MEAT & LIVESTOCK AUSTRALIA

Pasture tools for a profitable beef enterprise

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Contents

Introduction

Successful pasture utilisation requires precise control of the grazing pressure and herd structure of the beef business.

This booklet provides the basis to determine how pasture can be successfully turned into saleable beef to profit the farm business.

By using the formulas provided, following the examples and then inserting your own working examples, you will be able to:

- Estimate stocking rate over short periods;
- Make tactical grazing decisions about the short-term stocking rate/ha;
- Plan seasonal pasture and animal performance to achieve targets; and
- Calculate the gross financial benefit to the grazing business.

This information enables the grazing operation to be more precisely managed. The conversion of pasture energy and nutrients into saleable beef is achieved while leaving pasture residue in the best condition for rapid regrowth. It will also better match the seasonal feed supply with beef enterprise opportunities and business objectives.

PROGRAZE® information

To make the best grazing management decisions some basic PROGRAZE® or equivalent information is required *(Figure 1).*

Figure 1: Information required for grazing management decisions

- The amount of pasture (kg DM/ha) in a paddock, grazing block or whole farm
- Pasture quality (MJ ME/kg DM)
- Pasture growth rate (kg DM/ha/day)
- The stock to be grazed and the target weight gain required (kg/head)

The following estimates are used in the practical working examples:

Pasture at the start of grazing	2,500kg DM/ha
Pasture at the end of grazing	1,500kg DM/ha
Pasture quality	10MJ ME/kg DM
Pasture growth rate	30kg DM/ha/day
Pasture allowance (kg DM/day)	estimate of maximum intake + 20% for wastage
Steers or unjoined heifers	300kg grown to 400kg at sale
Mature cows (British breed)	500kg, fat score 2.5–3

kg DM/ha = kilograms of dry matter per hectare

MJ ME/kg = megajoules of metabolisable energy per kilogram of dry matter

See the tables in the appendices for further estimations for use in calculating the important components of managing the grazing system.

Estimating short-term stocking rate/ha

STEP 1 How much pasture is available for cattle to graze

This involves estimating the 'grazing opportunity' in kilograms dry matter per hectare (kg/DM/ha) by assessing pasture height and related density using the MLA Pasture Ruler or equivalent measurement tool. Refer to MLA
Tip & Tool FP.03: *Improving pasture use with the MLA Pasture Ruler* for information on how to use the MLA Pasture Ruler to convert the height of a moderately dense pasture into an accurate estimate of kilograms of green dry matter per hectare.

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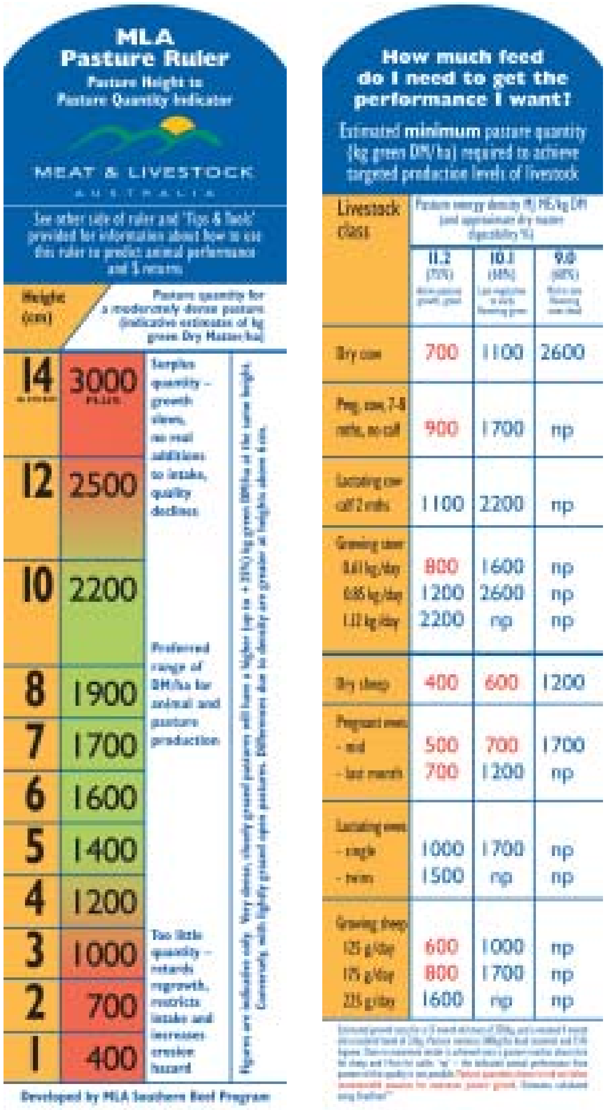
Figure 2: The MLA Pasture Ruler



