

Egyptian Cotton Breeding Program

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All the Egyptian cotton varieties belong to *Gossypium barbadense L.* Egyptian cotton breeding program is unique and depends on breeding pure progeny lines, therefore Egyptian cotton varieties have higher stability and continues for several years in common agricultural.

Cotton breeding research section CRI- ARC in Egypt is responsible for the production and breeding of cotton varieties .more than 80 cotton varieties were bred and introduced by artificial crossing followed by single plant selection from one generation to another accompanied by the selfing of flowers of the selected plants (Pedigree method).

Pedigree breeding starts with the crossing of two genotypes, each of which have one or more desirable characters lacked by the other and obtained the hybrid progeny of the first generation (F1). No selection is made within the plants of the first generation because they are genotypically the same.

The F2 generation:

The breeder planted about 500 plants wide spaced because the segregation is at the maximum and most of traits are quantitative characters. At the flowering time selection in the field depend on the plant type, earliness and boll size. After picking, selection in the Lab depends on, boll weight, lint percentage, fineness and fiber length and strength.

In F3 generation:

Selfed seed for each F2 selected plant is sown as individual plants (20 single plants) and natural seed of the same plants selected grown as a bulk family (3 rows). The selection process is done between families and then inside individual plants of the selected families. Selection eliminates undesirable families and individual plants which below in seed cotton yield.

In F4 generation:

Superior plants selected from F3 generation are grown as F3

generation and selection method reduce the number of families.

In F5 generation:

F5 is grown as F4, with selection of the superior plants and best families. By the F5 generation the pure-breeding condition (homozygosity) is extensive, and emphasis shifts almost entirely to selection between families.

In F6 generation:

Selfed and natural seeds of the individual plants selected in F5 are grown as the same in last generation and in addition to preliminary strain test yield trial A ,which is sown from F5 selected families seed which grown a bulk (five ridge, sown at normal spacing from the a natural seed of the parental plant) .selection process was done between bulk families, inside individual plants families and between strains in trail A.

In F7 generation:

Grown as F6 (single plants, bulk families and strains) for every selected family in addition to testing of the selected strains in the yield trail (Trail B) which grown in different locations. In this stage all levels of the breeding program are presented (single plants, families, preliminary strain test yield trial A and yield trails in different locations B).

In F8 generation: As in F7.

In F9 generation: As in F8.

In F10 generation:

If a new cross proves its superiority compared with commercial varieties in yield (trial B) it will be planted in isolated field and build the nucleus seed which is the source of pure seed (breeder seed).

Isolated field

In F10, the breeder selected 50 single plants from F9.

The selfed seed from 50 single plants are sown in isolated field in 50 families as individual plants. Isolated field for the new promising cross continue to long period nearly 5 - 6 years until the breeder seed could be planting in 5000 Acer. It's to be released as a new commercial variety.