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RESPONSE OF SOME TOMATO VARIETIES TO BIO AND NITROGEN FERTILIZERS UNDER DRIP IRRIGATION SYSTEM.

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ABSTRACT

A pot experiment was carried out at the Agricultural Research Station of Sakha, during the summer season of 2011 to study effect of bio and mineral nitrogen fertilizer on productivity of some tomato varieties under drip fertigation system. Split split plot design with four replicates was performed. The main plots were assigned by 2 tomato var. of Alesa and Super streen B, The sub plots were occupied with 2 biofertilizer treatments 1- unfertilized 2- fertilized with biofertilizer (bio fertilizer is compost tea enriched with *Bacillus megatheriem*, *Azotobacter* and *Azosperlium*). Finally, the sub-sub plots were occupied with 4 N fertigation levels (Without N fertigation dose, 50%, 75% and 100% of the recommended N fertigation dose).

Data revealed that the highest mean values of fresh and dry weights of whole plant (g pot-1) were obtained from 100% of the recommended N fertigation dose with biofertilizer under Alesa var. Meanwhile, the lowest values of fresh and dry weights of whole plant (g pot-1) were obtained from the control without biofertilizer under Super streen B var.

The highest mean values of fruits as fresh and dry weights (g pot-1) were obtained from 100% of the recommended N fertigation dose with biofertilizer under Alesa var. Meanwhile, the lowest mean values of fruits as fresh and dry weights (g pot-1) were obtained from the control without biofertilizer under Super streen B var.

The highest values of N and P concentration (%) in shoots were obtained from 100% of recommended N fertigation dose with biofertilizer under Alesa var, while the highest (K%) value was obtained from 100% of the recommended N fertigation dose with biofertilizer under Super streen B var compared with the control. The highest value of N concentration (%) in fruits was obtained from 100%of the recommended N fertigation dose with biofertilizer under Alesa var. compared with the control. The highest values of (P and K%) in fruits were obtained from100% of the recommended N fertigation dose with biofertilizer under Super streen B var compared with the control (without biofertilizer under Super streen B var.).

Keywords: Tomato varieties, N, P, K %, N fertigation, biofertilizers and sandy soils.

INTRODUCTION

Tomato (*Lycopersicon esculantum. Mill*) is one of the most popular and widely grown vegetable crops in the worled as well as in Egypt. It can be used as fresh fruits like salad and processed like tomato–Ketchup, (Nielsen, 1994). Tomato is rich source of nutrition, 100 g of tomato contains 0.9 g of proteins, 3.6 g of carbohydrates, 48 mg of calcium, 20 mg of phosphorous, 27 mg of ascorbic acid, 0.4 mg of irons, 0.2 g of fat, 0.5 g of minerals, 0.8 g of fibers, 351 mg of carotens, 0.12 mg of Thiamine, 0.06 mg riboflavin, 0.4 mg of Niacin and 20 K cal of energy (Goplan *et al.,* 1980). It is very helpful in healing wound because of the antibiotic properties found in ripe red fruit

(Conn and Stumph 1970). Tomato crop is highly responsive to nitrogen (N) fertilizer application. (Taber 2001). N fertilizers often are of high mobility in soils and they can pollute soils and groundwater. Therefore, application time is very important (Depascal *et al.,* 2006).There are two ways to overcome this problem the first is using biofertilizers and the second is the fertigation.

Biofertilizers are substances which contain living microorganisms which applied to seed, plant surfaces, or soil, colonize the rhizosphere or the interior of the plant, and promote growth by increasing the supply or availability primary nutrients to the host plant.

Bio-fertilizers are eco-friendly inputs and less damaging to the environment comparing with chemical fertilizers use (Gentili and Jumpponen, 2006)

The category of biofertilizer most commonly refers to products containing soil microorganisms in icreasing the nutrients for plants (like rhizobia and mycorrhizal fungi). Malusa *et al.,* (2012).

Therefore, the main objective of this research is to evaluate the response of some tomato varieties to bio and mineral nitrogen fertilizer under drip irrigation system.

