

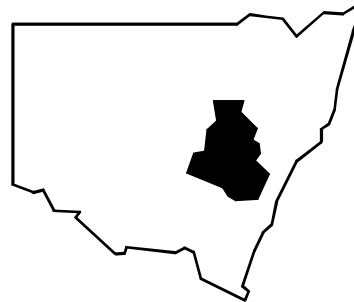


NSW Agriculture

Matching pasture production to livestock enterprises Central Tablelands and Central West Slopes



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This publication contains both estimates of the daily growth rate of pastures and selected forage crops, as well as a guide to selecting pasture and forage crop types for enterprises requiring high livestock growth rates.

Estimates are of the median growth rate, and are based on available research results, growth predictions from the 'Growest' model, (a simple growth model using soil moisture, temperature and light) and from long term observations by experienced agronomists and livestock officers. This approach has been adopted as it is inappropriate to base growth rates solely on research data given the climatic variability and the relatively short period over which research results are collected.

Growing conditions vary greatly between seasons, between regions, districts and indeed between parts of paddocks. The estimates presented are therefore **approximations only and intended only as a guide** to assist producers in budgeting feed supply to meet livestock requirements.

It is anticipated that as further information comes to hand that these guidelines will be updated. Feedback is most welcome.

In the future, improved models such as 'GrassGro' (currently being developed by CSIRO) will provide more accurate estimates.

Producers are advised when using these estimates that large variability in the reliability of feed supply occurs and reference to the section covering variability is strongly advised. Presented growth curves are 'smoothed' with variability reduced to facilitate use.

ASSUMPTIONS

Pastures are of satisfactory density for the area, growing on a soil of good moisture holding capacity (e.g. clay loam), grazed at moderate stocking pressure, well managed and fertilised adequately (except where specified) to avoid nutrient deficiencies. Pasture is assumed to be maintained in the active phase of growth at all times.

Climatic data used in the 'Growest' model was Bathurst 1974-90 (Central Tablelands); Wellington 1966-90 (Central West Slopes).

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ESTIMATES OF DAILY GROWTH RATE OF PASTURES

CENTRAL TABLELANDS

Description of pasture types used in estimates

Oats

Sown early February into good moisture and moderate to good fertility soil with adequate fertiliser.

Temperate perennial grass, sub clover

Phalaris or cocksfoot or fescue or perennial ryegrass suited to the soil and area. Well balanced with clover, with at least 20% present in the growing season. Fertiliser applied to maintenance levels of soil nutrients.

Microlaena, Danthonia, sub clover

Year long green perennial native grasses with a good balance of sub clover (greater than 20% in the growing season). Moderate to good fertility soil. Fertiliser applied to maintenance levels for soil nutrients.

Microlaena, Danthonia grass

Pasture dominated by these species. Very little clover present, minor amounts of broadleaf weeds present. No fertiliser applied for many years.

Summer grass plus sub clover

Main grasses are frost sensitive species such as red grass. Sub clover at least 20% of pasture in growing season and minor amounts of annual weeds present. Soils moderate to good fertility. Fertiliser applied to maintenance level. Usually found at lower altitudes of tablelands.

