

ABSTRACT

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This study was carried out during the summer seasons from 2000 to 2003 at Kaha Horticultural Research Station, Kaluabia governorate. Three F_2 populations, obtained from three F_1 commercial hybrids by selfing, were continuously selfed for three successive generations (F_3 , F_4 and F_5) to obtain five inbred lines from each population to be compared with Castlerock (a true breeding cultivar). The used experimental design was a randomized complete blocks design, with three replicates.

Data were recorded on plant height, number of main branches/plant, earliness of flowering, early yield, marketable yield, total yield, fruit shape index, fruit weight, fruit firmness, number of locules per fruit, flesh thickness, T.S.S., fruit pH and ascorbic acid content. The inbreeding depression (I.D.%) was determined for the above mentioned characters and the correlation between the studied characters was calculated. In addition, molecular markers were used, for identification of the studied genotypes and selected populations.

Results indicated that insignificant differences were obtained between F_1 and F_3 for all characters of the three populations. The estimated percentage of I.D.% in the F_3 for total yield were 12.3%, 18.2% and 7.5% for Dora, Petopride2 and Rocky populations, respectively. Positive and negative inbreeding depression values were calculated for the tested characters between F_1 hybrids and some F_4 or F_5 generations. Results showed clearly that the detected differences among the selected populations in the F_4 or F_5 and Castlerock appeared insignificant. Moreover, the best lines of the selected populations were found to be L_2 and L_4 of Dora, L_4 and L_5 of both Petoprids2 and Rocky.

The results showed that significant positive correlation coefficients were detected between total yield and each of plant height, early yield, marketable yield and flesh thickness.

Results of molecular markers indicated the presence of differences between all selected five lines and their original F₁ hybrid, in the three tested populations in number of bands and band sites when they were tested by the two primers OPC-13 and OPD-11.

Key words: Tomato, F₁ Hybrid, F₃, F₄, F₅, Inbreeding depression, Yield, Fruit quality, Molecular markers.

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