

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

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 f wheat plants (*Triticum estevium* 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 rhizospher 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 rhizospher of different crops on Baghdad and Dyiala 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 n nitrogen fixation by measuring fixed nitrogen concentrations .

2. Field experiments :-

Two field experiment were conducted on Muqdadyia , Dyiala 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 affected 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}) .

**THE ROLE OF VAM FUNGUS
(GLOMUS MOSSEAE)
IN
GROWTH OF WHEAT AND
CORN PLANTS**

Athesis

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BY

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Summary

Two Factorial experiments carried out in the woody shelter . These two experiments are the 16-week wheat experiment and the 8-week corn experiment that carried out in sterilized sandy loam soil . The two experiments conducted according to the (R.C.B.D.) design . The wheat experiment included 24 treatments resulted from the interaction between inoculation (inoculation and without inoculation) and Phosphorus with four levels (0 , 60 , 120 and 240 Kg P ha⁻¹) and Zinc with three levels (0 , 10 and 20 Kg Zn ha⁻¹) using three replication for each treatment . While the corn experiment included eight treatment resulted from the interaction between inoculation (inoculation and without inoculation) and Phosphorus with four levels (0 , 60 , 120 and 240 Kg P ha⁻¹) using three replication for each treatment .

At the end of The two experiments , The plants were taken to determine the effect of the vesicular arbuscular mycorrhizal fungus (Glomus mosseae) on the growth of wheat and corn plants and on the availability and absorption of Phosphorus and Zinc . The results have showed the following:

1. Inoculation with the Vam (G. mosseae) caused a significantly increase in the dry weight of the shoot and root . The percentage of infected roots with the fungus and the weight of mycorrhizal roots also significantly increased by inoculation . The inoculation with VAm also significantly increased the Phosphorus and Zinc concentration and total content of the shoot and root for the two experiments .

2. The added Phosphorus was significantly increased the dry weight of the shoot and root of wheat plant , on the other hand , the increasement in the dry weight of the shoot and root of the corn plant was not significant . While its effect was significant with Zinc concentration and insignificant with Phosphorus concentration of shoot and root . The added Phosphorus also affected significantly the total content of Phosphorus and Zinc of shoot and root of wheat plants . In corn experiment , the addition of Phosphorus had a significant effect on Phosphorus and Zinc concentration in the shoot and root ; However , it had no significant effect on the total content of Phosphorus and Zinc of shoot , but it had significant effect on their total content of root . The added Phosphorus reduced the fungus infection percentage of roots and the weight of mycorrhizal root for the two plants .
3. The VAM inoculation – Phosphorus levels interaction showed a significant effects on the weight of shoot , root and Phosphorus , Zinc concentration and total content of shoot and root of wheat plants . On the other hand , the interaction reduced the dry weight of shoot significantly and the dry weight of root of corn plants . The interaction had significant effect on concentration and total content of Phosphorus and Zinc of shoot , root and on significant in concentration Phosphorus of root .
4. The addition of Zinc levels had no significant effect on dry weight of shoot , but it had significant effect on the dry weight of wheat's root . It affected significantly the concentration and total content of Phosphorus and Zinc in the shoot and root of wheat plant . The

result showed that the increase in the Zinc levels had no significant effect on infection percentage and weight of mycorrhizal roots .

5. The interaction between mycorrhiza fungus and Zinc levels had no significant effect on dry weight of shoot and root of wheat plants and also on concentration and total content of Phosphorus in shoot . While the interaction had a significant effect only on concentration and total content of Zinc in the root .
6. The interaction between Phosphorus and Zinc was significantly affected the dry weight of shoot and root of wheat . while , it affected significantly the Phosphorus concentration of shoot and insignificantly the root , but it had significant effect on total content in shoot and significant effect on its total content in root . The interaction had a significant effect on Zinc concentration and the content of shoot and root.
7. The interaction effect between Phosphorus , Zinc and inoculation had no significant effect on the dry weight of shoot and root of wheat plants , but it had significant in effect on Phosphorus and Zinc concentration of shoot and a significant effect on Zinc and Phosphorus concentration in root . The interaction had significant effect on total content of Zinc in shoot , root and insignificant effect on total content of Phosphorous in shoot and root of wheat plant .