MATERIALS AND METHODS

The experimental work of the present study was carried out in a pot experiment during summer season of 2011 at the Agricultural Research Station farm, Sakha, Kafr El–Sheikh, Egypt to study the effects of nitrogen fertilizer and biofertilization on the yield, quality and nutrients uptake of some tomato varieties under drip fertigation system.

The experiment was conducted in pottery pots of 33cm diameter, 40 cm deep and contain 15 kg weight soil. The used soil was collected from Kalabsho, Zyan area, at depth of 0-30 cm. Soil sample was air dried and passed through 2 mm sieve, then put in pottery pots. All the pots were filled with constant weight of soil incorporating with stable weight of farm yard manure (500 g pot-1). A composite sample was taken from the collected soil before growing season; to determine some physical and chemical properties (Table 1).

Table 1: Some physical and chemical properties of the studied soil:-

Partical size distribution	Sand%	Clay%	Silt%	Texture	Available Nutrients (mg kg soil-1)			Soluble cations (meq L-1)				Soluble anions (meq L-1)			
					N	P	K	Ca+2	Mg+2	K+	Na+	CO3=	HCO3-	Cl-	SO4--
	85.90	6.20	7.90	Sandy	22	2	146	14.25	12.00	00.87	25.8	00.0	7.45	30.5	14.97

Some Physical and Chemical Properties				
pH (1:2.5 susp.)	EC dSm-1 (soil past)	Organic matter %	CaCO3 %	SP%
7.71	5..29	0.75	5.92	23.00

Split split plot design with four replicates was performed. The main plots were assigned by 2 tomato var. of Alesa and Super streen B., The sub plots were occupied with two biofertilizer treatments (unfertilized and fertilized with biofertilizer) Finally, the sub sub plots were occupied with 4 N fertigation levels (Without N fertigation dose, 50% (3.25 g pot-1), 75% (4.87 g pot-1) and 100% (6.50 g pot-1) of the recommended N fertigation dose 200 kg N fed-1). Nitrogen was added in the form of Urea ammonium nitrate liquid (U.A.N, 32% N), Potassium as Pota Delta liquid (40% K2O), and phosphorus as phosphoric acid liquid (60% P2O5). The treatments of N requirements for the two var. were carried out under drip fertigation system.

Random plant samples of 2 plants were taken from each treatment of tomato (*Lycopersicon esculentum, Mill*) at harvest (after 120 days) from transplanting to study the differential responses parameters:

1. Fresh and dry shoots weight (g pot-1).
2. Fresh and dry roots (g pot-1).
3. Fruits yield (g pot-1).
4. Chemical composition: total nitrogen was determined by using Kjeldahl method according to Hesse, (1971), phosphorus was determined colorimetrically at wave length of 720 nm using the method of Schouwenburg *et al.,* (1967).The colorimetric determination of phosphorus was made using spectrophotometer, potassium was estimated using flame photometer as described by Jackson (1967).

All data were statistically analyzed according to the technique of analysis of variance (ANOVA) and the least significant differences between the treatment means were compared as published by Gomez and Gomez (1984).

RESULTS AND DISCUSSION

1. Fresh and dry weights of whole plant (g pot-1) as affected by tomato var., bio and mineral nitrogen fertilization:-

From the tabulated data in Table 2 clear that there are significant differences between average of fresh and dry weights (g pot-1) due to tomato var., where Alesa had the highest fresh weight of 2216.72 (g pot-1) compared with 2038.72 (g pot-1) for Super streen B as well as dry weight 363.13 (g pot-1) compared with 359.76 (g pot-1).These results could be enhanced by those obtained by Glala *et al.,* (2010).

With respect to the effect of biofertilizer, Table 2 show that the mean value which were calculated on averages of the treatments of fresh weight was 2509.87 (g pot-1) tended to increase with biofertilized plants as compared with 1745.57(g pot-1) without biofertilizer, as well as the dry weight 418.48 (g pot-1) compared with 304.27 (g pot-1).These results were could be enhanced by those obtained by Najafvand *et al.,* (2008) and Zare *et al.,* (2011).

