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**EFFECT OF SLOPE CLASS ON DEFOLIATION  
FREQUENCY AND SEVERITY OF *Trifolium  
repens* BY SHEEP IN HILL PASTURES**

**A thesis presented in partial fulfilment of the requirements for the degree of  
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# EFFECT OF SLOPE CLASS ON DEFOLIATION FREQUENCY AND SEVERITY OF *Trifolium repens* BY SHEEP IN HILL PASTURES

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## ABSTRACT

Hill pastures demonstrate varying intensities of grazing related to slope. A study of this effect was carried out at the Ballantrae Hill Country Research Station on set-stocked pastures that were maintained on high (H) and low (L) soil fertilizer/stocking rate treatments.

In the first experiment, 10 marked white clover stolons were observed at 1-week intervals for grazing damage in each (200 \* 300 mm) of 10 paired quadrats on both flat terrain (FT) between 0-20° and steeply sloping terrain (ST) between 30-45° in each of two treatments (H & L) in winter of 1995. The defoliation frequency (0.38 vs 0.29 ± 0.10; P<0.05) and severity (0.45 vs 0.30 ± 0.11; P<0.05) were significantly higher on the FT than on ST, but this phenomenon only occurred on the H treatment.

In order to determine the reason for causing sheep grazing discrimination between terrain, 10 sites that contained the FT and ST were selected on the L treatment. At each site, four paired turves (200 \* 300 mm) were cut, two turves were from the FT

and the other two from the ST, were transplanted into similar or contrary terrain to give all combinations of turf and terrain in spring of 1995 and again in autumn of 1996. In autumn, turf from the FT was grazed more frequently (0.38, 0.36 vs 0.15,  $0.11 \pm 0.18$ ;  $P < 0.001$ ) and severely (0.81, 0.87 vs 0.28,  $0.19 \pm 0.41$ ;  $P < 0.001$ ) irrespective of its location in the sward, but this effect was stronger within the first three weeks of the grazing period. In contrast, this phenomenon did not occur in spring, and when FT turf was transplanted into the FT it was less (0.09 vs 0.32, 0.31,  $0.37 \pm 0.23$ ;  $P < 0.05$ ) severely defoliated than the other treatments.

It is concluded that sheep generally defoliated white clover on the FT more frequently and severely than on the ST and the main reason for this discriminatory grazing was the difference in the vegetation conditions (e.g., botanical composition) of pastures. This preference for the FT was stronger during autumn, on the H treatment, and in the early stage of a grazing period. These findings suggest it may be possible to lessen discriminatory grazing in hill pastures by improving pasture botanical composition, adjusting fertilizer application rate or by seasonal manipulating of grazing policies.

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