Table (1). Effect of irrigation intervals and some soil and foliar application treatments on plant growth at 110 days after planting of sweet potato during 2019 and 2020 seasons

	Vine length (cm)		Number of branches / plant		Fresh weight of shoot (g)		Dry weight of shoot (g)	
	2019 season	**2020 season**	**2019 season**	**2020 season**	**2019 season**	**2020 season**	**2019 season**	**2020 season**
	Effect of irrigation intervals							
15 days	153.12 a	157.25 a	12.75 a	13.25 a	614.08 a	610.00 a	112.71 a	113.46 a
30 days	152.44 a	154.22 b	12.33 a	13.00 a	600.79 a	593.41 b	112.75 a	111.71 b
	Effect of some soil and foliar application treatments							
HA	102.84 g	105.50 h	8.83 e	8.33 f	405.11 g	420.10 g	81.72 e	76.19 f
HA+ Trehalose	153.44 e	155.67 e	11.33 d	12.49 d	602.02 d	591.63 e	110.09 d	110.41 d
HA+ KSi	161.17 d	166.85 d	13.33 c	14.33 c	641.17 c	639.16 d	118.39 c	123.49 c
HA+ Algae	140.62 f	147.82 f	11.16 d	13.00 d	552.80 e	549.03 f	106.89 d	106.21 e
FA	99.57 g	110.55 g	11.16 d	10.49 e	419.08 f	412.03 g	84.40 e	78.45 f
FA + Trehalose	184.23 b	187.57 b	14.50 b	15.33 b	718.78 b	713.28 b	131.69 b	135.96 b
FA+ KSi	206.57 a	195.93 a	17.16 a	18.33 a	812.33 a	796.28 a	142.59 a	144.16 a
FA+ Algae	173.86 c	176.03 c	12.83 c	12.66 d	708.22 b	692.18 c	126.09 b	125.82 c

HA= Humic acid at 20 kg /fad. and FA= fulvic acid at 10 kg /fad. as soil application

Trehalose at 1 g/l, KSi= Potassium silicate at 1 ml/l, and algae extract at 1 g/l as foliar application

Values having the same alphabetical letter(s) did not significantly differ at the 0.05 level of significance, according to Duncan's multiple range test.

Table (2). Effect of the interaction between irrigation intervals and some soil and foliar application treatments on plant growth at 110 days after planting of sweet potato during 2019 and 2020 seasons

Treatments		Vine length (cm)		Number of branches / plant		Fresh weight of shoot (g)		Dry weight of shoot (g)	
Irrigation intervals	**Soil and foliar application treatments**	**2019 season**	**2020 season**	**2019 season**	**2020 season**	**2019 season**	**2020 season**	**2019 season**	**2020 season**
15 days	**HA**	101.33 h	107.00 h	9.00 fg	8.00 j	412.54 gh	429.86 i	74.33 h	73.00 i
	HA+ Trehalose	154.33 e	155.33 e	12.33 e	12.66 fg	607.36 e	596.26 f	111.67 ef	112.67 e
	HA+ KSi	157.67 de	168.33 d	14.00 cd	14.66 cd	650.00 d	657.98 d	121.00 cd	126.00 cd
	HA+ Algae	145.00 f	149.33 f	10.33 f	14.00 de	561.26 f	564.72 g	107.00 ef	106.33 f
	FA	100.33 h	114.67 g	10.33 f	9.66 i	428.82 g	417.38 ij	87.33 g	81.67 g
	FA + Trehalose	183.33 b	189.67 b	15.00 bc	15.33 c	724.88 b	716.56 b	132.00 b	135.67 b
	FA+ KSi	210.00 a	196.33 a	18.33 a	19.33 a	814.66 a	803.22 a	142.00 a	149.67 a
	FA+ Algae	173.00 c	177.33 c	12.66 de	12.33 fgh	713.10 bc	694.02 c	126.33 bc	122.67 d
30 days	**HA**	104.34 h	104.00 h	8.66 g	8.66 ij	397.67 h	410.33 j	89.10 g	79.38 gh
	HA+ Trehalose	152.54 e	156.00 e	10.33 f	12.33 fgh	596.67 e	587.00 f	108.50 ef	108.16 ef
	HA+ KSi	164.66 d	165.36 d	12.66 de	14.00 de	632.33 d	620.33 e	115.78 de	120.98 d
	HA+ Algae	136.24 g	146.30 f	12.00 e	12.00 gh	544.33 f	533.33 h	106.78 f	106.08 f
	FA	98.80 h	106.42 h	12.00 e	11.33 h	409.33 gh	406.67 j	81.46 gh	75.22 hi
	FA + Trehalose	185.12 b	185.46 b	14.00 cd	15.33 c	712.67 bc	710.00 b	131.38 b	136.24 b
	FA+ KSi	203.14 a	195.52 a	16.00 b	17.33 b	810.00 a	789.33 a	143.18 a	138.66 b
	FA+ Algae	174.72 c	174.72 c	13.00 de	13.00 ef	703.33 c	690.33 c	125.84 bc	128.96 c

