Plant Archives Vol. 20, Supplement 2, 2020 pp. 3995-4001 **e-ISSN:2581-6063 (online), ISSN:0972-5210**

THE EFFECT OF BIOFERTILIZATION POTASSIUM SPRAY, WATER STRESS AND PROLINE LEAF CONTENT ON SOME CORN *ZEA MAYS* L. GROWTH CHARACTERISTICS

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Abstract

A potting experiment was carried out in one of the greenhouses of the Faculty of Agriculture, Al-Qasim Green University for the spring season 2019-2018 to study bio-fertilization and potassium sprinkling in reducing water stresses and yellow corn growth in soil with clay-blended tissue that included three water stresses (90,70,50) as an exhaustion from Ready water in the soil, symbolized by the symbol (S3, S2, S1), respectively, and pollinated with a microscopic amount of 15 g and not pollinated and symbolized by the symbol (M1, M0) and the addition of potassium fertilizer sprinkled with a concentration of ppm3000, its symbolization in the symbol (K1) and the lack of spraying compared to its symbol (K0) Thus the number of transactions became 2*2*3=12 (12) with three iterations to count D. Experimental units (36) experimental units according to a complete random design (CRD). Yellow corn seeds were planted and during the growth stages, the height of the plant and the chlorophyll index were measured. After the harvest, the dry weight of the vegetable and root groups was measured. The leaf content of proline, fungi and bacteria preparation and nutrient concentrations were measured in K, P. , N in the soil, and the results were as follows: 1-Biochemical fertilization with mycorrhizas resulted in a significant increase in most growth characteristics represented by the dry weight of the vegetative and root complexes, plant height, and chlorophyll index. **2**-The potassium spray (K1) increased most of the growth characteristics of the yellow corn represented by the dry weight of the vegetative and root groups, plant height and chlorophyll index. **3**-The low water stress resulted in a significant increase in the growth factors represented by the dry weight of the vegetative and root groups, plant height and chlorophyll index.
***Keywords*:** bio-fertilization, water stress, potassium, sorghum.

Introduction

Bio Fertilizer A fertilizer that is associated with biological vaccines and plant extracts, or in other words, fertilizer that adopts microorganisms such as rhizobia and mycorrhizal fungi whose fungi play a major role in the formation and durability of soil clusters through the spread of fungal strands between the initial minutes of the soil and its clusters, as well as Its secretions are sticky, hydrophobic gum compounds such as clomaline, which collects and binds soil particles together, depending on the soil content of clay and organic matter (both quantity and quality). As soil pollination with mycorrhiza in the presence of organic matter and appropriate conditions will stimulate the development of the relationship between the host and the mycorrhizal fungus and then dense growth of fungus strands and their spread between soil particles and the formation of fixed soil clusters.

Potassium plays an important role in metabolic processes, protein synthesis, and osmotic regulation, and that the maintenance of the cytoplasm is related to the presence of potassium ion which is essential for plants in environmental conditions, especially in the case of high water tension, since the dissolved potassium in cells affects the water tension of cells and then increases the Efficiency of the plant to withstand water stress caused by drought (Hsiao and Lauchli, 1986). The process of gathering potassium in the guardian cells is the driving force of the process of opening and closing the stomata, since exposing the plant to watertight increases the formation of ABA, giving the roots signals to the vegetative group, and this acid works on the movement of potassium from the guardian cells, to the neighboring cells, and then the guardian cells shrink The stomata are closed, thus the transpiration process stops, which leads to the preservation of water inside the cells (Muhammad and Yunus, 1991). Given the importance of potassium fertilization due to the increase in the plant's need for it, especially with its age, because the released amounts of proven potassium are unable to meet the plant's need of ready-made potassium due to the slow release of the potassium installed in the soil. To reduce the competition between positive ions, especially sodium, present in high concentrations in a saline soil solution with potassium during the absorption process, adding potassium through leaves or foliar feeding is a successful alternative to terrestrial addition, that foliar feeding is one of the methods that leads to increasing the quantity and improving the quality of the resulting yield On adding fertilizers in the conditions that add to the fertilizers added to the soil.

