Is your rotation mining sulphur?

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Sulphur (S) is an essential mineral for plant and animal development. Deficiencies can significantly reduce crop and pasture production. With increasing planting of crops such as canola which require large quantities of sulphur (Colton 1993), there is greater evidence of deficiencies that are reducing yield and quality.

Table 1 shows the additions and removals of sulphur during an eight year rotation of 4 years of cropping and 4 years of pasture production with a first cross lamb enterprise in the high-rainfall cropping areas of southern and central NSW. All figures were calculated on a per hectare basis, and represent the maximum sulphur removal. For example, for calculation purposes, first cross lambs were assumed to have an average liveweight of 40 kg, and burning was assumed to remove 100% of the sulphur in the stubble.

Table 1. Effects of farm enterprises on addition and removal of sulphur in an 8 year rotation (kg/ha).

	Year								Total
	1	2	3	4	5	6	7	8	
Added									
Gypsum at 200 kg/ha	28.0								
DAP at 75 kg/ha	1.5	1.5	1.5	1.5					
Rainfall (600 mm)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	
Removed by crop									
Canola (2 t/ha = 1% S)	20.0								
Wheat (4 t/ha = 0.2% S)		8.0							
Lupins (2 t/ha = 0.23% S)			5.0						
Barley (4 t/ha = 0.22% S)				9.0					
Removed by burning stubble									
Wheat (0.24% S)		14.0							
Returned in retained stubble									
Canola (1.26% S)	(33)								
Lupins (0.36% S)			(12)						
Barley (0.21% S)				(12)					
Removed by livestock									
Meat					0.7	0.7	0.7	0.7	
Wool					1.2	1.2	1.2	1.2	
Transfer to camps (kg/ha)					0.5	0.5	0.5	0.5	
Total additions (kg/ha)	30.7	2.7	2.7	2.7	1.2	1.2	1.2	1.2	43.6
Total removals (kg/ha)	20.0	22.0	5.0	9.0	2.4	2.4	2.4	2.4	65.6
Balance (kg/ha)	**10.7**	**-19.3**	**-2.3**	**-6.3**	**-1.2**	**-1.2**	**-1.2**	**-1.2**	**-22.0**

Data for calculations obtained from Blackburn and McLeod (1983), Schultz and French (1976) and Schultz and French (1978).

In this example, the inputs of sulphur are insufficient to maintain adequate sulphur levels in the longer term. The figures suggest that growers will experience deficiencies in their crops and pastures at the application rates of gypsum and DAP used in the budget. Sulphur supplied in rainfall is minimal, although it can be significant closer to the coast.

Sulphur deficiency can take considerable time to be recognised. This means, for example, in an 8-year rotation it may take two to three cycles for the problem to occur, particularly when reserves are already present in the soil.

References

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