

# EFFECT OF POTASSIUM ON YIELD OF PEPPER (*CAPSICUM ANNUUM L.*) CV CHARISMA UNDER PROTECTED CULTIVATION ( RAZZAQ OWAYEZ IDAN )

Department of Horticulture, Faculty of Agriculture, University of Karbala Ministry of Higher Education and Scientific Research. Iraq

## ABSTRACT

The present investigation entitled Effect of potassium on yield of pepper (*Capsicum annuum l.*) cv charisma under protected cultivation .The experiment was carried out in at the desert region in karbala during winter 2014 with following treatments of which was T 1 ( 0 ) T2 ( 10 ) T3 ( 15 ) T4 ( 20 ) kg potassium sulfate per poly house ( 504 m<sup>2</sup> ) .the cultivar of pepper was *CHARISMA* , the highest number of fruit (22.10),fruit weight (184.10 g ), yield per plant ( 4.07 kg) and total yield per poly house ( 3.25 tones) was obtained in T4 .

**KEYWORDS:** pepper , *Capsicum annuum L.* , number of fruit, fruit weight , yield per plant , total yield per poly house

## INTRODUCTION

Pepper (*Capsicum annuum L.*) belongs to family solanaceae. Pepper one of most popular and nutritious fruit vegetable [7] . Pepper is considered to be the most important vegetable crops in the Mediterranean region. [7] . pepper has its origin in South America, where he found a wild situation different forms and then moved to India warm and tropical regions and in all the continents of the world as root eastern India, China, Spain, Greece and Africa ] 18[ . The crop is grown in most parts of Iraq in open fields as well as in facilities protected agriculture Kalpiot plastic spending [15] .Pepper total area under pepper crop in Iraq is assessed to be 14101 tones with the productivity of 28568 tones [3] . Pepper is grown for its fruits are eaten fresh and is completely green before maturity or after maturity and fully colored, peppers and fruits rich in vitamin C, which the body needs especially in the winter season to resist the cold and flu illnesses as they are relatively rich in vitamin (A) [15] .

To improve the yield of the produce , it is necessary to pay attention on optimum balance use of nutrient through fertilizer application pepper The solanacea vegetable crops generally take up large amounts of nutrients from the soil [14]. In recent years, because of increased levels of K fertilizer are important for better nutrient management. Growers and farmers need to manage the fertilizer for better quality of fruit production. Potassium is considered to be one of the most essential elements for the growth and development of plants [16] , [20 ] .and [18 ] .studies have proved that K plays a major role in many physiological and biochemical processes such as enzyme activation; metabolism of carbohydrates and protein compounds. Potassium is the most prominent inorganic chemical influencing plant physiology [12] .Also potassium has a significant role to play in the plant energy status for storage of assimilates and tissue water relation. K plays a key role in crop quality [5]; [14] . K also improves the size of the fruit and stimulates root growth [12] ; [14] . . [10]indicated that biomass, fruit count, and fruit weight per plant increased linearly with increasing K rate. studies reported

that the total yield, marketable yield, commercial fruit yield and total average yield per plant were increased by increasing application rates of potassium (K). To determine levels of potassium sulfate that lead to optimum plant yield of pepper.

## MATERIALS AND METHODS

The present investigation "effect of potassium on yield of pepper under protected cultivation" was carried out during Winter season 1/10/2014 at desert region of karbala . The experiment was laid out in R.B.D with three replication and four treatments. Potassium was applied as potassium sulfate . the fertilizer was applied recommended dose viz ( 10 , 15 and 20 kg per poly house ). also NP were applied with rate 30 -22 Kg respectively, Half dose of N and total dose of Triple superphosphate were applied as basal dose one week before transplanting. The second dose of N was applied as top dressing at 30 DAT. and well mixed with the soil to all treatments. K fertilizer levels was applied to the soil tow times at equal and constant levels (the first portion was applied one week before transplanting stages, the second one six week after transplanting.

### Details of Layout

Crop	:	PEPPER
Cultivar	:	CHARISMA
Design of experiment	:	Randomized Block Design (RBD)
No. of replications	:	3
No. of treatment	:	4
Total no. of plots	:	12
Spacing plant to plant	:	40cm
Total No. of plants/plot	:	10
Total No. of plants in field	:	120

### Treatments Detail

Treatment No.	Treatment Detail
T <sub>1</sub>	Control
T <sub>2</sub>	potassium sulfate 10 Kg per plastic house ( 504 m <sup>2</sup> )
T <sub>3</sub>	potassium sulfate 15 Kg per plastic house ( 504 m <sup>2</sup> )
T <sub>4</sub>	potassium sulfate 20 Kg per plastic house ( 504 m <sup>2</sup> )