Increasing nitrogen fertilizer dose from zero up to 100% of the recommended dose increased plant fresh and dry weights. The mean value which were calculated on averages of the treatments of fresh weight under zero nitrogen fertilizer was 1573.10 (g pot-1), 50% of the recommended dose

of N fertigation the mean value was 1869.27 (g pot-1), 75% of the recommended dose of the mean value was 2247.65 (g pot-1), and under 100% of the recommended dose of the mean value was 2820.87 (g pot-1) as well as dry weight the mean value of zero nitrogen fertilizer was 254.02 (g pot-1), 50% of the recommended dose of N fertigation the mean value was 318.30 (g pot-1), 75% of the recommended dose of the mean value was 374.57 (g pot-1), and under 100% of the recommended dose of the mean value was 498.62 (g pot-1).These results are in agreement with those obtained by Podsiado and Jaroszewska (2007) and Najafvand *et al.,* (2008).

Table 2: Fresh and dry weights of whole plant (g pot-1) at harvest (120 days from transplanting) as affected by tomato varieties, bio and mineral nitrogen fertilization.

Treatments				
A	**B**	**C**	**Fresh weight**	**Dry weight**
Tomato varieties	**Bio- Fert.**	**Mineral Fert.**		
Alesa	**Without Bio-Fert**	**control**	1537.40	231.60
		50% of rec. N	1621.00	269.40
		75% of rec. N	2036.00	286.80
		100% of rec. N	2124.90	336.70
	Mean		**1829.82**	**281.12**
	With Bio-Fert	**control**	1710.20	318.40
		50% of rec. N	2098.00	398.20
		75% of rec. N	2932.50	447.30
		100% of rec. N	3673.80	615.60
	Mean		**2603.62**	**444.87**
	Average		**2216.72**	**363.13**
Super streen B	**Without Bio-Fert**	**control**	1251.20	189.40
		50% of rec. N	1626.50	280.50
		75% of rec. N	1667.80	320.90
		100% of rec. N	2099.78	518.90
	Mean		**1661.32**	**327.42**
	WithBio-Fert	**control**	1793.60	276.70
		50% of rec. N	2131.60	325.10
		75% of rec. N	2354.30	443.30
		100% of rec. N	3385.00	523.30
	Mean		**2416.12**	**392.10**
	Average		**2038.72**	**359.76**
Sig.			**A**B**C****	**A**B**C****
Inter.Sig. (A.B.C)			**25.332**	**4.677**

2. Fresh and dry weights of tomato fruits (g pot-1) as affected varieties., bio and mineral nitrogen fertilization:-

As shown in Table 3, the fresh and dry weights as tomato fruit high significantly affected by tomato varieties, where Alesa had the highest mean values in fruits fresh weight of 1120.58 g pot-1 compared with 1039.46 g pot-1 of Super streen B as well as the fruits dry weight 70.01 g pot-1 compared with 58.91 g pot-1 of Super streen B. This may be due to the increase of fruit weight of Alesa compared with Super streen B as well as increasing fruit set in Alesa than Super streen B. These results are in agreement with those obtained by Midan *et al.,* (1986) , Hewedy *et al.,* (1994) , Merghany (1997)

and Glala *et al.,* (2010) who revealed that Alesa fruits recorded higher mean fruit weight, dry matter total acidity than Super streen B fruits.

With respect to the effect of biofertilizer on fruit fresh and dry weights (g pot-1), Table 3 shows that the mean values which were calculated on averages of the treatments of fresh fruits weight was 1268.23 (g pot-1) tended to increase with fertilized plants as compared with 891.81 (g pot -1) without biofertilized plants as well as the dry fruits 72.53 (g pot-1) with biofertilizer compared with 56.38 (g pot-1) without biofertilizer. These results could be supported by those obtained by Abd El-Maged *et al.,* (2000) , El-Zeiny *et al.,* (2001) who indicated that inoculation of tomato seedling with biofertilizer containing *Azotobacter* and *Azosperillium*, *Bacillus*, increased plant height, leaf number per plant, fruit mean weight and yield in compare with the control (without biofertilizer) and Youssef *et al.,* (2001).

