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花期追施氮肥对不同株型黑豆品种生殖生长期叶片生理生化特性的影响

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作者: 陈振武 (KeySearch.aspx?type=Name&Sel=陈振武); 钱朗 (KeySearch.aspx?type=Name&Sel=钱朗); 王海英 (KeySearch.aspx?type=Name&Sel=王海英); 张惠君 (KeySearch.aspx?type=Name&Sel=张惠君)
沈阳农业大学 农学院, 辽宁 沈阳 110866

Author(s): CHEN Zhen-wu (KeySearch.aspx?type=Name&Sel=CHEN Zhen-wu); QIAN Lang (KeySearch.aspx?type=Name&Sel=QIAN Lang); WANG Hai-ying (KeySearch.aspx?type=Name&Sel=WANG Hai-ying); ZHANG Hui-jun (KeySearch.aspx?type=Name&Sel=ZHANG Hui-jun)

College of Agronomy, Shenyang Agricultural University, Shenyang 110866, Liaoning, China

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摘要: 选用沈黑3号(直立型)和辽黑1号(半蔓生型)2个黑豆品种为材料,设置0 kg·hm⁻²(N0)、45 kg·hm⁻²(N1)、90 kg·hm⁻²(N2)和90 kg·hm⁻²叶面喷施22.5 kg·hm⁻²(N3)4个追施氮肥处理,探讨了花期追施氮肥对不同株型黑豆品种叶片生理生化特性的影响。结果表明:不同施氮处理并没有显著改变黑豆叶片不同生育期叶绿素含量、净光合速率、蒸腾速率、气孔导度和胞间CO₂浓度等的变化规律,辽黑1号的各光合生理指标明显高于沈黑3号。不同施氮处理间的叶绿素含量和净光合速率呈现明显的差异,而叶片蒸腾速率、气孔导度和胞间CO₂浓度差异不显著。在开花期、结荚期和鼓粒期,随着施氮量的增加,2个黑豆品种的SOD、POD和CAT活性均逐渐增强,辽黑1号叶片的SOD、POD和CAT活性均高于沈黑3号。不同施氮处理相比较,N₂对生理指标影响大于N₃,而N₃对生化指标影响大于N₂;品种间比较,辽黑1号优于沈黑3号。

Abstract: Erect black soybean variety of Shenhei No.3 and semi-rampancy variety of Liaohei No.1 were used as materials.Four nitrogen fertilizer application levels,0 kg·hm⁻²(N0),45 kg·hm⁻²(N1),90 kg·hm⁻²(N2) and 90 kg·hm⁻² plus leaf spraying 22.5 kg·hm⁻²(N3),were set.Photosynthetic traits of chlorophyll content(CC),net photosynthetic rate(P_n),transpiration rate(T_r),stomatal conductance (Cond) and intercellular carbondioxide concentration (Ci) as well as protective enzymes of superoxide dismutase(SOD),peroxidase (POD) and catalase (CAT) at reproductive stage were determined.The purpose of this study was to discuss the effects of different nitrogen fertilizer levels on physiological and biochemical characteristics in different black soybean varieties.Nitrogen treatment didn't change the changing trend of the tested photosynthetic indexes,the CC, P_n, T_r, Cond and Ci of Liaohei No.1 were significantly higher than those of Shenhei No.3.CC and P_n varied significantly between nitrogen treatments,while no distinctive difference were found for T_r, Cond and Ci.With the increment of nitrogen amount,SOD,POD and CAT of both cultivar showed increasing trend.SOD,POD and CAT activity of Liaohei No.1 were higher than those of Shenhei No.3.In conclusion,N₃ had more influences on photosynthetic traits,while N₂ shows more effects on protective enzymes.Besides,Liaohei No.1 performed better than Shenhei No.3.

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第一作者简介:陈振武(1953-),男,教授,研究方向为作物栽培生理。E-mail:chenzhenwu2003@163.com。

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