HA= Humic acid at 20 kg /fad. and FA= fulvic acid at 10 kg /fad. as soil application

Trehalose at 1 g/l, KSi= Potassium silicate at 1 ml/l, and algae extract at 1 g/l as foliar application

Values having the same alphabetical letter(s) did not significantly differ at the 0.05 level of significance, according to Duncan's multiple range test.

Table (3). Effect of irrigation intervals and some soil and foliar application treatments on plant water relationship at 110 days after planting of sweet potato during 2019 and 2020 seasons

Treatments	Total water (%)		Free water (%)		Bound water (%)		Osmotic pressure (%)	
	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season
	Effect of irrigation intervals							
15 days	85.64 a	86.34 a	68.30 a	68.45 a	17.33 b	17.89 b	5.74 b	5.93 b
30 days	80.94 b	82.18 b	54.28 b	54.16 b	26.66 a	28.01 a	8.60 a	9.31 a
	Effect of some soil and foliar application treatments							
HA	79.26 f	80.10 g	51.60 g	53.42 f	27.65 a	26.68 a	8.42 a	8.79 a
HA+ Trehalose	84.06 c	85.85 c	62.79 d	63.21 b	21.27 c	22.64 bc	7.25 bc	7.54 c
HA+ KSi	81.63 e	81.60 e	57.81 e	57.66 d	23.82 b	23.94 b	7.44 b	7.98 b
HA+ Algae	79.24 f	80.86 f	54.77 f	55.04 e	24.46 b	25.81 a	8.12 a	8.51a
FA	83.03 d	84.31 d	62.19 d	61.81 c	20.84 c	22.50 c	6.85 c	7.50 c
FA + Trehalose	88.60 a	88.54 a	69.82 a	68.26 a	18.78 d	20.28 d	6.26 d	6.76 d
FA+ KSi	85.86 b	87.29 b	66.90 b	67.32a	18.96 d	19.97 d	6.32 d	6.65 d
FA+ Algae	84.65 c	85.53 c	64.43 c	63.75 b	20.22 c	21.77 c	6.74 cd	7.26 c

HA= Humic acid at 20 kg /fad. and FA= fulvic acid at 10 kg /fad. as soil application

Trehalose at 1 g/l, KSi= Potassium silicate at 1 ml/l, and algae extract at 1 g/l as foliar application

Values having the same alphabetical letter(s) did not significantly differ at the 0.05 level of significance, according to Duncan's multiple range test.

