

研究报告

土壤水分对不同季节番茄叶片水和二氧化碳交换特性的影响

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摘要 以番茄品种“L402”为试材, 研究了土壤水分对不同季节番茄光合及蒸腾特性的影响. 结果表明: 全生育期内春番茄光合速率 (P_n) 和蒸腾速率 (T_r) 均以土壤相对含水量80%处理最高, 65%处理次之, 50%处理最低; 土壤水分降低, 显著改变了番茄 P_n 和 T_r 的日变化动态, 导致光合午休加重; 叶片水分利用效率 (WUE) 以65%处理最高. 冬番茄在全生育期内 P_n 和 T_r 以50%处理最低, 但65%和80%处理无显著差异, 且均无光合午休; WUE 则以50%处理最高, 80%处理最低, 说明不同季节番茄对土壤水分的反应存在显著差异. 春番茄与冬番茄的 P_n 及 T_r 日变化规律显著不同, 且在相同土壤水分条件下, 春番茄 P_n 及 T_r 显著高于冬番茄.

关键词 [番茄](#) [栽培季节](#) [土壤水分](#) [光合特性](#) [蒸腾速率](#)

分类号

Effects of soil water content on H₂O and CO₂ exchange in tomato leaves in different seasons

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Abstract

With tomato variety “L402” as test crop, this paper studied its photosynthetic and transpiration characteristics in different seasons under different soil water contents. Three treatments were installed, *i. e.*, 80% (I), 65% (II) and 50% (III) soil water content. The results showed that when cultivated in spring, the photosynthetic rate (P_n) and transpiration rate (T_r) of tomato leaves were the highest in treatment I, followed by treatments II and III, while the water utilization efficiency (WUE) was the highest in treatment II. The decrease of soil water content changed the diurnal variations of P_n and T_r significantly, and aggravated the midday depression of photosynthesis. The tomato growing in winter had the lowest P_n and T_r in treatment III, while no difference was observed between treatments I and II. No midday depression of photosynthesis was found among the three treatments. The WUE was the highest in treatment III, and the lowest in treatment I. All of these suggested that the tomato plants cultivated in different seasons had different responses to soil water content. The diurnal variations of their P_n and T_r were significantly different, and the P_n and T_r of spring tomato were significantly higher than those of winter tomato under the same soil water content.

Key words [tomato](#) [cultivation season](#) [soil water content](#) [photosynthetic characteristics](#) [transpiration rate](#)

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