SUMMARY

Experiments were conducted in the Faculty of Agriculture, Moshtohor to study the side effect of four chlorinated hydrocarbon insecticides (endrin, DDT, dieldrin and lindane) at different concentrations (5,10, 20 and 40 ppm) on germination and growth of both wheat and corn.

A sandy loam soil nearly free from pesticides residues collected from a newly reclaimed area in Salhia was used in this study.

The soil treated by different concentrations of the tested pesticides was planted with corn and wheat seeds and was irrigated with water to 75% of its field capacity.

Moisture content of the treatments were adjusted to be 75% of the field capacity by weighing the pots every two days and compensating the water loss.

The percentages of germination were recorded after 10 days. The roots and green parts of the tested plants were measured after 30 days of cultivation.

The absorption and translocation of the pesticides residues via the roots of the plants were also determined after 30 days of cultivation.

Insecticide residues levels through bread processing were also determined in grains, bran, flour and also on the final bread.

The chemical analysis of pesticide residues were conducted following the Universal method. GLC was used for the determination of these residues in both plants, soil, grains, bran, flour and also in bread.

232 samples from cereal grains and their product were collected from 11 governorates (Alexandria, Behera, Gharbia, Dakahlia, Sharkia, Kafre-El-Sheikh, Kalubia, Monofia, Cairo, Giza and El-Fayum).

These samples were wheat, wheat flour, wheat bran, maize, maize flour, millet, rice, paddy rice, rice bran, barley and bread.

All these samples were analyzed for pesticide residues in

the Institut für Lebensmitteltechnologie, Technische Universitat, Berlin.

The same methods which are used as a routine for pesticide residues analysis in this institute were used for the extraction, clean up and determination of pesticide residues.

Results indicated that the tested insecticides at all concentrations did not affect the percentage of corn and wheat germination.

All the tested insecticides decreased root growth of corn plants when cultivated in soil treated with pesticides at rates more than 20 ppm.

The maximum decrease in corn root growth (-30.8%) was recorded from soil treated with lindane at the rate of 40 ppm.

Endrin, DDT and dieldrin at the same rate enhanced slightly the root growth of corn plants. The same concentrations of the same insecticides tested hardly decreased the wheat root growth (-33.3%, -75.2% and 28.9% respectively).

Concentration of the tested insecticides at rates more than 10 ppm decreased the length of green parts of corn plants. Wheat plants were more sensitive to dieldrin and lindane than to DDT and endrin. All concentrations tested decreased the length of the green parts.

The phytotoxic effects of the tested insecticides appeared clearly in the case of wheat and corn plants as a limited wilt and chlorosis in the tip and edges of the leaves, specially at high rates (more than 20 ppm) in most treatments.

Lindane and endrin enhanced the dry weight of corn plants when cultivated at concentrations more than 20 ppm.

The dry weights of the wheat plants were decreased at all concentrations tested of dieldrin, while the other tested insecticides slightly enhanced the dry weight at concentrations more than 5 ppm.

Corn and wheat plants absorbed and translocated endrin, dieldrin, DDT and lindane residues from soil contaminated by the tested insecticides at concentration of 40 ppm.

Pesticide residues were detected in the plant root in levels higher than in green parts. Lindane headed all the tested insecticides in its absorption and translocation in both roots and green parts.

The concentrations in roots were higher (1.9 and 2.93 ppm) than in green parts (0.72 and 1.42 ppm) in the case of wheat and corn respectively.

The mean pesticide residues in wheat grain samples showed that grains contained 0.086, 0.138, 0.032 and 0.358 ppm of endrin, ΣDDT, dieldrin, and lindane respectively.

The wheat flour produced from these grains contained 0.008, 0.016, 0.020, and 0.030 ppm of endrin, ΣDDT, dieldrin, and lindane respectively.

Bran contained higher concentrations of endrin (0.012 ppm), ΣDDT (0.252 ppm), dieldrin (0.120 ppm) and lindane (0.536 ppm).

Pesticide residues levels in fresh bread were 0.002, 0.007, 0.010 and 0.016 ppm of the above insecticides respectively.

From 232 samples form cereal grain and their products, 19, 122, 20 and 3 samples contained residues of lindane, ΣHCH, ΣDDT and malathion higher than the acceptable residues limits in FRG.

More than 50% of the tested wheat samples contained more than the acceptable limits of ΣHCH, while from 54 maize samples only 10 samples contained high levels of the same compound.

High levels of ΣHCH and lindane were detected in 53.9% and 15.4% of the samples tested respectively.

Unacceptable residue levels of pesticides were detected in 100 %, 85.7 %, 81.8%, 80.0%, 66.6%, 63.00%, 60.0%, 50.0%, 50.0%, 36.3% and 24.6% of the samples from Cairo, Behera, Gharbia, Kafre El-Sheikh, Dakahlia, Sharkia, Giza, El-Fayoum, Alexandria, Monofia and Kalubia respectively.