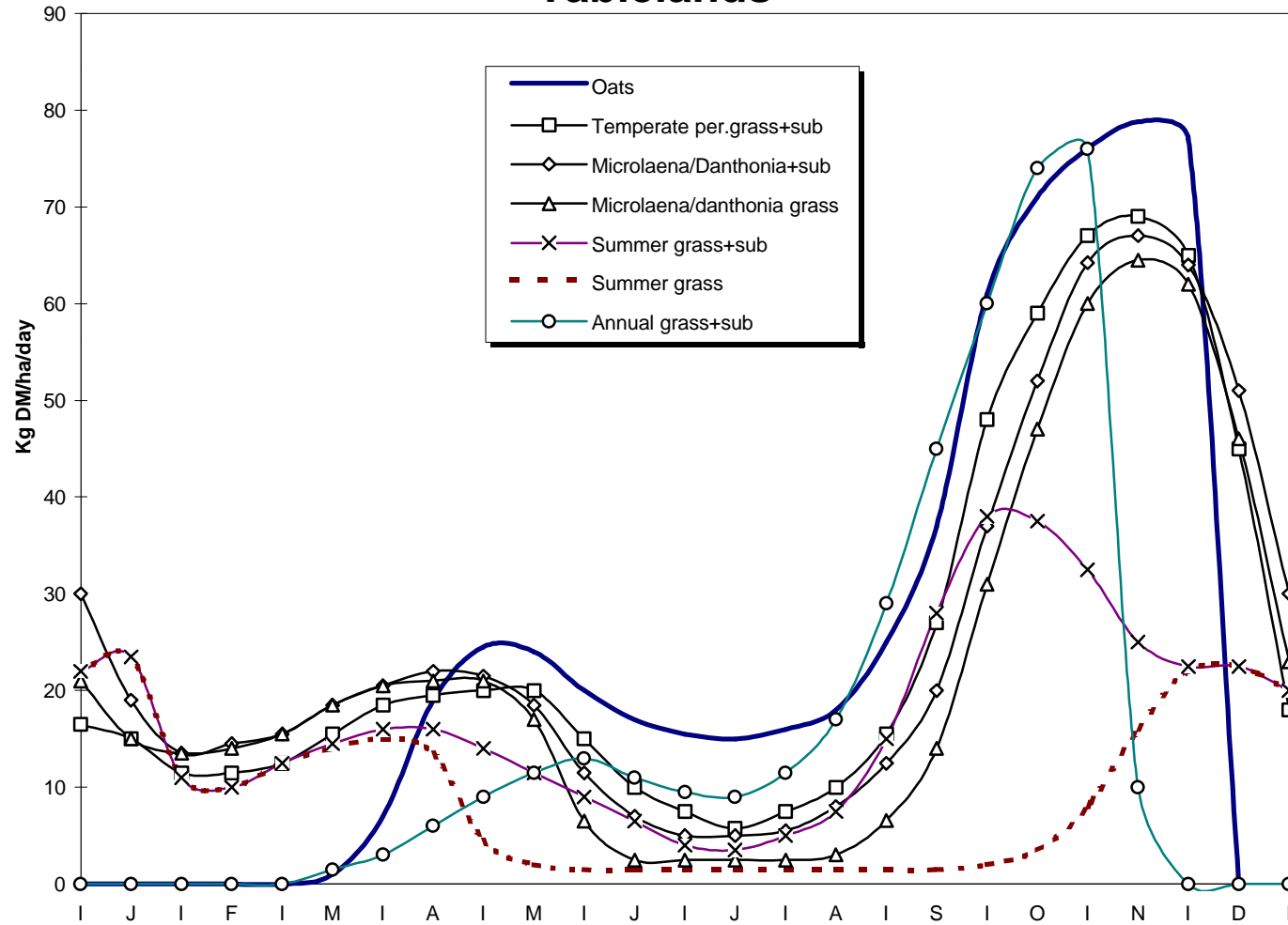
Summer grass

Dominated by frost sensitive grasses such as red grass. Very little clover or annual weeds. Soils moderate to good fertility. Not fertilised for many years if at all. Usually found at lower altitudes.

Annual grass, sub clover

Dominated by grasses such as vulpia, barley grass and ryegrass, with a good balance of clover (at least 20% clover) and moderate amount of broad leaved weeds. Soil fertility good.

Estimated growth rate of pastures - Central Tablelands



CENTRAL WEST SLOPES

Description of pasture types used in estimates

Oats

Early March sown on good moisture. Soil fertility good and sown with adequate fertiliser.

Temperate perennial grass, sub clover

Phalaris, cocksfoot ryegrass or fescue sown in soils and localities suited to appropriate species. Clover content good - in excess of 20% in winter and spring. Fertiliser applied at maintenance levels only.

Lucerne plus sub clover

Good density of lucerne (greater than 60%) with sub clover (greater than 15%) content significant in winter/spring months. Low content of annual grass or broadleaved weeds. Moderate to good fertility soils, with fertiliser applied at maintenance levels. Lucerne variety is winter active.

