

Pasture analyser – A database of the growth rates of irrigated temperate species in southern Queensland

K.F. LOWE¹ AND G.B. SIMPSON²

¹ Queensland Primary Industries and Fisheries, Mutdapilly Research Station, Peak Crossing, Queensland, Australia

² Queensland Primary Industries and Fisheries, Toowoomba, Queensland, Australia

Introduction

There is considerable interest in comparing the performance of different cultivars of temperate species or even in comparing the performance of different species as a way of improving the forage systems used in the dairy and beef industries. A great deal of money has been invested by seed companies and Rural Research Industry funds in collecting these data. However, rarely are these data presented to the end users in a practical and usable format.

The data

The dairy pasture research unit at Mutdapilly Research Station, south-west of Ipswich, Queensland has evaluated a range of temperate species, including annual, hybrid and perennial ryegrass, tall fescue, prairie grass, annual and perennial clovers, lucerne and herbaceous species under irrigation from 1978 to 2009. Commercial cultivars and experimental lines have been compared in small, replicated experiments and cut to record monthly growth. These data have been published in a series of papers in *Tropical Grasslands* (Lowe *et al.* 2007; 2008; 2010). Only data from commercial cultivars are available in the database.

The data have been collected at Gatton and Mutdapilly Research Stations under ideal environmental conditions and under a cutting regime

with no grazing imposed on the swards. All were fully irrigated and grown on highly fertile soils. Grasses were grown as pure swards and fertilised with luxury levels of nitrogen. Data were collected to ‘recommended’ grazing height, *i.e.*, around 5 cm. In other words, the data provide information on the best possible performances of all forages.

Aim of the database

While publication in a research journal provides scientists with information about the relative performance of commercial cultivars, it does not allow the layperson to utilise the data in a practical way to determine how a species might contribute to the forage system on a commercial farm. These data provided a unique opportunity to construct a database, which collated the results of evaluation studies and could be interrogated by farmers and agribusiness personnel. We set about developing an interactive database, which would provide information on how a cultivar might perform over a number of years, how it might compare with another species under the same environmental conditions and what it might contribute to the feed system in each season of the year.

What the database presents

The 5 options for output from the database are as follows:

- (1) The *Compare species* option allows a comparison of the annual and seasonal production of various species grown under irrigation in south-east Queensland in a single graph (Figure 1). The output is in the form of bar graphs, showing the annual production of each selected species. This option displays

production as total yield in kg/ha. One bar graph is presented for each species chosen.

(2) The *Species*cultivar* option allows comparisons of the growth rates of cultivars within a given species (Figure 2). The output is in the form of growth rate graphs for individual years for a single cultivar of the species of your choice. The presentation can either be

as growth rates (kg/ha/day) or as growth per cut (kg/ha). Growth is presented as days from sowing, as all experiments had different sowing dates. Annual ryegrasses, perennial ryegrass, tall fescue, annual clovers, herbs and mixtures were all sown between 1 April and 20 April each year. Lucerne was sown between 1 July and 20 August each year.

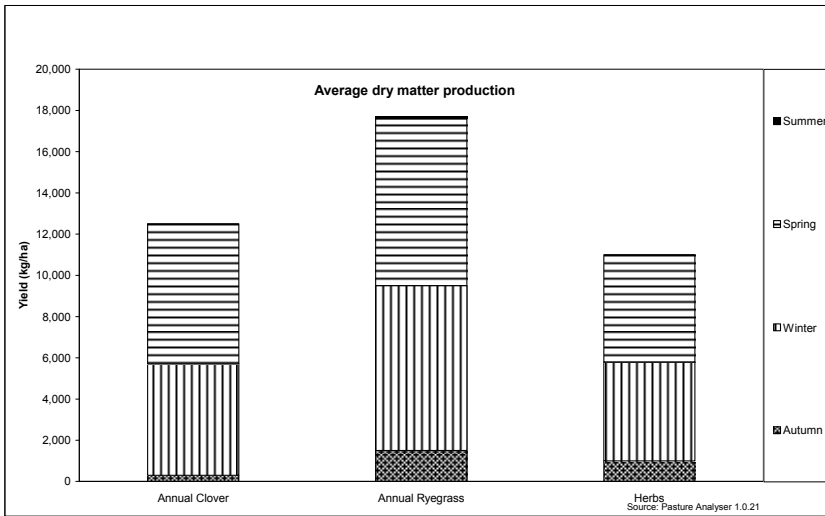


Figure 1. Sample screen showing dry matter production of annual ryegrass, annual clover and herbs by season of the year.

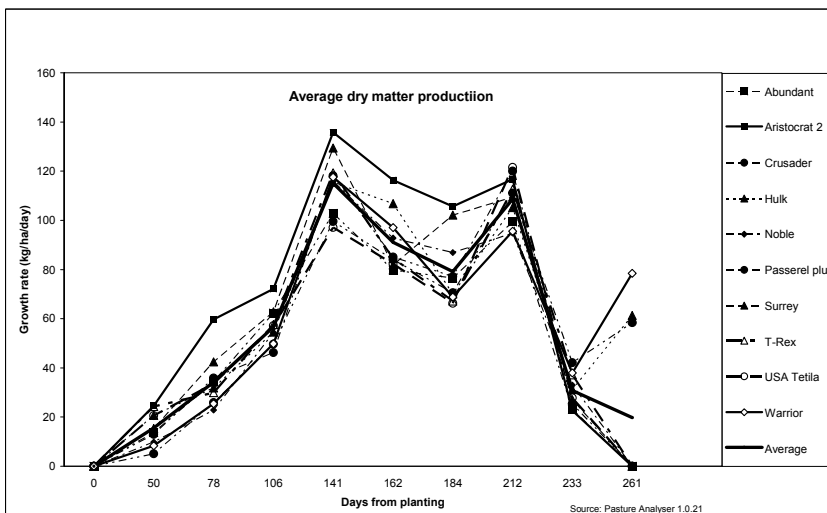


Figure 2. Sample screen showing growth rates of annual ryegrasses in 2007.

