

**EFFECT OF LOCATIONS AND GROWING SEASONS
ON PERFORMANCE AND STABILITY OF SOME
EGYPTIAN COTTON GENOTYPES FOR
AGRONOMIC, FIBER AND SPINNING
QUALITY TRAITS**

By

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M. Sc. Agric. Sc. (Agronomy), Cairo University, 2009

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ABSTRACT

Eman Rashwan El-Sayed Abd El- Rahman: Effect of Locations and Growing Seasons on Performance and Stability of some Egyptian Cotton Genotypes for Agronomic, Fiber and Spinning Quality Traits. Unpublished Ph. D. Thesis, Department of Agronomy, Faculty of Agriculture, Ain Shams University, 2016.

The present research was conducted to evaluate performance and stability of six cotton genotypes included two long staple (variety Giza86 and promising strain 10229 \times Giza86) and four extra-long staple (Giza88, G92, promising strains; Giza77 \times Pima S6 and G84(G70 \times 51b) \times P62. These materials were evaluated for seed cotton and lint yields (k/f) as well as yield components - fiber and yarn traits: fiber length (mm), fiber strength(g/tex), fiber maturity ratio (%), fiber brightness and yellowness as well as single yarn strength (cN/tex), yarn elongation and yarn evenness with two spinning systems (ring and compact). Experiments were planted in four locations of the middle and north Delta during the years of 2011 and 2012. Analysis of variance showed highly significant differences for each of year (Y), location (L) and genotype (G) for all traits suggesting the presence of wide range of differences among genotypes and locations. The first order as well as the second order ($Y \times L \times G$) interactions were significant for all studied traits except ($Y \times G$) with seed cotton and lint yields.

The overall mean performance for varieties and lines across the eight environments (4 locations \times 2 years) demonstrated that Gharbia location was superior to other locations in seed cotton and lint yields and Kafr El-Sheikh came in second rank followed by Damietta, while Dakahlia produced the lowest value. Damietta location was superior to other locations in fiber strength, fiber maturity, yarn strength and yarn elongation of both spinning system (ring and compact), while Dakahlia location surpassed the other locations in fiber length. Kafr el-Sheikh

location ranked second in the superiority of fiber and yarn traits in all governorates.

The long staple promising strain 10229 × Giza86 surpassed variety Giza86 in seed cotton and lint yields, fiber strength, degree of maturity and yarn strength of both ring and compact spinning. The extra- long staple G84 (G70×51b) × P62 recorded the highest seed cotton and lint yields followed by variety Giza 92. Variety Giza 92 surpassed all other genotypes in fiber maturity, fiber strength and yarn strength of ring and compact spinning, while variety Giza 88 showed superiority in fiber length followed by strain Giza 77 × Pima S6.

The compact spinning system was superior to the traditional ring spinning in single yarn strength and improved yarn evenness for all genotypes under various environments. The results of phenotypic stability revealed that the promising extra - long staple strain G84 (G70×51b) ×P62 had the highest seed and lint cotton yields, regression coefficient equals to one and the deviation from the regression line did not significantly deviate from zero, so it is characterized by high yield, good stability and convenience for all environments. The strain 10229 × Giza86 (long staple category) had the highest seed and lint yield and adaptability to different environments. Therefore, these two promising strains are recommended to be developed as new elite cultivars.

Key words: Cotton yield, Fiber, Yarn, Environment, Phenotypic stability, Adaptability

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