GRAZING MANAGEMENT AND TECHNIQUES:

Critical parameters for monitoring annual leys

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In southern Australia, on-farm improvements in pasture production have lagged behind improvements in crop production. Serious declines in medic and subterranean clover pastures have been reported, declines which have been attributed to ecological changes, poor technology and apathy (Carter *et al.* 1982; Carter 1987; Dear *et al.* 1987; Hochman *et al.* 1990). A contributing factor is the lack of pasture benchmarks, similar to those used enthusiastically by farmers to monitor crop development (*e.g.* Canola Check).

At Charles Sturt University (CSU), a project is underway to monitor a number of pasture parameters for the objective description of annual ley pastures based on subterranean clover.

Method

In two field experiments sown at CSU in 1994, clover seeding rate, clover cultivar and grass management treatments were used to create a range of annual ley pastures for monitoring in 1994, 1995 and 1996. In addition, six on-farm sites near Wagga Wagga were monitored. All pastures were grazed continuously at 10 DSE/ha at CSU and according to normal farm practice at the farm sites.

At regular intervals the pastures were assessed in terms of the following parameters: clover population (seed and seedling numbers), cover (% of total area) and botanical composition (% of total green herbage) using a rod-point technique (Little and Frensham 1993), and biomass. Less frequently, the pastures were assessed for disease incidence, pasture growth (early spring), nitrogen fixation by the legume component and available soil nitrogen.

Results and discussion

Some simple descriptors of pasture sites during 1995 are shown in table 1. The pastures varied considerably in terms of the parameters measured, both on-farm and in the CSU experiments. Farm sites 2, 3 and 6 produced pastures which appeared adequate in terms of their legume content during 1995 (a favourable year after the 1994 drought), but only the CSU 1 site produced a dense crop of clover seedlings in April 1995 and retained a satisfactory amount of residual hard seed in August 1995. Farm

Table 1. Simple descriptors of the 1995 pasture sites

Site	Seed reserves (kg/ha)		Clover density (#/m^2)	Green cover (%)			Botanical composition (%)		Total Green DM (kg/ha)		
	Dec 1994	Aug 1995	Apr 26	Jul 3	Aug 28	Oct 23	Clover	Grass	Jul 3	Aug 28	Oct 23
Farm site 1	325	35	230	80	97	100	12	89	506	1527	3439
Farm site 2	550	50	630	60	52	99	96	4	996	624	2596
Farm site 3	255	10	300	41	30	100	96	4	1124	431	2335
Farm site 4	270	20	290	55	28	84	36	49	1028	254	2561
Farm site 5	n/a	<10	75	55	75	96	26	65	401	909	2237
Farm site 6	n/a	<10	220	19	67	100	89	10	325	929	2533
CSU 1	565	240	1340	73	97	100	98	3	764	1604	4117
CSU 2	45	<10	135	33	58	100	76	18	251	875	2961
CSU 3	160	80	575	51	85	100	96	4	392	1214	3928
CSU 4	320	145	695	87	99	100	84	15	1541	1934	4912
CSU 5	240	120	530	94	100	100	91	9	1288	1850	5458

CSU 1 - Experiment 1, *cv.* Junee sown @ 1000 plants/m^2 in 1994, winter cleaned in June 1995.
CSU 2 - Experiment 1, *cv.* Junee sown @ 10 plants/m^2 in 1994, winter cleaned in June 1995.
CSU 3 - Experiment 2, *cv.* Junee sown @ 100 plants/m^2 in 1994, winter cleaned in June 1995.
CSU 4- Experiment 2, *cv.* Junee sown @ 100 plants/m^2 in 1994, not winter cleaned.
CSU 5- Experiment 2, *cv.* Junee sown @ 100 plants/m^2 with 100 plants/m^2 ryegrass in 1994, not winter cleaned.

sites 1, 4 and 5 were poor, possibly reflecting the variable persistence of their predominant clover variety, Woogenellup, which is outclassed in persistence and production in this environment by cv. Junee (Dear and Jenkins 1992).

The work is continuing in order to obtain profiles of good, satisfactory and poor subterranean clover leys in terms of the parameters being measured. The eventual aim of the project is to recommend to farmers a protocol for pasture monitoring, and to provide them with management targets (benchmarks) based on seasonal indicators and pasture measurements.

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Grazing strategies to get more out of coolatai grass

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Coolatai grass *(Hyparrhenia hirta)* is a summer growing perennial grass, native of South Africa. It was first introduced into northern New South Wales in the mid 1940s. In less than 50 years it has spread rapidly, and now occurs widely on the Northern Slopes, most coastal areas, Northern and Central Tablelands, Hunter Valley, Central Slopes and southern Queensland. The grass is most apparent along roadsides and in travelling stock routes, although in recent years it has invaded large areas of grazing country.

Summer rainfall produces rapid growth and plants grow up to 1-1.5 m high. Once frosted this mass of growth is unpalatable and of low forage value. Coolatai grass is widely regarded as a weed because of this accumulation of unpalatable, low quality roughage.

A grazing experiment was established in the Manilla district of northern New South Wales in 1990 to investigate the effects of grazing management on persistence of coolatai grass and develop management strategies to improve animal performance. Six treatments were applied in replicated 0.4 hectare blocks: heavy grazing (37 sheep/ha, 15 sheep/acre); light grazing (5 sheep/ha, 2 sheep/acre); burning in spring 1990 followed by heavy grazing; burning in spring 1990 followed by light grazing; slashing in spring 1990 followed by heavy grazing; and slashing in spring 1990 followed by light grazing.

Results

After three years of grazing all plots remained heavily dominated by Coolatai grass. There was little long term effect of the pregrazing treatments of slashing and burning and their main benefit was to remove tall dry rank growth, providing higher quality green, leafy feed. However from November 1990 to the end of April 1994, heavily grazed plots have provided 4120 sheep grazing days, compared with 1410 sheep grazing days in the lightly grazed plots.