ملخصات البحوث

Effect of AM fungi Inoculation in Antioxidant Enzymes Activity in Corn and Sunflower plants under Salinity Condition .

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Abstract

A factorial experiment was conducted using a randomized complete block design (RCBD) in sandy loam soil plastic sacks to study the effect of fungus mycorrhiza under salt stress in promoting the growth and activity of antioxidant enzymes (CAT, POD, SOD) to maize and sunflower, as it included the two factor, (inoculation, and without inoculation) with a mixture of fungus mycorrhiza (*Glomus fasciculatum* + *Acoulospora laevis*) and salinity of the water drainage factor (0, 5, 10) ds.m^{-1} .

The results showed that the fungus mycorrhiza inoculation and all salinity levels led to a significant increase in leaf area, the percentage of chlorophyll total, fresh and dry weight of the shoot and wet weight of the roots of the plant maize compared to plants not inoculation, while led to increased insignificantly In all the traits of the sunflower.

The Activity of enzymes (CAT ,POD , SOD) in plants, maize and sunflower mycorrhizal is increased at the level of (5 ds.m^{-1}), but decreased at the high level of salinity (10 ds.m^{-1}). mycorrhiza inoculation and when all levels of salinity led to an increase in the of the Activity enzyme (CAT, POD, SOD) in maize and sunflower compared to non- inoculation, and recorded the highest values of the Activity of these enzymes in plants mycorrhizal and at the level of (5 ds.m^{-1}) and both plants compared to plants non mycorrhizal, mycorrhiza inoculation and at the level of (5 ds.m^{-1}) led to a significant increase in the Activity of the enzyme (CAT, POD, SOD) to corn and sunflower compared to non-inoculation and at the level of(zero ds.m^{-1}) .

Effect of organic fertilizer and EM1bio- fertilizer in leaves content of date palm offshoots varieties Al- Berhi and Khallas of some mineral elements.

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Abstract

Carried out the experiment in accordance with the design of randomized complete block (RCBD) in palm Mandali station / General Authority for palm - the Ministry of Agriculture in the growing season from 2013 to 2014 to study the effect of adding EM1bio- fertilizer, seaweed extract and gibberellic acid in leaf content of date palm offshoots varieties Al-Berhi and Khallas resulting from the multiplication histological agriculture of some mineral elements (Cl, Na, Ca, K, P, N).

The results showed that the addition of bio-enriched EMI , seaweed extract and gibberellic acid in single or mixed led to a significant increase in the percentage of the concentration of nitrogen, phosphorus, potassium and calcium in the leaves compared to treatment of comparison . Record the triple interaction (seaweed extract + gibberellic acid + bio-enriched EMI) a higher concentration of nitrogen, phosphorus, potassium, calcium significantly a superior to Single treatments and treatments interaction duo. Led interaction between the bio-enriched EMI, seaweed extract and gibberellic acid the cultivars Al- Berhi and Khallas in a single or mixed to a significant increase in the concentration of nitrogen and potassium, calcium, phosphorus in palm leaves and both cultivars compared to treatment of comparison . And record the triple overlap (seaweed extract + gibberellic acid + bio-enriched EMI), the highest concentration of nitrogen, phosphorus, and calcium and potassium for both cultivars.

Add the bio-enriched EMI and seaweed extract and gibberellic acid in single or mixed it led to a significant reduction in the percentage of sodium and chlorine concentration compared to the treatment comparison, And record interaction the triple (seaweed extract + gibberellic acid + bio-enriched EMI) lower percentage of sodium and chlorine concentration. The addition of bio-enriched EMI and seaweed extract and gibberellic acid and varieties and interaction between the two in a single or mixed led to a significant reduction in the percentage of sodium concentration and both cultivars compared to treatment of comparison . While it led to a significant reduction in the percentage of the concentration of chlorine to class Berhi and not significant for the class of Khallas exception of my treatment interaction duo (bio-enriched EMI + gibberellic acid) and triple interaction (seaweed extract + gibberellic acid + bio-enriched EMI), which led to a significant reduction

in the percentage of the concentration of chlorine class of salvation, recorded (seaweed extract + gibberellic acid + bio-enriched EMI) lower values of the percentage of chlorine and sodium concentration of both cultivars.