Lucerne

Good density of lucerne (greater than 75% of pasture) with minor annual weeds present. Moderate to good fertility soils. Fertiliser applied at maintenance levels only. Variety is winter active (e.g. Aurora)

Annual grass, sub clover

Good density of annual grasses such as barley grass, vulpia, brome grass with at least 20% of sub clover through winter/spring. Soils moderate to good fertility, fertiliser applied to maintenance levels only.

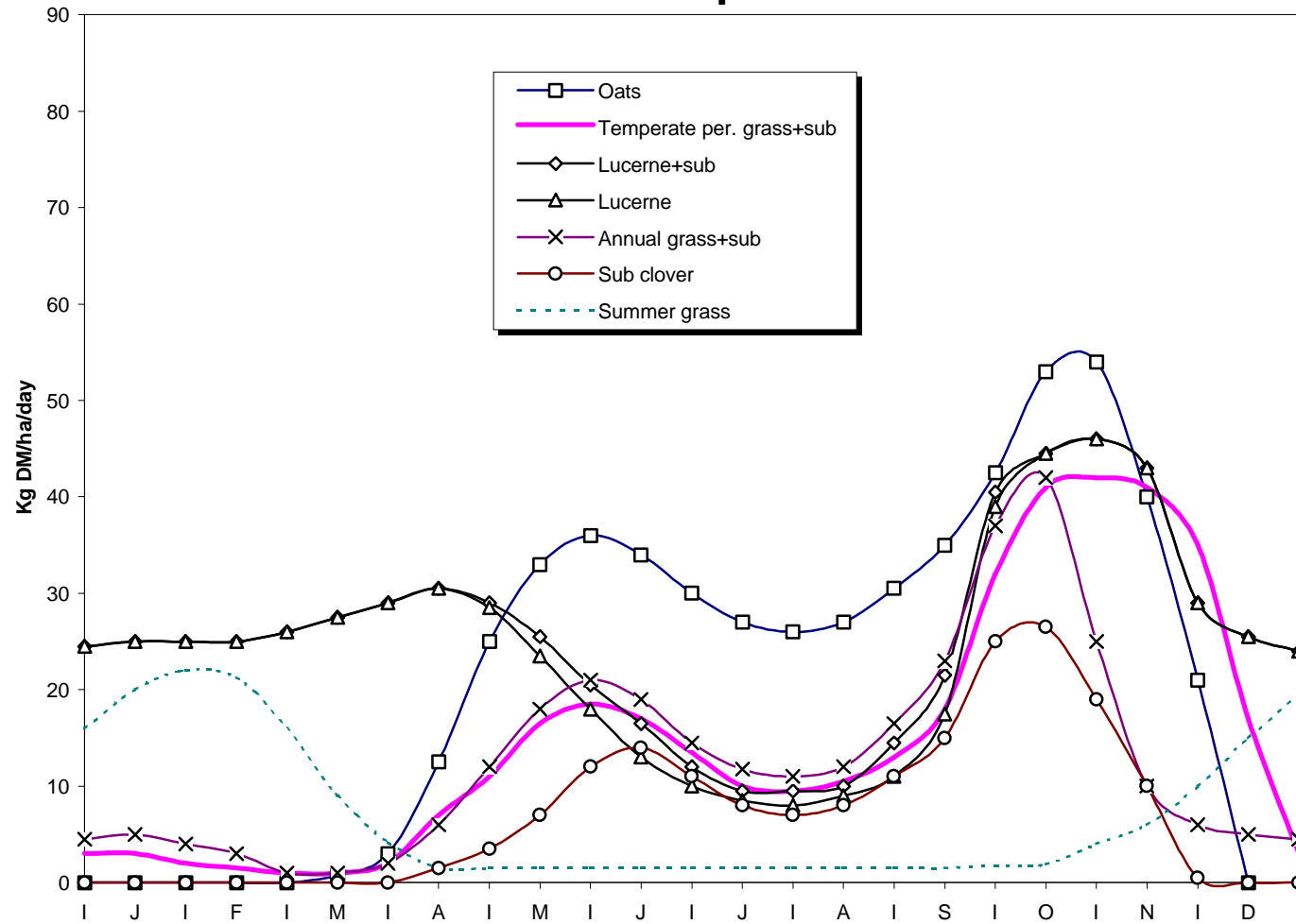
Sub clover

Predominantly sub clover (at least 60%), with minor quantities of annual grasses and broadleaved weeds. Moderate to good fertility soils with fertiliser applied to maintenance levels.

