

Effect of Soil Media, Salicylic Acid and Disper on Some Chemical Traits of Date Palm Offshoots of Cv Barhee

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Abstract.

This factorial experiment was carried out in a private nursery in Wassit province to investigate the best soil media between three different of them .also, the effect of spraying by salicylic acid and a Disper chlorophyll fertilizer 3 Nitrogen and Sodium percentage. The results showed that using 2/3 field soil and 1/3 decomposed animal manure(M2) has a significant effect in studies characters (Chlorophyll content mg.l⁻¹, Nitrogen % and Potassium% were got(1.31, 1.82, 0.29) respectively. Using salicylic acid spraying by 300mg.l⁻¹ (S2)got best result Nitrogen and potassium percentage got (1.71, 0.39)respectively . Also, results showed a reduction in Chlorophyll content percentage it was got the lowest value by using 200 mg.l⁻¹ of salicylic acid reached (1.15) mg.l⁻¹ and the D2 (spraying by 600 mg.l⁻¹ Disper got the best result of chlorophyll, nitrogen and potassium percentage it was got (1.37, 1.71, 0.39).

Keywords. Acid , Disper , Date palm offshoots, Micro-elements

1. Introduction

Date palm (*Phoenix dactylifera* L.) consider one of the oldest fruit known by humans and has been cultivated since ancient times , from the beginning, dates became essential food in food shortages and crises time [1], date palm offshoots are a standard method for date palm vegetative propagation due their ability to roots formation [2], this ability depend

a lot on the quality of offshoot separation so, planting low offshoot quality will disgrace of seedling growth opportunity [3]. nowadays, offshoots are exposed to various pests and diseases; of the most critical cases is Global warming or global climatic changes, so an increase in the temperature leads to increase diseases and pests [4], Pollock,1986 found that cultivated seedlings in pots impossible to grow faster than which cultivated in open fields, also the size of pot has important in plant growth better than which cultivated in the area [5].

To enhance the plant's resistance to withstand climate conditions and stresses, a group of organic productions has recently appeared that is used to activate the plant's vital processes for its ability to increase the plant's ability to withstand stresses such as salinity, drought, high or low temperature, and plant diseases[6,7].

Biostimulants are natural or artificial components used for seeds, plants, and soil [8;9]. These substances cause differences in essential and structural functions, affecting plant growth through enhanced toleration to abiotic stresses and improving seed and/or grain yield and quality. In addition, biostimulants decline the demand for fertilizers [10,11].

Salicylic acid caused many physiological functions in the plant, some functions were boosters, and others were hindered. Different levels of salicylic acid seemed to perform as antitranspirants and impeded stomata opening in epidermal strips [12].

Ahmed et al.,2018 found that spraying Barhee fruitful date palm with salicylic acid registered the highest percentage of chlorophyll in fruit; Salicylic (S) is a simple phenolic compound that has proved as a growth regulator for external influence and has a physiological effect of plant growth [13]. On another hand, Disper fertilization it contains the essential nutrients, Calcium and Potassium, free of amino acids. It can potentially reduce the salt stress of soil and plants, and it's usually added to some organic materials [14]. Choosing the media is sensitive to offshoot growth, and beat moss is a common medium in mixing agricultural media in nurseries and greenhouses. It is often combined with other media to increase the ability to retain water [15], containers that use alternative media have a greater nutritional capacity than those media in which soil is used, and date palms produced in containers that use soil only are exposed to deficiency of nitrites [16]. Any plant requires water, air, light, suitable temperature, and 16 nutrients to grow healthy. Plants absorb elements of carbon, hydrogen and oxygen from the surrounding environment (air and water).

This experiment aims to study the effect and response of offshoots grown in the texture containers to spray with nutrients to stimulate them to produce.

2. Materials and Methods

An experiment was carrying out in one of the privet nursery in Wassit province ,in 2021 by cultivation a Barhee date palm offshoots in texture pots 40 kg capacity in green house by used three medias (M) ,M₁ represented the field soil ,M₂ represented 2/3 field soil and 1/3 decomposed animal manure and M₃ represented field soil with 1 kg compost content of 60% organic matter and N.P.K 3:3:4 fertilizer . Seedlings were cultivated in early of march 2021 , after three months of planting seedlings when the offshoots started grow, were spraying by salicylic acid (S) as a first factor was three concentrations(0, 100, 200) mg.L⁻¹ four times, one month between

treatment and another , S₀ represented the control treatment without spraying, S₁ represented 100 mg.L⁻¹ and S₂ represented 200 mg.L⁻¹ . Also , the second factor was spraying by Disper in three concentrations(D₀ , D₁ , D₂) means spraying by (0, 300,600) mg.L⁻¹ respectively. The chlorophyll content in the leaf (wicker) was estimated by (Mackinny,1941) method ,also estimated the Nitrogen , and potassium in the special laboratory. The complete randomized design(R.C.B.D) was used (3 agricultural media * 3 concentrations of salicylic acid * concentrations of Disper chlorophyll) with three replications, the results were analyzed by using the Genstat program at the (0.05)LSD.

3. Results

The results in table (1) showed there is a significant effect of medias on chlorophyll content in wickers of date palm offshoots in studied experiment , using 2/3 field soil with 1/3 decomposed animals (M₂) was superior in chlorophyll content character by registered a (1.31) mg.g⁻¹ compare with control treatment which gave (field soil M₁) 1.08 mg.g⁻¹ . also, there is a significant effect of spraying by salicylic acid , the results showed a superior of control treatment by registered a (1.31) mg.g⁻¹ and spraying by 100 mg.L⁻¹ concentration has registered a lower value reached (1.15) mg.L⁻¹ . there is significant effect on chlorophyll content in leafs by spraying Disper , spraying by (600) mg.L⁻¹ has registered a height value reached (1.37) mg.L⁻¹ .