Table (4). Effect of the interaction between irrigation intervals and some soil and application treatments on plant water relationship at 110 days after planting of sweet potato during 2019 and 2020 seasons

Treatments		Total water (%)		Free water (%)		Bound water (%)		Osmotic pressure (%)	
Irrigation intervals	**Soil and foliar application treatments**	**2019 season**	**2020 season**	**2019 season**	**2020 season**	**2019 season**	**2020 season**	**2019 season**	**2020 season**
15 days	**HA**	80.79 g	82.14 ij	57.73 h	60.00 ef	23.06 e	22.14 e	7.09 ef	7.18 f
	HA+ Trehalose	88.92 b	90.34 a	70.13 d	70.87 b	18.79 g	19.47 f	6.59 f	6.49 g
	HA+ KSi	84.70 e	83.70 gh	64.40 e	63.40 d	20.30 fg	20.30 ef	6.77 f	6.77 fg
	HA+ Algae	81.25 g	82.93 hi	59.92 g	61.39 e	21.33 f	21.54 e	7.11 ef	7.18 f
	FA	84.71 e	85.07 ef	69.78 d	69.38 c	14.93 h	15.69 g	4.98 g	5.23 h
	FA + Trehalose	90.97 a	90.91 a	77.70 a	76.08 a	13.27 i	14.83 g	4.42 g	4.94 hi
	FA+ KSi	87.40 c	88.93 b	74.67 b	75.10 a	12.73 i	13.83 g	4.24 g	4.61 i
	FA+ Algae	86.38 d	86.72 c	72.10 c	71.40 b	14.28 hi	15.32 g	4.76 g	5.11 h
30 days	**HA**	77.73 ij	78.06 l	45.48 l	46.84 k	32.25 a	31.22 a	9.75 a	10.41 a
	HA+ Trehalose	79.20 h	81.37 j	55.45 i	55.56 gh	23.75 de	25.81 d	7.92 de	8.60 e
	HA+ KSi	78.57 hi	79.50 k	51.23 j	51.92 i	27.34 b	27.58 cd	8.11 cd	9.19 cd
	HA+ Algae	77.23 j	78.79 kl	49.63 k	48.70 j	27.60 b	30.09 ab	9.14 ab	9.85 b
	FA	81.36 g	83.55 gh	54.61 i	54.24 h	26.75 bc	29.31 a-c	8.72 bc	9.77 b
	FA + Trehalose	86.23 d	86.18 cd	61.94 f	60.44 ef	24.29 de	25.74 d	8.10 cd	8.58 e
	FA+ KSi	84.33 e	85.65 de	59.14 g	59.54 f	25.19 cd	26.11 d	8.40 b-d	8.70 de
	FA+ Algae	82.93 f	84.34 fg	56.76 h	56.11 g	26.17 bc	28.23 bc	8.72 bc	9.41 bc

HA= Humic acid at 20 kg /fad. and FA= fulvic acid at 10 kg /fad. as soil application

Trehalose at 1 g/l, KSi= Potassium silicate at 1 ml/l, and algae extract at 1 g/l as foliar application

Values having the same alphabetical letter(s) did not significantly differ at the 0.05 level of significance, according to Duncan's multiple range test.

Table (5). Effect of irrigation intervals and some soil and foliar application treatments on N,P and K contents in shoots as well as proline amino acid in leaves at 110 days after planting of sweet potato during 2019 and 2020 seasons

Treatments	N (%)		P (%)		K (%)		Proline amino acid (m/100 gm DW)	
	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season
	Effect of irrigation intervals							
15 days	2.49 a	2.53 a	0.360 a	0.348 a	2.31 a	2.34 a	146.07 b	149.83 b
30 days	2.42 b	2.46 b	0.353 b	0.343 b	2.27 b	2.32 b	177.31 a	185.93 a
	Effect of some soil and foliar application treatments							
HA	2.10 h	2.23 f	0.323 h	0.312 f	2.10 g	2.12 g	198.52 a	207.82 a
HA+ Trehalose	2.47 e	2.49 d	0.349 e	0.347 d	2.24 d	2.26 e	151.81 e	163.08 d
HA+ KSi	2.37 f	2.36 e	0.347 f	0.339 e	2.18 e	2.20 f	156.26 d	171.15 c
HA+ Algae	2.54 d	2.60 c	0.353 d	0.352 c	2.34 c	2.35 d	182.93 b	189.35 b
FA	2.15 g	2.24 f	0.337 g	0.335 e	2.16 f	2.11 g	171.23 c	173.35 c
FA + Trehalose	2.69 b	2.71 b	0.379 b	0.361 b	2.43 b	2.55 b	134.02 g	126.24 f
FA+ KSi	2.60 c	2.59 c	0.369 c	0.351 cd	2.54 a	2.60 a	139.27 f	150.14 e
FA+ Algae	2.73 a	2.76 a	0.397 a	0.368 a	2.34 c	2.46 c	159.48 d	161.89 d

