasture production than that which occurs in the south of the State. The timing of lambing and calving or the sales of surplus stock are ways that managers address the seasonal variation in carrying capacity.

While pasture growth curves show a strong seasonal trend (see Appendix 4), there is still wide variation to those trends within seasons, which is mainly due to rainfall variation. Variation in pasture growth again leads to variation in carrying capacity. Drought is an extreme adverse effect of the variation. Managers react to the within-season variation by implementing strategies such as supplementary feeding, lot feeding, selling stock, buying stock or conserving surplus feed, time of lambing or calving.

Over stocking can be defined as where stocking rate is constantly exceeding carrying capacity or supplementary feeding is needed each year. While under stocked farms may be defined as those where stocking rate rarely exceeds carrying capacity or supplementary feeding is never needed.

Stocking rate

Stocking rate is a term used to describe the number of stock on a paddock or farm. It is usually assessed in terms of DSE's/hectare but also, head/hectare particularly when describing stocking rate at the paddock level.

One common goal of grazing systems, and probably the most important for producers, is to optimise profits from the grazing enterprise. Numerous bench marking studies have shown that the farm's stocking rate is a critically important parameter in achieving this outcome.

Figure 8.2 describes the general relationship between stocking rate and per head production, per hectare production and gross margin ($) returns. As stocking rate increases per head production, after holding steady for a time, can be expected to decline. However, per hectare production continues to increase

well past this point but eventually will plateau and then decline. Enterprise profit is likely to follow a similar line to that of per hectare production except it will plateau earlier and decline earlier. This is often associated with the increased costs of supplementary feeding. At low production per hectare the profit is down due to the overhead costs being spread over a small amount of production.

The stocking rate at which the profit is nearing its peak is probably the target at which most producers will aim, particularly when risk management issues are considered.

Livestock fat scores and the extent of supplementary feeding can be a useful guide to how close stocking rates are to carrying capacity. For example, if fat score targets in the livestock segments of the manual are rarely met or if it requires excessive amounts of supplementary feeding to achieve these targets, stocking rates probably exceed carrying capacity too frequently and profits suffer.

Conversely, if livestock are constantly in excess of fat score targets or rarely require supplementary feeding then it may be possible stocking rates are well below carrying capacity and potential returns have been foregone.

Stocking density

Stocking density is a term not dissimilar to stocking rate when stocking rate is referring to a paddock. Although, it might be that stock are being restricted to part of a paddock through the use of a temporary electric fence i.e. strip grazing. Stocking density is usually described as head/hectare.

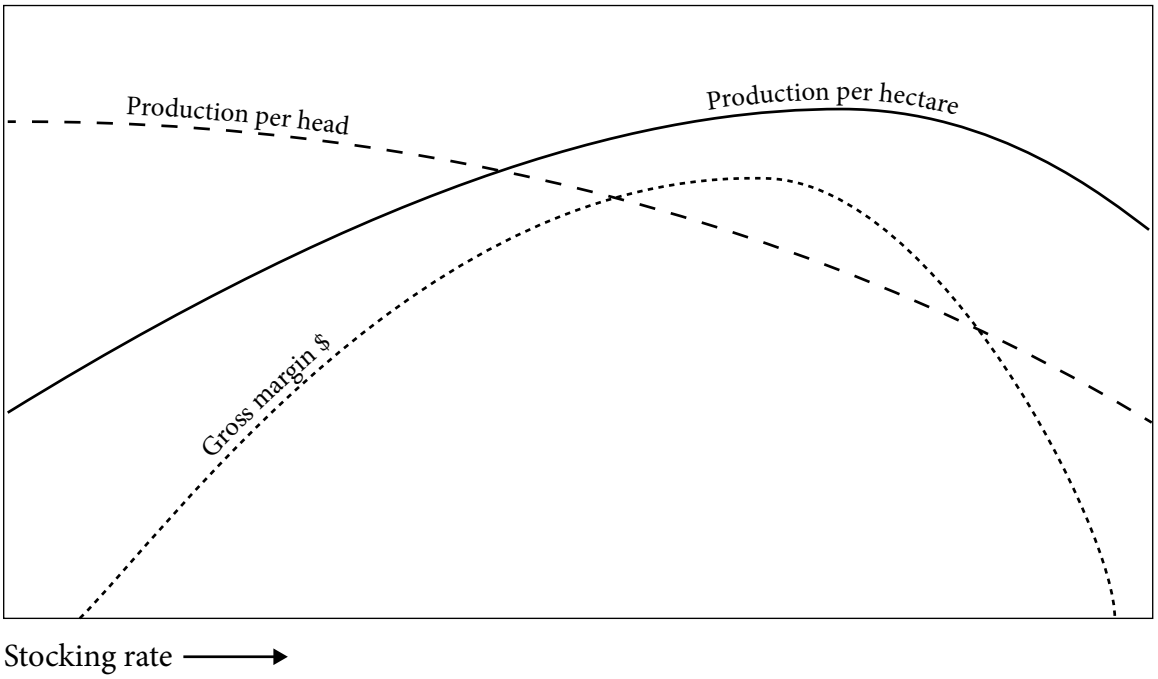
Stocking density is a very powerful pasture management tool. Densities to achieve a specific target may range from a relatively low level of up to 5 times the average stocking rate, to a high which may be 25 times.

