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种植密度对东北特早熟棉区棉花生物量和氮素累积的影响

王子胜[1,2]，吴晓东[2]，郭文琦[1]，徐 敏[2]，那艳斌[2]，张 雷[1]，周治国[1*]

1. 南京农业大学/农业部作物生长调控重点开放实验室, 南京 210095；2. 辽宁省经济作物研究所, 辽宁 辽阳 111099

Effects of Planting Density on Biomass and Nitrogen Accumulation in Cotton, Northeast China

WANG Zi-sheng[1,2], WU Xiao-dong[2], GUO Wen-qi[1], XU Min[2], NA Yan-bin[2], ZHANG Lei[1], ZHOU Zhi-guo[1**]

1.*Key Laboratory of Crop Growth Regulation*, *Ministry of Agriculture/ Nanjing Agricultural University*, *Nanjing* 210095, *China*; 2. *Liaoning Provincial Institute of Cash Crops*, *Liaoyang*, *Liaoning* 111099, *China*

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摘要 以辽棉19号（生育期125 d）和新棉33B（生育期135 d）2个生育期差异较大的品种为材料，于2007－2008年在东北特早熟棉区（辽宁辽阳，41 ° 26' N，123 ° 14' E）设置棉花种植密度试验（7.50万、9.75万、12.00 万株 · hm^{-2}），研究不同棉花群体生物量与氮素动态累积特征的差异及其与产量品质形成的关系。结果表明，棉花群体生物量和氮素累积动态随生育进程的变化符合“ S ”型曲线，棉花群体生物量和氮素存在异速累积现象，氮素累积快速起始期及终止期均较生物量累积提前10 d左右。2品种均以9.75 万株 · hm^{-2}密度下棉花生物量、氮素动态累积过程最为优化，皮棉产量最高，纤维品质最优；密度过高尽管群体生物量、氮素累积量较高，但经济产量下降。

关键词： 东北特早熟棉区 棉花 种植密度 生物量 氮素累积 产量 品质

Abstract： We investigated the effects of planting density on biomass and nitrogen accumulation of cotton, and the relationships with yield and fiber quality. A field experiment was conducted using cotton cultivars Liaomian 19 and NuCTON 33B in Liaoyang City, Liaoning Province (latitude 41 ° 26'N, longitude 123 ° 14'E), in 2007 and 2008. The general pattern of cotton biomass and nitrogen accumulation followed a logistic curve; planting density was able to change biomass and nitrogen accumulation, and subsequently influence yield and fiber quality. The beginning and end of the high speed accumulation stage for nitrogen was about 10 days earlier than that for biomass; indicating that nitrogen and biomass are not synchronously accumulated. Fiber yield and quality were highest at a planting density of 9.75 × 10^4 plants · hm^{-2} for both cultivars. This density also gave the highest speed of accumulation of cotton dry matter and nitrogen, the longest duration of acceleration period, and the highest yield. A reduction in fiber yield would be caused by planting with excessive density.

Keywords： northeast China early maturation cotton,planting density biomass nitrogen accumulation yield quality

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Corresponding Authors: giscott@njau.edu.cn

About author: 王子胜，男（1965-），博士，wangzisheng6666@126.com

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