HA= Humic acid at 20 kg /fad. and FA= fulvic acid at 10 kg /fad. as soil application

Trehalose at 1 g/l, KSi= Potassium silicate at 1 ml/l, and algae extract at 1 g/l as foliar application

Values having the same alphabetical letter(s) did not significantly differ at the 0.05 level of significance, according to Duncan's multiple range test.

Table (6) . Effect of the interaction between irrigation intervals and some soil and foliar treatments on N,P and K contents in shoots as well as proline amino acid in leaves after 110 days from planting of sweet potato during 2019 and 2020 seasons

Treatments		N (%)		P (%)		K (%)		Proline amino acid (m/100 gm DW)	
Irrigation intervals	**Soil and foliar treatments**	**2019 season**	**2020 season**	**2019 season**	**2020 season**	**2019 season**	**2020 season**	**2019 season**	**2020 season**
15 days	**HA only**	2.22 i	2.25 j	0.331 j	0.316 i	2.14 k	2.13 kl	193.43 b	192.24 d
	HA+ Trehalose	2.47 g	2.54 f	0.352 ef	0.349 de	2.27 g	2.29 h	133.30 h	148.39 i
	HA+ KSi	2.38 h	2.38 h	0.350 fg	0.340 fg	2.20 hi	2.22 i	152.25 fg	160.15 h
	HA+ Algae	2.54 f	2.60 e	0.354 e	0.354 cd	2.38 e	2.40 f	167.98 d	169.11 g
	FA only	2.16 j	2.30 i	0.342 i	0.338 fgh	2.19 ij	2.14 k	147.86 g	149.42 i
	FA + Trehalose	2.75 b	2.75 b	0.381 b	0.361 b	2.45 c	2.54 c	119.95 i	105.88 l
	FA+ KSi	2.62 d	2.62 e	0.377 c	0.352 cde	2.49 b	2.58 b	121.09 i	132.19 k
	FA+ Algae	2.77 a	2.82 a	0.398 a	0.380 a	2.38 e	2.47 d	132.69 h	141.27 j
30 days	**HA only**	1.97 l	2.21 k	0.315 k	0.309 i	2.07 l	2.12 l	203.61 a	223.41 a
	HA+ Trehalose	2.47 g	2.44 g	0.347 gh	0.345 ef	2.22 h	2.24 i	170.32 d	177.78 f
	HA+ KSi	2.37 h	2.35 h	0.344 hi	0.338 gh	2.17 j	2.19 j	160.26 e	182.16 e
	HA+ Algae	2.55 f	2.61 e	0.352 ef	0.350 de	2.31 f	2.31 g	197.87 b	209.59 b
	FA only	2.13 k	2.17 l	0.332 j	0.332 h	2.13 k	2.08 m	194.59 b	197.28 c
	FA + Trehalose	2.64 d	2.67 d	0.377 c	0.362 b	2.42 d	2.56 b	148.09 g	146.60 i
	FA+ KSi	2.59 e	2.57 f	0.361 d	0.351 cde	2.59 a	2.62 a	157.46 ef	168.09 g
	FA+ Algae	2.68 c	2.71 c	0.396 a	0.357 bc	2.30 f	2.45 e	186.26 c	182.51 e

HA= Humic acid at 20 kg /fad. and FA= fulvic acid at 10 kg /fad. as soil application

Trehalose at 1 g/l, KSi= Potassium silicate at 1 ml/l, and algae extract at 1 g/l as foliar application

Values having the same alphabetical letter(s) did not significantly differ at the 0.05 level of significance, according to Duncan's multiple range test.

