

Experimental study on *stipa bungeana* grassland of enclosed , cutting and grazing succession for 26 years semi-arid region of northwest

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Introduction The study of management of grassland vegetation , successive process of utilization , rules of degraded pasture ecosystem or vanished vegetations , will help to reconstruct the original vegetations and diversity . That is of important guided meaning for cultivated and reconstruction stable community types (Cheng *et al.* , 2002) .

Materials and methods (A) a completely protected area (forbidden grazing) , the time sequence evolution of grass vegetation were observed ; (B) cutting area (cutting twice per year in mid-June and mid-September respectively) , after cutting , changes of community structure were studied ; (C) a reasonable grazing area (rational grazing in middle June , middle August , middle October , 1.5-2 sheep/hm²) , influence of grazing on community structure were studied ; (D) uncontrolled grazing area (over-grazing area) . Time sequence evolution of grass vegetation and community structure were studied during the experiments . Each treatment contains 3 fixed plots (1×1 m²) with 10 replications . Investigations of the vegetation were carried out on 10th April , 10th July and 5th October , respectively .

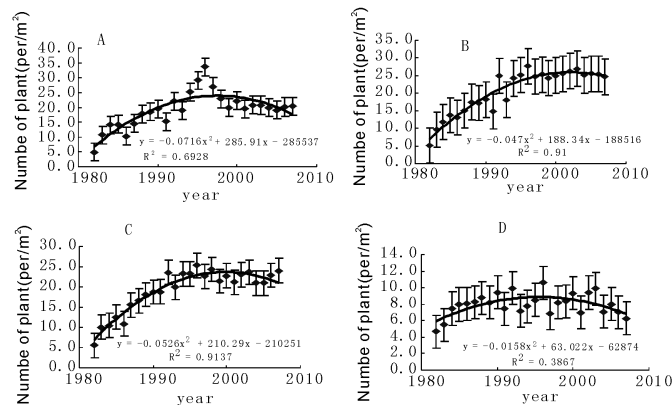


Figure 1 Grassland population quantity variation .

Results In district A , plant community density has reached the highest value (33 species/m²) during the first 15 years . In district B and C , change of population species diversity increased stably , and formed sub-climax community which is mainly composed of *Stipa bungeana* population in the 23rd year . In district D , grassland is usually in serious degradation states . The community biomass has the same change trend as the composition of plant density (Figure 1 and Figure 2) .

Conclusions With time lapsing , great change of evolution process occurred in rational cutting and grazing grassland . It eventually reached sub-climax community by four stages evolution . In 24th year of appropriate utilization , great changes have occurred and individual number of *Stipa grandis* increased sharply , having a tendency of replacing *Stipa bungeana* .

Reference

Cheng , J . M . , Wan , H . E . (2002) . Vegetation construction and water and soil conservation of Chinese Loess Plateau . Chinese Forestry Press . (in Chinese)

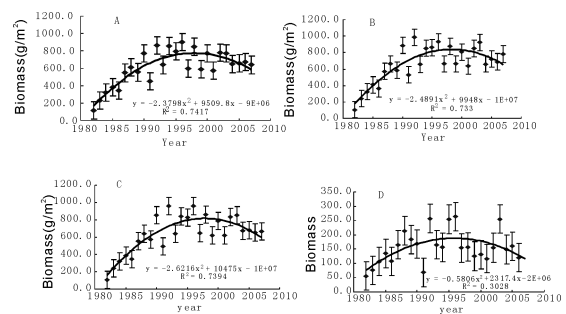


Figure 2 Inter-annual variability of grassland biomass(A enclosed area B cutting area C reasonable grazing area D unenclosed area) .