SUMMARY

SUMMARY

The use of pesticides is an accepted practice in the modern agriculture. Although insecticides are used in smaller quanitities than the herbicides, they are generally much toxic to mammals. In the present study, an attempt to evaluate the effect of some insecticides (Sevin. Larvin and Lannate) on the densities of certain bacteria (azotobacter and denitrifying bacteria) in soil and on some soil properties, their degradation or detoxification is consequently important. The carbamate insecticides, Sevin, Larvin and Lannate were applied in (1 nad 10-fold of field recommended dose) glucose amended and unamended soil samples. Also, the effect of these insecticides on the biological activities of selected bacteria and their persistance were investigated and the results were as follows :

1- The total bacterial counts increased in both glucose amended and unamended and insecticide treated and untreated soil samples, reaching the maximum after 5 days incubation time and then decreased

2- In presence of Sevin, Larvin, and Lannate, the azotobacter counts increased by time recording the highest counts after 5 days incunbation, in both glucose amended and unamended soil samples and then decreased with time.

3- The denitrifing bacterial counts were high in glucose amended soil in the presence or absence of the tested insecticides.

4- The effect of the tested insecticide on the chemical properties of soil inoculated with microbs, glucose amended and unamended soil samples were investigated.

(a) No significant effect of all insecticides tested on the organic carbon of the clay loam soil along the experimental condition used.

(b) The highest values of $CaCo_3$ were recorded after one day in control samples as well as in the amended insecticide treated soil samples inoculated with microbs.

(c) The tested insceticides (Sevin, larvin & lannate) had no significant effect on carbonate contents..

(d) The bicarbonate contents recorded the highest values after one day incubation time in glucose amended and unamended and insecticide treated and untreated soil samples.

(e) The highest values of total soluble salts were recorded after one day of incubation only in glucose amended control as well as glucose amended insecticide treated soil samples.

5- Two nitrogen fixer organism were isolated, characterized and identified as *Azotobacter. chroococcum.* A_4, A_{15}

(a) The effect of Sevin, Larvin, and Lannate on the growth of the two *Azotobacter. chroococcum* strains was studied. Compared to control both Sevin and Larvin had negative effect on *Azotobacter . chroococcum* A_4 growth, while 150 µg/ 100 ml culture medium of Lannate stimulate growth of this organism after one day incubation. Using Sevin and Lannate at the tested doses after 15 days incubation time, the growth of *Azotobacter chroococcum* A_{15} was stimulated, while at Larvin dose of 500 µg/ 100 ml culture medium and after incubation periods of 1 and 10 days, higher growth rates of the organisms compared to control were recorded.

(b) The amounts of fixed nitrogen by *Azotobacter chroococcum* A_4 were increased after 5 or 10 days incubation time in the presence of the tested doses of

Sevin or the recommended dose of Larvin or Lannate.Compared to control, the amounts of fixed nitrogen by *Azotobacter chroococcum* A_{15} were high in the presnece of the recommended dose of the different time intervals tested. The insecticide Larvin at its tested dose and at the different incubation periods had a depressing affect on the nitrogen fixation by *Azotobacter chroococcum* A_{15}. On the other hand Lannate stimulate the nitrogen fixation by this bacterium when used at the recommended dose and 5-fold after 5 days incubation.

(c) Both Sevin, Larvin and Lannate at the field recommended dose stimulate the ammonical nitrogen production by *Azotobacter Chroococcum* A_4 where the highest amounts were recorded after 10 days incubation time. Also, The production of ammoniacal nitrogen by *Azotobacter chroococcum* A_{15} in the presence of the tested insecticides, follows the same pattern as in *Azotobacter chroococcum* A_4

(d) The amounts of amino nitrogen produced by *Azotobacter chroococcum* A_4 using the different doses of Sevin, Larvin and Lannate ,recorded their highest values after 5 days of incubation. On the other hand, using both Sevin and Larvin at 5-and 10-fold the recommended dose, the amino nitrogen production by *Azotobacter chroococcum* A_{15} was stimulated to levels higher than control at the different time intervals. Also, the insecticide Lannate stimulated the amino nitrogen produced by this bacterium at doses 5-and 10-fold the recommended dose after incubation periods of 5 days.

(e) The ascorbic acid production by *Azotobacter chroococum* A_4 was increased by using the doses of the insecticide Sevin and 5-fold the recommended dose of larvin and lannate after incubation period of 15 days. The ascorbic acid production by *Azotobacter chroococcum* A_{15} was increased by using of Sevin or Larvin at doses of recommended dose, 5-fold and 10-fold after 5 days incubation time. Using

Lannate at doses of 30 & 300 µg/100 ml culture medium after incubation periods of 1 and 5 days, respectively, the ascorbic acid production by this organism was increase.

(f) The production of IAA by Az. *chroococcum* A_4 and A_{15} reached its maximum using the various tested doses of Sevin, Larvin or Lannate after one day incubation time.

(g) The persistency of Sevin, Larvin and Lannate in cultures, inoculated soil samples and cell-free extract of *Azotobacter chroococcum* A_4 and A_{15} was investigated. The persistancies of the tested insecticides using *Azotobacter chroococcum* A_4 in culture medium, cell-free extract and inoculated soil samples were lower than those using *Azotobacter chroococcum* A_{15} by which higher values of insecticide residues were determined. Compared to each other, the insecticide Larvin was more stable than Sevin, and Lannate was the most labile one using both organisms under the experimental condition tested.