SUMMARY

S U M M A R Y

Experiments were conducted under laboratory conditions in Plant Protection Dept. and under field conditions in the Experiment station of the Faculty of Agricultural Sciences, Moshtohor, Zagazig University.

Soil samples from Al-Amar village were used in these experiments. Samples were taken from field which was not treated by pesticide throughout the last 15 years.

For laboratory experiments, soil samples were treated with insecticides at rates of 10, 20, 40, 60, 80 and 100 ppm. Five kilograms of air dried soils were used for every experiment replicate. The equivalent concentration of insectcide was disolved in 250 ml acetone and the solution was sprayed using an atomizer. The treated soil was left for 24 hr. to get rid of acetone. Onion bulbs equal in diameter and weight were cultivated in the treated soil. The effects on root, green leaves development and flowering of the plants were recorded. Also the phytotoxic symptoms were recorded and Photographed.

Suspensions of chlrodane, endrin, mephospholan, methomyl and fenvalerate and colchicine were tested as water solution at concentrations, 10,20,40,60,80 and 100 ppm. Colchicine solution was used as control. Bulbs from the same variety, diameter, and weight were allowed to sprout. The number, length and the dry weight of the sprouted roots were estimated.

Cross sections in the treated sprouted roots were made after root killing and fixation. The stained cross sections were tested to study the side effect of these pesticides on the cell content.

Cytological and cytogenetic effects were also studied to show their effects on mitotic index and mitotic abnormalities.

Histochemical studies were carried out to study the side effect of some insecticides on the RNA and DNA synthesis in onion root cells .

Experiments were conducted also under field conditions to study the effect of these pesticides on crop

yield of a winter crop (broad bean) and a summer crop (cotton).

The following insecticides, triazophos, dimethoate, aldicarb, endrin, cypermethrin (in the case of broad bean), methomyl, fenvalerate, mephosfolan, profenfos and endrin (in the case of cotton) were used at the rate five folds of dose were recommended by the Ministry of Agric.

Results indicated:-

1- All onion bulbs gave green leaves after fifteen days of cultivation, while colchicine and fenvalerate retarted the appearance of green leaves.

2- The phytotoxic effects appeared clearly as a limited wilt and chlorosis in the tip of the leaves after treatment with mephosfolane at the rates of 60,80, and 100 ppm. Same results were obtained by methomyl at rates of 80 and 100 ppm. The degree of injury was increased with increasing concentrations.

3- After nine weeks from planting the flowers of onion plants had appeared only in mephosfolan and fenvalerate

at all concentrations except 10 ppm in the first and 10, and 100 ppm. in case of the second insecticide. Chlordane had nearly no effect.

4- Chlordane, fenvalerate and endrin decreased the numbers of roots sprouting four days after treatment. The percentage of decrease increased with increasing the concentrations. The other tested insecticides varied in their effect.

5- Chlordane and endrin decreased the dry weight of roots, while mephosfolan was somewhat less effective.

Methomyl increased the dry weight of the roots at all concentrations tested except 100 ppm. Fenvalerate increased also the dry weight except at concentrations 10 and 20 ppm.

6- In the case of colchicine treatment, tumours appeared at 2 to 3 mm., from the tips of the roots, while in the case of insecticides, tumours formations appeared in two different structures; tumourous throughout and terminal tumours.

7- Microscopic examination of transverse sections of treated onion root tips indicated that chlordane at the rates more than 40 ppm. slightly damage the pith layer forming a little gap. Most of the epidermis cells were distroyed. Mephosfolan damaged the vascular cylinder at all concentrations. The piliferous layer was also damaged. Methomyl destroyed the cortex layer and the pith layers. The following symptoms were clear in the case of fenvalerate, the destruction of both epiderm and cortex layer, hypertorophy and gaps in the root tissues.

8- Result indicated that all the insecticides at the different concentrations decreased the mitotic index.

9- The different abnormalities which were observed were, sticky chromosomes, fragment, briedge, break and gap. Also distributive or movement abnormalities were lagging chromosomes, polidy which included diploidy or polyploidy, multinuclate cells which included bi,tri and tetranuclus, and c-metaphase or distrubed cell.

10- All insecticides tested decreased RNA and DNA content.

11- Dimethoate, Triazophos, cypermethrin and aldicarb decreased the crop yield of broad bean, while endrin had nearly no effect.

Endrin, mephosfolan, profenfos, methomyl and fenvalerate increased the cotton yield.