

# Response of Lanyin III Zoysiagrass to Watering and Fertilization

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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% $E_0$ ,W2 :60% $E_0$ ,W3 :100% $E_0$ ) as main treatment and fertilization of 3 levels( F1 :N1 .5 g $m^{-2}$ ,F2 :3 .0 g $m^{-2}$ ,F3 :6g $m^{-2}$ 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% $E_0$ 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% $E_0$ 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% $E_0$ and fertilization of N1 .5-3 .0g $m^{-2}$ monthly .

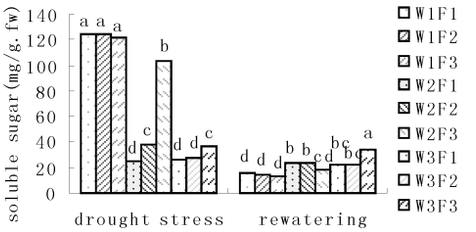


**Figure 1** *The effect of different treatments on soluble sugar .*

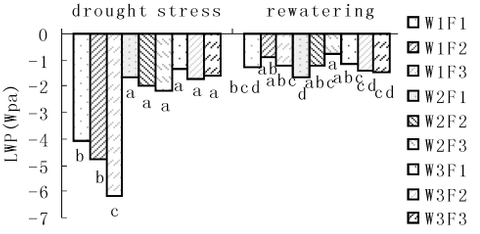


**Figure 2** *The effect of different treatments on LWP .*

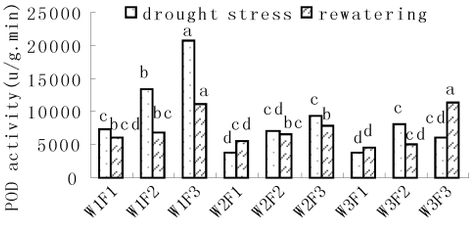


**Figure 3** *The effect of different treatments on POD activity .*

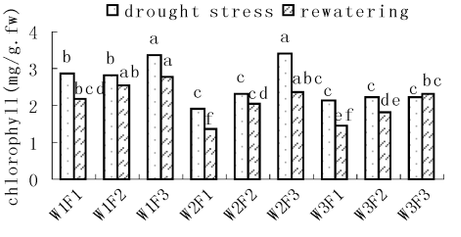


**Figure 4** *The effect of different treatments on chlorophyll .*

**References**

Flexas , J . , Escalona , J .M . , Medrand , H . (1999) . Water stress induces different levels of photosynthesis and electron transport rate regulation in grapevines . *Plant , Cell and Environment* , 22 , 39-48 .

White , R .H . , Engelke , M .C . , Morton , S . T . , *et al* . (1993) . Irrigation water requirement of zoysiagrass . Int . *Turfgrass Soc . Res* . J . 7 , 587-593 .