Table (7). Effect of irrigation intervals and some soil and foliar application treatments on tuber root characteristics of sweet potato during 2019 and 2020 seasons

Treatments	Tuber root diameter (cm)		Tuber root length (cm)		Tuber root weight (g)	
	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season
	Effect of irrigation intervals					
15 days	5.95 a	5.82 a	19.33 b	19.49 b	165.38 a	167.36 a
30 days	5.74 b	5.65 b	20.45 a	19.78 a	162.73 a	164.33 a
	effect of some soil and foliar application treatments					
HA	4.86 e	4.91 f	15.66 g	16.16 f	96.98 f	102.07 g
HA+ Trehalose	5.58 d	5.60 d	20.00 d	20.33 c	158.11 d	155.39 e
HA+ KSi	5.44 d	5.40 e	19.33 e	17.99 e	170.32 c	174.25 d
HA+ Algae	5.88 c	5.78 d	21.00 c	21.66 b	168.42 c	171.93 d
FA	5.03 e	4.85 f	18.33 f	18.66 d	112.73 e	114.23 f
FA + Trehalose	6.63 b	6.31 b	21.49 b	18.33 de	182.80 b	183.79 c
FA+ KSi	6.11 c	6.08 c	23.83 a	23.50 a	211.71 a	218.43 a
FA+ Algae	7.23 a	6.93 a	19.49 e	20.50 c	211.38 a	206.67 b

HA= Humic acid at 20 kg /fad. and FA= fulvic acid at 10 kg /fad. as soil application
Trehalose at 1 g/l, KSi= Potassium silicate at 1 ml/l, and algae extract at 1 g/l as foliar application
Values having the same alphabetical letter(s) did not significantly differ at the 0.05 level of significance, according to Duncan's multiple range test.

Table (8). Effect of irrigation intervals and some soil and foliar treatments on yield and its components of sweet potato during 2019 and 2020 seasons

Treatments	Unmarketable tuber roots yield (ton/fad.)		Marketable tuber roots yield (ton/fad.)		Total tuber roots yield (ton/fad.)		Marketable tuber roots (%) to total yield tuber roots	
	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season
	Effect of irrigation intervals							
15 days	1.850 b	2.214 a	13.520 a	13.331 a	15.371 a	15.545 a	87.96	85.76
30 days	2.124 a	2.168 a	12.800 b	12.851 b	14.924 a	15.020 a	85.77	85.56
	Effect of some soil and foliar treatments							
HA	2.931 a	2.840 a	9.225 f	9.099 f	12.156 e	11.939 f	75.89	76.21
HA+ Trehalose	2.316 c	2.034 c	11.870 d	12.517 c	14.186 d	14.552 d	83.67	86.02
HA+ KSi	1.654 e	2.394 b	13.775 c	13.342 b	15.430 c	15.737 c	89.27	84.78
HA+ Algae	1.956 d	2.459 b	12.281 d	12.093 d	14.237 d	14.553 d	86.26	83.10
FA	2.680 b	2.832 a	10.126 e	10.548 e	12.806 e	13.381 e	79.07	78.83
FA + Trehalose	1.521 e	1.354 e	15.702 b	15.703 a	17.224 b	17.057 b	91.16	92.06
FA+ KSi	1.840 d	1.970 c	16.216 a	15.869 a	18.056 a	17.840 a	89.81	88.95
FA+ Algae	1.002 f	1.644 d	16.087 ab	15.558 a	17.089 b	17.202 b	94.14	90.44

HA= Humic acid at 20 kg /fad. and FA= fulvic acid at 10 kg /fad. as soil application

Trehalose at 1 g/l, KSi= Potassium silicate at 1 ml/l, and algae extract at 1 g/l as foliar application

Values having the same alphabetical letter(s) did not significantly differ at the 0.05 level of significance, according to Duncan's multiple range test.