In practice, the conversion of pasture into beef product is greatest when the paddock grazing sequences ensure:

- The most appropriate class of cattle is used to meet production targets.
- Pasture energy supply matches animal energy demand.
- Pasture mass is maintained in a green, leafy and vegetative condition across the paddock between 1,500kg green DM/ha to 2,500kg green DM/ha (around 6cm to 12cm high) and with the recommended number of live leaves and tillers for the grazing period.
- The number of animals allocated for grazing enables accurate prediction of the grazing period, while maintaining pasture mass above 1,000kg green DM/ha (3cm high) to ensure rapid regrowth and to prevent grazing of new growth.

An estimate is needed of how much pasture is wasted through animals trampling and fouling during grazing. Around 20% wastage is a reasonable estimate and is used in the worked examples.

STEP 2 What pasture allowance is required for various classes of grazing cattle

Pasture allowance is described as food needed for growth and maintenance of the stock (intake) plus an allowance (20%) for trampling and fouling. Pasture allowance is based on pasture of at least 10 MJ ME/kg DM, and is not applicable to pastures of lesser quality.

Table 1: Guide to pasture allowance for steers and unjoined heifers at a range of weights grazing pasture of at least 10 MJ ME/kg

Liveweight (kg)	200	300	400	500
Pasture allowance (kg DM/head/day)	8	10	12	12

As an example, a 300kg steer or heifer requires a pasture allowance of 10 kg DM/day to achieve potential animal growth from pasture quality of 10MJ ME/kg/DM.

Table 2: Guide to pasture allowance for 500kg cows in different physiological conditions

Mature British breed cows (500kg, fat score 2.5–3.0)	Dry/late pregnant	Early lactation* (2 months)	Lactating* (5 months)
Pasture allowance (kg DM/head)	10	15	20

** Includes an allowance for calf*

As an example, a 500kg cow, fat score 2.5–3.0 in early lactation requires a pasture allowance of 15kg DM/day.

Table 3: Average daily gain for a range of feed quality and steer liveweights

Feed available (kg DM/ha)	1,000			1,500				2,000				2,500				3,000			
MJ ME/kg DM	9	10.5	12	7.5	9	10.5	12	7.5	9	10.5	12	7.5	9	10.5	12	7.5	9	10.5	12
Digestibility %	60	70	80	50	60	70	80	50	60	70	80	50	60	70	80	50	60	70	80
Steer liveweight																			
200kg – ADG (kg/day)	0.06	0.54	1.07	-0.5	0.19	0.83	1.16	-0.2	0.32	0.99	1.23	-0.02	0.42	1.09	1.31	0.04	0.49	1.16	1.36
300kg – ADG (kg/day)	-0.29	0.36	0.95	-0.7	0.08	0.67	1.08	-0.4	0.21	0.86	1.14	-0.24	0.3	0.98	1.22	-0.1	0.38	1.06	1.28
400kg – ADG (kg/day)	-0.48	0.26	0.82	-0.9	-0	0.55	0.95	-0.6	0.11	0.74	1.01	-0.44	0.2	0.86	1.09	-0.3	0.28	0.94	1.15
500kg – ADG (kg/day)	-0.77	0.11	0.65	-1.12	-0.33	0.4	0.78	-0.9	-0.03	0.58	0.84	-0.72	0.07	0.7	0.92	-0.59	0.14	0.78	0.98

ADG = average daily gain
Source: Calculated using GrazFeed v 4.1.5

The following assumptions are used:

1. The weights and ages are 200kg at 9 months; 300kg at 18 months; 400kg at 24 months; and 500kg at 30 months.
2. Breed type is British (Angus, Hereford, Shorthorn, etc.) and their crosses.
3. Mature weight of cows of same breed type 500kg.
4. There is no cold stress.
5. Pastures are manipulated for the calculation by setting dead material at 5% for 12, 10.5 and 9 MJ ME/kg DM (M/D) and green at 1% for 7.5 and 6 MJ ME/kg DM (M/D). The availability refers to amount present in the major component, eg MJ ME/kg DM 10.5 (or M/D 10.5). The green component was varied from 1, 1.5, 2, 2.5, 3t DM/ha.

