

不同密度条件下油后直播棉冠层温度对生长发育的影响

孙巨龙,刘帅,崔爱花,胡启星,白志刚

(江西省经济作物研究所,江西九江 332105)

摘要: 采用随机区组试验设计,共设置 6 个密度处理:15 000 株·hm⁻²、37 500 株·hm⁻²、60 000 株·hm⁻²、82 500 株·hm⁻²、105 000 株·hm⁻²和 127 500 株·hm⁻²,全天监测棉花倒四叶温度及冠层温度,定期测定棉花各器官干物质质量、籽棉产量等农艺性状,探索不同密度条件下油后直播棉冠层温度对生长发育的影响。结果表明:赣早 5 号冠层温度随密度的升高而升高;与 2021 年相比,2022 年高温干旱条件下赣早 5 号整体营养生长更加旺盛,株高较高,棉花成铃更加均匀,脱落率较高,但单株结铃数明显下降。因此,土壤水分的补充是决定赣早 5 号正常生长的重要因素之一。本研究通过温度传感器量化目标叶片温度与冠层温度,结合棉株株式图调查,探索在不同密度种植中棉花株型的变化,为江西省油后直播棉合理密植提供理论支撑。

关键词: 种植密度;江西;油后直播棉;冠层温度;生长发育

The effect of canopy temperature on growth and development of directly seeded cotton after rape under different density

Sun Julong, Liu Shuai, Cui Aihua, Hu Qixing, Bai Zhigang

(Jiangxi Cash Crop Research Institute, Jiujiang, Jiangxi 332105, China)

Abstract: A randomized block design of experiments was used to set up six density treatments: 15 000 plants·hm⁻², 37 500 plants·hm⁻², 60 000 plants·hm⁻², 82 500 plants·hm⁻², 105 000 plants·hm⁻² and 127 500 plants·hm⁻². The temperature of the top fourth leaves and canopy of cotton were monitored throughout the day, and the dry matter of cotton organs, seed cotton yield and other agronomic traits were measured regularly to explore the influence of canopy temperature on the growth and development of directly seeded cotton after rape under different densities. The results showed that the canopy temperature of Ganzao 5 increased with the increase of density. Compared with 2021, under high temperature and drought conditions in 2022, Ganzao 5 had more vigorous performance overall vegetative growth, higher plant height, higher uniformity of cotton boll formation, and higher abscission rate. However, the number of bolls per plant significantly decreased. Therefore, the supplement of soil moisture is one of the important factors determining the normal growth of Ganzao 5. This study quantified the target leaf temperature and canopy temperature through temperature sensors, explored the changes in cotton plant architecture under different densities of planting, and combined with cotton plant pattern surveys. This provides theoretical support for the rational of planting density of directly seeded cotton after rape harvesting in Jiangxi.

Keywords: planting density; Jiangxi directly seeded cotton after rape harvesting; canopy temperature; growth and development