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研究论文

不同夜间温度对小麦旗叶光合作用和单株产量的影响

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摘要 本文用不同夜间温度连续处理抽穗开花后的小麦植株，对旗叶的光合作用和单株产量进行了比较研究。结果表明夜间低温能明显延长叶片叶绿素含量缓降期和光合速率高值持续期，从而增加叶片的叶源量，提高产量。经计算缓降期延长一天，可使单株产量和千粒重分别提高2.0-2.5%和1.5-2.0%。夜间高温处理植株效果相反。试验进一步研究并证明了光合速率高值持续期与叶片的叶肉导度、可溶性蛋白和RuBP羧化酶含量以及RuBp羧化酶比活性具有密切关系。

关键词 夜间温度,光合作用,叶源量,单株产量

分类号

Influence of Different Nighttime Temperatures on the photosynthesis of the Flag Leaf and Yield in Wheat

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Abstract Individual wheat plants after flowering were put under different nighttime temperatures to study the influence of nighttime temperature on the photosynthesis of the flag leaf and yield per plant. The results indicated that low nighttime temperature condition could prolong the length of the Relative Steady Phase (RSP) of the chlorophyll content and the Photosynthetic Active Duration (PAD), leading to increase in Leaf Source Capacity (LSC) and yield. It was calculated that one more day of the RSP of the chlorophyll content could lead to 2.0-2.5% increase in 1,000-grain weight and 1.5-2.0% increase in yield, whereas the results of high nighttime temperature were just opposite. The results also revealed that PAD was positively correlated with mesophyll conductance, soluble protein content, RuBP Case protein and RuBP Case specific activity respectively.

Key words Nighttime temperature Photosynthesis Leaf source capacity Yield per plant

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