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Structures of the dormancy modules on *Puccinellia tenuiflora* populations in alkalized meadow in the Songnen Plains of China

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Key words: *Puccinellia tenuiflora*, dormancy modules, dormancy seedling, dormancy bud, population structure

Introduction *Puccinellina tenuiflora*, a perennial grass of tuft, and forms larger area monodominant communities in alkalized patches with loss of surface soil. Its economic value is considerable greater because of better capability of tolerance to the salt and alkali stress in alkalized meadow in the Songnen Plains of China (Zheng and Li, 1993). There were some reports about the bio-chemical mechanism, bio-ecological characteristics, the characteristics of production, etc (Yang and Zhu, 1994). However, the researches of the dormancy modules of *P. tenuiflora* populations have never been reported. Structures the dormancy modules were compared and analyzed on *P. tenuiflora* populations in two pastures for haying and grazing in the Songnen Plains, which may not only accumulate science materials on population ecology of tuft clone plant but also provide scientific evidence to suitable utilization of alkalized meadow.

Materials and methods The research was conducted in natural alkali meadow, located at the Pasture Ecology Research Station of Northeast Normal University, Changling, Jilin province of China (44° 45' N, 123° 31' E) which has temperate half-humid continental monsoon climate. The *P. tenuiflora* populations were sampled in two pastures for haying and grazing on early October, 2004. The sample area is 25 cm × 25 cm with six replications. The number of dormancy buds and dormancy seedlings were counted to each sample, respectively. That was changed from the sample area into the routine unite area of 1 m × 1 m (Zhang, et al., 1993).

Results The dormancy modules of *P. tenuiflora* populations consisted of dormancy buds and dormancy seedlings in the Songnen Plains at the end of the growth season (Table 1). The total number of dormancy modules on the populations was more 74.7% in the haying pasture than in the grazing pasture. Thereinto, the number of dormancy seedlings in the haying pasture was twice in the grazing pasture, the number of dormancy buds is the same in general. That showed the formation of dormancy modules, especially dormancy seedlings of *P. tenuiflora* populations could be promoted by haying using. Though there was larger difference on the number of dormancy modules and its compositions of *P. tenuiflora* in the two plots, there was still the similar characteristic of structures, that's to say, dormancy seedlings held a dominant position. The dormancy seedlings were 5.9 times of dormancy buds in the haying pasture, while the dormancy seedlings were 2.8 times of dormancy buds in the grazing pasture. Therefore, that would conclude that were favorable to the formation of dormancy seedlings of *P. tenuiflora* populations by using both haying and grazing.

Table 1 Structures of dormancy modules of *P. tenuiflora* populations in different sample plot.

Sample plot	Seedling		Bud		Total	
	Number/m ²	Percent (%)	Number/m ²	Percent (%)	Number/m ²	Percent (%)
Haying	5254.4 ± 2568.1a	85.6 ± 5.4a	1011.2 ± 891.2a	14.4 ± 5.4a	6265.6 ± 3380.8a	100
Grazing	2608 ± 1160.2b	73.6 ± 11.3b	979.2 ± 804.8a	26.4 ± 11.3b	3587.2 ± 1820.8b	100

Conclusions In the Songnen Plain, *P. tenuiflora* populations were in the stage of flowering and fruit setting in June, then were the vegetative growth stage after full ripeness. The forming vegetative tillers would not lived through the winter since which would enter the jointing nodes growth stage before the middle of August. But the forming vegetative seedlings would hibernate and continue to grow next year for the reason that would not enter jointing nodes after the middle of August. The phenomenon of top dominance universally existed in plants. The top dominance of all tillers was removed in the haying pasture after early August but the top dominance of part tillers was removed in the grazing pasture, which indicated that the formation of dormancy modules, especially dormancy seedlings would be promoted to *P. tenuiflora* populations by haying utilization.

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