Increasing the nitrogen fertilizer from zero up to 100% of the recommended dose increased fruits fresh and dry weights (g pot-1).The mean value which were calculated on averages of the treatments of fruits fresh weight with zero nitrogen fertilizer was 821.62 (g pot-1), under 50% of the recommended dose the mean value was increased to 971.27 (g pot-1), under 75% of the recommended dose of N fertigation the mean value was increased up to 1091.85 (g pot-1), and under 100% of the recommended dose of N fertigation the mean value was increased to 1435.37 (g pot-1), as well as dry fruits weight the mean value at zero nitrogen fertilizer was 42.55 (g pot-1), but under 50% of the recommended dose was 56.30 (g pot-1), under 75% of the recommended dose of N fertigation was 67.85 (g pot-1), and under 100% of the recommended dose of N fertigation was 91.17 (g pot-1).These results are in agreement with those obtained by Aly (1998) who found that average fruit weight and total yield were increased with increasing nitrogen level up to 200 kg N fed-1., compared with low level of 50 kg N fed-1, which had the lowest values in both years, Anderson *et al.,* (1999) who found that nitrogen fertilizer rate was related to marketable fruit yield., Singh (2000) who indicated that increasing nitrogen levels increased total yield and accumulated materials to the fruits, and consequently increased the average of fruit weight., Krishna and Krishnappa (2002) and Ito and Kawai (2005).

Table 3: Fresh and dry weights of tomato fruits (g pot-1) at harvest (120 days from transplanting) as affected by varieties, bio and mineral nitrogen fertilization.

A	B	C	Fresh weight	Dry weight
Tomato varieties	Bio-Fert.	Mineral Fert.		
Alesa	Without Bio-Fert	control	807.80	50.10
		50% of rec. N	963.30	58.20
		75% of rec. N	967.20	66.00
		100% of rec. N	978.30	90.00
	Mean		**929.30**	**66.07**
	With Bio-Fert	control	902.60	52.00
		50% of rec. N	1016.50	65.60
		75% of rec. N	1406.80	71.50
		100% of rec. N	1921.60	106.70
	Mean		**1311.87**	**73.95**
	Average		**1120.58**	**70.01**
Super streen B	Without Bio-Fert	control	640.80	24.20
		50% of rec. N	899.50	41.10
		75% of rec. N	907.50	59.40
		100% of rec. N	969.48	62.10
	Mean		**854.32**	**46.70**
	WithBio-Fert	control	935.30	43.90
		50% of rec. N	1005.20	60.30
		75% of rec. N	1085.80	74.40
		100% of rec. N	1872.10	105.90
	Mean		**1224.60**	**71.12**
	Average		**1039.46**	**58.91**
	Sig.		**A**B**C****	**A**B**C****
	Inter.Sig. (A.B.C)		**2.50**	**0.13**

3. N,P and K concentrations in tomato shoots (%) as affected of tomato var., bio and mineral nitrogen fertilization:-

Data in Table 4 show that N, P and K concentrations (%) in shoots high significantly affected by used tomato varieties, where Super streen B had the highest mean values of N (1.92%) in shoots compared with (1.87%) of Alesa var., as well as the P concentration (0.41%) compared with (0.39%), but in K concentration Alesa had the highest value (1.60%) compared with (1.52%) of Super streen B.

Concerning the effect of biofertilizer, Table 4 reveals that mean values which were calculated on averages of the treatments of N,P and K% in shoots tended to increase in the dry matter due to bio fertilization, where the highest mean values of plants with biofertilizer (2.32, 0.40 and 1.70%) compared with (1.47, 0.36 and 1.43%) without biofertilizer of N,P and K, respectively.These results could be confirmed with those obtained by Shalaan (2005), Simonovich and Kazdaev (2008) and Eid-Rawia *et al.,* (2009).

Increasing nitrogen fertilizer from zero to 100% of the recommended dose increased N, P and K in shoots. The mean values which were

calculated on averages of the treatments of zero N were (1.32, 0.31 and 1.20%) for N, P and K% respectively, with 50% of the recommended dose of N fertigation the mean values were (1.85, 0.35 and 1.46%) respectively, under 75% of the recommended dose the mean values were (2.00, 0.40 and 1.76%) respectively, and under 100% of the recommended dose the mean values were (2.40, 0.49 and 1.83%). These results could be confirmed with those obtained by El-Robae-Maha (2003).

