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Response of Lanyin Ⅲ zoysiagrass to watering and fertilization

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Key words: Lanyin Ⅲ zoysiagrass, watering, fertilization, soluble sugar, POD, leaf water potential, chlorophyll

Introduction Over-watering and over fertilization often led to poor turf quality (White *et al.*, 1993). This study was conducted to determine the physiological response of Lanyin Ⅲ Zoysiagrass under water-fertilizer integrated controlling.

Materials and methods 27 pots of Lanyin Ⅲ Zoysiagrass cultivated in the sand dominated root-zone were treated with watering of 3 levels (W1:20% E₀, W2:60% E₀, W3:100% E₀) as main treatment and fertilization of 3 levels (F1:N1.5 g m⁻², F2:3.0 g m⁻², F3:6 g m⁻² monthly at the same N:P:K ratio of 4:1:2) as secondary treatment and replicated 3 times. Soluble sugar, peroxides (POD), leaf water potential (LWP) and chlorophyll were measured during drought stress and after rewatering.

Results and discussion

The results showed that controlled watering and fertilization had significant effects upon the physiological characteristics of Lanyin Ⅲ Zoysiagrass. Soluble sugar accumulated dramatically under 20% E₀ watering level, but it kept lower level when watering was sufficient and after rewatering, (Figure 1). The leaf water potential was significantly lower under 20% E₀ watering level, whereas fertilization had no effects on it in sufficient watering condition (Figure 2). POD activity was distinctly high when watering was limited, which indicated that drought resulted in Lanyin Ⅲ zoysiagrass injury especially with high fertilization (Figure 3). Water stress could reduce the synthesis of chlorophyll, however under higher water condition the content of chlorophyll was lower due to dilution of abundant water (Flexas *et al.*, 1999) (Figure 4). In combination with watering, fertilization and their effects it was concluded that Lanyin Ⅲ Zoysiagrass could grow well under the condition of watering of 60% E₀ and fertilization of N1.5-3.0 g m⁻² monthly.

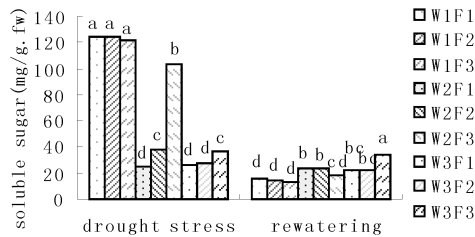


Figure 1 The effect of different treatments on soluble sugar.

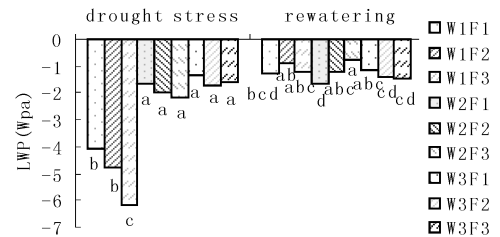


Figure 2 The effect of different treatments on LWP.

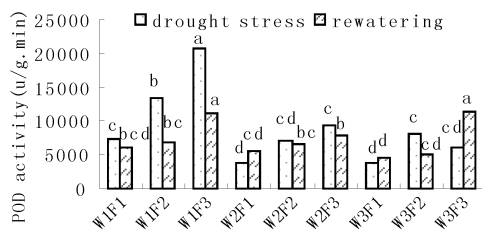


Figure 3 The effect of different treatments on POD activity.

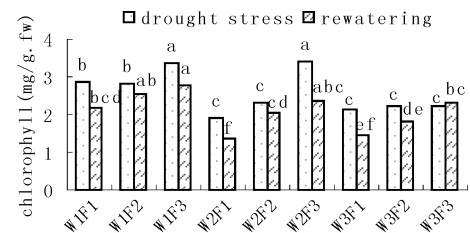


Figure 4 The effect of different treatments on chlorophyll.

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