

## 缩节胺(DPC)对干旱区杂交棉冠层结构及群体光合生产的调节

冯国艺, 姚炎帝, 杜明伟, 田景山, 罗宏海, 张亚黎, 张旺锋\*

石河子大学新疆兵团绿洲生态农业重点实验室/农学院, 新疆 石河子 832003

Dimethyl Piperidinium Chloride(DPC) Regulation of Canopy Architecture and Photosynthesis in a Cotton Hybrid in an Arid Region

FENG Guo-yi, YAO Yan-di, DU Ming-wei, TIAN Jing-shan, LUO Hong-hai, ZHANG Ya-li, ZHANG Wang-feng\*

The Key Laboratory of Oasis Eco-agriculture of Xinjiang Production Construction Group/College of Agriculture, Shihezi University, Shihezi, Xinjiang 832003, China

摘要

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**摘要** 在干旱气候生态条件下, 设置常规化调和轻量化调2种方式, 以常规棉品种为对照, 研究了不同剂量缩节胺(DPC)对杂交棉品种冠层结构及群体光合生产的影响。结果表明, 轻量化调下, 杂交种标杂A<sub>1</sub>和石杂2号棉株主茎第6及以上节间长度明显增加, 叶面积指数增大且生育后期下降较缓, 光截获量增加; 植株叶倾角增大, 叶片较直立, 冠层开度较大, 透光良好, 群体光合速率峰值高且高值持续期较长, 光合物质积累量明显增加, 皮棉产量显著提高。常规棉花品种新陆早13号和新陆早36号第6及以上节间长度变化不大, 叶面积指数峰值高但生育后期下降较快, 生育后期漏光损失严重, 群体光合速率下降, 产量显著降低。因此, 采用轻量化调, 有助于杂交种形成高光效冠层结构, 增强群体光合生产能力, 发挥其生长优势, 提高产量。

**关键词:** 化学调控 缩节胺 冠层结构 群体光合 杂交棉

**Abstract:** To investigate the effects of different concentrations of dimethyl piperidinium chloride (DPC) on canopy architecture and photosynthesis in two hybrid cotton varieties, we conducted an experiment with two levels of growth regulator compare with two traditional varieties. With mild growth regulator and in cotton hybrids Biaoza A<sub>1</sub> and Shiza 2, we observed a significant increase in internode length above the sixth internode which is the starting point of the canopy, a higher and slower decline in leaf area index, larger leaf angle, greater light interception, larger diffuse non-interceptance, and a higher canopy photosynthetic rate with longer duration. This meant that photosynthetic accumulation and yield increased significantly. In Xinluzao 13 and Xinluzao 36 the internode length above the sixth internode changed slightly, while the peak in leaf area was index higher, the diffuse non-interceptance was greater, leaf area index declined quickly and less light was intercepted, the group photosynthetic capability was significantly weakened, and the yield consequently decreased. The traditional growth regulator resulted in the deterioration of hybrid cottons' canopy structure, fall of the group photosynthetic capacity and yields. It showed that the mild growth regulator thus contributed to improve the efficiency of hybrid cottons' canopy structure and photosynthetic capability, and was thus beneficial for improved growth and cotton yield.

**Keywords:** growth regulation dimethyl piperidinium chloride canopy structure canopy apparent photosynthesis hybrid cotton

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Corresponding Authors: Zhwf\_agr@shzu.edu.cn

About author: 冯国艺(1982-), 男, 博士研究生, guoyi\_sg@163.com

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