Yellow corn *Zea mays* L. Among the important cereal crops, which ranks third in the world in terms of cultivated area and production after wheat and rice crops, the crop is grown for its high nutritional value for humans and animals alike, because it contains carbohydrates, proteins, oil, ores and mineral fibers, as well as containing it It has vitamins such as Vitamin A, Thiamine (B1) and Cobalamine (B12) and its introduction as a feedstock in many food industries such as starch, oil, etc. as well as being essential in the concentrated feed industry for poultry (Al-Yunus, 1993).

Aim of the study

1. The effect of adding mycorrhiza to reduce water stress.
2. Study the effect of potassium supplementation with foliar fertilization and its role in reducing water stress.

Materials and Methods

Site of the experiment

A field experiment was carried out in one of the fields affiliated to the Soil and Water Resources Department of the Faculty of Agriculture, Al-Qasim Green University in

Babylon Governorate during the spring season (2019-2018) to grow the yellow corn crop *Zea mays* L. in clayey soil according to the modern American classification (Soil Survey Staffe, 2006).

Experiment factors

- Sprinkling with potassium 3000 ppm and symbolizing it (K1), and when spraying and symbolizing it with the symbol (K0)
- Water stress treatments in mycorrhizae, which are depletion of 90%, 70%, and 50% of available water, which represent water stresses and are denoted by the symbols S3, S2, and S1.

Table 1 : Some fertile and biological characteristics of field soils before planting

	Property	Unit	Value
Available elements	Available nitrogen	$mg\ kg^{-1}$	35.22
	Available phosphorous		29.13
	Available potassium		158.95
Vital characteristics	Bacterial	Formation unit colony g dry $soil^{-1}$	10^6*30
	Fungi		10^3*28
	Bacterial and Fungi		3

Table 2 : Some chemical and physical properties of field soils before planting

	Property	Unit	Value
	pH		7.65
	EC	dSm^{-1}	3.05
	CEC	Cmol+kg^{-1} soil	22.50
	OM	g kg^{-1}soil	6.33
	Bulk density	mg g^{-3}	1.37
positive dissolved ions	Ca^{+2}	mmol L^{-1}	11.10
	Mg^{+2}		8.50
	Na^{+}		6.30
	K^{+}		0.80
Negative dissolved ions	SO_4^{-2}		12.50
	HCO_3^{-}		6.80
	CO_3^{-2}		Nil
	Cl^{-}		14.22
Soil particle	Sand	g kg^{-1}	220
	Silt		410
	Clay		370
Texture class			Clay laom
	Volumetric moisture content is at 33.0	cm^3cm^3	0.144
	Volumetric moisture content is at 1500		0.075
	available water		0.069

Properties

1. The height of the pot (cm)

The height of the plant was estimated immediately after the extraction by measuring the lengths of the main stems of one plant and from the soil surface level to the growing top of five plants randomly for each experimental unit. The final rate of length (cm) was extracted.

2. Chlorophyll guide

The chlorophyll tint was estimated using the SPAD502 chlorophyll meter (SPAD: soil plant analysis device) supplied by the Japanese company Minnotta.

3. Prolin content analysis

Measure according to method Bates *et al.*; 1973.

Results and Discussion

The effect of bio-fertilization and potassium spray, water stress and its interactions in

1. Dry Weight of Vegetable Total (g. Pot)

The results of the statistical analysis showed that each of the biological fertilization, spraying with potassium, water stress and their interactions had a significant effect on the dry weight of the vegetative group. From 32.75 gm. Pot to 33.36 gm. Potential with an increase of 1.9%, and the potassium spray effect resulted in a significant increase in the dry weight of the vegetative group if it increased from 33.61 gm. Pot to 34.90 g. Pot and with an increase of 3.83%. Water stress in the vegetative system It is noted from the same table that the effect of low water stress (S1) was distinguished in increasing the dry weight of the vegetative group g. Pot with the highest value of 33.75 g. Pot, while this value decreased at the two water stresses (53,52) with values of 30.64, 32.61

