

## 施钾量和施钾时期对棉花产量及不同部位棉铃纤维品质性状的影响

李宗泰, 陈二影, 宋宪亮, 张美玲, 赵庆龙, 许晓龙, 姬红, 孙学振\*

作物生物学国家重点实验室, 山东农业大学农学院, 山东泰安 271018

Effects of rate and time of potassium application on yield and fiber quality of cotton (*Gossypium hirsutum* L.) at different fruit positions

LI Zong tai, CHEN Er ying, SONG Xian liang, ZHANG Mei ling, ZHAO Qing long, XU Xiao long, JI Hong, SUN Xue zhen\*

Key Laboratory of Crop Biology of China/Agronomy College of Shandong Agricultural University, Taian, Shandong 271018, China

摘要

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**摘要** 在大田试验条件下, 以鲁棉研28号为材料, 设置两个施钾量 (K<sub>2</sub>O 100和150 kg/hm<sup>2</sup>), 采用一次性基施、1/2基施、1/2花铃期追施, 研究施钾量和施钾时期对棉花 (*Gossypium hirsutum* L.) 产量及不同部位棉铃纤维品质性状的影响。结果表明: 与不施钾相比, 施钾显著提高了籽棉产量和皮棉产量; 在施钾量为K<sub>2</sub>O 150 kg/hm<sup>2</sup>的条件下, 与一次性基施相比, 分期施钾极显著提高了籽棉产量和皮棉产量; 采用分期施钾时 (1/2基施、1/2花铃期追施), 随施钾量增加, 籽棉产量和皮棉产量均显著增加, 单株成铃数的增加是产量提高的主要原因。结果还表明, 与不施钾相比, 施钾显著提高了中部及上部果枝内围果节的马克隆值, 分期施用K<sub>2</sub>O 150 kg/hm<sup>2</sup>显著提高了中部果枝外围果节的纤维长度、比强度以及中部果枝内围果节的纤维成熟度; 在施钾时期相同的条件下, 增加施钾量对纤维长度、比强度无显著影响, 在施钾量相同的条件下, 与一次性基施相比, 分期施钾对纤维比强度无显著影响。

**关键词:** 棉花 施钾量 施钾时期 产量 纤维品质

**Abstract:** Recently, as modern cotton (*Gossypium hirsutum* L.) varieties including Bt (*Bacillus thuringiensis*) transgenic cotton are adopted, premature senescence caused by potassium (K) deficiency has become an important problem in cotton production in the Yellow River Valley of China. The objectives of this research were to determine the effects of rate and time of potassium application on cotton yield and fiber quality at different fruit positions. Field studies were conducted in 2009 and 2010 using the cotton cultivar, Lumianyan No. 28. Potassium rates of K<sub>2</sub>O 0, 100 and 150 kg/ha was applied as basal dressing and as 1/2 basal dressing and 1/2 top-dressing at the blossoming and boll forming stages. Data collected in the two years indicate that the application of potassium produces significant differences in seed cotton yield and lint yield compared with the untreated control, respectively. When the K application rate is 150 kg/ha, the split application of K produces significant higher seed cotton yield and lint yield compared with the basal application, respectively. When the fertilizer K is 1/2 basal-applied and 1/2 top-dressed at the blossoming and boll forming stages, seed cotton yield and lint yield are significant increased with increases of the K application rate, respectively, and the influence of K on the number of bolls per plant is the key reason for the increase. The results also show that the micronaire values in middle and upper fruit branches and inner nodes under the K application are significant increased compared with the untreated control. Split application of K<sub>2</sub>O 150 kg/ha produces significant higher fiber lengths, fiber strength in middle fruit branches and the outer nodes and fiber maturation in middle fruit branches and inner nodes compared with the untreated control, respectively. Moreover, at the same K application time, there were no effects on fiber length and fiber strength with the increase of K application, respectively. At the same K application rate, there was no significant difference in fiber strength between basal application and split application.

**Keywords:** cotton potassium application rate potassium application time yield fiber quality

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Corresponding Authors: 李宗泰 Email: lizongtai2005@126.com

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