Does superphosphate pay in a fine-wool enterprise?

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Application of superphosphate to native grass-based pastures that are used for fine-wool production is often perceived to not pay because it can lead to increased fibre diameter and a poorer wool price. However, this perception locks the enterprise into low stocking rates and a relatively high cost of production. A grazing demonstration was established at Bookham, with cooperation from Kelly & Co. Rural, Yass and the Bookham Agriculture Bureau. The purpose was to determine if superphosphate can be used to lift production, that fibre diameter can be controlled by stocking the pasture appropriately, and that improved profit can be achieved.

Methods

In 1993, a paddock with an unfertilised, predominantly native grass pasture (*Microlaena stipoides* and *Danthonia* spp. with some subclover, annual grasses and other annual legumes) carrying 6 Merino wethers/ha was divided in two. Superphosphate at a rate of 125 kg/ha was applied annually to one sub-paddock in latesummer, while the other sub-paddock remained unfertilised. The fertilised sub-paddock was stocked at 11-13 wethers/ha, but stocking rate was not increased on the unfertilised sub-paddock, as this may have lead to overgrazed pastures, tender wool and possible stock losses.

The unfertilised pasture maintained a Colwell soil test value of about 9 mg P/kg soil. The target Colwell value for the fertilised pasture on this soil should be in the range 20-30 mg/kg (McLachlan 1965; Spencer *et al.* 1969). This target was achieved by 1997/98. Plant tests (subclover shoots) in spring 1998 also indicated that soil fertility was optimal. Annual fertiliser inputs will, therefore, be reduced to 62 kg superphosphate/ha from 1999 in an effort to maintain P fertility cost-effectively.

Results

Average annual production data for the period November 1993 to November 1998 is shown in Table 1. Superphosphate applications corrected both phosphorus and sulphur deficiencies at this site, and allowed the stocking rate to be doubled. Wool cut per head and fibre diameter were essentially unchanged, but wool cut per ha, and consequently profit, were doubled. Improved production allowed fixed costs per ha to be offset against a larger wool income per ha. Use of superphosphate without an adequate increase in stock numbers would not realise these benefits, and may result in reduced profits. There has been no loss of the native perennial grasses from the fertilised pasture.

Table 1. Stocking rate, wool production and quality, profit and cost of production for native grass-based pastures with and without applied superphosphate.

	Stocking rate	Clean wool		Fibre diameter	Staple length	Staple strength	Profit[A]	Production
	(wethers/ha)	(kg/ha)	(kg/head)	(micron)	(mm)	(N/Ktex)	($/ha)	($/kg clean)
No superphosphate	6.3	20.7	3.29	19.5	90	35	35.09	6.53
Superphosphate	11.8	39.9	3.38	19.7	90	34	72.25	6.02

[A] Profit is calculated as net farm income using the wool price current after Nov. shearing (approximate average fleece price, unfertilised pasture = 914 c/kg clean; fertilised pasture = 870 c/kg), variable costs of production, and an allowance of $90/ha (based on local data) for the fixed costs of production.

Dry autumns were the main problem time for the more intensively stocked, fertilised pasture. Feed shortages were more acute than on the unfertilised, low stocked pasture and could also contribute to wool strength problems. On occasions, careful cost-effective use of supplements was required to address these issues.

References

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