STEP 3 Calculate the stocking rate over short grazing periods

Follow the example to calculate the stocking rate for a 2,500kg green DM/ha pasture with a nutritional quality of (ME>10.5MJ/kg DM) for 300kg steers growing at 1kg/day (see *Table 3*).

Example for 1 day grazing

Information for calculation:

- Pasture at start of grazing — 2,500kg DM/ha
- Pasture at end of grazing — 1,500kg DM/ha
- Pasture allowance (PA) — 10kg DM/day/steer (see *Table 1*)
- Number of grazing days — 1 day

To estimate use the formula:

$$\text{Animals/ha} = \frac{\text{(pasture mass at start of graze } \textbf{\textit{less}} \text{ pasture mass at end of graze)}}{\text{pasture allowance}}$$

Animals/ha = (2,500kg DM/ha – 1,500kg DM/ha) = 1,000kg DM/ha

1,000kg DM/ha ÷ 10kg DM/day/steer PA (see *Table 1*)

Answer: 100 steers/ha for 1 day grazing

Example for 5 days grazing

Grazing a pasture of the same quantity and quality for 5 days:

= 100 steers/ha ÷ 5 days grazing

Answer: 20 steers/ha stocking rate

Note: when calculating the short-term stock numbers while using short-term, high density grazing (from 1 to 5 days) there is no need to make an allowance for any pasture growth.

When grazing pasture for longer periods, an allowance needs to be made for the expected pasture growth during the grazing period. As a guide to mid-monthly pasture growth estimates, refer to Appendix 1 for estimates of daily pasture growth rates (kg DM/ha/day) for typical conditions in a range of localities and regions across southern Australia.

STEP 4 Determine the stocking rate/hectare over longer grazing periods

The big challenge in grazing management is being able to predict the stocking rate that takes advantage of any period of rapid feed growth. The question to be answered is "*How many cattle are required to achieve the combination of productivity* ***and*** *profitability*".

In this example the stocking rate/ha (for no. days grazing) is estimated by the calculation:

(pasture mass at start of graze *less* pasture mass at end of graze) + (pasture growth rate x no. days intending to graze paddock) ÷ pasture allowance x no. days intending to graze paddock.

Information for calculation:

- Pasture at start of grazing 2,500kg DM/ha
- Pasture at end of grazing 1,500kg DM/ha
- Pasture growth rate (PGR) 30kg DM/ha/d (see Appendix 1 for state regions)
- Pasture allowance (PA) 10kg DM/day/steer (see *Table 1*)
- Number of grazing days 7 days

To estimate use the formula:

$$\textbf{Stocking rate} = \frac{\text{(pasture at start of graze } \textbf{\textit{less}} \text{ pasture at end of graze) + (PGR x no. graze days)}}{\text{(PA x no. graze days)}}$$

Example for 300kg steers or unjoined heifers for 7 days grazing

Where the estimated pasture mass at the start of grazing is 2,500kg DM/ha and expected end of grazing pasture mass is 1,500kg DM/ha, pasture growth rate is expected to be 30kg DM/ha/day and the pasture allowance is 10kg DM/day.

$$\frac{(2{,}500 - 1{,}500) + (30 \times 7)}{10 \times 7} = \frac{1{,}000 + 210}{70}$$

$$= 17$$

Answer: The stocking rate for the 300kg steers = 17/ha for 7 days grazing

This calculation is suited to a wider application and can be applied to many different pasture and grazing scenarios and stock classes.