The extent to which higher stocking densities can be achieved is determined by mob or herd size and the degree of subdivision of paddocks. When high stocking densities are required temporary electric fencing is commonly used.

Grazing systems

The following are some commonly used terms to describe grazing systems: The most critical factor for all systems is the stocking rate compared to the pasture's capacity of the paddock or farm. All systems will fail if the stocking rate exceeds the pasture's capacity. It is not the number/ha that is important but the relationship between pasture production and animal consumption. A stocking rate of

Figure 8.2. The fundamental relationship between stocking rate, livestock production and gross margin.



15 DSE/ha might be putting less pressure on the pasture and soil than 6 DSE/ha because it is growing 10,000 kg DM/ha rather than 3000 kg DM/ha.

Continuous stocking

As the name suggests, pastures are continuously stocked, rarely receiving a spell from grazing.

- The system allows animals to graze with a high degree of selectivity, so reducing their preferred species from the pasture. This allows the less preferred species to dominate. The likelihood of this eventuating depends on such factors as stocking rate; suitability of the pasture species to the location, paddock topography. Parts of the paddock might never be grazed and can result in increased biodiversity.
- Selection of preferred pasture species may lead to patch grazing and uneven growth.
- Management inputs are minimised.
- Because stock have a high degree of selectivity animal production/head can be very good.

Because the control in continuous grazing rest with the stock undesirable outcomes can occur. These include:

  - » the potential loss or decline of desirable pasture species;
  - » the lack of management control over pasture quality and quantity. This is important for both pasture productivity and managing the nutritional requirements of the stock. This is greatest if the paddock is under grazed.
  - » poor ground cover that results if the stocking rate exceeds the pasture's capacity.

There are examples of long term continuous grazed sites that have achieved the desired environmental outcomes and been profitable. **This system is the most sensitive to having the correct stocking rate**.

Set stocking

- Often used to describe continuous stocking but more appropriately it is a term used to refer to a specific grazing period when stock are not moved. For example, for lambing, calving or finishing stock.
- Following the period of set stocking, pastures may be spelled or stocked with a different stocking density. This is not a continuous stocking system. The major difference is that the stocking density during the year reflects the pasture capacity for growth.
- The stocking of pastures for extended periods of time, for example 3 months or even longer will not necessarily be detrimental to the pasture. However, this is going to depend on pasture type e.g. extended periods of grazing for lucerne are not recommended, seasonal conditions, soil fertility, the growth phase of the desired species within the pasture and the pasture's management prior to and after grazing.
- At times, set stocking may be the most appropriate pasture management strategy. An example may be when substantial grazing pressure is required over the growth phase of an undesirable plant species for its control or eradication.
- At times, set stocking may be the most appropriate strategy for livestock. It is a useful strategy where management does not wish to disturb stock say through lambing or calving and is the most appropriate for stock where high growth rates are required.
- Systems that involve moderate periods of set stocking, as compared to the more intensive rotational grazing systems, usually require lower input costs for fencing and watering.

