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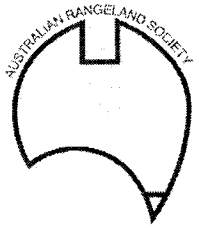

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NUTRITIVE VALUE OF PERENNIAL GRASSES AND WINTER ANNUALS IN THE RANGELANDS OF WESTERN NEW SOUTH WALES

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INTRODUCTION

Livestock production depends on the quantity and nutritive value of plants eaten by the animal. Forage availability is determined by several factors, including pasture composition, time lapsed since last effective rainfall, current seasonal conditions and grazing history. The nutritive value of plants is likely to alter according to season, rain and phenological state.

In the semi-arid woodlands, annual herbages are selectively grazed by stock when available, with perennial grasses providing feed at other times (1),(2). Annual herbages grow in response to cool season rains while most perennial grasses are stimulated by warm season rains. This work compares the nutritive value of important perennial grasses and winter herbage species of the semi-arid woodlands of western New South Wales.

METHOD

The annual herbage species collected every 10 to 14 days during winter were *Erodium cicutarium* (EDCC), *Medicago laciniata* (MELC) and *M. polymorpha* (MEPV). The perennial grasses *Aristida browniana* (ARBW), *A. contorta* (ARCT), *A. jerichoensis* (ARJK), *Digitaria brownii* (DGBR), *Eragrostis eriopoda* (EGEP), *Enteropogon acicularis* (ETPA), *Monachather paradoxa* (MONP), *Stipa variabilis* (SIVB) and *Thyridolepis mitchelliana* (THRM) were collected every three to four weeks when present during summer. The entire above ground biomass of at least three plants was taken each time. Sites in the Cobar district were revisited each sampling, which continued for a period of three years.

Samples were chilled when collected. Dry matter (DM) was determined by drying at 60°C for 48 hours. Nitrogen (N) was estimated using an automated Kjeldahl procedure. Digestible dry matter (DDM) was predicted using parameters of acid-detergent fibre and nitrogen (3). Organic matter (OM) was estimated using a muffle furnace at 55°C for three hours. Metabolisable energy (ME) was predicted as ME = 0.15 DDM.

RESULTS

The least square mean of DM (%), OM (% DM), N (% DM), DDM (%) and ME (mJ/kg DM) is calculated for each species over three years (see Tables 1 and 2). Differences between species are expressed at the 95% level of significance.

Table 1: Nutritive value of selected annual herbage species near Cobar, NSW

	Species		
	EDCC	MELC	MEPV
DM	27.78a	36.18b	35.11b
OM	85.43a	88.22b	89.38b
N	2.57b	3.41a	3.42a
DDM	72.17a	70.63a	71.62a
ME	10.83a	10.72a	10.77a

Although DM and OM for the winter herbage species are different, their nutritive value to livestock is similar. MELC and MEPV, which are naturalised medic species, have higher N levels than the native species EDCC.

Table 2: Nutritive value of selected grass species near Cobar, NSW

	Species								
	ARBW	ARCT	ARJK	DGBR	EGEP	ETPA	MONP	SIVB	THRM
DM	65.11ab	70.32c	66.90c	59.21ab	64.39bc	56.79a	61.64ab	67.17c	61.61abc
OM	89.84bc	86.69e	90.61ab	88.49cd	91.52a	87.68d	90.38b	90.53ab	85.94e
N	0.57e	0.89d	0.93c	1.22b	1.04b	1.51a	1.20b	1.13ab	1.11bcd
DDM	44.61d	45.49d	45.89d	48.83c	47.86c	54.47a	48.26c	51.27b	47.28c
ME	6.66e	6.74e	6.96de	7.45bc	7.20cd	8.28a	7.23cd	7.78b	7.11cde

The perennial grasses have greater variation between species than annual herbages. Although ETPA has the highest DDM, N and ME of the grasses, it has a much lower nutritive value than any annual species. DGBR, MONP and THRM, which are species commonly regarded as desirable, have moderate nutritive value. Surprisingly, EGEP is similar to these species, although it is often regarded as a courser grass. SIVB also ranks highly, probably because it is shorter lived than the other species, and was therefore more frequently harvested in a fresh vegetative state. Species with the lowest nutritive values, ARBW, ARCT and ARJK, are often considered a problem causing grass seed contamination.

DISCUSSION

These results confirm that the grass species traditionally considered important for pastoral stability are also desirable for livestock production. Such species are often at low abundance in rangeland pastures and less desirable species such as Aristida sp can dominate. Pastoralists can manipulate pasture composition to encourage desirable species by grazing management (4).

The nutritive value of species also varies according to seasonal conditions and phenological state (S Muir, unpubl. data). Some management decisions, such as season to lamb and supplementary feeding, are strategically planned around the seasonal variation in pasture quality.

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