

## *ABSTRACT*

The present study was planned to assess the seven rapeseed genotypes P<sub>1</sub> (N.A 302), P<sub>2</sub> (Serw4), P<sub>3</sub> (N.A 278), P<sub>4</sub> (N.A 51), P<sub>5</sub> (N.A 355), P<sub>6</sub> (Serw6) and P<sub>7</sub> (Pactol) as parents in rapeseed crosses, to improve yield and some characteristics in the breeding programs. The seven genotypes were crossed in a diallel cross without reciprocals to study heterosis and combining ability in the F<sub>1</sub> generation for some agronomic traits, yield and its components as well as some chemical characters.

The study was carried out at Ismailia Agricultural Research Station, during 1999/2000 - 2000/2001 season .

Results indicates that the seven genotypes varied significantly in their performance from each other in most of the traits investigated. The variety (N.A 355) was found to be the earliest and the variety P<sub>7</sub> (Pactol) gave the highest no. of primary racemes per plant. As for yield and yield component P<sub>2</sub> (Serw4) was the best in seed yield/plant (26.26 gm), 1000 seed weight (11.43 gm) and seed yield kg/f. (975.86 kg)

As for chemical characters P<sub>4</sub> (N.A 51) gave the highest value for oil percentage (42.43%) while P<sub>1</sub> (N.A 302) was the best in protein percentage (22.56%).

Heterosis was studied in the F<sub>1</sub> generation and the increase was related to both mid-parent and better parents. Results showed that some crosses exhibited highly significant positive heterosis for yield and yield component. Heterosis recorded (72.18%) in the cross P<sub>1</sub>×P<sub>6</sub> (N.A 302 × Serw6) over the mid-parent for seed yield/plant (gm) and (54.47%) over better parent. For 1000 seed weight, the increase was (29.03%) in the cross P<sub>1</sub>×P<sub>2</sub> (N.A 302 × Serw4) over mid-parent and (22.27%) over the better parent. The cross P<sub>4</sub>×P<sub>5</sub> (N.A 51 × N.A 355)

had the highest value for no. of primary racemes and heterosis recorded (88.8%) over mid-parent and (65.6%) over better parent.

Mean squares for general combining ability (GCA) and specific combining ability (SCA) were highly significant for all the studied traits. The ratio of GCA/SCA variance varied regarding the character under study. The best general combiners were the variety P<sub>3</sub> (N.A 278) for earliness, and the variety p<sub>2</sub> (Serw4) for days to 100% flowering, plant height, seed yield/plant and seed yield/faddan. The genotype P<sub>4</sub> (N.A 51) was the best general combiner for 1000 seed weight, while the variety P<sub>5</sub> (N.A 355) the best general combiner for oil % .

On the other hand, some genotypes were good general combiners and proved to be also good specific combiners in crosses such varieties are P<sub>2</sub> (Serw4), P<sub>4</sub> (N.A 51), P<sub>3</sub> (N.A 278) and P<sub>6</sub> (Serw6).

It could be concluded that there is a good possibility to increase yield of Canola in Egypt through the pedigree method of breeding utilizing the additive gene effects controlling yield and other traits. On the other hand, there is also a possibility of utilizing the high heterotic effects in the F<sub>1</sub> hybrids by the production of hybrid Canola.

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