Rotational grazing

- Period of grazing followed by a period of rest. The rest period or rotation length is generally influenced by pasture growth rate. The aim is for the pasture to have re-grown to a given stage of growth before the next grazing. The spell period length has a big impact on how these system works. A 30 consistent day rotation produces a completely different system to a consistent spell of 200 days. The longer spell length will result in a system with large amounts of low quality feed and therefore lower stock production.
- Controlled rotational grazing, block, crash, mob stocking and strip grazing, as well as cell or time controlled grazing, are varying forms of rotational grazing.

- The majority of pastures comprise a variety of species which have different growth times and habit i.e. tall or short. During any rest period some species might benefit and others suffer. Shorter growing species will be shaded by taller growing species, so not all species will benefit during rest periods, the longer the rest period the greater the potential impact.
- There are often well defined rules which determine the grazing and spell periods. These rules are usually based on time, which might be a one week graze followed by a six week spell, or one of grazing to a specific residual green herbage mass, say 1000 or 1500 kg DM/ha and then spelling until the pasture reaches 2500 or 3000 kg DM/ha.
- Recent research recommends using a green herbage allowance in kg DM/hd/day to set the rotation length. In spring the green allowance should be 0.8 to 1.2 kg DM/hd/day (use the higher figure for breeding animals) and as digestibility decreases it should be increased to 2 to 3 kg DM/hd/day to allow selective grazing to enhance diet quality. If the paddock has green that is of very low quality (e.g. dried off or frosted) then the allowance increases to 3 to 5 kg DM/hd/day. For example we have 1000 kg DM/ha of green and 1000 kg DM/ha of dead in the paddock. The dead is telling us digestibility is dropping so we will use the 4 kg DM/hd allowance. The stocking density will be 40 hd/ha. 1000 kg DM/ha divided by 4 kg DM/hd/day give us 250 grazing days divided by 40 hd/ha tells us we can graze the paddock for 6 days and achieve satisfactory animal performance. This allowance method only applies when there is green in the pasture.
- Rotational grazing may be implemented for part of the year or, in the case of time control grazing, conducted over the whole year.
- There is wide variation in the number of paddocks in rotational grazing systems. The minimum is usually about four while the maximum may reach 60, in some intensive systems. Recent research has shown there is little advantage in having more than a 15 paddocks rotation. It also showed improved dollar returns when moving from a continuously grazed 1 paddock system to a 20 paddock rotation system if the infrastructure is in place. There was no difference or lower returns between the systems depending on the infrastructure that had to be built.

  Basing fencing decision to control under-utilized parts of paddock provides a return on the investment. It targets the costs to the area which will give the biggest returns.

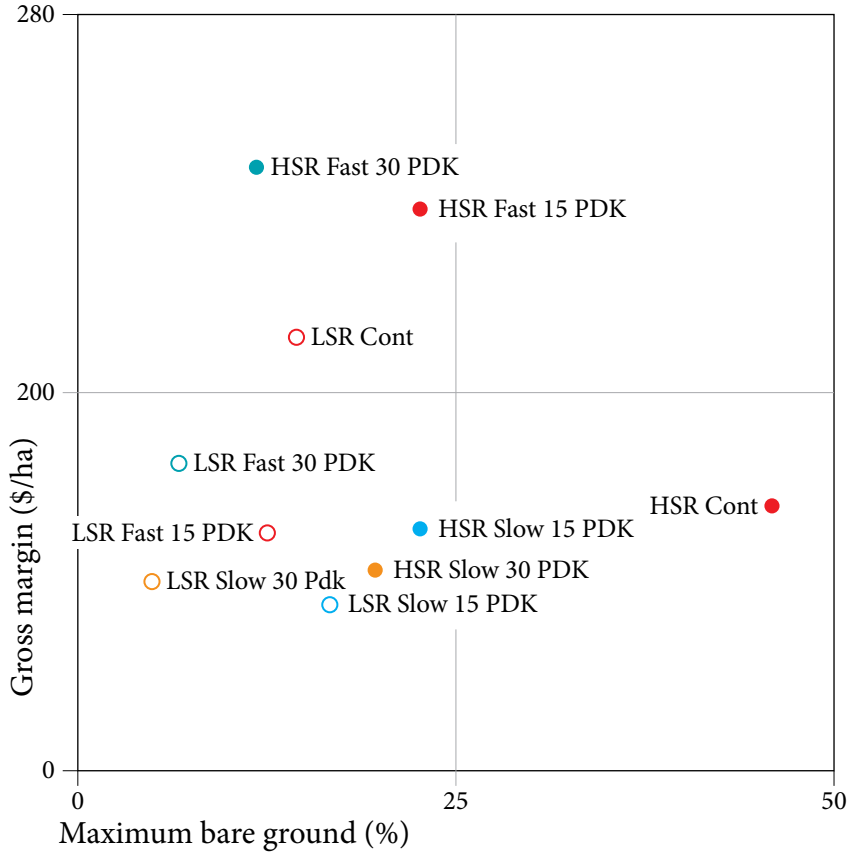
  As the grazing system increases stocking density the manager has increased control of pasture eaten and how it will recover. At low stocking densities the control moves to the stock. The 3 systems continuous, set stock and rotation all have strong and weak points. The critical issue is that you use the appropriate system for what you are trying to achieve.