Example using the same pasture information for cows in early lactation for 30 days grazing

Information for calculation:

- Pasture at start of grazing 2,500kg DM/ha
- Pasture at end of grazing 1,500kg DM/ha
- Pasture growth rate (PGR) 30kg DM/ha/day (see Appendix 1 for regions)
- Pasture allowance (PA) 15kg DM/day/steer (*Table 2*)
- Number of grazing days 30 days

To estimate use the formula:

$$\textbf{Stocking rate} = \frac{\text{(pasture at start of graze } \textbf{\textit{less}} \text{ pasture at end of graze) + (PGR x no. graze days)}}{\text{(PA x no. graze days)}}$$

$$= \frac{(2{,}500 - 1{,}500) + (30 \times 30)}{(15 \times 30)}$$

$$= \frac{1{,}000 + 900}{450}$$

$$= 4.2$$

Answer: The stocking rate for lactating cows = 4.2 cows/ha for 30 days

In this example, a 30ha paddock with a pasture growth rate of 30kg/ha/day is capable of running (30ha x 4/ha) = 120 cows for 30 days; and a 50ha paddock could run 200 cows for 30 days.

Example for a 3-day rotational grazing system

Using the same calculation for the 30-day example applied to a 3-day grazing rotation, the stocking rate for lactating cows:

$$= \frac{(2{,}500 - 1{,}500 + 0 \text{ for pasture regrowth})}{(15 \times 3)}$$

$$= \frac{1{,}000}{45}$$

Answer: 22 cows/ha

A 10ha paddock is capable of running 220 cows (10ha x 22/ha) for the 3-day grazing period in the rotation.

A 30ha paddock with nil pasture regrowth is capable of running 660 cows (30ha x 22/ha) for 3 days; and a 50ha paddock could run 1,100 cows for 3 days grazing.

Estimating stock growth rate and weight gain (kg/head/day)

Example for estimating growth in 300kg growing steers or unjoined heifers in 100 days grazing

Information for calculation:

- Steer liveweight at start — 300kg
- Pasture at start of grazing — 2,500 kg DM/ha
- Pasture growth rate — 30kg DM/ha/day *(see Appendix 1 for regions)*
- Quality of feed — 10.5MJ ME/kg DM *(see Table 3*)*
- Average daily gain — 0.98kg/day (or approximately 1kg/day – *see Table 3**)
- Number of grazing days — 100 days

**In this example, use Table 3 to estimate animal growth rate (average daily gain) in a pasture with 2,500kg DM/ha at 10.5MJ ME/kg DM with a growth rate of 30kg DM/ha/day.*

Answer: In 100 days grazing expected weight gain is 100kg liveweight/head

Planning seasonal pasture and animal performance to achieve targets

Information required for the calculation:

- Average pasture growth rate over the season (see Appendix 1*)
- Number of grazing days

* Appendix 1 contains tables providing mid-monthly growth estimates of daily pasture growth rates (kg DM/ha/day) for typical conditions at a range of localities and regions across southern Australia. Use the MLA Pasture Ruler to generate similar estimates of pasture growth rates for selected paddocks or the whole farm.

Be sure to make adjustments to suit the local seasonal and pasture growth conditions:

- In dry seasons reduce the estimate of kg DM/ha/day.
- Adjust estimates according to the growing conditions, pasture density or when there is more than 30% bare ground.

STEP 1 Calculate the accumulated pasture growth over the season

Example for calculating the total pasture growth

Information for calculation:

- Average pasture growth rate 40kg DM/ha/day (see Appendix 1 for regions)
- Number of grazing days 100 days

In this example, there is an average pasture growth rate of 40kg DM/ha/day for 100 days for a normal spring season in southern Australia. Refer to Appendix 1 for a guide to the daily mid-monthly pasture growth estimates (kg DM/ha/day) for typical conditions at a range of localities and regions. Use the MLA Pasture Ruler to generate similar estimates of pasture growth rates for selected paddocks or the whole farm.

