



外源激素对棉花前期生长发育的影响

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Effect of Exogenous Hormones on Cotton (*Gossypium hirsutum* L.) Growth and Development during the Early Growth Period

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摘要

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摘要 以鲁棉28为材料, 在大田条件下设置吲哚乙酸 (IAA) 5 mg·L⁻¹、10 mg·L⁻¹、6-苄基腺嘌呤 (6-BA) 50 mg·L⁻¹、100 mg·L⁻¹、赤霉素 (GA) 20 mg·L⁻¹、50 mg·L⁻¹ 6个不同浓度水溶液处理, 以清水为对照, 在苗期至蕾期叶面喷施3次, 研究外源激素对棉花前期生长与发育的影响。结果表明, 外源激素处理后, 棉花主茎纵向生长速度缓于对照, 茎粗大于对照。50 mg·L⁻¹ GA处理的棉株出叶速度、单株叶面积高于对照。6个处理的棉株主茎功能叶叶绿素SPAD值均高于对照。不同浓度IAA、GA处理均促进棉花现蕾, 其中20 mg·L⁻¹ GA处理棉花单株现蕾数多于对照。本试验条件下, 苗期叶面喷施IAA和GA能协调棉花营养与生殖生长, 促进蕾的发育, GA处理效果优于IAA处理, 其中20 mg·L⁻¹GA效果最佳, 6-BA处理未能促进棉花现蕾。

关键词: 外源激素 叶面喷施 棉花 生长发育

Abstract: Field experiment was conducted to study the effect of exogenous hormones on cotton (*Gossypium hirsutum* L. cv SCRC 28) growth and development during the early growth period. Six different concentrations of three exogenous hormones were designed, which were heteroauxin (IAA) 5 mg·L⁻¹ and 10 mg·L⁻¹, 6-benzyl adenine (6-BA) 50 mg·L⁻¹ and 100 mg·L⁻¹, gibberellin acid (GA) 20 mg·L⁻¹ and 50 mg·L⁻¹, with water as control, for foliar application three times from seedling stage (6-7 true leaves) to squaring stage. The results showed that the vertical growth rates of main stem of cotton plants with six different concentrations of exogenous hormones by foliar application during seedling stage were all slower than those of control. Diameters at cotyledonary node of main stem of cotton plants with six exogenous hormones treatments were greater than those of control. The growth rates of leaves of cotton plants were significantly speeded up by treatment of 50 mg·L⁻¹ GA, with the leaf areas of whole plants increasing significantly. SPAD values of chlorophyll in functional leaves (4th leaf from the top) of cotton plants with six different concentrations of exogenous hormone treatments were significantly higher than those of control. Treatments with different concentrations of IAA, GA promoted the development of bud of cotton plants, and the treatment of 20 mg·L⁻¹ GA achieved marked effect. The results above showed that in the experimental conditions vegetative and reproductive growth of cotton plant could be coordinated and buds could be better developed from seedling stage to squaring stage by foliar spraying IAA with concentrations of 5 mg·L⁻¹, 10 mg·L⁻¹ or GA with concentrations of 20 mg·L⁻¹, 50 mg·L⁻¹. Effect of GA was better than that of IAA, and effect of 20 mg·L⁻¹ GA was the best among 4 treatments. Treatments with 6-BA was noneffective to promote the development of buds.

Keywords: exogenous hormones foliar application cotton growth and development

Received 2013-03-14;

Fund:

公益性科研院所基本科研业务专项 (SJB1216); 国家棉花产业体系建设专项资金 (CARS-18-17)

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引用本文:

李鹏程, 董合林, 刘爱忠, 李如义. 外源激素对棉花前期生长发育的影响[J] 棉花学报, 2013, V25(3): 278-282

LI Peng-Cheng, DONG He-Lin, LIU Ai-Zhong, LI Ru-Yi. Effect of Exogenous Hormones on Cotton (*Gossypium hirsutum* L.) Growth and Development during the Early Growth Period[J] Cotton Science, 2013, V25(3): 278-282

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