  Evidence from around the world indicates that provided pasture are not seriously under or over grazed then the differences in pasture growth will be small. This is because pasture can change their growth habit under different systems i.e. smaller leaves but more tillers under set stocking or larger leaves on fewer tillers under rotational grazing. The benefits of moving to a rotational system are greatest at high stocking rates because you have better control of the feed and therefore animal nutrition.

Recent work compared continuous grazing against rotational systems with varying stocking rates, rotation speeds and paddock numbers. The results are shown in Figure 8.3 and the key points are;

- High stocking rate (HSR) and fast rotation (60 days) regardless of the number of paddock used in the rotation gave the best combined results while low stocking rate (LSR) continuous grazing (Cont) was not far behind.
- The slow rotation (120 days) regardless of paddock number or stocking rate had low gross margins and similar ground cover to the higher performing systems.
- The high stocking rate continuous system suffered reduced gross margins due to the extra feed required and had problems with amount of bare ground. These issues reduced in later years of the trial so the dot move towards the LSR Cont dot.

Figure 8.3 Comparing gross margin and maximum bare ground of grazing management options for a merino cross terminal sire system on cocksfoot pastures at Orange. Source W. Badgery.



SUMMARY

A successful grazing system can;

- manage seasonal variation mostly by the structure of the livestock enterprise
- improve livestock performance per head but it requires careful management and is difficult.
- improve pasture growth and composition by targeting the life cycle of the critical species. This is limited to certain parts of the year.
- there is currently no evidence that soil fertility and soil carbon are enhanced with intensive rotational grazing. Enhancing root production mainly by improving fertility will increase soil carbon.
- improve the bottom line provided the spending on infrastructure is targeted to areas of greatest return and the stocking rate results in utilisation rates of 40 to 50% for breeding operations. Trading operations have higher levels of utilisation due to the ability to vary stocking rate in line with pasture supply.

Tactical Grazing

Tactical Grazing is the approach promoted by PROGRAZE for the implementation of best practice in grazing management. It contains four components *setting objectives, determining strategies, implementing tactics and monitoring results*.

- *Setting objectives* is about setting outcomes for the farm. These are best set at three levels; the farm, paddock and enterprise.

  The objectives at the farm level could include issues involving the landscape, environment including biodiversity, effective use of on-farm rainfall, managing climate variability, farm carrying capacity and business profitability. At the paddock level, issues may include pasture productivity, pasture composition, efficient pasture utilisation, stocking rates and pasture management needed to meet livestock productivity targets, riparian protection, salinity control, ground cover levels. At the enterprise level production targets including calving/lambing percentages, wool production, meeting market specifications for livestock products and production costs are all issues for consideration.

- *Determining strategies* to achieve the set objectives is the next step. No formula exists for determining the strategy to achieve a particular objective. Strategies to achieve similar outcomes will vary from environment to environment and circumstance to circumstance.

  Strategies are the broad principles that need to be applied to achieve the objective but recognising there may be a need to vary tactics during the implementation phase due to any number of factors. The grazing plan in table 8.1 is an example.

  Wherever possible strategies should be measurable with targets in kgdm/ha, kg liveweight at an age or fat scores.

- *Implementing tactics* is about the day-to-day, week-by-week, management decisions required to achieve the desired outcome. Management needs to respond tactically to changing conditions in order to achieve that outcome. There are ranges of grazing management tools that may be part of a strategy. These include (but are not confined to):

  » timing, duration and intensity of grazing, for livestock performance,

  » species or class of livestock used for grazing,

  » timing and duration of pasture spelling, for pasture productivity/persistence,

  » grazing/spelling to pasture benchmarks as a basis for achieving production targets (e.g. growth in livestock), pasture objectives (e.g. botanical composition) and environmental outcomes (e.g. height of water table), and

  » grazing/spelling for the control of internal parasites in livestock.