g. Pot for each of them sequentially, the results showed that the interaction of water stress with potassium had a significant effect on the dry weight characteristic of the vegetative group and that its highest value was when treating the interference S1K1 in which the dry weight of the vegetative total reached 34.00 g. Pot while the lowest value was when treating S3K0 interference of 30.49 gm. Potent two-way interference between water stress and mycorrhiza. He notes from the table that it was significant and gave the highest value of the dry weight of the vegetative group when treating the interference S1M1 which amounted to 31.84 gm. Pot and the lowest value for it was when the interference intervention S3M0 in which the value of the dry weight of the vegetative group reached an increase of 9.3.14 g. It is noted from the table itself (3) that the bilateral interaction between mycorrhizal and potassium had a significant effect in increasing the dry weight of the vegetative group and that its highest value was when treating the interference M1K1 which amounted to 33.90 g. Pot and that the lowest value was when treating the interference M0K0 which reached 32.14 Cloudy pot, with an increase of 5.5% while The treatment of triple interference between biological fertilization and potassium spraying and water stress of the table achieved the same significant increase in the dry weight of the vegetative group and that its highest value was when the triple interference S1K1M1 whose dry value of the vegetative group reached 32.69 g. Pot and the lowest value of this trait was when treating the interference S3K0M0 trio valued at 28.33 and an increase of 15.39%

Table 3 : Effect of biofertilizing and spraying with potassium ,water stress and weight of the root and vegetative total of the plant g.

Water stress x Mycorrhizae	potassium		Mycorrhizae	Water stress
	K_1	K_0		
31.62	32.50	30.75	M_0	S_1
31.84	32.69	31.00	M_1	
29.59	30.00	29.19	M_0	S_2
30.16	30.51	29.81	M_1	
29.14	29.95	28.33	M_0	S_3
29.5	30.00	29.00	M_1	
0.22	0.03		A.F. M.A. 0.05	
Mycorrhizae				
32.75	33.35	32.14	M_0	**Mycorrhizae x potassium**
33.36	33.90	32.81	M_1	
0.01	0.13		0.05 LSD	
Water stress				
33.75	34.00	33.50	S_1	Potassium x water stress
32.61	32.81	32.40	S_2	
30.64	30.79	30.49	S_3	
0.02	0.18		LSD 0.05	
	34.90	33.61	Potassium	
	0.59		LSD 0.05	

2. Dry Weight of Root Sum (g. Pot^{-1})

The results of the statistical analysis, Table (4), indicated that the effect of both biofertilization and potassium spraying, water stress and their interactions significantly affected the dry weight increase of the root population (gaseous) pot. G. Pot of non-pollinated (M0) to 14.21 g. Pot of treatment with inoculated with mycorrhizas that reached (M1) with an increase of 3.6%, and the effect of potassium has an increase in dry weight of the root system g. Pot of increased from 10.33 to 11.00 g. K0 to the treatment K1, either for the effect of interference between financial stress E and potassium have significantly affected the dry weight of the root system and that its highest value was when treating the K1S1 interference that reached 15.63 g Pot and the lowest value when treating and overlapping K0S3 that reached 13.95 $gAss^{-1}$ and with an increase of 12.0% for the effect of water stress In the dry weight attribute of the root system, it had a significant effect on this trait, and its highest value was at water stress (S1) whose value was 15.37 g. Pot^{-1} and the lowest value was at water stress (S3) whose value was 13.98 g Pot^{-1}, while it is observed from the same table that the effect of bilateral interference between mycorrhizal and potassium has affected Significantly in the dry weight attribute of the root system and that the highest value when treating the interference was K1M1, which amounted to 14.52 g. Pot^{-1} and the lowest value was when the interference was K0M0 which reached 13.33 g Pot^{-1}. As for the effect of the bilateral interaction between water stress and mycorrhiza, it affected the effect Significantly in the dry weight attribute of the total root $gaseem^{-1}$ and that the highest value for it was when treating and bilateral interference between water stress and mycorrhizal M1S1 with a value of 11.23 $gPot^{-1}$ and the lowest value was when treating bilateral interference M0S3 with a value of 9.95 g Pot^{-1} at a rate of 12.86%, as noted in the same table that the triple effect between biological fertilization and potassium spraying and water stress affected a significant effect on increasing the dry weight characteristic of the root total of the yellow (gm Pot^{-1}). Its highest value was when treating the interference Triple M1K1S1 which amounted to 11.96 $g.Ass^{-1}$ and the lowest value when treating interference M0K0S3 was 8.69 $g.Ass^{-1}$, with an increase of 37.63%.

