

# The effect of exclosures on *Poa bulbosa* and determination of predation: a case study in the Nodoushan rangelands, central steppe of Iran

Anahita Rashtian

Yazd University, Pajohesh Ave, Yazd, Iran

Contact email: arashtian@yazd.ac.ir

**Keywords:** Distribution patterns, plant cover, plant diameter, biomass.

## Introduction

In order to undertake investigations leading to reclamation management for rangelands, information is needed on the effect of exclosures on the production and morphology of key species such as *Poa bulbosa*. This paper describes a comparison of some morphological and ecological characteristics of *P. bulbosa* when subjected to grazing or protected long-term with exclosures. The investigation was undertaken on the Nodoushan rangelands of Yazd Province, Iran.

## Material and methods

In the exclosure and grazing areas, sampling took place on 40 x 1 m<sup>2</sup> quadrats randomly located along 10 transects.

Also 30 *P. bulbosa* plants were selected randomly in each area and measured for plant height, diameter, canopy cover, vitality and weight of current year production. The distribution pattern of *P. bulbosa* was assessed with Morisita's index of dispersion (variance/mean ratio).

## Results

Between the grazing and exclosure areas, there were significant differences ( $P < 0.05$ ) in the production of *P. bulbosa* and in the parameters contributing to production such as canopy cover, density and vitality (Fig. 1).

Based on the index of dispersion, plant distribution was uniform in the exclosure areas, but changed to clumps in the grazed area. The relationship between biomass and

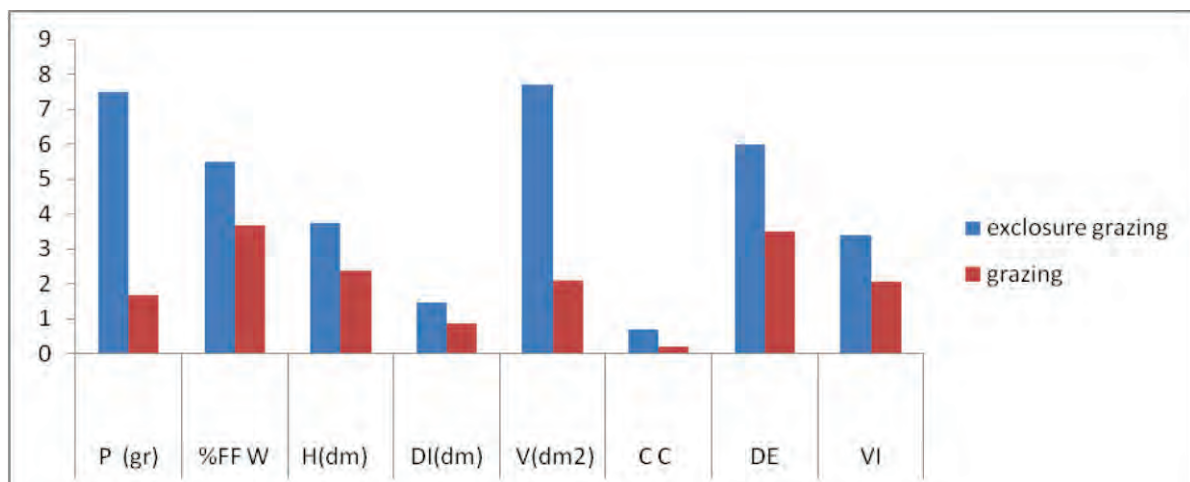


Figure 1. Some parameters of *Poa bulbosa* in grazing and exclosure situations.

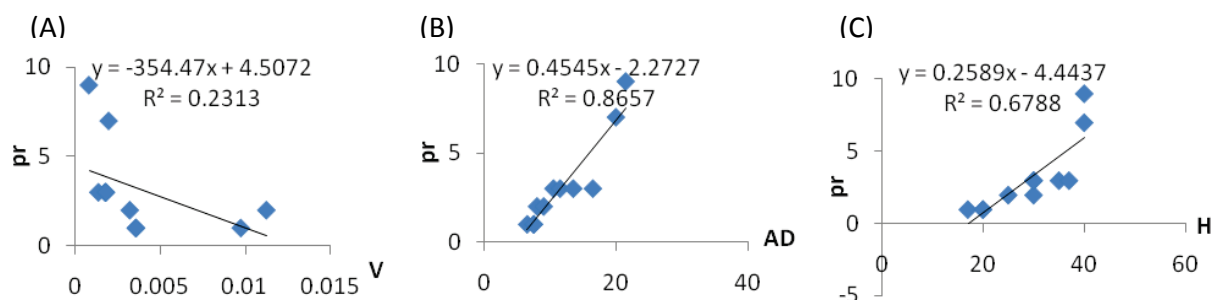


Figure 2: Production estimates (y-axis) in relation to measurements of A) Cover (area), B) Average Diameter and C) Height.

other plant parameters is shown in Figure 2. Regression equations indicated that the best estimator of biomass was achieved by measuring average plant diameter. Plant cover was least correlated with *P. bulbosa* biomass.

### Conclusion

The overall grazing reduced plant parameters whereas the ungrazed state increased coverage, plant density and the vitality of *P. bulbosa*. The effect of grazing on plant distribution was to produce clumped vegetation. The best factor upon which to base a production estimate was the average plant diameter.

### Guiding References

- Allred BW, Fuhlendorf SD, Smeins FE, Taylor CA (2012). Herbivore species and grazing intensity regulate community composition and an encroaching woody plant in semi-arid rangeland, *Journal of Basic and Applied Ecology* **13**(2), 149–158.
- Anderson PML, Hoffman MT (2011). Grazing response in the vegetation communities of the Kamiesberg, South Africa: Adopting a plant functional type approach. *Journal of Arid Environments*, **75**(3), 255–264.
- Milchunas DG, Sala OE, Lauenroth WK (1988). A generalized model of the effects of grazing by large herbivores on grassland community structure. *American Naturalist* **132**, 87-106.