  In addition, there are other tactics available to managers. While some are not specifically grazing management techniques, they may include components of grazing management in their execution, and may be important components of a strategy. These could include the:

  » sowing of new pastures or new species into existing pastures,

  » correction of soil nutrient deficiencies,

  » use of chemicals to control pasture pests,

  » use of fodder conservation as a pasture management tool as well as providing a future source of feed for livestock,

  » use of pasture renovation including mulching,

  » use of controlled burning,

  » strategically establishing trees and shrubs to assist water table management,

  » use of supplementary feeding to achieve livestock objectives when pasture lacks quantity and/or quality, and

  » use of sub divisional fencing to facilitate the implementation of grazing management strategies and the management of areas identified for conservation and biodiversity value including riparian zones.

- *Monitoring results* is the final component to tactical grazing. Tactical Grazing is targeted at achieving the stated objectives. Monitoring provides an assessment of progress and helps ensure objectives are achieved. As a result of monitoring, objectives may be changed or their priority altered. The effectiveness of tactics is assessed and adjusted where necessary. Monitoring indicators may include:
  - » stocking rate,
  - » pasture composition,
  - » ground cover,
  - » soil nutrients,
  - » herbage mass levels at critical times of the year,
  - » fat score of livestock at critical times of the year,
  - » physical and financial production ratios such as calving/lambing percentages, turn-off or cut per head and per hectare and income and costs per head and per hectare,
  - » supplementary feeding,
  - » water quality in dams and water ways,
  - » worm egg counts,
  - » the proportion of livestock products meeting market specifications, and
  - » farm business returns.

  The essential element of Tactical Grazing is that grazing management needs to be flexible. It recognises grazing management cannot be based on simple recipes or driven by a set of rules that might claim to suit all pastures types, pasture conditions and enterprise types.

  Tactical Grazing recognises that grazing management decisions need to be made within a framework which has considered farm and enterprise objectives. Decisions should be based on pasture type, the recent history and present condition of each pasture paddock, short and long-term pasture productivity and finally the specific requirements of livestock that graze within the system.

Tactics

The following are a few examples of different grazing tactics which could be implemented to achieve specific targets for pasture and livestock. Tactics that are appropriate in one year are not necessarily appropriate the next.

DROUGHT

PROGRAZE does not specifically address drought. However, it does address supplementary feeding and the effect of prolonged adverse conditions on pastures, two important components of drought.

Supplementary feeding is addressed through pasture assessment which is critical to sound supplementary feeding decisions and the use of GrazFeed. The early stage of drought and in many instances well into drought, the situation is still one of supplementary feeding i.e. pastures are still contributing to the farm's livestock production.

Specific issues relating to drought feeding and management are addressed in a number of NSW DPI publications. See the further reading and information list below and the Department's drought web site at www.dpi.nsw.gov.au. In addition, the Department's StockPlan program assists users develop drought strategies. These include strategies to be implemented pre-drought as well as those relevant to circumstances as drought develops and action needed post drought. Drought plans are similar to grazing plans in that there is no one plan that all producers should implement. Any drought plan should be judged on the business's health 2 years after the drought not during the drought. Different strategies have different times of impact on the business hence the need to assess over a longer time period. StockPlan covers all these issues.

The early part of this Segment addressed planning. It is essential both from a grazing management perspective, as well as from a broader whole farm perspective, that droughts are factored into planning. Historically, drought is a common occurrence within Australian agriculture and this should be reflected in planning. StockPlan can be accessed via the Tocal College web site.

PADDOCK RECORDING

Over time, monitoring the grazing use of a paddock enables comparisons between paddocks to be made and provides a better indication of the capabilities of paddocks for animal production. This enables pasture inputs to be directed where it will be most effective.

An example of a recording sheet is shown on the following page. Comparisons of stock carrying capacity are in dry sheep equivalent (DSE)/ha. Each paddock on your property will have a recording page. Care needs to be taken with paddock records i.e. paddocks used for finishing or reproduction will have a lower DSE/ha because higher animal performance needs increased herbage mass so a lower stocking rate, don't just look at the DSE/ha in making input decisions.