Marketable tuber roots (average tuber roots was about 100-250 g), Unmarketable tuber roots (average tuber roots less than 100 g or more than 250 g)

Table (9). Effect of the interaction between irrigation intervals and some soil and foliar application treatments on tuber root characteristics of sweet potato at harvest time during 2019 and 2020 seasons

Treatments		Tuber root diameter (cm)		Tuber root length (cm)		Tuber root weight (g)	
Irrigation intervals	Soil and foliar application treatments	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season
15 days	HA	4.90 ij	4.90 h	14.00 h	15.00 j	99.26 h	105.37 hi
	HA+ Trehalose	5.53 gh	5.50 fg	20.00 d	20.00 e	159.26 ef	157.15 f
	HA+ KSi	5.53 gh	5.40 g	19.66 de	18.33 g	175.56 c	179.07 cd
	HA+ Algae	5.96 ef	5.80 de	21.00 c	21.33 c	168.52 d	173.22 de
	FA	5.06 ij	4.96 h	17.66 g	18.33 g	114.07 g	112.59 gh
	FA + Trehalose	6.80 bc	6.46 b	20.66 c	21.00 cd	179.26 bc	184.82 c
	FA+ KSi	6.26 de	6.16 c	22.33 b	22.00 b	212.59 a	219.44 a
	FA+ Algae	7.56 a	7.36 a	19.33 ef	20.00 e	214.48 a	207.18 b
30 days	HA	4.83 j	4.93 h	17.33 g	17.33 h	94.69 h	98.77 i
	HA+ Trehalose	5.63 fgh	5.70 ef	20.00 d	20.66 d	156.95 f	153.64 f
	HA+ KSi	5.36 hi	5.40 g	19.00 f	17.66 h	165.08 de	169.42 e
	HA+ Algae	5.80 efg	5.76 def	21.00 c	22.00 b	168.31 d	170.64 de
	FA	5.00 ij	4.73 h	19.00 f	19.00 f	111.40 g	115.87 g
	FA + Trehalose	6.46 cd	6.16 c	22.33 b	15.66 i	186.33 b	182.75 c
	FA+ KSi	5.96 efg	6.00 cd	25.33 a	25.00 a	210.82 a	217.42 a
	FA+ Algae	6.90 b	6.50 b	19.66 de	21.00 cd	208.28 a	206.15 b

HA= Humic acid at 20 kg /fad. and FA= fulvic acid at 10 kg /fad. as soil application

Trehalose at 1 g/l, KSi= Potassium silicate at 1 ml/l, and algae extract at 1 g/l as foliar application

Values having the same alphabetical letter(s) did not significantly differ at the 0.05 level of significance, according to Duncan's multiple range test.

Table (10). Effect of the interaction between irrigation intervals and some soil and foliar application treatments on yield and its components of sweet potato during 2019 and 2020 seasons