Table 4 : Effect of bio-fertilizing and spraying with potassium, water stress and water stress and their interactions on the dry weight of the root system (gm Pot^{-1}).

Water stress x Mycorrhizae	Potassium		Mycorrhizae	Water stress
	K_1	K_0		
10.75	11.36	10.13	M_0	S_1
11.23	11.96	10.50	M_1	
10.16	10.50	9.81	M_0	S_2
10.77	11.53	10.00	M_1	
9.95	11.22	8.69	M_0	S_3
10.14	11.33	8.95	M_1	
0.30	0.25		0.05 LSD	
Mycorrhizae				
13.72	14.10	13.33	M_0	Mycorrhizae x Potassium
14.21	14.52	13.90	M_1	
0.05	0.13		0.05 LSD	
Water stress				
15.37	15.63	15.10	S_1	Water stress x Potassium
14.90	14.92	14.88	S_2	
13.98	14.00	13.95	S_3	
0.95	0.31		0.05 LSD	
	11.00	10.33	Potassium	
	0.02		LSD 0.05	

Height of plant (cm)

The results of statistical analysis showed in Table (5) that the effect of bio-fertilizing and spraying with potassium, water stress and their interactions significantly affected the characteristic of the height of the yellow corn plant (cm) and that the effect of bio-fertilization was significant in this trait as it reached its highest value when treating M1 which reached 91.64 Cm compared to the unfertilized treatment, which amounted to 89.16 cm and an increase of 2.9%. As for the effect of potassium spraying, the spray treatment (K1) significantly affected the increase in the characteristic of the yellow corn plant height and gave the highest value of 90.8 cm compared to the transaction K0 which amounted to 88.20 cm, It is also noted from the same table that the stress of water stress t A significant effect on the characteristic of yellow corn height (cm) and that its highest value was when treating water stress (S1) which amounted to 97.81 cm compared to the water stress factors (S2) and (S3) whose value was 93.15 and 81.50 cm each, respectively. It is also noted from the table that the bilateral interactions between water stress and potassium have significantly affected the characteristic height of the yellow corn plant and that its highest value was when treating and bilateral intervention K1S1 which reached 99.31 cm compared to the intervention treatment K0S3 in which it reached 80.00 and an increase rate of 24.14%, as for the effect The bilateral interaction between mycorrhiza and potassium is noted from Table (5) that Their effect was significant in increasing the height of the plant to the yellow corn (cm), and its highest value was when treating the bilateral interference M1K1, whose value was 92.97 cm compared to the interference treatment M0K0, which amounted to 85.41 cm. The effect of the bilateral interaction between water stress and microscopic effect was significant on the height of the plant, and that higher Its value was when treating bilateral interference M1S1 which amounted to 94.47 cm compared to the comparison treatment of bilateral interference between water stress and mycorrhiza which reached the lowest value when treating M1S3 82.93 cm. As for the effect of triple interference between biological fertilization and spraying potassium and water stress it has affected Significant effect on the characteristics of the height of the yellow corn plant (cm) and that its highest value was when treating triple interference between water stress and sprinkling with potassium and mycorrhiza when treating M1K1S1 which reached a value of 97.61 cm compared to the lowest value that was when treating triple interference to factors studied between water stress And spraying with potassium and mycorrhizal inoculation, which was at treatment M0K0S2, which amounted to 79.31 cm, an increase of 23.0%, which did not differ significantly from the treatment of triple interference M1K0S3.

Table 5 : Effect of bio-fertilizing and spraying with potassium, water stress, water stress and their interactions on plant height, yellow corn (cm).

Water stress x Mycorrhizae	Potassium		Mycorrhizae	Water stress
	K_1	K_0		
92.79	95.40	90.18	M_0	S_1
94.47	97.61	91.33	M_1	
89.92	93.33	86.50	M_0	S_2
90.50	94.00	87.00	M_1	
83.13	86.95	79.31	M_0	S_3
82.93	86.00	79.85	M_1	
2.33	3.10		LSD 0.05	
Mycorrhizae				

89.16	92.90	85.41	M_0	Water stress x Potassium
91.64	92.97	90.31	M_1	
0.73	1.95		0.05 LSD	
Water stress				
97.81	99.31	96.31	S_1	Mycorrhizae x Potassium
93.15	94.20	92.10	S_2	
81.50	83.00	80.00	S_3	
1.95	4.31		0.05 LSD	
	90.81	88.20	potassium	
	0.44		0.05 LSD	

