Achieving the potential of the pasture resource in south-west Victoria

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Summary. Applying the relationship developed by French (2) for pasture and livestock production, the potential productivity of pastures in south-west Victoria is 95 kg wool per hectare per annum. Production measured in experiments and on one farm shows that this potential is achievable. A study of farms found the average wool production was 44 kg/ha and that this had not changed for at least 20 years. Poor pastures are a major reason for this. Variation between paddocks in annual growth ranged from 4.4 to 9.3 t DM/ha. We also found only 5% of paddocks contained at least 20% subterranean clover and 30% improved grasses. Understanding why more farmers are not using current, well publicised, pasture technology is the first step in attempting to quickly achieve a sharp change.

Introduction

In their study of the relationships between wheat yield, water use and climate French and Schultz (3) developed the concept of potential yield with rainfall during the growing season being the main limiting factor. French has extended the concept to pasture and livestock production (2). Applying the relationship he developed to Hamilton in south/west Victoria (average rainfall 650 mm/year), the potential carrying capacity is 21 dry sheep equivalents (dse) per hectare, producing between 84 and 105 kg of 20 micrometre wool per hectare.

Experimental pastures based on phalaris or perennial ryegrass and subterranean clover, and stocked with 18.6 wethers per hectare cut 87 kg wool per hectare (1). An all ewe spring lambing flock stocked at 20.3 ewes (26.4 dse) per hectare on a high soil fertility plot (annual application 32 kg P/ha, soil Olsen P (0-10 cm) 24 ppm) cut 99 kg wool per hectare and raised 100% lambs (Saul and Cayley unpublished data). In both cases relatively simple management procedures were used, that is, constant set stocking and no supplementary feeding.

This paper uses the results of two studies to assess the progress farmers are making towards achieving the potential production of their farms.

Materials and methods

The South West Victoria Monitor Farm Project was designed to study farming trends in the region. It has, since 1971-72, monitored the physical and financial performance of 40 dryland grazing properties in the region. In the year 1990/91 a 'typical' farm consisted of 842 ha, ran 5,600 sheep and 165 beef cattle and cropped 40 ha.

The Pasture Survey of south/west Victoria has, for the three growing seasons 1988-90, made detailed assessments of pastures on 12 randomly selected paddocks within the grazing (wool, sheep and beef cattle) zone of a land corridor 30 km in width and stretching south from Stawell to the coast. The growth of the pastures was measured using exclosure cages which were repositioned at four-weekly intervals during the growing season. In addition, in October 1989 on 286 randomly selected paddocks within this zone of the land corridor, a visual estimate was made of the contribution of each species to the available dry matter. Soil samples (0-10 cm) were also collected.

Results

Monitor farms

The average wool cut over the 20 years of the project was 44 kg/ha and has remained fairly constant. The stocking rate over this period dropped from 13 to 11 dse/ha. The highest wool production achieved in a year on one property was 84 kg/ha.

A comparison of several performance parameters of the highest and lowest ranked three farms (based on return to equity) for the 10 years to 1989-90, shows that many factors contribute to high performance (Table 1). The three highest ranked farms spent $6.50/ha (60%) more on their pastures, stocked them at a heavier (19%) rate and spent less (31%) on supplementary feed. This suggests productive pastures are one of the important keys to achieving high levels of performance on farms.

Table 1. Selected performance parameters of the three highest and three lowest ranked farmers in the Monitor Farm Project for the 10 years to 1989-90. Costs and returns are converted to 1990 dollars.

Parameter	Highest ranked three farms	Lowest ranked three farms
Return to equity (%)	6.5	1.1
Stocking rate (dse/ha)	12.3	10.3
Wool cut (kg/ha)	47	41
Net wool price (c/kg greasy)	635	485
Pasture costs ($/ha)	17.46	10.90
Supplementary feed ($/ha)	22.76	33.17
Total sheep costs ($/ha)	80.20	87.20

Pasture costs were fertiliser, weed and pest control and resowing costs. Supplementary feed includes bought in and homegrown feed. Home grown feed was valued at the current market price.

Pasture survey

On the 12 intensively monitored sites the total pasture growth in 1989 ranged from 4.4 to 9.3 t DM/ha. Pasture growth rate varied from 0 to 29 kg DM/ha/day in July, the month of generally lowest pasture growth, and from 30 to 143 kg DM/ha/day in October, generally the best month for pasture growth.

The average contribution of the four major pasture components to the total dry matter in the 286 paddocks examined in October 1989 are shown in Table 2. While subterranean clover was widespread, improved grasses *(Lolium perenne, Phalaris aquatica, Dactylis glomerata, Festuca arundinacea)* were not. Annual grasses *(Briza* spp., *Bromus* spp., *Aira* spp., *Vulpia* spp., *Lolium rigidum, Critesion murinum* ssp., *leporinum)* were widespread and often dominated the pasture. Broad-leaved weeds *(Arc totheca calendula, Erodium* spp., *R umex ace tosella, Plantago* spp.) were common. Only 5% of paddocks contained at least 20% subterranean clover and 30% improved grasses.

Table 2. The contribution made by groups of species to pastures in south-west Victoria, and the proportion of paddocks meeting specified standards.

Pasture component	Average contribution to total dry matter (%)	Specified standard (%)	Paddocks reaching standard (%)
Subterranean clover	22	≥20	47
Improved grasses	19	≥30	14
Annual grasses	26	≤20	44
Major broad-leaved weeds	11	≤10	60

The mean soil phosphorus (Olsen) level was 10.4 ppm. It is generally accepted that profitable response to applied P occurs with a soil Olsen P < 10 ppm. This situation was found on 60% of the paddocks.

Discussion

The level of production achieved in experiments and on one farm strongly suggests that French's concept of potential yield can be usefully applied to grazing properties in south-west Victoria. Comparing the production on farms in the Monitor Farm Project, with the potential, shows that virtually all farmers in south-west Victoria arc foregoing a substantial opportunity to increase their production and profitability. The results of this project, and the Pasture Survey, show that poor pastures are a major reason for this. A better understanding of why farmers are not using widely publicised well known technology more extensively, is essential if a sharp improvement in the current situation is to be achieved.

References

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