The estimate of total pasture growth is 40 x 100 = 4,000kg DM/ha

Answer: 4,000kg DM/ha (growth over 100 days)

STEP 2 Calculate the number of grazing animals required/ha

Example for calculating the number of grazing animals required

Information for calculation:

- Total pasture growth 4,000kg DM/ha (Step1 – total pasture growth calculation)
- Pasture allowance 10kg DM/day/steer (see *Table 1*)
- Number of grazing days 100 days

To estimate use the formula:

$$\textbf{Number of animals} = \frac{\text{pasture growth}}{(\text{pasture allowance x no. grazing})}$$

A herd of 300kg steers with an estimated 4,000kg DM/ha total growth over the 100 days spring growth and a pasture allowance of 10kg DM/head.

$$= \frac{4{,}000}{(10 \times 100)}$$

Answer: Number of animals = 4/hectare

In this example, 120 animals (4/ha x 30ha) are required in a 30ha paddock to have the same amount of pasture mass at the start and finish of grazing through 100 days of pasture growing at 40kg DM/ha/day.

Calculating gross financial benefit/hectare

Once you have an estimate of the stocking rate and the number of days that stock will be grazing the pasture to achieve the target weight gain, the gross return per hectare can be calculated.

Example for calculating gross financial benefit

Information for calculation:

• Purchase price	\$600 (300kg x \$2/kg)
• Sale price	\$760 (400kg x \$1.90)
• Difference sale and purchase	\$160 (\$760 – \$600)

To estimate use the formula:

Number of cattle per hectare x (purchase price ***less*** sale price)

Answer: At the stocking rate of 4 steers/ha x \$160, estimated gross return is \$640/ha

Note: This is simply the gross financial benefit to the grazing business. The operating costs need to be deducted to arrive at an estimated gross margin.

APPENDIX 1: Daily pasture growth estimates for southern Australia

These mid-monthly estimates of pasture growth rates (kg DM/ha/day) are for average seasonal conditions for a range of localities and regions across southern Australia. They are from state PROGRAZE manuals, available from your state department of agriculture, 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 a reference to what growth occurred in
the previous month.

These estimates provide a basis to assist with the calculations for short- to medium-term decision making in the beef business. They are **intended as a guide** to assist with the calculations in this booklet. It is recommended that the MLA Pasture Ruler is used to generate similar estimates of pasture growth rates for selected paddocks or the whole farm.

Assumptions

The following assumptions are made for the range of pastures/pasture mixes unless otherwise stated in the estimates:

- Pastures are of moderate to high density;
- Soil has good moisture-holding capacity, such as a clay loam;
- Pasture is maintained in an active growth phase at all times during the growing season;
- Pastures are well managed and fertilised to avoid nutrient deficiencies; and
- Estimates are for the middle of each month.

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

1. Climate (rainfall and temperature)
2. Soil type and variability
3. Pasture species
4. Fertiliser (nutrient) requirements
5. Grazing management

Estimates of pasture growth rate

Unless stated, the estimates are for expected availability of feed of adequate quality and are based on:

- Pastures or pasture mixes with a good balance of legumes, grown on suitable soils;
- Pastures that are well managed to be maintained in the active growth phase so that quality is at a high level;
- Using some form of rotational grazing to enable pastures to rest and grow between grazing events; and
- The growth rate of the pasture, stocking rate, degree of wastage through trampling and fouling and the previous management of the pasture.

In any period the pasture type is capable of growing pasture mass of adequate quantity and quality to suit the requirements of seasonal conditions.

In the following tables, estimates are presented for localities or regions in New South Wales, Victoria, Tasmania, South Australia and Western Australia.

New South Wales – Feed year growth rate patterns

Source: NSW PROGRAZE Manual, NSW Agriculture, Appendix 4

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.

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

	Good growing season	Poor growing season
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
Microlaena/Austrodanthonia grass + sub-clover	19	15	19	22	19	7	5	8	18	52	62	51
Microlaena/Austrodanthonia 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 and Monaro

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	20	10
Microlaena, Austrodanthonia#, clover + fertiliser 1-in-2 or 3 years	16	14	10	8	7	5	5	6	15	30	24	18
Red grass, kangaroo grass, no fertiliser applied	10	6	3	3	2	1	1	1	7	15	21	13
Introduced perennial grass and clover + annual fertiliser	10	80	20	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 50–60% pasture, 25–30% clover and 10–20% annual 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	50% above	40% below
Autumn	50% 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
Austrodanthonia/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	3	2	1	7	14	16	10	11	18	41	41	17
Sub-clover	0	0	0	2	7	4	8	8	15	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	12	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	17	16	26	47	64	43	12
Cocksfoot/sub-clover	9	8	16	25	24	17	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

Victoria – Feed year growth rate patterns

Source: Victoria PROGRAZE Manual, adapted from Figure 8, 'Pasture growth rates in kg DM/ha/day for different areas of Victoria', pp 20–22.

