GENETIC MEAN ANALYSES OF EARLINESS AMONG BRAZILIAN AND US UPLAND COTTON

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Abstract

The utilization of new cotton lines with improved earliness has always been an important breeding goal around the world. In Brazil, the boll weevil (Anthonomous grandis) has become a major pest of cotton, causing severe economic damage. In this country, the use of early-maturing cotton cultivars has been the major agricultural practice to reduce losses and such practice also allows planting of a second crop such as soybean after cotton. During the summer of 2011, six basic generations (P1, P2, F1, F2, BC1 and BC2) for each cross were generated and sown in a randomized block design with three replications in College Station, Texas. Experimental plots consisted of thirty five plants with measurements taken on five normally developing plants in each plot. Data were collected on: node first fruiting branch, first white flower, first open boll, vertical flowering interval, horizontal flowering interval, vertical maturation interval, and horizontal maturation interval. Tamcot CAMD-E was the best parent to get earlier materials. The additive gene effect was predominant for all traits studied in all populations indicating that genotypes with improved earliness could be identified through pedigree method and selection methodology. The interaction AD (Additive- Dominant) gene effect was significant only for D.F.O.B trait in population BRS 158 X CAMD-E. Earliness of crop maturity is an important objective in many cotton breeding programs, although the development factors that determine it are not completely understood. Early maturity is the end result of several growth and fruiting processes, or components which are interrelated, and which presumably can be manipulated separately in the breeding process (Godoy and Palomo, 1999). According to Bednarz and Nichols (2005) early crop maturity is probably a combination of several events. It seems likely that the greatest advances in early crop maturity can be made through modifications in flowering intervals, boll filling periods, or whole plant yield distribution. The development of new cotton lines with improved earliness has always been an important breeding goal around the world. In Brazil, the boll weevil (Anthonomous grandis) has become a major pest of cotton, causing severe economic damage. In this country, the use of early-maturing cotton cultivars has been the major agricultural practice to reduce losses and such practice also allows planting of a second crop such as soybean after cotton. The objective of the present work was to study the genetics and heritability for earliness using generation mean analysis (GMA) in cultivars with different maturity from Brazil and United States. These cultivars consisted of BRS 269 (cultivar), CNPA GO 2005-809 (inbred) and CNPA GO 2005-158 (inbred) from Brazil as well as three U.S. cultivars: Tamcot CAMD-E, PSC 355, and Acala 1517-99. Six basic generations (P₁, P₂, F₁, F₂, BC₁ and BC₂) for each cross were generated and sown in a randomized block design with three replications during the summer of 2011 in College Station. Texas. Tamcot CAMD-E was the best parent to get earlier materials. The additive gene effect was predominant for e traits in all populations indicating that genotypes with improved earliness could be identified through pedigree method and selection methodology. The effect AD gene effect was significant only for D.F.O.B in population BRS 158 X CAMD-E.

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