Table 4: N, P and K concentrations (%) in tomato shoots as affected by varieties, biofertilizer and N fertigation treatments after 120 days from transplanting.

Treatments			N, P and K% after 120 days from transplanting in shoots		
A	B	C			
Tomato varieties	Bio-Fert.	Mineral Fert.	N%	P%	K%
Alesa	Without Bio-Fert	control	1.26	0.30	1.12
		50% of rec. N	1.56	0.31	1.06
		75% of rec. N	1.72	0.33	1.73
		100% of rec. N	1.80	0.42	1.79
	Mean		**1.59**	**0.34**	**1.43**
	With Bio-Fert	control	1.63	0.32	1.24
		50% of rec. N	2.11	0.35	1.73
		75% of rec. N	2.30	0.45	2.10
		100% of rec. N	2.59	0.55	2.04
	Mean		**2.16**	**0.42**	**1.78**
	Average		**1.87**	**0.39**	**1.60**
Super streen B	Without Bio-Fert	control	1.20	0.30	1.02
		50% of rec. N	1.24	0.37	1.49
		75% of rec. N	1.27	0.42	1.56
		100% of rec. N	**1.68**	**0.45**	**1.66**
	Mean		**1.35**	**0.39**	**1.43**
	WithBio-Fert	control	1.19	0.32	1.42
		50% of rec. N	2.52	0.38	1.56
		75% of rec. N	2.73	0.47	1.66
		100% of rec. N	3.53	0.55	1.83
	Mean		2.49	0.43	1.62
	Average		**1.92**	**0.41**	**1.52**
Sig.			**A**B**C****	**A**B**C****	**A**B**C****
Inter.Sig. (A.B.C)			**0.04**	**0.01**	**0.03**

4. N,P and K concentrations in tomato roots (%) as affected by tomato var., bio and mineral nitrogen fertilization:-

Data in Table 5 show that the N, P and K concentration (%) in roots high significantly affected by tomato varieties, where Alesa had the highest mean N values (1.48%) compared with (1.37%) of Super streen B var., but for P concentration Super streen B had the highest mean values (0.19%)

compared with (0.18%) of Alesa var, as well as K concentration (1.58%) compared with (1.49%).

Concerning the effect of biofertilizer, Table 5 reveals that mean values which were calculated on averages of the treatments of N,P and K% in roots tended to increase in the dry matter due to bio-fertilization, where the highest mean values of plants with biofertilizer (1.50, 0.20 and 1.66%) compared with(1.36, 0.18 and 1.41%) without biofertilizer.

These results are in agreement with those obtained by Shalaan (2005), Simonovich and Kazdaev (2008) and Eid-Rawia *et al.,* (2009).

Increasing nitrogen fertilizer from zero to 100% of the recommended dose increased N,P and K% in roots, the mean values at zero N of N, P and K% were (1.14, 0.14 and 1.38%) respectively, with 50% of the recommended dose of N fertigation the mean values were (1.29, 0.16 and 1.47%) respectively, under 75% of the recommended dose were (1.41, 0.20 and 1.55%) respectively, and under 100% of the recommended dose were (1.86, 0.24 and 1.73%).These results could be confirmed with those obtained by El-Robae-Maha (2003).

Table 5: N, P and K concentration (%) in tomato roots as affected by tomato varieties, biofertilizer and N fertigation treatments after 120 days from transplanting.

Treatments			N, P and K% after 120 days from transplanting in roots		
A	B	C			
Tomato varieties	Bio-Fert.	Mineral Fert.	N%	P%	K%
Alesa	Without Bio-Fert	control	1.18	0.12	1.12
		50% of rec. N	1.35	0.15	1.33
		75% of rec. N	1.47	0.17	1.27
		100% of rec. N	1.68	0.25	1.74
	Mean		**1.42**	**0.17**	**1.37**
	With Bio-Fert	control	1.19	0.12	1.56
		50% of rec. N	1.36	0.15	1.60
		75% of rec. N	1.49	0.22	1.62
		100% of rec. N	2.17	0.25	1.70
	Mean		**1.55**	**0.19**	**1.62**
	Average		**1.48**	**0.18**	**1.49**
Super streen B	Without Bio-Fert	control	1.01	0.15	1.31
		50% of rec. N	1.21	0.17	1.36
		75% of rec. N	1.35	0.21	1.52
		100% of rec. N	1.63	0.22	1.61
	Mean		**1.30**	**0.19**	**1.45**
	WithBio-Fert	control	1.19	0.17	1.56
		50% of rec. N	1.26	0.19	1.62
		75% of rec. N	1.36	0.22	1.79
		100% of rec. N	1.99	0.25	1.87
	Mean		**1.45**	**0.21**	**1.71**
	Average		**1.37**	**0.19**	**1.58**
Sig.			A**B**C**	A*B**C**	A**B**C**
Inter.Sig. (A.B.C)			**0.02**	**0.01**	**0.01**