Treatments		Unmarketable tuber roots yield (ton/fad.)		Marketable tuber roots yield (ton/fad.)		Total tuber roots yield (ton/fad.)		Marketable tuber roots (%) to total yield tuber roots	
Irrigation intervals	Soil and foliar application treatments	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season
15 days	HA	2.600 b	2.803 bc	9.600 i	9.094 i	12.200 i	11.897 i	78.69	76.44
	HA+ Trehalose	2.592 b	2.685 cd	11.675 fg	11.835 f	14.267 ef	14.520 fg	81.83	81.51
	HA+ KSi	1.352 e	2.558 d	14.511 d	13.735 d	15.863 cd	16.293 cd	91.48	84.30
	HA+ Algae	1.465 e	2.594 d	13.478 e	12.926 e	14.943 de	15.520 de	90.20	83.29
	FA	2.075 c	2.312 e	10.838 h	11.075 g	12.913 ghi	13.387 h	83.93	82.73
	FA + Trehalose	1.829 cd	1.665 i	15.104 d	15.468 bc	16.933 b	17.133 bc	89.20	90.28
	FA+ KSi	1.911 cd	1.836 h	16.682 a	16.447 a	18.593 a	18.283 a	89.72	89.96
	FA+ Algae	0.982 f	1.262 j	16.275 ab	16.068 a	17.257 b	17.330 b	94.31	92.72
30 days	HA	3.262 a	2.878 b	8.850 i	9.103 i	12.112 i	11.981 i	73.07	75.98
	HA+ Trehalose	2.041 c	1.384 j	12.064 f	13.199 e	14.105 efg	14.583 ef	85.53	90.51
	HA+ KSi	1.957 cd	2.231 ef	13.039 e	12.949 e	14.996 de	15.180 ef	86.95	85.30
	HA+ Algae	2.447 b	2.325 e	11.083 gh	11.260 g	13.530 fgh	13.585 gh	81.91	82.89
	FA	3.285 a	3.353 a	9.414 i	10.022 h	12.699 hi	13.375 h	74.13	74.93
	FA + Trehalose	1.214 ef	1.044 k	16.301 ab	15.938 ab	17.515 ab	16.982 bc	93.07	93.85
	FA+ KSi	1.769 d	2.104 fg	15.749 bc	15.292 c	17.518 ab	17.396 ab	89.90	87.91
	FA+ Algae	1.022 f	2.026 g	15.898 b	15.048 c	16.920 bc	17.074 bc	93.96	88.13

HA= Humic acid at 20 kg /fad. and FA= fulvic acid at 10 kg /fad. as soil application

Trehalose at 1 g/l, KSi= Potassium silicate at 1 ml/l, and algae extract at 1 g/l as foliar application

Values having the same alphabetical letter(s) did not significantly differ at the 0.05 level of significance, according to Duncan's multiple range test.

Marketable tuber roots (average tuber roots was about 100-250 g), Unmarketable tuber roots (average tuber roots less than 100 g or more than 250 g)

Table (11). Effect of irrigation intervals and some soil and foliar application treatments on tuber root quality of sweet potato at harvest time, during 2019 and 2020 seasons

Treatments	N (%)		P (%)		K (%)		Total carbohydrates (%)		DM (%)	
	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season
	Effect of irrigation intervals									
15 days	1.59 a	1.57 a	0.247 a	0.243 a	2.01 a	2.01 a	57.00 a	57.00 a	22.79 b	23.50 a
30 days	1.55 b	1.56 a	0.239 b	0.234 b	2.01 a	2.00 a	56.50 a	56.33 a	23.91 a	24.41 a
	Effect of some soil and foliar application treatments									
HA	1.22 h	1.24 g	0.142 h	0.140 h	1.69 g	1.71 g	52.83 e	52.83 d	19.33 e	19.33 f
HA+ Trehalose	1.57 e	1.55 e	0.244 e	0.238 e	1.89 e	1.86 e	56.50 c	55.16 c	22.83 d	24.50 d
HA+ KSi	1.52 f	1.54 e	0.227 f	0.216 f	1.79 f	1.79 f	55.00 d	53.50 d	22.00 d	22.00 e
HA+ Algae	1.64 d	1.65 d	0.257 d	0.263 d	2.22 c	2.22 c	57.50 c	58.00 b	24.50 bc	25.83 c
FA	1.29 g	1.29 f	0.149 g	0.147 g	1.66 h	1.69 g	53.50 e	52.83 d	19.83 e	19.66 f
FA + Trehalose	1.76 b	1.75 b	0.310 b	0.299 b	2.24 b	2.27 b	59.00 b	59.00 b	25.50 b	27.00 b
FA+ KSi	1.69 c	1.68 c	0.287 c	0.282 c	2.36 a	2.32 a	62.50 a	63.16 a	28.50 a	29.50 a
FA+ Algae	1.84 a	1.84 a	0.326 a	0.324 a	2.20 d	2.19 d	57.16 c	58.83 b	24.33 c	23.83 d

HA= Humic acid at 20 kg /fad. and FA= fulvic acid at 10 kg /fad. as soil application

Trehalose at 1 g/l, KSi= Potassium silicate at 1 ml/l, and algae extract at 1 g/l as foliar application

Values having the same alphabetical letter(s) did not significantly differ at the 0.05 level of significance, according to Duncan's multiple range test.

