Adaptability of *Cleistogenes songorica* to Drought Stress

Tao Qu
Lanzhou University, China

Zhibiao Nan
Lanzhou University, China

The XXI International Grassland Congress / VIII International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

Adaptability of *Cleistogenes songorica* to drought stress

QU Tao and NAN Zhi-biao(zhibiao@lzu.edu.cn)
College of Pastoral Agriculture Science and Technology, Lanzhou University, Lanzhou 730020, China

Key words: adaptability, drought stress, *Cleistogenes songorica*, shoot weight, root weight

Introduction *Cleistengenes songorica* is an important native forage species growing in the arid regions of northwestern China where the annual rainfall is about 120 mm. Efforts have been made to understand its reproductive triats (Zeng, 2005), nutritive value (Wu, 2006) and response to defoliation (Liao, 2006). However, little is known about its response to drought stress. The objective of this work was to understand its shoot and root growth under various soil water contents.

Materials and methods Seeds of *C. songorica* (C) were harvested in 2006 from Alasan desert grassland, Inner Mongolia, China, and were sown at the rate of 30 seeds per pot on May 01, 2007. The pots were kept in a controlled environment with alternating temperatures of 30/25℃ for day and night (12h/12h), and 80% of the relative humidity. Three watering treatments (T1, T3 and T9) were compared, i.e. watering to its field capacity every 3, 6 or 9 days, respectively. Seedlings were sampled at 30 day intervals up to 90 days after sowing. Shoot and root dry weights per pot were determined at each harvest, Tall fescue (*Festuca arunginacea*), known as a drought tolerance species, was used as the control.

Results and discussion *C. songorica* had more shoot dry weight than tall fescue for the T9 treatment which had the prolonged watering interval. However, no such difference was found for the root dry weight (Table 1).

Table 1 *Shoot and root dry weight of* Cleistogenes songorica *and* Festuca arunginacea *growing in pots.*

Days after sowing	Treatment	Shoot dry weight (g)		*LSD 0.05*	*Root weight (g)*		LSD 0.05
		F. arunginacea	*C. songorica*		*F. arunginacea*	*C. songorica*	
30	T1	1.92	1.17	0.532	0.82	0.48	0.037
	T3	2.14	1.46	0.358	1.12	0.47	0.036
	T9	2.15	3.22	0.227	1.52	0.47	0.032
	LSD0.05	0.040	0.283		0.029	0.033	
60	T1	2.83	1.63	0.245	1.05	0.52	0.045
	T3	2.72	2.32	0.453	1.27	0.61	0.051
	T9	3.20	4.81	0.358	2.01	0.72	0.037
	LSD0.05	0.371	0.258		0.042	0.036	
90	T1	3.53	2.74	0.752	1.23	0.7	0.032
	T3	3.66	3.39	0.109	1.44	0.7	0.028
	T9	4.11	6.11	0.774	1.96	0.89	0.054
	LSD0.05	0.842	0.614		0.047	0.031	

Conclusions *C. songorica* accumulated more aboveground dry matters than *F. arunginacea* under drought conditions. There is a need to further confirm this result in the field and to study the underlying drought tolerance mechanism in *C. songorica*.

References

Liao W.B. 2006. Effects of cutting height on growth of *Cleistogenes songorica*. *Master thesis*, Lanzhou University.
Wu Y.P. 2006, Effects of fencing on reserves of *Cleistogenes songorica*. *Master thesis*, Lanzhou University
Zeng Y.J. 2005. Effects of grazing and non-grazing on propagation of *Cleistogenes songorica*. *Master thesis*, Lanzhou University.