5. N, P and K concentrations (%) in tomato fruits as affected by tomato varieties, bio and mineral nitrogen fertilization:-

Data in Table 6 show that N,P and K concentration (%) in tomato fruits high significantly affected by the varieties, where Alesa had the highest mean values (1.74%) in fruits compared with (1.67%) for Super streen B variety. P concentration in Super streen B was the highest (0.61%) compared with (0.59%) for Alesa, as well as K concentration (4.10%) compared with (3.93%).

Concerning the effect of biofertilizer, Table 6 reveals that mean values which were calculated on averages of the treatments of N,P and K% in tomato fruits tended to increase in the dry matter due to bio-fertilization, where the highest mean values were obtained with biofertilizer (1.81, 0.62 and 4.11%) compared to (1.60, 0.58 and 3.92%) without biofertilizer.
These results could be confirmed with those obtained by Shalaan (2005) , Simonovich and Kazdaev (2008) and Eid-Rawia *et al.,* (2009).

Table 6: N, P and K concentrations (%) in tomato fruits as affected by varieties, biofertilizer and N fertigation treatments after 120 days from transplanting.

Treatments			N, P and K% after 120 days from transplanting in tomato fruits		
A	B	C			
Tomato varieties	Bio-Fert.	Mineral Fert.	N%	P%	K%
Alesa	Without Bio-Fert	control	1.06	0.50	2.87
		50% of rec. N	1.34	0.55	3.34
		75% of rec. N	1.93	0.57	4.50
		100% of rec. N	1.96	0.65	4.63
	Mean		**1.57**	**0.57**	**3.84**
	With Bio-Fert	control	1.88	0.55	3.05
		50% of rec. N	1.92	0.60	4.21
		75% of rec. N	1.93	0.62	4.24
		100% of rec. N	1.95	0.66	4.63
	Mean		**1.92**	**0.61**	**4.03**
	Average		**1.74**	**0.59**	**3.93**
Super streen B	Without Bio-Fert	control	1.31	0.51	3.12
		50% of rec. N	1.63	0.62	4.10
		75% of rec. N	1.79	0.58	4.22
		100% of rec. N	1.80	0.65	4.59
	Mean		**1.63**	**0.59**	**4.01**
	WithBio-Fert	control	1.34	0.60	3.34
		50% of rec. N	1.71	0.61	4.12
		75% of rec. N	1.89	0.63	4.56
		100% of rec. N	1.93	0.69	4.72
	Mean		**1.71**	**0.63**	**4.19**
	Average		**1.67**	**0.61**	**4.10**
Sig.			**A**B**C****	**A*B**C****	**A**B**C****
Inter.Sig. (A.B.C)			**0.06**	**0.01**	**0.05**

Increasing nitrogen fertilizer from zero to 100% of the recommended dose increased N,P and K in fruits, the mean values which were calculated on averages of the treatments under zero applied N were (1.39, 0.54 and 3.09%) respectively, with 50% of the recommended dose of N fertigation the

mean values were (1.65, 0.59 and 3.94%) respectively, under 75% of the recommended dose the mean values were (1.88, 0.60 and 4.38%) respectively, and under 100% of the recommended dose the mean values were (1.91, 0.64 and 4.64%). These results are confirmed with El-Robae-Maha (2003).

