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The XXI International Grassland Congress / VIII International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

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Studies on the autecology of *Astragalus caragana* F. et M in the Esfahan Province of Ira

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Key words : planting, grazing value, semi steppe, vegetative spread

Introduction The genus *Astragalus* is generally considered the largest plant genus of Iran with more than 800 species (Lock and Simpson, 1991). *Astragalus caragana* F. et M. is the most important species of this genus. *Astragalus caragana* is distributed in semi steppe regions of Esfahan province. This paper presents the autecology and grazing value of *Astragalus caragana* in Esfahan province.

Materials and methods The study area is located in the semi steppe region of Esfahan Province in central Iran. The method of research was a standard reconnaissance method including collection of botanical, pedological, phenological, and climatological data as well as examining grazing preference values for the species and developing distribution maps.

Results and discussion The results indicated that the species is distributed over 568,400 ha of the western foothills of the Province at elevations between 1978 and 3320 m with 300 to 750 mm precipitation and 700 to 1300 mm evapotranspiration. It occurs on sandy to sandy loam soils with pH between 7.3 and 7.83 and salinity between 0.054 and 0.22 dsm⁻¹. *Astragalus caragana* covers about 3.8% of the ground in *Astragalus* spp., *Agropyron* spp., *Artemisia aucheri*, *Cousinia cylindracea*, *Scariola orientalis*, *Euphorbia* spp., *Ferula ovina*, and *Bromus tomentellus* types. Phenological studies indicated that the vegetative growth begins in March when the average temperature is above 0°C and the minimum temperature for 3 days is above -2°C. The best time for grazing is from 20 May to 5 Jun according to phenological studies. Due to its aromatic and phenolic components, it receives little use early in the season, but it is intensively grazed in mid season.

Astragalus caragana spreads via sexual and vegetative propagation but most commonly spread occurs through development of rhizomes due to pests. This results in a clumped distribution of the species. Weight of 1000 seeds is about 20.5 g with 21.5% germination and with 58% scarification (does this mean hard seeds that must be scarified?). Interseeding in pitting are the best ways of revegetating the species. Seeds must be planted 2.5 cm deep, and germination of 82% can be expected.

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