VI. SUMMARY

Experiments were conducted under laboratory conditions in plant protection Dept. and under field conditions in the experiment station of the faculty of Agricultur e. Moshtohor, Zagazig University.

Kenaf Hibiscus cannabinus variety Giza 3 was used to study the side effect of some insecticides (endrin, dimethoate, mephosfolan, profenofos, chlorpyrifos, methomyl, cypermethrin and fenvalerate.

A soil free to a large extent from pesticide residues was used in the laboratory experiments.

Four insecticides were used under laboratory conditions to study the side effect of soil polluted by the above insecticides on germinotion, root and stem growth and on the chemical contents of kenaf plants.

The above insecticides were used at the rate of 10, 20, 40, 60, 80 and 100 ppm, as active ingredient.

Treated soils were placed in pots and were cultivated with 10 seeds of kenaf. Each pot was irrigated with 75% of soil field capacity. The pots were weighed every two days and the loss in water was compensated. After 10 days the percentage of germination was recorded. After 30 days the root and stem length were measured. Also the symptoms of damage to plants were recorded. For

chlorophyll and carotenoids determinations 0.4 gm. samples from the leaves were used. Samples were extracted by grinding in 85% aqueous acetone and a small amount of Ca CO_3 were added to acetone solution before grinding. The total chloroplast pigments were ditermined by spectrophotometer. The chloroplast pigments were calculated according to the equations mentioned by Arnon 1949 and Abdel-Haffez 1981.

Total phosphorous, potassium, total sugars (reducing and non reducing sugars), and total nitrogen were also determined.

Under field conditions, kenaf was cultivated in plots 1/200 feddan. The area consisted of nine treatments with three replicats for each.

Dimethoate, profenofos, chlorpyrifos, mephospholan, endrin, methomyl, cypermethrin and fenvalerate were tested at the rate of 1.0 kg, 2.0 kg, 2.1 kg, 2.25 kg., 3.75 kg, 1.35 kg, 0.3 kg, and 0.6 kg active ingredient respectively. Plants were treated with insecticides just before presowing irrigation. The standard agricultural treatments were followed.

After 9 weeks, samples were taken to measure root and stem length. Also the symptoms of insecticide damage on plants were recorded.

Same methods used before to determine chlorophyll, phosphorous, potassium, total sugars and total nitrogen were conducted in field experiments.

After the crop maturity the straw and seeds were weighed.

Results indicated that endrin, profenofos, methomyl and chlorpyrifos decreased the percentage of germination. Generally all the above insecticides decreased root growth Dwarfing was evident in all treatments. Chlorpyrifos and methomyl were the most harmful insecticides tested for root and stem growth. Endrin was the only insecticide which increased the stem length at all concentrations tested. Profenofos seems to be less effective than methomyl and chlorpyrifos. The phytotoxic effects appeared clearly in the methomyl treatments.

It appeared in the form as deleterious effects on the green parts. It took the form of a marginal browning of the edges of plant leaves.

Chlorpyrifos retarted the appearance of the 4th. and 5th. leaf. Endrin increased chlorophyll a and b at all concentrations tested. Methomyl and chlorpyrifos decreased chlorophyll a and b, while profenofos increased chlorophyll b and decreased chlorophyll a at doses more than 60 ppm.

Methomyl and chlorpyrifos also reduced carotenoids at all concentrations tested, while endrin increased carotenoids only at doses more than 20 ppm.

Low doses of profenofos (less than 40 ppm) increased carotenoids.

All insecticides tested increased the total soluble sugars except the high doses of chlorpyrifos (up 40 ppm).

While endrin increased the reducing sugar, it inhibited the non reducing sugar at all concentrations tested.

Methomyl was the only insecticide which increased both reducing and non-reducing sugar.

Profenofos increased the reducing and non-reducing sugar only at high and low dosages only, while at 20-60 ppm the sugar content was inhibited Chlorpyrifos increased the reducing sugar at high and low dosages while the same dosages decreased the non-reducing sugar. Endrin at all concentrations reduced the nitrogen contents. Chlorpyrifos at all concentrations tested increased nitrogen. Low concentration of methomyl and high concentrations of profenofos increased nitrogen content.

All insecticides tested at all concentrations increased potasium content except low doses (10-20 ppm) of methomyl/

Chlorpyrifos increased phosphorous content of the plants when used at rates less than 40 ppm, while all other insecticides tested reduced the phosphorous content.

Results under field conditions indicated that all insecticides tested inhibited stem growth except methomyl. They also inhibited root growth except mephosfolan and profenofos. All the tested insecticides reduced chlorophyll a, b and carotenoids in the plants.

Generally all tested insecticides decreased nitrogen, phosphorous and potasium contents of the plants.

All insecticides increased the reducing sugar except cypermethrin and fenvalerate but in the same time they decreased the non-reducing sugar except chlorpyrifos and cypermethrin.

Fenvalerate was the only insecticide which increased seeds yield. The percentage of decrease varied between 14.29 - 59.2%.

Methomyl was the only insecticide which increase straw yield (60.49%), the percentage of decrease in the other treatments varied between 2.88% - 74.07%.