CONCLUSION

It could be concluded that the highest mean values of fresh and dry weights of whole plant and fresh and dry tomato fruits weights (g pot-1) were obtained from 100% of the recommended N fertigation dose with biofertilizer under Alesa var. Meanwhile, the lowest values of fresh and dry weights of whole plant (g pot-1) were obtained from the control without biofertilizer under Super streen B var.

The highest values of N and P concentrations (%) in shoots were obtained from 100% of the recommended N fertigation dose with biofertilizer under Alesa, while the highest (K%) were obtained from 100% of the recommended N fertigation dose with biofertilizer under Super streen B compared with the control. The highest value of N concentration (%) in fruits was obtained from 100%of recommended N fertigation dose with biofertilizer under Alesa var. compared to the control. In fruits the highest values of (P and K%) were obtained from100% of the recommended N fertigation dose with biofertilizer under Super streen B var. compared to the control (without biofertilizer under Super streen B var.).

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إستجابة بعض أصناف الطماطم لإضافة الأسمدة الحيوية والتسميد النيتروجينى تحت نظام الرى بالتنقيط

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****قسم بحوث تغذية النبات- معهد بحوث الأراضي والمياه والبيئة-مركز البحوث الزراعية-الجيزة**

أُقيمت تجربة أصص بمحطة البحوث الزراعية بسخا خلال الموسم الصيفى ٢٠١١ لدراسة تأثير الأسمدة الحيوية والمعدنية علي النمو والمحصول ومحتوي النبات من النيتروجين والفوسفور والبوتاسيوم لبعض أصناف الطماطم تحت نظام التسميد مع الري . استخدم تصميم القطع المنشقة مرتين فى أربع مكررات ، و شغلت القطع الرئيسية بصنفين من الطماطم : ١- أليسا ٢- سوبر استرين ب هجين
وشغلت القطع الشقية بمعاملتين للتسميد الحيوى ١- بدون إضافة السماد الحيوي ٢- إضافة السماد الحيوي (السماد الحيوي عبارة عن مستخلص شاى الكمبوست غنى ببكتريا مذيبة للفوسفور *Bacillus megatheriem* *وبكتريا مثبتة للنيتروجين* *Azotobacter* and *Azosperlium*) وشغلت القطع تحت الشقية بأربعة مستويات للتسميد النيتروجينى مع مياه الري ١- بدون ٢- ٥٠% من المعدل الموصي به للطماطم ٣- ٧٥% من المعدل الموصي به للطماطم ٤- ١٠٠% من المعدل الموصي به للطماطم.

وفيما يلي عرض لملخص النتائج المتحصل عليها:

- أظهرت النتائج أن أعلى قيم لوزن النبات الأخضر والجاف ووزن الثمار الطازجة والجافة بالجرام / أصيص كانت مع المعاملة ١٠٠% من الاضافة الموصي بها وذلك مع استخدام الأسمدة الحيوية والصنف أليسا بينما كانت أقل القيم لوزن النبات الأخضر والجاف ووزن الثمار الطازجة والجافة جرام / أصيص كانت مع المعاملة بدون سماد نيتروجينى وبدون سماد حيوي وصنف الطماطم سوبر استرين ب هجين.
- كما كانت أعلي قيم لتركيز النيتروجين والفسفور فى المجموع الخضري مع اضافة ١٠٠% من المعدل الموصي به للطماطم من النيتروجين والتسميد الحيوي مع صنف أليسا بينما أعلي قيم للبوتاسيوم كانت مع ١٠٠% من المعدل الموصي به من النيتروجين والتسميد الحيوي مع صنف سوبر استرين ب هجين.
- كما أشارت النتائج أن أعلى قيم لتركيز النيتروجين والفوسفور والبوتاسيوم فى المجموع الجذري مع إضافة ١٠٠% من المعدل الموصي به للطماطم من النيتروجين والتسميد الحيوي مع الصنف أليسا.
- وكانت أعلي قيم للنيتروجين في الثمار مع ١٠٠% من المعدل الموصى من النيتروجين مع التسميد الحيوي مع الصنف أليسا أما تركيز الفوسفور والبوتاسيوم فى الثمار كانت مع ١٠٠% من المعدل الوصي به مع التسميد الحيوي مع الصنف سوبر استرين ب هجين.

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