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A study on Ningxia desert grassland (*stipa breviflora*) utilization

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Key words : *stipa breviflora*, desert grassland, grazing density, grazing regime, control measures

Abstracts We studied the effect of grazing density, grazing regime and related management measures on the desert grassland dominated by *Stipa breviflora* in the middle arid and semi-arid areas of Ningxia.

Study methods and contents The Sidunzi village in Yanchi county of Ningxia was selected as the trial area and the dominant plant specie was *Stipa breviflora*. The experimental area was 400hm², and the demonstration area was 800hm². The selected animal was the Ningxia tan sheep.

Experimental results and findings

Grazing density The experimental results showed a strong negative relationship between the unit sheep weight and the grazing density. The regression equation was: $G_a = 18.48 - 7.01G$ ($r = -0.97^{**}$); A strong positive relationship existed between the unit grassland area (1hm²) weight and the grazing density. The regression equation was: $G_h = 0.31 + 17.60G - 6.60G^2$ ($r = 0.87^*$). It showed that the grazing density suitable for this grassland should be around 0.750 sheep/hm² (see chart 1). When the grazing density exceeded 0.750 sheep/hm², ewes exhibited barrenness, lower lambing rate and delayed pregnancy. A close relationship existed between barrenness or lambing rate and the grazing density, respectively: $Y = -18.10 + 30.98X$ ($r = 0.97^{**}$), $Y = 136.50 - 65.68X$ ($r = -0.95^*$).

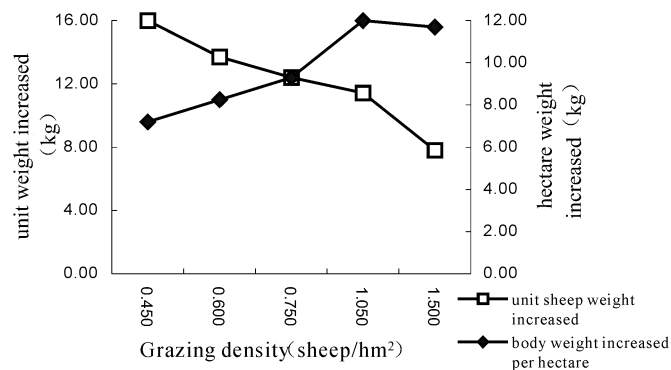


chart 1 Relations between the tan sheep unit weight increased and hectare weight increased under the different grazing densities

Grazing regime Assume 0.75 sheep/hm² as the grazing density and take the free grazing as a reference, several rotational grazing experiments were begun in 2 to 6 blocks to test this grazing regime. The experimental results indicated that the biomass of the plant communities, coverage and density in six rotation grazing blocks and those in four rotation grazing blocks were remarkably higher than the ones with free grazing ($P < 0.05$). The trend of density and coverage of the palatable forage was as follows: grazing rotated in 6 blocks > grazing rotated in 4 blocks > grazing rotated in 2 blocks > free grazing. During the growing period the stocking capacities in six rotation graze blocks, four rotation graze blocks and two rotation graze blocks separately were higher than the one in the free grazing area by 21.5%, 15.8% and 8%, respectively. The weights of the tan sheep increased during the grazing period. This result showed that the density of 0.75 sheep/hm² was good for this grassland.

Management measures (1) Develop contracts with households or joint households; (2) Build fences for all contracted grasslands which would not be larger than 200hm²; (3) Define the grazing capacity for each grassland in accordance with the grazing density; (4) Combine several households into a joint grazing team who would be issued a Grazing Permit and implement rotational grazing in four to six rotated grazing blocks.

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