The impact of continuous grazing by free ranging sheep on the structure and botanical composition of grassland as determined by multivariate analysis

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Introduction Grazing shapes the botanical composition of vegetation at the landscape level (Oksanen *et al.*, 1995). Sheep seek spatially scattered plants of nearly constant and high nutritional value. There is strong interaction between the grazing behaviour of the sheep and the structure of the plant community that it grazes (Squires, 1981). This paper examines the situation in a grassland vegetation grazed by free-ranging sheep in a semi arid region of North Eastern Iran.

Materials and methods Twelve indices of soil surface condition (Tongway, 1994) were assessed in each of five quadrats within each transect. The data were collected from five transects in five contiguous 1 m^2 quadrats along a 50 m transect located about 100 m from each other in excloser and exposer areas at each site. Vegetation cover for each species was measured in each quadrat. Detailed analyses have been made of plant and soil characteristics and the data sets analysed using multivariate techniques.

Results By plotting plant and soil features against distance from water, the grazing gradient method distinguished three common grazing gradient zones (Figure 1). These three zones were the disturbed (degraded) zone, the sensitive zone (the boundary region between them) and the "outer" zone located from closest to the water point to furthest from the water point, respectively. Based on the dendrogram derived from UPGMA cluster analysis of these features, overgrazing around the trough has apparently resulted in an increased density of unpalatable species, decrease of palatable species, and decrease the percentage of crustose soil lichen cover.

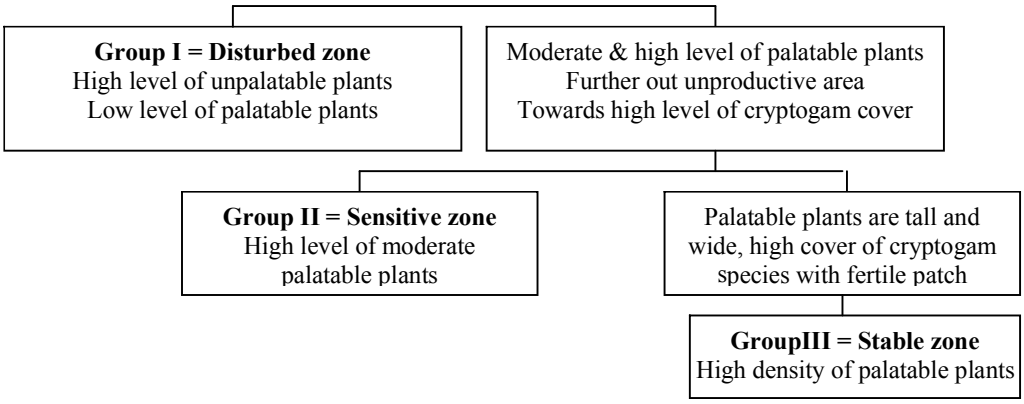

Figure 1 Stylised dendrogram group relationships with plant indicator features for each group

Conclusions In other studies, Crisp (1978) considered that under continuous grazing an increase in unpalatable species and a decrease in palatable species occurs, although these palatable plant species may be lost by excessive browsing. There was an area between the outer and degraded zone where the rangeland condition was different from the other two. This area was called the sensitive zone. The rate of increase of less palatable plants to palatable and start of reducing cryptogam cover are the best indicators for changing the direction of sensitive zone to disturbed zone. It seems that large and abundant palatable plants are the best indicators of stable zone.'

References

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