Western Victoria – Hamilton

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	20	30	30	35	35	50	90	130	100	100
Poor pasture	0	0	0	5	10	15	15	20	40	70	30	0

Good pasture = dense, introduced grass/sub-clover based pasture
Poor pasture = less dense, annual grass/sub-clover/annual weed-based pasture

Western Victoria – Balmoral

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	0	20	30	30	30	30	65	120	60	40
Poor pasture	0	0	0	0	10	5	15	15	30	40	30	0

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 – Ellenbank

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	18	10	19	20	18	16	10	20	55	80	70	59

Average pasture = moderately dense pasture

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 dryland pasture = moderately dense pasture

Tasmania – Feed year growth rate patterns

Source: Darryl Johnson, Department of Primary Industries, Water and Environment, 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 and grading to sub-clover in the lower rainfall areas. The measurements were taken over four 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 – 500mm 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
Trial site measurements	0	0	0	3	3	3	3	5	15	45	35	15

South Australia – Feed year 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 – Feed year growth rate patterns

Source: Western Australia PROGRAZE Manual, 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	25	28	39	44	37	8	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

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	8	13	15	29	48	24	9	0

Southern

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	15	0
Lake Grace	0	0	0	2	6	11	13	26	45	34	11	0
Narrogin	0	0	0	1	7	12	14	26	50	36	12	0
Plantagenet	0	0	0	8	21	23	20	25	45	58	42	0

South East

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	23	0
Esperance	0	0	0	7	12	16	18	29	47	35	23	0

Commonly used grazing terms

- **Digestibility**
  A measure of the proportion of pasture or feed that once consumed can be utilised by the animal. Higher digestibility usually means higher animal production.

- **Dry matter (DM)**
  Plant material without water. Usually expressed as a percentage of total weight of feed.

- **Fat score**
  An objective score of the extent of fat cover in live animals.

- **Feed intake**
  Amount of feed eaten by an animal, measured in kilograms of dry matter per day per head.

- **Feed on offer (FOO)**
  Kilograms of total dry matter per hectare (kg DM/ha). The total amount of above ground, attached plant material.

- **kg DM/ha**
  Kilograms of total dry matter of pasture per hectare. Sometimes called feed on offer (FOO)

- **kg green DM/ha**
  Kilograms of dry matter of green pasture per hectare.

- **M/D**
  M/D is the content of metabolisable energy in feed dry matter, measured in units of MJ ME/kg DM.

- **Metabolisable energy**
  Energy from feed that can be used for animal production.

- **MJ ME/kg DM**
  Megajoules of metabolisable energy per kilogram of dry matter. A measure of the energy content of feed, directly related to feed digestibility.

- **Pasture availability (kg green DM/ha)**
  Kilograms of total green pasture per hectare. Sometimes called feed on offer (FOO).

- **Pasture allowance (PA kg DM/day/head)**
  The estimated maximum food intake plus an allowance for trampling and fouling. Allowance is also the pasture available divided by the number of stock.

- **Pasture growth rate (PGR kg DM/ha/day)**
  The daily growth in kilograms of green dry matter of pasture per hectare.

- **Pasture quality (MJ ME/kg DM)**
  Megajoules of metabolisable energy per kilogram of dry matter. A measure of the energy content of feed, directly related to feed digestibility. (Can be calculated as 0.15 x dry matter digestibility % or 0.16 x organic matter digestibility %.)

- **Stocking density (head/ha)**
  The number of stock per hectare on a grazing area at any one time. (Usually used to describe the number of stock per unit area in a high density grazing situation.)

- **Stocking rate (DSE/ha)**
  The number of stock on a paddock or a whole farm. (Usually used to describe the long-term stocking rate – at least on an annual basis.)