Summer grass

Frost sensitive native grasses such as red grass. Very little clover or annual grasses or broadleaved weeds present. Soils moderate fertility. Fertiliser not applied for many years, if at all.

Estimated growth rate of pastures - Central West Slopes



GUIDE TO PASTURES CAPABLE OF PROVIDING FOR CATTLE AND SHEEP ENTERPRISES REQUIRING HIGH LIVEWEIGHT GAIN


Feed Plans

Estimates made on the likely availability of feed of adequate quality have been made on this basis of,


- a) Pastures are grown in suitable soils etc and are well adapted to that environment.
- b) Pastures are well managed for both the good of the pasture and the livestock enterprise. This may involve spelling pastures for say up to two months to accumulate adequate quantity of feed to supply enterprise requirements. Pastures are also maintained in the active growth phase so that quality is at a high level. (This is especially relevant with summer growing species such as forage sorghums etc.).
- c) Quality feed in the context of these plans means feed on offer having a digestibility of 70% or better, and means a 'mixed' pasture has a good balance of legume present.
- d) Plans do not infer that this is only one paddock of a particular pasture type i.e. one may be grazed while others are rested to enable availability to be improved to meet livestock requirements.
- e) The estimates are intended as a **guide only** to assist in selection of appropriate pasture types to suit the enterprise targets. The variability in production is large and is covered in the variability section.
- f) The quantity of feed available will be dependant on the growth rate of the pasture, stocking rate, rate of wastage, and previous management of the pasture. These estimates only indicate that in any particular half month period the pasture type is capable of having feed on offer of adequate quantity and quality to suit requirements in average seasonal conditions. Additionally, potential production may be greater than that indicated, given exceptional management and/or favourable aspects of pasture production. Similarly, production can be less than that indicated, especially if management is less than accepted 'best practice'.


A guide to pastures and forage crops capable of achieving at least 75% of maximum liveweight gain given best practice management of pastures and livestock

Key

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

CENTRAL TABLELANDS

 High quality sheep feed capable of achieving 75% of potential liveweight gain


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

Pasture	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Native summer grasses												
Microlaena/white clover												
Summer grass/sub clover												
Cocksfoot/white/sub clover												
Phalaris/sub clover												
Phalaris/white clover												
Lucerne												
Annual ryegrass/sub clover												
Lucerne/sub clover												
Perennial ryegrass/sub clover												
Forage crops												
Japanese/shirohie millet												
Oats												
Chicory												
Brassicas (spring sown)												
Short term ryegrass												
Hybrid sorghum/sudan												


These estimates are provided by agronomists and livestock officers as an aid to pasture selection and represent the likely production from these feed sources in average years, given the feeds are grown in appropriate soils and are well managed. Adjustments will need to be made in most situations to cover the many variables involved in pasture production. Months are represented by two half months.* See Prograze manual for benchmarks on feed availability requirements for various levels of liveweight gain.


A guide to pastures and forage crops capable of achieving at least 75% of maximum liveweight gain given best practice management of pastures and livestock

Key

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

CENTRAL WEST SLOPES

 High quality sheep feed capable of achieving 75% of potential liveweight gain

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

Pasture	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Native summer grasses												
Summer grass/sub clover												
Phalaris/sub clover												
Lucerne												
Annual rye/sub clover												
Lucerne/sub clover												
Perennial rye/sub clover												
Cocksfoot/sub clover												
Forage crops												
Japanese/shirohie millet												
Oats (grain recovery)												
Oats (full grazing)												
Chicory												
Brassicas (spring sown)												
Cowpeas												
Hybrid forage sorghum/sudan												
Lablab												

These estimates are provided by agronomists and livestock officers as an aid to pasture selection and represent the likely production from these feed sources in average years, given the feeds are grown in appropriate soils and are well managed. Adjustments will need to be made in most situations to cover the many variables involved in pasture production. Months are represented by two half months. * See Prograze manual for benchmarks on feed availability requirements for various levels of liveweight gain.