## RESULTS AND DISCUSSIONS

### Number of Fruits per Plant

The data presented in table clearly showed that the potassium played significant role in affecting number of fruits per plant. The maximum number of fruits per plant was recorded statistically significant in potassium application T<sub>4</sub> ( 20 kg per poly house ) which was recorded ( 22.10 ) followed by T<sub>3</sub> ( 15 kg per poly house ) which was recorded ( 20.9 ) superior over control which was recorded ( 17.27 ) . These results are in close conformity with the finding of [5] , [11] ,[1] and[2]

### Fresh Weight of Fruits (g)

Result showed in table the potassium played significant role in affecting fresh weight of fruit ( g ) . The maximum fresh weight of fruit ( g ) was recorded statistically significant in potassium application T<sub>4</sub> ( 20 kg per poly house ) which was recorded ( 184.1 g ) followed by T<sub>3</sub> ( 15 kg per poly house ) which was recorded ( 170.33 ) superior over control which was recorded ( 145.08 ) .Similar findings were obtained by [5] ,[19] and [4]

### Fruit Yield Plant<sup>-1</sup> (kg)

The data presented in table clearly showed that the potassium played significant role in affecting fruit yield per plant . The maximum fruit yield per plant was recorded statistically significant in potassium application T<sub>4</sub> ( 20 kg per poly house ) which was recorded ( 4.07 kg ) followed by T<sub>3</sub> ( 15 kg per poly house ) which was recorded ( 3.56 kg ) superior over control which was recorded ( 2.50 kg ) .Similar results were reported by [19] ,[5] and [2]

### Total yield per poly house ( tones)

Result showed in table the potassium played significant role in affecting Total yield per poly house ( tones). The maximum Total yield per poly house ( tones) was recorded statistically significant in potassium application T<sub>4</sub> ( 20 kg per poly house ) which was recorded ( 3.25 t ) followed by T<sub>3</sub> ( 15 kg per poly house ) which was recorded ( 2.85 t ) superior over control which was recorded ( 2 t ) .Similar results were reported by [4] in (pepper), [11] in (pepper), [5] in (pepper) Similarly with [19] in (pepper).

## DISCUSSIONS

Potassium is considered to be one of the most essential elements for the growth and development of plants [16] [ 20]. and [ 18]. K plays a major role in many physiological and biochemical processes such as enzyme activation, metabolism of carbohydrates and protein compounds. Potassium is the most prominent inorganic chemical influencing

plant physiology [ 13]. Also potassium has a significant role to play in the plant energy status for storage of assimilates and tissue water relation . K also improves the size of the fruit and stimulates root growth [ 13]; [ 14]. [10] .indicated that biomass, fruit count, and fruit weight per plant increased linearly with increasing K rate. results may be due to the role of potassium element in metabolism and many processes needed to sustain and promotion plant vegetative growth and development. Moreover, many studies proved that K plays a major role in many physiological and biochemical processes such as cell division and elongation and metabolism of carbohydrates and protein compounds [ 8 ].application of potassium which might have accelerate the vigorous growth increase of fruit per plant , fruit weight and total yield .

## CONCLUSION

Based on the result of experimental it was aimed to identify suitable treatment for pepper with respect to productivity of pepper during winter 2014 . it may be concluded that the treatment T 4 ( 20 kg per poly house ) was recorded the best among treatments on yield the treatment T4 was obtained the highest total yield ( 3.25 ) tones in poly house ( 504 m<sup>2</sup> ) under protected cultivation

### Effect of potassium on yield of pepper

Treatment No.	Treatment	Number of fruit per Plant	Fruit weight g	Yield per plant	Yield per poly house Tones
T <sub>1</sub>	Control	17.27	145.08	2.50	2.00
T <sub>2</sub>	potassium sulfate 10 Kg per poly house	20.37	154.17	3.14	2.51
T <sub>3</sub>	potassium sulfate 15 Kg per poly house	20.90	170.33	3.56	2.85
T <sub>4</sub>	potassium sulfate 20 Kg per poly house	22.10	184.10	4.07	3.25
	F - test	S	S	S	S
	S. Ed. (±)	0.15	3.02	0.067	0.053
	C. D. (P = 0.05)	0.36	7.38	0.164	0.131

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#### **AUTHOR DETAILS**



**Razzaq Owayez Idan** Iraq 1-7 1972 Received his Bachelor of agriculture, horticulture, University of Baghdad, Faculty of Agriculture, in Iraq in 1999. He obtained his. M.Sc. (Ag) Horticulture, from SHIATS Allahabad- India. in 2013 he his expéience for eight years with Agriculture. Prsently he is working as the College of Agriculture, University of Karbala, Ministry of Higher Education and Scientific Research. Iraq.

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