The DSE is a value based on the energy requirements of a 2 year old, 50 kg Merino wether. Table 8.2 shows the relative values for sheep and cattle of different classes and liveweights. Some DSE tables still use the standard as a 45 kg wether which creates confusion within industry.

Strategy	Tactics
• Remove bulky dead pasture residue to eliminate shading on new pasture growth. • Rationing pasture over winter. • Regeneration of annual based pastures in autumn. • Suppress annual grasses and encourage legume production. • Controlling rapid spring pasture growth, so keeping it vegetative to maximise stock growth rates. • Increase fat score of stock. • Feeding over lactation to maximise intake. • Feeding growing stock to maximise intake. • Preparation of a low worm, weaner sheep paddock. • Preparation of lambing/calving paddock.	• Moderate to high density grazing with dry stock. Supplements may be needed. • High density rotations. Short graze periods. • Defer grazing after the autumn break until pasture mass is around 500–800 kg green DM/ha. • High density set stocking winter/early spring grazing. • Aggregate stock; moderate density needs to start in late winter. Make hay or silage. • Set stocking has shown to have advantages over rotational grazing however, the decisive issue is that pasture is not grazed below critical benchmarks – manage pastures to optimise digestibility i.e. Phase II. • Paddock kept in a green, leafy phase and graze with cattle or dry adult sheep when necessary. • Remove any significant build-up of dry feed early. Sheep: plan for a minimum of 900 kg green DM/ha at the start of lambing. Cattle: plan for 1500 kg green DM/ha at the start of calving.

Table 8.2. DSE ratings for various classes of livestock.

Mature ewes					
Liveweight	Pregnant			Lactating	
kg	Dry	Single	Twin	Single	Twin
40	0.9	1.1	1.3	2.1	2.9
50	1.0	1.3	1.5	2.5	3.4
60	1.2	1.4	1.6	2.9	4.1

Growing lambs			
Liveweight	Growth (g/day)		
kg	50	100	150
20	0.6	0.8	1.0
30	0.9	1.1	1.3
40	1.0	1.3	1.5

Breeding cattle			
Liveweight	Dry	Pregnant	Lactating
kg			
350	6.0	7.0	12.3
400	6.5	7.7	13.7
450	6.9	8.2	14.8
500	7.1	8.4	15.2
550	7.7	9.0	16.5
600	8.4	9.7	17.3

Growing cattle			
Liveweight	Growth (kg/day)		
kg	0.5	1.0	1.5
200	5.3	6.8	8.3
250	6.4	8.1	9.7
300	7.3	9.2	11.1
350	8.4	10.6	12.9
400	9.1	11.4	13.7

Paddock area					**(ha)(a)**						
(b)	(c)						(d)	(e)		(f)	
Date in	Date out	kg/DM/ha Green in	kg DM/ha Total in	kg/DM/ha Green out	kg DM/ha Total out	Fatscore Out	No. of days in (c−d)	No. of stock	Class of stock	DSE	TOTAL (d × e × f)
						Year total					(g)
						Annual DSE rating (g÷a÷365)					DSE/ha

SUMMARY

- Planning is the key to efficient grazing management. Elements of planning include:
  - » Strategic planning.
  - » Medium term planning.
  - » Tactical day to day decisions.
  - » Drought preparedness needs to be an element of strategic plans.
- The balance between carrying capacity and stocking rate is critical to grazing management success.
- Stocking density is a powerful pasture management tool.
- Tactical Grazing provides the basis for effective grazing management.
- Paddock recording provides an opportunity to objectively measure their performance thereby providing a basis for more effective management.

Further reading and information

- StockPlan course and software – contact Tocal college.
- PROGRAZE Plus course – contact Tocal college.
- *Livestock feeding on pasture*. New Zealand Society of Animal Production. Occasional Publication No. 10. Hamilton, New Zealand.
- *Pasture management technology for the 21st century*. Kemp, D.R. & Michalk, D.L., (Eds), 1993, CSIRO Information Services
- *Managing Drought* – 6th edition NSW DPI
- Grazing Management system explained – Evergraze exchange – www.evergraze.com.au
- www.dpi.nsw.gov.au