Effect of mycorrhizal fungi inoculation and seaweed extract spray on some growth characters and yield of cucumber *Cucumis sativus* L.
Faris M. Suhail

Abstract

A factorial experiment was conducted in green house in clay loam soil, according to randomized complete block design, to study the effect of seaweed extract applied as a foliar spray concentration (0, 1.0 , 2.5 , 4.0 , and 5.5) ml.l⁻¹ with or without mixture of fungus mycorrhiza (*Glomus fasciculatum* + *Acaulospora laevis*) on growth and yield of cucumber . The plant length, fresh weight , dry weight, percentage of total chlorophyll, leaf area, number of fruits, yield per plant and total yield was found maximum at 2.5 ml.l⁻¹ seaweed extract with fungus mycorrhiza compared to other concentration and increase significant (14.65 , 112.32 , 59.21 , 15.97 , 27.26 , 52.28 , 82.42 and 82.46 %) respectively .

The effect of bio and chemical fertilizers on growth and grain yield of wheat plants (*Triticum aestivum*)with and pesticide application .

F.M.Suhail

Abstract

Filed experiment was conducted to study the effect of bio and chemical fertilizers on the growth and grain yield of wheat with and without pesticide basamid application .

The result of current study showed that single or dual application of fungal (*Glomus mosseae*) and bacterial (*Azotobacter chroococcum*) fertilizer significantly increased the growth and grain yield and mycorrhiza percentage of infection with and without pesticide basamid applied .

The maximum grain yield was achieved with dual application of biofertilizers with level (100%) of chemical fertilizer with pesticide basamid application and this value was not significant without pesticide basamid , the maximum increased (32.26%) with level (100%) of chemical fertilizer without pesticide basamid application .

The dual application was achieved maximum mycorrhizal infection percentage (81%) with level (50%) of chemical fertilizer without pesticide basamid application .

Response of Azospirillum brasilense Bacteria to the Types and Concentrations of Different Salts

Faris Mohammed SUHAIL

Abstract. Carried out Two experiments laboratory in the Department of Horticulture - College of Agriculture Diyala University in 2011 to study the effect of salinity on the growth Azospirillum brasilense bacteria, as it included the first experiment salinisation of soil salt levels different (1.8, 4, 6, 8 and 10) ds.m⁻¹ for periods to incubation different (4, 8, 12 and 16) days, the results showed increasing levels of salinity caused a reduction significantly the numbers of bacteria. affected the periods of incubation affected significantly in the numbers of cells of bacteria. Gave period incubation (16) days on highest values for the numbers of bacterial cells. Was a significant effect of interaction in the numbers of bacterial cells, as it reached the highest numbers at the level of salinity (1.8) ds.m⁻¹ and at period incubation (16) days and gave the level (10) ds.m⁻¹ at period incubation (8) days lower the values Second experiment studied the effect of five salts (NaCl , Na₂SO₄ , MgCl₂.6H₂O , MgSO₄.7H₂O and CaCl₂.2H₂O), with six concentrations (0, 0.04, 0.08, 0.12, 0.16 and 0.20) Mole.L⁻¹ on the numbers bacterial cells Azospirillum brasilense, the results showed that increasing the level of salt reduced the numbers of bacteria cells a significant decrease irrespective of the type of salt. Mgcl₂ salt gave the highest numbers irrespective of the level of salt and not significant differences for salt (MgSO₄ , CaCl₂), while the salt gave (NaCl₂) lower the values followed by salt (Na₂ SO₄). That increasing levels of salinity affected significantly reduce the numbers of bacteria and all types of salts studied, as the salt (NaCl₂) and at (0.16) Mole.L⁻¹ did not record any growth of bacteria, and salt (Na₂ SO₄) did not record any growth at (0.20) ds.m⁻¹, recorded salt (MgSO₄) at (0.04) Mole.L⁻¹ higher values for the numbers of bacteria.