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Study on responses of *Leymus chinensis* of degraded grasslands to kinds of improved measures

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Introduction As a result of influences of climates and human beings , more than 70% grasslands are degraded and gradually increasing . The pasture husbandry is highly influenced and so the income of humans . This study was used kinds of improved measures in order to increase constitutes of dominant species and the productivity of grassland (Vallentine , 1980) .

Materials and methods The site was on the country of Tai Pusi , Xilin Gol League of Inner Mongolia (114°51' ~ 115°49' E , 41°35' ~ 42°10' N) . The altitude is between 1400m ~ 1500m and the mean rainfall was 407mm . The dominant species of pasture was *Leymus chinensis* , and other species such as *Potentilla acaulis* , *Potentilla bifurca* , *Cleistogenes squarrosa* , *Agropyron michnoi* , *Stipa* , *Thalictum petaloideum* , *Artemisia frigida* etc . From May 2007 to Sep . 2007 , 5 treatments were adopted in a randomized uniform block and each treatment plot was 800m² . They were : (1) meadow cutting (H) : 10cm depth along the contour line ; (2) irrigation (G) : 40m³ water each plot ; (3) meadow cutting and irrigation (H + G) ; (4) fertilizing and irrigation : four concentrations of urea (46% nitrogen) as follows : N1 (25kg/hm²) , N2 (50kg/hm²) , N3 (75kg/hm²) , N4 (100kg/hm²) , each plot was 5 m × 2 m with 3 replicates ; (5) fertilizing : 50kg/hm² of urea (46% nitrogen) . The indexes of height , density , coverage and weight of *L . chinensis* were measured once every month . Data were analyzed using SPSS 13 . 0 .

Results The height , density , coverage and DW of *Leymus chinensis* in each treatment were increased more or less and the DW were highest in August . The increasing percentage of DW were 99 . 34% , 196 . 48% , 282 . 49% , 183 . 08% , 114 . 28% , 360 . 94% , 200 . 76% and 201 . 44% separately (Table 1) .

Table 1 Effects of improved measures on DW of *Leymus chinensis* (g/m²) .

Treatment	June	July	Aug .	Sep .
CK	8 . 11 a	17 . 04 a	17 . 29 a	16 . 73 a
H	7 . 89 a	14 . 44 a	54 . 97 ab	40 . 65 b
H+G	19 . 52 bc	41 . 19 b	72 . 92 bcd	41 . 8 b
G	24 . 19 bc	51 . 92 bc	98 . 52 cd	51 . 69 b
S	9 . 62 a	35 . 19 ab	69 . 17 bc	53 . 52 b
N1	17 . 48 b	36 . 01 ab	34 . 73 ab	38 . 57 b
N2	33 . 86 d	70 . 28 c	110 . 48 d	58 . 12 b
N3	23 . 14 bc	44 . 54 b	59 . 58 bc	50 . 7 b
N4	27 . 26 cd	55 . 08 bc	48 . 34 ab	47 . 68 b

Conclusions Water is the limiting factor to the productivity of grassland . Meadow cutting can promote the reproducibility of *L . chinensis* . These measures were all effective to degraded grasslands . They were all significantly increased the productivity of *L . chinensis* . The concentration of 50kg/hm² of urea (46% nitrogen) was critical and it was the most effective way to improve the grasslands in the treatment .

Reference

Vallentine J . F . 1980 : Range development and improvements . Second Edition . Brigham Young University Press , Provo . Utah .