

Effects of spring-resting (spring grazing banning) on grassland productivity and vegetation composition in typical grassland of Inner Mongolia ,China

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Introduction Traditionally ,grasslands in Northern China had been utilized in a way of "whole year around grazing of grasses on offer" in which animals had too heavily rely on the herbage available on the grassland .Heavy grazing pressure and excessive trampling during winter-spring season caused large areas of grassland degradation .Plant regrowth was checked off by grazing animals at the critical time of spring early growth .This stimulated a vicious cycle for the grassland deterioration ,i .e . ,grazing pressure was heavy ,herbage became less ,and as a consequence ,grazing pressure became even heavier .A new animal production system with "grazing banning in winter-spring" was introduced and its effects on grassland were checked .

Materials and methods The site is in the typical grassland region of Balin Right Banner in Chifeng Municipality of Northern China .Since year 2001 ,grazing has been banned during winter-spring period till the end of June .Primary productivities and plant composition were measured in 2001 and 2004 and compared with previously monitored data before the grazing ban .

Results and discussion Table 1 summarizes the main results of grassland monitoring before and after the grazing banning . Herbage yield almost doubled in the first year of banning .Four years after banning ,herbage yield increased substantially and plant composition changed greatly .More palatable herbage of grasses and legumes increased and others (mainly annual weedy plants) decreased .

Table 1 *grassland productivity and plant composition affected by grazing banning .*

Grassland production and vegetation composition	Before banning			After banning	
	Sept .99	Sept .00	Sept .01	Jun .04	Sept .04
Herbage yield (kg/ha)	1251	953	2466	1226	2652
Grasses (%)	12 .87	22 .23	25 .16	21 .4	46 .6
Legumes (%)	4 .13	7 .16	6 .12	24 .51	25 .1
Compositae (%)	9 .79	16 .73	23 .59	18 .07	12 .1
Others (%)	73 .21	53 .88	43 .13	36 .02	16 .2
Grasses+legumes(%)	17	29 .39	31 .28	45 .91	71 .7

Conclusions The grazing ban obviously improved the grassland conditions in terms of plant growth and vegetation composition . Restrain of grazing at spring critical time allows the grassland have revival time for sustainable utilization .It need minimal cost for maintaining the animal for short period in compared with other grassland revegetation and animal development measures in the grassland regions .