## The annual requirement of pasture for phosphate

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The productivity of ungrazed subterranean clover can be related to a leaf test for phosphorus (P) status (1,2). The objective of this study was to use the test to make decisions about the P requirement of grazed pasture.

## Methods

A set of six fertilized strips was established in each of the 18 plots of a grazing experiment in which three rates of stocking (SR) with Corriedale hoggets had been compared over a range of six levels of P status for a number of years. The plots, apart from the strips, received no fertilizer during the present study. Sites for test strips were chosen during spring, a sample of subterranean clover was taken from each site and the P status (1) established. In the following year, P (as superphosphate) was applied to the strips at rates between 0 and 60 kg/ha and the P status of each strip was assessed at the end of winter. The strips were grazed continuously. The effects of current P status (CS) and SR of 18 and 10 or 18 and 14 sheep/ha on annual greasy wool produced per ha (W) were assessed by multiple regression using the model N = a + b CS + cSR + dCS.SR. The effects of SR, P applied to the strips (PA) and P status during the previous spring (PS) on CS were assessed by multiple regression using the model CS .= w + xSR + yPA + zPS.

## **Results and Discussion**

The effects of CS and SR on *W* are shown in Figure 1. Data from the two higher levels of CS at 18 sheep/ha (shown in parenthesis) were omitted because it was clear that there was no longer a response in W to CS beyond about 70 parts per million at this SR.



There was an interaction between the effects of P status and SR on wool production. This was because the response in W to increasing CS was negligible at 10 or 14 sheep/ha (0.07 kg of wool/ha per unit increase in CS) compared to the response at 18 sheep/ha (1.08 of wool/ha per unit increase in CS).

The effects of SR, PA and PS on CS are shown in Figure 2. It can be seen that in order to maintain the P status of pasture at a given level, less P was required at a high than at *a* low SR.

Our results suggest that the recommendation to monitor the P status of pasture in order to maintain it at a level sufficient to ensure 90% of potential pasture production (1) is simplistic as no effects of SR are considered.

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