

## ABSTRACT

Field experiments included 4 cultivars and 3 local inbreds of tomato (*Lycopersicon esculentum* Mill) were tested in 3 years (2002,2003 and 2004) in a full diallel crossing. Parents and F1's were planted along with the check "Jenan" under plastic tunnels in Dila governorate. An (R.C.B.D.) of 3 replicates was used for 3 consecutive seasons.

The objectives were to evaluate the best parent to develop an elite hybrid, and to study some genetic parameters by using first method of fixed model (Griffing 1956 b). Results obtained showed significant differences among parents and crosses. The cross (Special Pack X SL3) outyielded other crosses in no. of branches/plant, leaf no., leaf area and fruit yield (190.45t/ha). However the cross (SL3 X LL1) outyielded other crosses in stem thickness, raceme no. /plant, floret/raceme and no. of fruit/plant (average of 122 fruits). Meanwhile, the cross (Special Pack X WL4) was the best in early yield and fruit weight. The higher value of fruit hardness was obtained in the cross (SL3 X WL4) (8.24 kg/cm<sup>2</sup>), while the higher TSS was found in the cross (Early Person X Super Queen).

In reciprocal crosses; the cross (LL1 X Early Person) gave higher fertility % no. of fruit /plant (124.2),plant yield (average 11.8 kg/plant which gave a yield of 196.1 t/ha and fruit hardness 8.86 kg/cm<sup>2</sup>).

However, the cross (Super Queen X Early Person) gave a positive hybrid vigor in fruit/plant, plant yield and total yield/ha. The cross (Special Pack X WL4) gave a significant and positive hybrid vigor in fruit weight, while there were results indicating cytoplasm effects in several traits. The mean of GCA & SCA of crosses were significant in both seasons. The SCA effects were also significant in several traits. The average degree of dominance was higher than one for most studied traits indicating the non-additive gene action

effect, other traits were controlled by additive gene action. Broad sense heritability was high for most of traits and the highest value was 99% for number of leaves, leaf area and early production, while the lowest value was 50% for number of days before flowering, while narrow sense heritability was high for early production (73%) and the lowest value was for dry material in leaves (3%). Ultimately, the crosses (LL1 X Early Person), (Special Pack X SL3) and (SL3 X LL1) seems to be promising for their high productivity parameters.