VARIABILITY IN FEED PRODUCTION

Important Factors Affecting Reliability of Feed Production

The variability in pasture production in tableland and slopes districts can be very large and for this reason, it is wise to consider all important variables that may affect pasture production in a paddock.

The more important factors to consider are:

- Climate
- Soil type
- Grazing management
- Soil fertility/fertiliser use

Climate

This is the largest variable across the tablelands and slopes of NSW

To get an idea of the extent that climate can affect pasture production, the growth model used to assist in producing the pasture curves elsewhere in this publication can also give an indication of how much variation occurred in the past based on historical climatic data.

On the **Central Tablelands**, assuming that species capable of growing in all months make up the pasture and that they are capable of producing at 100 kg/ha/day, the model predicts that in good growing conditions in summer, growth rates can be over 100% above the median values. In the other seasons the differences were not as great, being about 40% higher. In poor growing conditions across all growing seasons, the growth rate predictions are about 60-70% or more below the median values.

Similarly, on the **Central West Slopes** the model predicts that in good growing conditions in summer and autumn, growth rates can be over 100% above the median values. In other seasons the differences were not as great, being about 70% higher. In poor growing conditions across spring and summer, the growth rate predictions are about 80% or more below the median values. For poor growing conditions, in autumn and winter growth rate predictions were about 60% below the median. Variability can exceed these predictions in droughts and years of excessive rainfall.

Geographic location

The growing conditions within these geographic areas can be very significant. Generally growing conditions are more favourable in the east than they are to the west which is drier with less reliable rainfall.

North to South differences can also be significant with summer dominance in rainfall increasing to the north.

Soil type

The daily growth curves presented assume a soil type that has good moisture holding capacity (eg. clay loam).

On lighter textured soils (eg. granites) the pasture production will be much less as soil dries out more rapidly reducing pasture production potential. On the positive side, lighter soils tend to respond quicker following rain than do heavier soils.

Grazing management

Pasture production estimates assume that pastures are in the active stage of growth, and stocked at moderate grazing pressure and well managed. Overstocking and inappropriate grazing management for the species concerned may greatly affect the ability of the pasture to reach its full potential. Alternatively, correct management can greatly enhance the probability of the pasture reaching its full potential.

Pastures that have been grazed hard in the months beforehand may have inadequate leaf area to produce to maximum potential. Similarly, lax grazing will result in low potential for growth rate

Soil fertility/fertiliser use

Soil deficiencies especially phosphorus, sulfur and molybdenum, can greatly affect the potential of pasture to produce. Similarly, low pH may have an adverse affect depending on the species in the mixture. Nutrient deficiencies can affect not only the overall production but also the reliability of production, seasonal production, botanical composition and quality of feed produced.

Pasture quality

Pasture quality is also very variable along with production quantity.

In the growth curves presented, quality will not be uniform throughout the year from any one species. For example, in the spring growth will tend to be lower quality than in the autumn because of the greater proportion of stem than leaf produced. This factor is extremely important with summer growing species when they are in the reproduction phase.

Other factors

A large range of other factors may influence the potential of the pasture to reach its full potential. In some instances, these minor factors can cause devastating reduction in the reliability of feed supply.

Factors include pasture species adaptability, weeds, pests, diseases, aspect, waterlogging, salinity etc.

If in doubt about the extent of the potential reduction in pasture production due to any of the above mentioned factors consult your district agronomist.

CONTRIBUTORS

The following agronomists and livestock specialists have contributed information presented for the respective areas.

Central Tablelands:

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DISCLAIMER

The information contained in this publication is based on knowledge and understanding at the time of writing (January 1996). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up-to-date and to check currency of the information with the appropriate officer of New South Wales Department of Agriculture or the user's independent adviser.

NOTE

Pasture improvement may be associated with an increase in the incidence of certain livestock health disorders. Livestock and production losses from some disorders are possible. Management may need to be modified to minimise risk. Consult your veterinarian or adviser when planning pasture improvement.

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