Table (12). Effect of the interaction between irrigation intervals and some soil and foliar application treatments on tuber root quality of sweet potato at harvest time during 2019 and 2020 seasons

Treatments		N (%)		P (%)		K (%)		Total carbohydrates (%)		DM (%)	
Irrigation intervals	Soil and foliar application treatments	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season	2019 season	2020 season
15 days	HA	1.23 i	1.24 j	0.144 m	0.147 l	1.70 j	1.66 i	52.66 hi	52.33 g	18.33 h	18.33 j
	HA+ Trehalose	1.58 f	1.55 g	0.244 i	0.233 i	1.92 f	1.91 d	55.66 e-g	54.00 f	22.00 f	24.00 f
	HA+ KSi	1.53 g	1.53 g	0.230 j	0.215 j	1.82 h	1.86 e	54.33 g-i	53.33 fg	22.00 f	22.00 gh
	HA+ Algae	1.66 d	1.67 e	0.264 g	0.264 g	2.21 de	2.19 c	57.00 de	57.33 de	23.66 e	25.66 c-e
	FA	1.30 h	1.27 i	0.153 l	0.151 k	1.56 k	1.68 i	54.66 f-h	52.66 fg	19.33 gh	19.00 ij
	FA + Trehalose	1.80 b	1.77 c	0.314 c	0.314 c	2.27 b	2.27 b	60.00 bc	60.00 bc	25.00 c-e	27.00 c
	FA+ KSi	1.72 c	1.71 d	0.291 e	0.291 d	2.37 a	2.32 a	64.00 a	65.00 a	27.66 b	28.66 ab
	FA+ Algae	1.88 a	1.87 a	0.333 a	0.328 a	2.21 cd	2.19 c	57.66 de	61.33 b	24.33 de	23.33 fg
30 days	HA	1.21 i	1.24 j	0.141 m	0.133 n	1.68 j	1.76 g	53.00 hi	53.33 fg	20.33 g	20.33 hi
	HA+ Trehalose	1.57 f	1.55 g	0.244 i	0.244 h	1.87 g	1.81 f	57.33 de	56.33 e	23.66 e	25.00 d-f
	HA+ KSi	1.51 g	1.56 g	0.224 k	0.218 j	1.76 i	1.71 h	55.66 e-g	53.66 fg	22.00 f	22.00 g
	HA+ Algae	1.63 e	1.64 f	0.250 h	0.263 g	2.23 c	2.26 b	58.00 cd	58.66 cd	25.33 cd	26.00 cd
	FA	1.29 h	1.32 h	0.144 m	0.142 m	1.77 i	1.71 h	52.33 i	53.00 fg	20.33 g	20.33 hi
	FA + Trehalose	1.73 c	1.74 d	0.306 d	0.283 e	2.22 cd	2.27 b	58.00 cd	58.00 d	26.00 c	27.00 bc
	FA+ KSi	1.66 d	1.66 e	0.282 f	0.273 f	2.35 a	2.32 a	61.00 b	61.33 b	29.33 a	30.33 a
	FA+ Algae	1.79 b	1.81 b	0.320 b	0.320 b	2.19 e	2.20 c	56.66 d-f	56.33 e	24.33 de	24.33 ef

HA= Humic acid at 20 kg /fad. and FA= fulvic acid at 10 kg /fad. as soil application

Trehalose at 1 g/l, KSi= Potassium silicate at 1 ml/l, and algae extract at 1 g/l as foliar application

Values having the same alphabetical letter(s) did not significantly differ at the 0.05 level of significance, according to Duncan's multiple range test.