

Study on Heredity and Combining Ability of Earliness of Short Season Cotton

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Abstract: The 9×9 incomplete diallel crosses were designed between 7 short season, 1 middle mature and 1 late mature cotton varieties. The results showed that both dominant and additional effect played important roles in genetic characteristics for earliness and yield of short-season cotton, and the reaction between genetic effect and environment couldn't be neglected. These traits with high heredity, about 0.262~0.528, including growth and development stage, percentage of lint, boll weight, and percentage of cotton harvested before frost could be selected seriously in early generations. The percentage of lint and boll weight were affected no-significantly in different environment, in opposition to the first branch. But in a same place without environment effect, the heredity of the first branch

was high, about 0.244~0.652. So growth and development stage, percentage of pre-frost and the first branch were certainty to estimate earliness of short season cotton in a same cotton ecology region. In addition, general combining ability (GCA) of 4 varieties in 9 experimental materials for earliness was higher than that of other varieties, 16 crosses with high specific combining ability (SCA) for early maturity and yield were found in the incomplete diallel crosses. The heterosis of CCRI 36 \times Liaomian9, Liaomian10 \times CCRI 27, CCRI 10 \times Yumian 1 was significant, and the increment over their parents was 15% at least for yield of cotton harvested before frost. Therefore, the research indicated that earliness and high yield crosses were selected easily from the hybridized combination between short season cotton with high GCA for earliness and middle mature varieties with high GCA for yield.

key words: short season cotton; earliness; heredity; combining ability