

环割措施对棉花生长发育、产量及水分利用效率的影响

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Effects of girdling on growth, yield and water use efficiency of cotton.

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摘要

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摘要

分别于花铃初期和花铃盛期对棉花主茎及果枝进行环割,探讨环割对棉花生长发育、产量及水分利用效率的影响.结果表明:与对照处理相比,环割处理显著降低了棉花叶面积指数,且提前5~15 d达到峰值.环割处理降低了棉花蕾铃脱落率,其中花铃盛期采用主茎环割处理的蕾铃脱落率较对照降低15.8%.花铃盛期主茎环割处理显著提高了籽棉产量,较对照增产24.4%,水分利用效率较对照提高26.7%;花铃初期果枝环割处理的产量和水分利用效率亦有所提高,分别较对照增加13.9%和16.7%;而花铃盛期果枝环割处理对产量和水分利用效率的提高效果不显著;花铃初期主茎环割处理产量与对照差异不显著,水分利用效率略有降低.表明花铃盛期采用主茎环割可有效降低棉花蕾铃脱落率、提高产量及水分利用效率,实现高产、节水的有效统一.

关键词: 环割 棉花 生长发育 产量 水分利用效率

Abstract:

An experiment with girdling applied on the main stem and fruit branch during the early or flourishing stage of flowering and boll-setting was conducted to investigate the effects of different girdling treatments on the growth, yield and water use efficiency (WUE) of cotton. The results showed that compared with the control (CK), leaf area index (LAI) of girdling treatments reduced significantly and the maximum LAI of girdled cotton occurred 5-15 days in advance. Girdling reduced the shedding rate of squares and bolls significantly, and the shedding rate of squares and bolls with girdling applied on the main stem at the flourishing stage was 15.8% lower than that of CK. In contrast with CK, the seed cotton yield and WUE increased by 24.4% and 26.7% with girdling applied on the main stem at the flourishing stage, and increased by 13.9% and 16.7% with girdling applied on the fruit branch at the early stage, respectively. However, the girdling on the fruit branch at the flourishing stage improved the seed cotton yield and WUE insignificantly. The seed cotton yield with girdling on the main stem at the early stage had not significant difference and its WUE reduced slightly compared with CK. It has been concluded that the girdling applied on the main stem at the flourishing stage of flowering and boll setting could effectively reduce the abscission rate of squares and bolls, improve yield and WUE significantly, and realize the effective unity of high production and water saving.

Key words: girdling cotton growth yield water use efficiency.

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