4. The Chlorophyll guide

The results of the statistical analysis, Table (6), indicated that the effect of water stress and sprinkling with potassium and mycorrhizia had a significant effect in the chlorine index of Spad unit for yellow corn plant, as the pollination of yellow corn seeds with mycorrhizis had a significant effect on this trait and gave the highest value of the pollinated treatment (M1) that reached the value of Spad unit 43.88 compared to the unvaccinated treatment (M0), which amounted to Spad unit 43.55 and the effect of sprinkling with potassium element has resulted in the spraying factor (K1), the highest value of the chlorophyll index was Spad unit 47.22 compared to the non-spraying treatment (K0) that reached Spad unit 46.31, and It is noted from the same table that the effect of water stress in As the chlorophyll evidence had a significant effect on the characteristic and that its highest value was the water stress treatment S1 which had a value of Spad unit 45.60 compared to the water stress treatments S2 and S3 whose value was 43.08 and 41.41 each respectively, the results of the statistical analysis of the same table indicated that the effect of bilateral interference Between water stress and potassium have significantly affected the characteristic of chlorophyll evidence Spad unit and that its highest value was when treating bilateral interference K1S1 which reached Spad unit 46.00 Vias with the lowest value of the interference treatment K0S3 which amounted to 41.33 As for the effect of bilateral interference between mycorrhiza and potassium, the results of the decomposition indicated The statistical statistics of the same table indicated that it significantly affected the characteristic of the chlorophyll evidence, Spad unit, and that its highest value was when treating bilateral interference M1K1 that reached Spad unit 44.51 compared to the lowest value that was when treating bilateral interference M0K0 that reached Spad unit 43.10 As for the effect of bilateral interference between stress The aqueous effect has a significant effect in this characteristic that the highest value for it was when treating the interference M1S1 in which the value of Spad unit 51.25, and the lowest value was when dealing in the interference M0S3 in which the value of Spad unit 47.20 and with an increase of 8.6%, as noted from the results analysis Statistical table No. (6) for the effect of interference The triple between biofertilization and potassium spray and water stress all affected a significant effect on the characteristic of the chlorophyll index Spad unit and that its highest value was when treating triple interference for treatment M1K1S1 that had a value of Spad unit 52.00 and the lowest value was when treating triple interference for treatment M0K0S3 that had a value of Spad unit 46.20 and an increase of 13% that was not significantly different from the M1K0S3 triple interference factor

Table 6 : Effect of bio-fertilizing and spraying with potassium, water stress, water stress and their interactions in the chlorophyll guide.

Water stress x Mycorrhizae	**Potassium**		**Mycorrhizae**	**Water stress**
	K_1	K_0		
50.75	51.39	50.10	M_0	S_1
51.25	52.00	50.50	M_1	
48.67	49.00	48.33	M_0	S_2
49.05	49.51	48.59	M_1	
47.20	48.20	46.20	M_0	S_3
47.82	48.63	47.00	M_1	
0.77	1.15		LSD 0.05	
Mycorrhizae				
43.55	44.00	43.10	M_0	Mycorrhizae x Potassium
43.88	44.51	43.25	M_1	
0.03	0.05		LSD 0.05	
Water stress				
45.60	46.00	45.19	S_1	Water stress x Potassium
43.08	43.4	42.95	S_2	
41.41	41.49	41.33	S_3	
0.09	1.80		LSD 0.05	
	47.22	46.31	Potassium	
	0.55		0.05 LSD	

