V. SUMMARY

Two field experiments were conducted during 1983 and 1984 seasons at the Agricultural Research and Experiment Center of the Faculty of Agriculture at Moshtohor, Zagazig University, Kalubia Governorate, Egypt.

The aims of this study were to determine the effect of weed control, nitrogen fertilizer levels, plant density and their interactions on growth, yield, yield components of Giza 2 maize cultivar and associated weeds.

Each experiment included 36 treatments which were arranged at random in a split-split plot design with four replications where plant densities(20,000, 24,000 and 30,000 plants/fad.) were distributed in the main plots, nitrogen levels (45, 90 and 135 Kg.fad.) were assigned to sub-plots and the sub-sub plots were alloted to weed control treatments (unweeded, hand-hoed, chemically treated maize by Gesaprim and Laddok).

The most important results could be summarized as follows:

A- Effect of plant density:

1. Densities differed significantly in ear length, number of kernels/row, ear weight, weight of grains/ear in 1983, leaf area of topmost ear and stand plants at harvest in 1984 and stem diameter in both seasons. Both the thin and the medium plant densities were higher in those characters than the dense planting, while the differences between thin and medium densities were almost insignificant.,

2. Plant population densities exhibited insignificant differences in number of days to 50% tasseling and silking in 1984 season and plant height, number of green leaves/plant, ear diameter, number of rows/ear, shelling percentage, 100-grain weight, hectoliter weight, grain and straw yields (ton/fad.) and N,P, K % of maize grains in both seasons.

3. Densities had no significant effect on dry weight of most weed groups in both smaples and seasons except on narrow-leaved group at 40-days from planting of the first season only.

B- Effect of nitrogen fertilizer levels:

1. Nitrogen levels affected significantly plant height, stem diameter, number of days to 50% silking in 1984. Nitrogen level of 90 Kg/fad. surpassed the two other levels in its effect on plant height and stem diameter but the higher nitrogen level (135. Kg/fad.) was superior in promoting early silking.

   Also, it produced significantly more green leaves/ plant.

   The differences in leaf area of topmost ear were insignificant between levels in both seasons, likewise the number of days to 50% tasseling in 1984 season.

2. Both ear length in the two seasons and shelling precentage in the first season were significantly affected by nitrogen levels. Nitrogen levels had significant effect on ear diameter, number of kernels/row, ear weight, weight of grains/ear, 100-grain weight and grain yield (ton/fad.) in 1984 season. Increasing nitrogen level from 45 to 90 and 135 Kg/fad. increased the grain yield by 34% and 37%, respectively.

   Stand at harvest, number of rows/ear, hectoliter weigth and straw yield(ton/fad.) were insignificantly affected by various nitrogen levels in both seasons.

3. There was no significant effect of nitrogen levels on N, P and K% of maize grain in both seasons of study.

4. Nitrogen levels had no significant effect on dry weight of most weed groups in both samples (at 40 and 60 days from planting) as well as seasons except on narrow-levaved group at the first sampling date of the first season only.

C. Effect of weed control treatments:

1. Weed control treatments affected significantly plant height, stem diameter, number of green leaves/plant and leaf area of tompost ear in both seasons and number of days to 50% tasseling and silking in 1984 season.

All weed control treatments significantly surpassed unweeded treatment in improving maize growth measurements, meanwhile hand hoeing and Gesaprim had the best effect on those characters.

2. Stand maize plants at harvest, ear length, ear diameter, number of rows/ear, number of Kernels/row, ear weight, weight of grains/ear, grain-and straw-yield (ton/fad.) were significantly affected by weed control treatments in both seasons.

Both chemical and mechanical weed control treatments improved most yield characteristics of maize.

Hand-hoed and Gesaprim-treated maize surpassed significantly Laddok-treated plots but the differences between hand hoeing and Gesaprim were almost insignificant in this respect.

Grain yield of treated maize was increased by 27 ; 105% for hand hoeing , 25; 96% for Gesaprim and 20; 77% for Laddok as compared with unweeded maize in 1983 and 1984 seasons, respectively.

3. N,P and K% of maize grain were insignificantly affected by weed control treatments in both seasons.

4. All weed control treatments exhibited significant effect on dry weight of broad -,narrow-leaved weeds and their total in both samples and seasons. It was clear that hand hoeing was more effective than Gesaprim on all weed characters in both seasons. Laddok proved to be very effective in controlling broad-leaved weeds.

Hand hoeing controlled 76; 65% and 81; 74% of total weeds at 40 and 60 days from planting in 1983 and 1984 sesons, respectively , whereas Gesaprim application reduced the total weeds by 54, 41% and 47, 39% in the two seasons. respectively.

On the other hand Labddok killed 71; 60% and 85; 88% of broad-leaved weeds of respective sampling dates and seasons.

D- Interactions effect:

1. The effect of the interaction between plant density and N levels had a significant effect on P% of maize grains in 1983 season, Other characters were not significantly affected by this interaction in both seasons. The highest P% (0.163%) in maize grain was produced by the medium N level (90 Kg/fad.) and the medium density (24,000 plants/fad.) while the highest density (30,000 plants/fad.) supplied by the same N-level produced the lowest P% (0.127%) of maize grain.

2. Only plant height in 1984 was significantly affected by the interaction of N. levels with weed control treatments. The tallest maize plants were produced under the fertilization by 90 or 135 Kg N/fad. and weedy treated with hoeing or Gesaprim , while the lowest N level resulted the shortest plants in unweeded maize plots.

3. The second order interaction of plant density, N - levels and weed control treatments affected significantly ear weight of maize in 1983 season and dry weight of

narrow-leaved weeds at 60 days from planting in 1984 season.

The highest value of ear weight(275.8 g) was produced by maize plants grown by 20,000 plants/fad. supplied with 135 Kg N/fad. and treated by Gesaprim, whereas unweeded maize supplied with the lowest N level of 45 Kg/fad and grown by medium density of 24,000 plants/fad. produced the lowest value of ear weight (196.9 g).

The lowest dry weight of narrow-leaved weeds(1.0g/m^2) was recorded by hand hoeing treatment fertilized with 135Kg N and growing under 20,000 plants/fad. While the greatest infestation of this weed group (12,9 g/m^2) was recorded in maize plots treated by Laddok and grown under a density of 20,000 plants/fad. and supplied with the lowest N level of 45 Kg/fad.

4. Plant population density and weed control treatments interaction had no significant effect on all studied characters of maize and weeds in both seasons.