ABSTRACT

The present work was carried out to study the possibility of inducing variation in some Egyptian cotton populations using gamma rays. Giza 86 (P1) variety and the promising variety (P2) resulted from the hybrid (Giza 89x Pima-S6) were grown and crossed in 2000 season to obtain F1 seeds. In 2001 season, seeds of P1, P2 and F1 were divided into two portions; one was planted without irradiation and the other was exposed to gamma irradiation at the rate of 15Kr and then planted. Crossing was again made between P1 and P2 irradiated and unirradiated both as male or female parents, and in the same time, selfing was made on both unirradiated and irradiated F1 plants to obtain F2 seeds. In 2002 season, 18 populations were grown, and different characters for earliness, yield and fiber quality were measured.

Differences between each to corresponding means, induced variances, heritability, heterosis and correlation were computed. Also, skewness and kurtosis of the induced variation were evaluated.

In M1 generation, significant increase in mean for boll weight in P1M1 compared with P1. Significant increase in variance of boll weight and lint percentage was found in irradiated populations compared with unirradiated populations. Significant positive heterosis % was found in F1 in lint percent. Heritability values were more than 70% in boll weight and lint percentage in P1M1, P2M1 and F1M1.

In M2 generation, significant differences were found in mean and variance in the treated parents compared with normal parents more than the other populations. Significant increases were found in G.86 (P1) irradiated or unirradiated when used as a female parent in means and variances for number of bolls per plant, seed cotton yield per plant, boll weight, lint yield per plant, seed index and uniformity ratio, while, significant decrease were found in G.86(P1) irradiated or unirradiated when used as a male parent in means and variances for earlinesss characters and fiber fineness.

Significant negative coefficient of skewness were found in P1M2 (when plants selected for boll weight) for number of days to first flower, number of days to first boll opening and fiber fineness, as well as, in P1M2 (when plants selected for lint percent) for first fruiting node, and in P2M2 (when plats selected for boll weight) for number of days to first flower and fiber fineness., as well as, in P2M2 for fiber fineness. Significant positive coefficient of skewness were found in P1M2 for number of fruiting branches per plant, seed cotton yield per plant, boll weight, lint yield per plant and lint index, and in P1M2 (when plants selected for lint percent) for number of bolls per plant, seed cotton yield per plant, boll weight, lint yield per plant, lint percentage and seed index.

Moment coefficient of kurtosis was more than three (of leptokurtic) in P1M2 (when plants selected for boll weight with regarding to number of fruiting branches per plant, seed cotton yield and lint yield per plant, and in P1M2 (when plants selected for lint percent) for plant height, number of bolls per plant, seed cotton yield per plant and fiber length, as well as, in P2M2 (when plants selected for boll weight) with regarding to seed cotton yield per plant, lint yield per plant, lint index and uniformity ratio, and in P2M2(when plants selected for lint percent) for first fruiting node, plant height, number of fruiting branches per plant, seed cotton yield per plant, lint percentage and uniformity ratio.

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