5. Proline leaves corn content (Microcol. Kg^{-1})

The results of the statistical analysis, Table (7) showed that each of the biological fertilization and spraying with potassium and water stress had a significant effect on increasing the content of yellow corn leaves from proline. M0 and the proline content became 3.68 micromol. g^{-1} when pollinated with the maize seeds from the mycorrhizal M1. As for the effect of potassium spray, it was increased when potassium was not sprayed at treatment K0 whose value reached 3.81 compared to the spray treatment of K1 which amounted to 3.31 $micromol^{-1}$ As for the effect of water stress In the yellow corn content of proline, the leaf content increased, the water stress increased. In the high water stress S3 the leaf content was 3.69 micromol. Kg^{-1} and decreased to 2.98 micromol. Kg^{-1} when the water stress was treated S1. As for the effect of bilateral interference to its soil treatments, it affected bilateral interference. Between water stress and potassium were significant in this capacity, and that the highest value was when treating bilateral interference S3K0, which amounted to 3.77 micromol. g^{-1}, and the lowest value was when treating bilateral interference between water stress and potassium when treatment S1K1, which amounted to 2.95 micromol. g^{-1}. Either to effect For the intersection of the diode between water stress and mycorrhiza, it is observed from the same table that the interference treatment M0S3 gave the highest value of 4.98 micromol. It had a significant effect on increasing the content of yellow corn leaves from proline acid and that its highest value was when treating bilateral interference M0K0 which amounted to 4.20 with mycorrhiza and potassium with a value of 3.30 micromol. gm^{-1}, when treatment M1K1, either for the effect of triple interference between fertilization A Vital and spraying with potassium and water stress. All the factors under study had a significant effect on the yellow corn content of proline acid and that the highest value of this acid was when treating triple interference M0K0S3 which amounted to 5.00g When treating triple interference M1K1S1 with a value of 3.61 micromol. g^{-1} with an increase of 38.5%.

Table 7 : The effect of bio-fertilizing and spraying with potassium, water stress and water stress and its interactions on the content of yellow corn leaves from proline (Micromol. gm^{-1})

Water stress x Mycorrhizae	**potassium**		**Mycorrhizae**	**Water stress**
	K_1	K_0		
4.10	3.80	4.40	M_0	S_1
3.86	3.61	4.41	M_1	
4.32	4.00	4.63	M_0	S_2
4.23	3.95	4.50	M_1	
4.98	4.80	5.00	M_0	S_3
4.85	4.80	4.90	M_1	
0.25	0.15		0.05 LSD	
Mycorrhizae				
4.04	3.88	4.20	M_0	Mycorrhizae x Potassium
3.68	3.30	4.05	M_1	
0.02	0.40		0.05 LSD	
Water stress				
2.98	2.95	3.00	S_1	Water stress x Potassium
3.46	3.41	3.51	S_2	
3.69	3.60	3.77	S_3	
0.03	0.21		LSD 0.05	
	3.31	3.89	potassium	
	0.02		LSD 0.05	

