Atelier : "précocité"

New early short season cottons for Egypt

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In the paper entitled *Cotton production in Egypt* presented to the Regional meeting held in Athens, Greece, 1984, it was indicated the cotton production in Egypt faces some constraints, notably the apparent delay by farmers in sowing cotton to gain a complete winter crop before cotton. Date of planting has been pushed back for at least one month beyond March, the optimum time for sowing. Egyptian varieties need at least seven months from March to October to mature.

Looking for earlier varieties has been one of the main objectives in Egyptian cotton breeding programme since the rise of scientific research on cotton in the early 1920's. Brown (1951) has listed three factors which bring about earliness :

1. time taken from sowing to appearance of first flower ;
2. time taken from sowing to peak of flowering ;
3. time taken from sowing to appearance of first boll.

The shorter the above three periods, the earlier will be the variety. Richmond and Radwan (1962) defined earliness as *the extent to which square initiation, flower occurrence, and complete boll opening occurs in relation to time of planting*. They used seven criteria for earliness but found that only two criteria gave significant differences among the means of four parent types used by them, *i.e.*, number of days from planting to opening of first boll, and ratio of weight of seed cotton harvested in the combined first and second picking to the total weight of seed cotton harvested expressed as a percentage.

A plan for breeding earlier and short season Egyptian varieties has been started five years ago. The first step was to provide the breeder with resources for earliness germplasm. The available resources are as follows :

1. **Early Egyptian varieties** : *e.g.*, Ashmouni, Menoufi, Dendera, Giza 72 and some other new strains were crossed to commercial Egyptian varieties in all possible combinations with intensive selection for earliness while maintaining the distinguished characteristics of Egyptian cotton varieties. Some of those crosses proved to be promising and showed to be about 10-15% earlier than the existing commercial varieties. Their yield is expected to be equal or slightly higher than the commercial varieties. The fibre quality has been maintained. The crosses (Giza 72 x Giza 78) and (Giza 66 x Giza 72) are examples for such lines.

2. **Lines descended from interspecific crosses** : A hybrid between the Egyptian cotton variety Giza 72 (*G. barbadense*) and the Delcerro variety (*G. hirsutum*) was backcrossed two times to the Egyptian parent. The product was stable, fertile and possesses some Upland characteristics such as earliness. These developed lines were crossed with Egyptian varieties and lines. The cross (Giza 72 x *Delcerro*) x (*Giza* 72 x Giza 67) is distinguished with high lint percentage plus a significant earliness. This new cross is in its fifth generation

and is evaluated under different localities. This cross matures in about 165 days compared with about 200 days for Egyptian varieties. The cross is characterized with a high lint percentage of about 38-42% and good fiber quality. The yield is expected to be high.

3. **Interspecific crosses** :
Short season and early mature Upland varieties are to induce earliness in Egyptian cotton varieties. Back-crossing to Egyptian cotton varieties were made for several times to evade sterility and to preserve the high quality of Egyptian varieties.

In 1980, a total of 28 crosses were made between seven Egyptian varieties and five Upland varieties. The F1's were backcrossed two times to the Egyptian parents with a severe selection for early maturing plants. After the two backcrosses, somes lines looked homogeneous and promising.

In this year 1986, all the promising families will be tested in yield trials under different localities. These interspecific crosses followed by backcrossing to Egyptian varieties yielded 29 lines which mature in about 160 days. One or more additional backcrosses to the Egyptian parent may be needed to acquire more stability. However, these lines are distinguished with high lint percentage.

4. **Introduction of early breeding stocks of *G. barbadense* :**
Few short season Russian varieties were crossed to some Egyptian extra long staple varieties attempting to develop short season varieties in the extra long staple category.

*** Measuring earliness**
The following methods are used in measuring earliness in breeding materials :

1. **Number of days from planting to first flower** :
This parameter proved effective when cotton is planted in the optimum time. In late planting, the differences in earliness among lines become narrow and less clear. Few lines were selected with less number of days from planting to first flower. Some of these lines proved to be 10-15 days earlier in flowering than the control.

2. **The node number of the first sympodium** :
The lower node of the first fruiting branch is a good indication for earliness and has a high genetic heritability. Some lines are selected with lower fruiting branch than the standard Egyptian varieties by 1-2 nodes.

3. **The ratio between the first pick and the total yield** :
The percentage of the first pick to the total yield is the most common way for estimating earliness. This method may not be reliable when selection is conducted within early lines.

4. **Flowering and bolling curves** :
Flowering and bolling curves help in studying the earliness behaviour.

Good progress was achieved in selection for earliness. All our new varieties require about seven months or less from the date of planting till picking time, whereas the Sahel of 1920 required nine months. This earliness has a great effect on the protection of the cotton crop from the ravages of insects, especially the pink bollworm.

It may be of interest to mention that besides earliness, boll size and lint percentage are being sucessfully increased through the phenomenon of transgressive segregation in the progenies of intervarietal crosses.