(3) The *Species*selected year* option allows a comparison of the growth rates of all cultivars included in a particular experiment in one graph (Figure 3). The output is in the form of growth rate graphs of all cultivars sown in individual experiments. The presentation can be either as growth rates (kg/ha/day) or as growth per cut (kg/ha). The 'year' indicates when the experiment was sown. Experiments

with perennial species were conducted over 3 years, while annual species were assessed over 1 year.

(4) The *Perennials*selected year* option allows a comparison of 3-years' growth of a cultivar of any perennial species. The output is in the form of a bar graph, showing individual seasons within each of 3 years. The presentation can be viewed only as total annual yield in

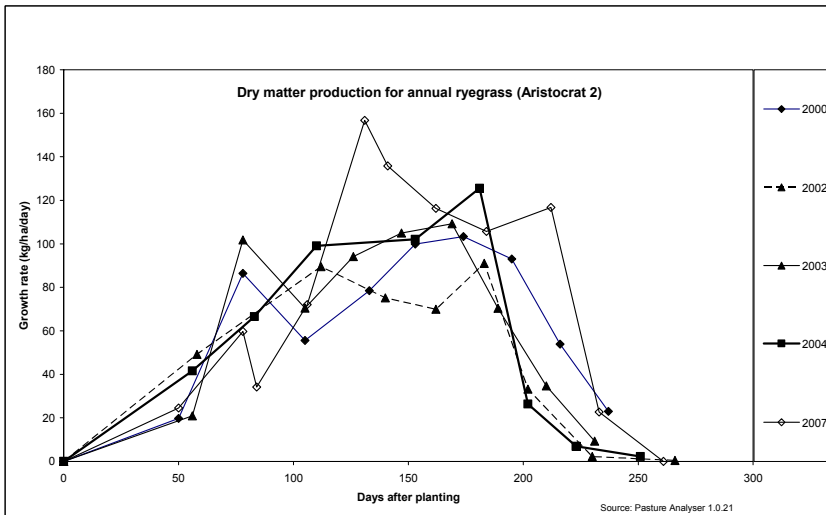


Figure 3. Sample screen showing the performance of Aristocrat 2 annual ryegrass in various years.

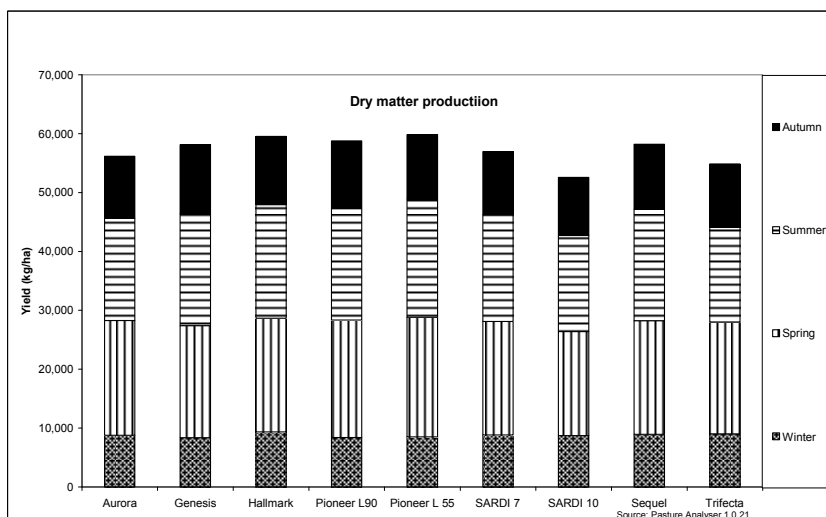


Figure 4. Sample screen showing seasonal and total yields of lucerne cultivars in 2003.

kg/ha and only 1 experiment can be viewed at a time.

- (5) The *Seasonal production* option allows a comparison of the total production of a cultivar or multiple cultivars of any species. The output is in the form of a bar graph, showing individual seasons (Figure 4). The presentation can be viewed only as total annual yield in kg/ha. Production from perennial species will be over 3 years, while annual species will be over an 8–12 month period. Only 1 experiment can be viewed at a time.

How to access Pasture Analyser

The program is available through the Subtropical Dairy Program site (www.dairyinfo.biz). It can

be downloaded to your computer by clicking on the website Icon. Alternatively, it can be obtained on CD by contacting the authors. The program has a detailed ‘Help’ file to allow the user to get the most out of the database.

References

- LOWE, K.F., BOWDLER, T.M., CASEY, N.D., LOWE, S.A., WHITE, J.A. and PEPPER, P.M. (2007) Evaluating temperate species for the subtropics. 1. Annual ryegrasses. *Tropical Grasslands*, **41**, 9-25.
- LOWE, K.F., BOWDLER, T.M., CASEY, N.D., LOWE, S.A., WHITE, J.A. and PEPPER, P.M. (2008) Evaluating temperate species for the subtropics. 2. Perennial grasses. *Tropical Grasslands*, **42**, 1-26.
- LOWE, K.F., BOWDLER, T.M., CASEY, N.D. and PEPPER, P.M. (2010) Evaluating temperate species for the subtropics. 3. Irrigated lucerne. *Tropical Grasslands*, **44**, (in press).