

THE EFFECTS OF INTERACTION BETWEEN BIO AND CHEMICAL PESTICIDES ON BIO FERTILIZATION OF WHEAT PLANTS

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Four experiments were carried out as well as isolation, classification purification of (*A.chroococcum*) bacteria . The first and second experiment were field experiment to study the effect of bio and chemical pesticides on biofertilization of wheat plants (*Triticum aestivum* L.) Tkai (1) as well as its effect on the microbiological properties in soil .

The third and fourth experiment were carried out at laboratory. Soil sample were taken from a wheat rhizosphere which treated and untreated with a mixed chemical pesticides in the second experiments for measuring minimum inhibitory concentration (MIC) by adding for level of mixed herbicide (Tobic + Logran) , twelve bacterial isolation . Growth and number of bacteria cells were calculated to get resistant local isolation for adding mixed herbicides.

1. Isolation and classification of Azotobacter :-

Seventeen Azotobacter isolate were taken from soil rhizosphere of different crops on Baghdad and Diyala governance .

The results of classification showed that all the (17) isolate belong to (*A.chroococcum*) species . The isolate (A17) was selected as local isolate and used as a biofertilizer in field experiments on the basis of its high activity and efficiency in nitrogen fixation by measuring fixed nitrogen concentrations .

2. Field experiments :-

Two field experiment were conducted on Muqadadyia , Diyala governance by using (RCBD) design in winter season (2002-2003) and each experiment was included (48) experimental units produced of (4) fertilizers treatment , (2) levels of chemical fertilizer NPK (50% and 100%) 2 levels of (bioagent and mixed of herbicide and (3) replication .

The results of current experiment revealed that application of fungal and bacterial biofertilizers in the form of single or dual application were significantly increased the dry weight and grain yield in the presence and absence of T-harzianum with mixture of chemical pesticide i.e. (Tobic + Logran) compared without addition of biofertilizers.

A significant increase in grain yield with adding dual biofertilizers as compared with the treatments of a single biofertilizers.

The highest grain yield was recorded by using bioagent (*T-harzianum*) with both level of chemical fertilizer and overall single and dual biofertilizers.

The highest grain yield value (3085.21) kg.ha⁻¹ was happened with the addition of duplicate biofertilization under (100%) of chemical fertilizer and this value not significant as compared with (50%) chemical fertilizer which is (3039) kg.ha⁻¹. The duplicate addition enhance the grain yield by (30% and 20.69%) and (23.07% and 18.1%) under the two level (50% and 100%) of chemical fertilizer with the addition and no addition of agent, respectively. Those on the interaction among *A.chroococcum*, *G-mosseae* and *T-harzianum* are positive.

Addition of chemical pesticide mixture a loss with respect to biofertilization caused non significant increase in grain yield for both levels of chemical fertilizer compared with no addition. Thus the duplicate addition of biofertilization caused increase (18% and 18.21%) with addition and non addition of chemical pesticide mixture respectively.

The biological groups were effected by addition of bio and chemical pesticide for all treatments and under the two level of chemical fertilizer. Addition of (*T-harzianum*) increased number of bacteria cells, fungal units of Trichoderma, spores and percentage of mycorrhiza infection compared with non addition for all treatment.

The highest number happened with the addition of duplicate biofertilizer compared with the single biofertilization. The duplicate addition caused increase (32.42% and 23.8%), (81.42% and 60.5%), (25.67% and 19.35%) and (24.83% and 28.57%) for in Azotobacter cell number fungal units of Trichoderma, percentage of infection and

spores number with the addition of (50% and 100%) of the chemical fertilizer respectively compared with no addition .

Addition of chemical pesticide mixture caused reduction bacterial cells number , mycohrizal infection percentage , and spores number compared with no addition for the treatment and both level of chemical fertilizer .

As increasing the level of chemical fertilizer for (50% to 100%) of the fertilizer recommendation caused reduction of bacteria cells number and mycohrizal infection percentage significantly for both experiments .

3.Laboratory experiments :-

two laboratory experiments were carried out with (RCBD) design . Each experiments were included (144) experimental units for each incubation period and comes of (12) bacterial isolation , (4) level of herbicide mixture and (3) replication five period of incubation (3,7,10,14,21) day were used for measuring (MIC) of growth and bacterial cells number .

The results showed that the isolation (I_1 , I_2 and I_3) which were taken from treatments of mixed pesticide considered as resistant local isolations to mixed pesticide compared with the isolations (I_4 , I_5 and I_6) which were taken from untreated treatment with mixed pesticide .

So the (MIC) of (I_1 , I_2 and I_3) isolation is (C3) for (3) days incubation and growth in all concentration for the period of incubation (7,10,14 and 21) days , while the isolation (I_4 , I_5 and I_6) was not recorded growth and numbers with (3)days incubation the (MIC) in (C3) for the incubation period (7,10,14 and 21) days .

The results also showed that the isolation (I_7 , I_8 and I_9) which were taken from treatments of pesticide mixture addition as considered resistant local isolation for mixture of pesticide compared with isolation (I_{10} , I_{11} and I_{12}) .