

ABSTRACT

The objective of the present work was to study the mode of inheritance for the only morphological character (Frego bract) as well as, heterosis, inbreeding depression, potence ratio, gene action, heritability, the expected genetic advance and relationship among traits for boll characteristics, earliness, yield and yield components and fiber quality in the three interspecific crosses. This investigation was carried out during 2001, 2002 and 2003 season on P₁, P₂, F₁, F₂, BC₁ and BC₂ generations for each of the three crosses at Giza experimental station. All cultural practices were made as usual. The results could be summarized as follows:

The inheritance of the frego bracts was a simple inherited character and controlled by single pair of recessive genes.

Negative and positive highly significant heterotic effects relative to mid and better- parents were found all characters in the three crosses except the first fruiting node in the three crosses, days to the first flower, days to the first boll opening, lint percentage in crosses II and III, and, fiber strength in crosses I and III .

Positive and negative highly significant inbreeding depression values were found for all crosses except days to the first boll opening, lint percentage and fiber strength in crosses I, III and fiber fineness in the three crosses.

Over dominance was observed for all studied characters in the three crosses except for boll diameter, days to the first boll opening and boll weight in the three crosses, bract length, days to the first flower, fiber fineness and fiber strength in crosses I and III, which their values showed partial dominance.

A, B and C (scaling test) values deviated from zero for all studied characters.

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All characters were controlled mainly by additive gene effects and the additive portion is greater than other effects. The dominance and epistasis genetic effects were also played an important role in the inheritance of these characters.

The relatively high and moderate heritability in broad sense were noticed for all characters in the three crosses except boll diameter and the first fruiting node in cross III. High and moderate heritability estimates in narrow sense were found for all characters in the three crosses except boll diameter and fiber strength in the three crosses, bract length, bract area, first fruiting node, days to the first boll opening, lint yield / plant, seed index, lint index, 50% S.L. and uniformity ratio in some crosses.

High and moderate expected genetic advance values were found for all characters except for boll diameter, fiber strength and uniformity ratio in the three crosses, bract length, bract area, bract width, earliness traits, seed index, lint index, 50% and 2.5% span length in some crosses.

Genotypic correlation coefficients were higher than phenotypic ones for some characters, indicating that environmental factor had depressed the phenotypic correlation estimates in such characters.

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