

## Studies on Classification of the Leaf Systematic Quality and Leaf Area Distribution in Cotton

CHEN Yuan, GU Wan-rong<sup>1</sup>, WANG Ru-li<sup>2</sup>, CHEN De-hua<sup>1</sup>, WANG Yu-long<sup>1</sup>, WU Yun-kang<sup>1</sup>

(1. Agricultural College, Yangzhou University, Yangzhou 225009, China; 2. Agricultural Bureau of Yangzhou City, Yangzhou 225009, China)

**Abstract:** The lint yield has close relationship with constitute and function of the leaf in the plant of the cotton (*Gossypium* L.). The objective of this study was to investigate the characteristics of the leaf size, constitute, distribution, photosynthetic function, exported carbohydrates on boll size, boll retention and lint yield under different planting densities, strategy of nitrogen fertilizers, during the 1996 – 1997 cotton growing seasons at the Yangzhou University Farm, Yangzhou, Jiangsu Province, China.

In the 1996, three planting densities (42000, 48000 and 64000 plant · hm<sup>2</sup>) and two nitrogen fertilizer (300 and 375 kg · hm<sup>2</sup>) were designed to study the relationship between leaf area constitute and boll retention, lint yield under similar maximum LAI. The <sup>14</sup>C labeled and part of sympodium leaf cut were used to study the function and the carbohydrate export of different sympodium leaf with three potted cultivars (Simian No. 3, Sumian No. 5 and CCRI 12). Based on the 1996 results, in 1997 the

three different developing type of cotton population were designed with nitrogen fertilizer strategy to study leaf size, LAI distribution on the vertical distribution of sun light intensity in the three cotton populations. The results showed that the role of the sympodium leaf on boll retention, boll size and lint yield was different, the developed leaves after August 15 – 20 were not much photosynthetic products to the yielding organs, the sympodium leaf with opposite 10 days boll had higher photosynthetic intensity and exported more carbohydrates to the opposite boll. The leaves of the plant can divided into effective and ineffective leaves according to the site of the sympodium leaves on the plant; high efficient leaves and low efficient leaves according to the exist of the opposite boll. The smaller leaf and even LAI distribution made higher sun light intensity in the cotton population and higher lint yield. These conclusions suggest that increasing the ratio of the effective and high efficient leaf area, making smaller leaves and maintaining even leaf area distribution during boll developing stage were key characteristics of the leaf systematic quality for higher boll retention and lint yield.

**Key words:** cotton; high lint yield ; leaf systematic quality; effective and high efficient leaf area; leaf distribution