It is noted from the results of Table ((3,4,5,6,7) that the effect of bio-fertilizing and spraying with potassium and water stress has a significant effect on the dry weight of the vegetable and root system, plant height, chlorophyll index, and the content of yellow corn leaves from proline acid, the reason for that may be due to The ability of microorganisms (bio-fertilization) to absorb nutrients through the interlinking of fungal heifers in the root capillaries region in the root as in (Diagne *et al.*, 2013). The other reason is that the mycorrhiza may provide a fertile and healthy environment in order to play its vital role in the soil as its existence lies It contains many elements a Food and organic acids, which improve the height of the plant and thus increase the dry weight of the vegetable and root group (Thiruman *et al.*, 2009) who mentioned that biofertilization with microscopy has a high content of major and minor elements as well as organic acids, carbon compounds and natural growth regulators such as cytokines, auxins, and gibberellins that contribute to The increase in plant growth, and the reason for the increase in the dry weight of the vegetative group can be attributed to the fact that potassium contributes to increasing cell division and increasing the size of cells, thus increasing the vegetative group as well as the fact that potassium stimulates the action E photosynthesis and the transmission of its products, which are mainly due to the stimulation of the ATP formation necessary to load the products of representation in the water, as well as increasing the rate of photo phosphorylation, Havline *et al.*, 2005. The addition of potassium also affected the increase in the dry weight of the root mass of the natrum when spraying and the potassium component as the potassium It leads to an increase in the depth of the root system spread, which increases the plants' response to added fertilizers (Lorenz, Widders and Al-Rubaie, 1979). As for the effect of bilateral interference between water stress and potassium in the studied characteristics of the tables above, it may be due to the role of potassium in reducing the effect of water stress resulting from the low water content of the soil, as well as to the role of physiological potassium in increasing the efficiency of water use and high control to open and close the gaps, as The lack of water works to reduce vegetative growth by reducing the expansion of the leaves and their carbonic representation, but the presence of potassium works to reduce the negative effects of the water shortage because the plants equipped with potassium lose less water, because potassium works to work to regulate the necessary effort Zee has the effect of the closure of the stomata, thereby working on the balance of shipments of negative ions and affects the absorption and transmission (Abodahi and Younis, 1988). The addition of potassium significantly affected the increase in the content of chlorophyll evidence for the yellow corn plant. Potassium ears have a relationship in raising the efficiency of the plant in photosynthesis. What the plant needs from this element (Tnaka *et al*., 1974 and Abou dahi and Yunus, 1988) that biofertilization with mycorrhiza had a physiological effect in increasing the chlorophyll index (Same *et al*., 1983 and 1990, Pacovsky), but the effect of water stress in the chlorophyll index in low water stress is nutrient Added to the soil such as potassium and existing Aslavera more Jahazeeah due to their solubility in the soil solution, and the increase of chlorophyll guide Baankhvad water stress was the result of improved efficiency rooted in the absorption of nitrogen, which is one of the components involved in the synthesis of chlorophyll molecule Chlorophyll, as well as the role of biosynthesis in its encouragement of plant growth to secrete many substances, such as cytokinins, vitamins, and some organic acids that help improve plant growth by increasing photosynthesis as well as its resistance to some pathogens, and that increased water stress led to a decrease in chlorophyll evidence due to Reduced chlorophyll pigments, which results in inhibition of photosynthesis as a result of limiting the opening of the stomata, which affects the growth of chloroplasts, and thus leads to the reduction of pigments, including chlorophyll pigments (Ludlow *et al*., 1990). This is consistent with Maranvilla, Karron (1995). Therefore, it indicated that the chlorophyll pigments decreased when the plant was exposed to water stress, and this is reflected positively in reducing the makeup of mycorrhiza as a result of reducing water stress on the plant, as the plants pollinated with mycorrhizas have a low, temporal and effortless effort that is sustained through the accumulation of fungal secretions, which leads to improving the state of the osmotic system of the plant through Increased bloating effort and improved water condition (Erelin, 1989; Smith *et al*., 2009) attributed to a decrease in proline spraying with potassium. Perhaps it is due to the role of potassium in increasing the percentage of protein formed in the plant and the catalyst cycle to produce the growth regulator cytokinin that retards the Aging and then delaying the demolition of proteins in the plant, which leads to reduced proline. These results are consistent with the mechanism of (Mujtaba, 2007; Fanaei and Others, 2011). They indicated a reduction in the leaf content of proline acid for the first researcher and Canola for other researchers, as for the effect of high water stress. In increasing the content of yellow corn leaves from proline acid, this acid decreased by decreasing water stress, and it was its lowest content in low water stress, and since this acid was caused by the demolition of protein and the formation of other amino acids such as aspartic and clothamel, most of which have a detrimental effect on the effectiveness of enzymes What causes the seed buds to dormant when gathering in large quantities, unlike proline acid, which is slightly effective, so the art of converting these two acid into proline is one of the defensive means to reduce the effect of these two acid (Stewart, 1983). Proline ears gather in all parts of the plant subject to water stress, to collect This acid in yellow corn leaves increased the content of these leaves in guard cells, which leads to a decrease in water stress in these cells, which increases the ability to absorb water, because the protein works as a store of metabolic substances within the cell that regulates osmosis, and this is consistent with what the mechanism of each of Has (Hasegawa et al. 1984 and Zhu , 2000) who indicated that increased water stress resulted in an increase in the content of yellow corn leaves from proline acid. These results are consistent with the findings of (Alfreda, Castro, 2002), who indicated that the severity of drought led to an increase in the leaf content of proline acid, It may also be attributed the reason for reducing the negative effects of water stress on plant growth due to the ability of bio-fertilization and mycorrhiza to increase the formation of root branches and the production of various plant hormones such as cytokinin (Casanoras *et al*., 2003). The blocking of irrigation water leads to a significant increase in the proline content and the proline accumulation occurs due to the inability of the vegetable tissues to build protein as well as the processes of its demolition (Ahmed, 1984 and Smgh *et al*., 2009).

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