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The effects of late-fall mowing on the performance of 6 *Buchloe dactyloides* varieties

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Key words: Jingyin buffalograss, turning-green phase, withering phase, regreening, mowing

Introduction *Buchloe dactyloides* is a warm-season perennial C₄ grass, a species native in the Great Plain of North America (Frank et al., 2004), and widely used for water conservation and other recreational purposes. However, its long winter dormancy period (around 185d green period in Beijing) has greatly restricted the utilisation of this species. Jingyin buffalograss, originally from a wild variety introduced from America in 1995, has been propagated in the experimental field of the Temple of Heaven (116°24'E, 39°53'N, 63m a.s.l.), Beijing, for 3 years. It was found to have a long green period when it was vegetatively propagated in another experimental field of the Temple of Heaven. The objectives of this study were to: (i) evaluate the impact of mowing on turning-green phase; (ii) compare the green periods and drought resistances between Jingyin buffalograss and other 5 varieties.

Materials and methods This study was conducted in the experimental field of the Temple of Heaven. On 7 Apr. 2000, plugs (5 × 5 × 7 cm³) of Jingyin buffalograss and its original variety were transplanted into new plots (1 × 1 m²). On 24 May, 2000, 4 other varieties introduced from America were seeded in plots within the same area. There were 6 replicates for each variety. Turf colour rating was on a scale of 0 to 5, where 0 was brown and 5 was dark green. On 17 Nov. 2000, half of the plots were mowed to a height of 10 cm to measure the impact of mowing on turning-green phase and drought resistance.

Results Compared with other varieties, Jingyin buffalograss was more tolerant to drought stress in spring than the other varieties. It was followed by Bison (Table 1). Mowing can improve grasses' resistance to drought in spring (Table 2), the explanation could be on 17 Nov, according to Table 1, most plants became dormant, and as a result, mowing just removed brown dead leaves. The mowing height was also raised, compared with common practices. Thus mowing should not have decreased the plants' tolerance to cold stress or affected photosynthetic activity, on the contrary, mowing reduced water loss to evaporation in winter. Moreover, from Table 3, it can be seen that the regreening stage was advanced after late-fall mowing. This may be due to litter removal and thus exposing growing points to more sunlight and elevating soil temperatures in early spring. All these contributed to the quick reviving of dormant plants.

Table 1 Colour differences between grasses in withering phase in autumn of 2000.

Grass	Date							
	17/10	25/10	27/10	31/10	1/11	5/11	7/11	11/11
Jingyin	4.6	4.3	4.2	4	3.3	2	1.8	1.5
Original	1	1	0.5	0	0	0	0	0
Tetanka	4.7	2.9	2.7	2.5	0.8	0.6	0	0
Bison	4.6	4.2	4.2	4	3.5	3.1	2.9	1
Cody	2.7	1.6	1.5	0.7	0	0	0	0
Texoka	3.5	3.1	3.1	2.9	1.5	0.3	0	0

Table 2 Colour differences between grasses' responses to spring drought and between mowed and unmowed grasses in 2001.

	mowed			unmowed		
	20/5	26/5	1/6	20/5	26/5	1/6
Jingyin	5	4	4	3	2	2
Original	2.8	1.8	1.3	1.3	0.3	0.3
Tetanka	4	2	2	3	2	2
Bison	5	3	2	4	3	2
Cody	4	2	2	3	2	2
Texoka	3	1.5	1.5	3	1.5	1.5

Table 3 The impact of mowing on turning-green phase (evaluated by the length of the newly-produced green leaves).

	Mowed (cm)					Unmowed (cm)				
	23/3	2/4	9/4	20/4	27/4	23/3	2/4	9/4	20/4	27/4
Jingyin	2	4.3	5.8	9.5	10.3	1	2.5	4	8.9	10
Original	1.4	2	2.7	4.2	5.7	0	1.9	2.9	4.9	7.8
Tetanka	1	2	3.8	5	6.8	0	0.7	1.1	4.6	6.7
Bison	0.8	2.5	3.7	5.3	6.3	0	1.3	2	5.5	9.4
Cody	1.2	1.7	3.9	4.7	6.9	0	2.3	3.7	5.5	6
Texoka	1	3.8	3.7	7	10.1	1	3.2	4.8	6.4	9.8

Conclusions Jingyin buffalograss had a longer green period than the 5 other varieties, however Bison can also thrive well in Beijing. Mowing in late fall can improve the performance of all varieties by improving drought resistance and advancing the turning-green phase.