The overlap between by media and spraying by salicylic showed a significant effect of spraying , the zero concentration with M₃ media (M₃S₀) registered (1.37) mg.L⁻¹.

The overlap of spraying by salicylic and Disper ,the results in table (1) showed the effect between treatments, S₀D₃ treatment registered A height value reached (1.50) mg.L⁻¹ , while the triple interferences between the three factors has a significant effect , the M₃ S₁ D₀ has registered a highest value reached (1.80) mg.L⁻¹.

Table 1. Effect of media and type of spraying with salicylic and Disper on total chlorophyll content (mg.gm^{-1}) for Barhee Date palm offshoots.

M.Treat	S	Disperse (D)	treatments	M S	M
		D ₀	D ₁	D ₂	
	S ₀	1.07	1.15	1.48	1.23
M ₁	S ₁	0.84	0.93	1.34	0.92
	S ₂	0.92	1.00	1.34	1.09
	S ₀	0.84	1.75	1.65	1.41
M ₂	S ₁	0.90	1.38	1.40	1.22
	S ₂	1.20	1.04	1.59	1.27
	S ₀	1.11	1.34	1.36	1.37
M ₃	S ₁	1.80	1.00	1.11	1.30
	S ₂	1.36	1.36	1.38	1.36
	D ₀	0.95	1.03	1.27	
M.D	D ₁	0.98	1.39	1.55	
	D ₂	1.34	1.24	1.29	
	D average		1.04	1.22	1.37
	S ₀		1.01	1.42	1.50
	S.D	S ₁	1.18	1.11	1.17
		S ₂	1.08	1.14	1.43
					1.15
					1.22

	M	S	D
L.S.	0.04	0.04	0.04
D	MS	MD	SD
	0.07	0.07	0.07
			0.12

Table 2. Effect of media and type of spraying with salicylic and disper on wicker content of Nitrogen percentage (%) for Barhee Date palm offshoot.

M.Treat.	SA	Dispers (D)	treatments	M SA	M
		D ₀	D ₁	D ₂	
	S0	1.52	1.76	1.50	1.59
M ₁	S1	1.76	1.61	1.72	1.72
	S2	1.50	1.54	1.87	1.64
	S0	1.80	1.85	1.90	1.85
M ₂	S1	1.82	1.71	1.70	1.74
	S2	1.60	1.89	2.05	1.85
	S0	1.70	1.70	1.60	1.66
M3	S1	1.69	1.65	1.63	1.65
	S2	1.75	1.50	1.68	1.64
	D0	1.60	1.64	1.71	
M.D	D1	1.74	1.82	1.89	
	D2	1.71	1.61	1.64	
	D average		1.68	1.69	1.75
					S average
	S0		1.67	1.77	1.66
S.D	S1		1.76	1.66	1.70
	S2		1.62	1.64	1.87
					1.71
L.S.	M		S		D
D	0.03		0.03		0.03

MS	MD	SD	MSD
0.05	0.05	0.05	0.08

The results in table (2) showed there is a significant effect of medias on nitrogen percentage content in wickers(leafs) of date palm offshoots in this experiment , results showed that using 2/3 field soil with 1/3 decomposed animals(M_2) was superior in nitrogen content character by registered (1.82)% compare with M_1 and M_2 treatments which they gave same values (1.65) %. also, there is no significant effect of spraying by salicylic acid between S_0 and S_2 they gave same average (1.71)% .the results showed a significant effect of spraying by Disper D_3 treatment 200mg.L^{-1} it was superior by

registered a (1.75)% and spraying by zero concentration (D_0) has registered a lower value reached (1.68)% .

The overlap between by media and spraying by salicylic showed a significant effect of spraying , the 600mg.L^{-1} concentration with M_2 media (M_2S_2) registered (1.85) %. The overlap of spraying by salicylic and Disper ,the results in table (2) showed the effect between treatments S_2D_3 treatment registered A height value reached (1.87) % , while the triple interferences between the three factors has a significant effect , the ($M_2 S_2 D_2$) has registered a highest value reached (2.05) %.

Table 3. Effect of media and type of spraying with salicylic and Disper on wicker content of Sodium percentage (mg.gm^{-1}) for Barhee Date palm.

M.Treat.	S	Disper (D)	treatments	M S	M
		D_0	D_1	D_2	
	S_0	0.16	0.17	0.38	0.23
M_1	S_1	0.24	0.18	0.60	0.34
	S_2	0.21	0.28	0.63	0.29
	S_0	0.22	0.25	0.80	0.42
M_2	S_1	0.24	0.20	0.26	0.23
	S_2	1.00	0.20	0.24	0.38
M_3	S_0	0.45	0.18	0.23	0.27

M.D	S1	0.20	0.15	0.20	0.18	S average
	S2	0.60	0.29	0.30	0.39	
	D0	0.45	0.22	0.43		
	D1	0.21	0.25	0.41		
	D2	0.42	0.21	0.22		
	D average		0.37	0.23	0.36	
S.D	S0		0.28	0.20	0.45	0.31
	S1	0.23		0.17	0.35	0.25
	S2		0.50	0.30	0.27	0.39
	M			S		D
		0.05		0.05		0.05
	L.S. D	MS		MD	SD	MSD
		0.09		0.09	0.09	0.015

A significant effect of medias on nitrogen percentage content in winkers(leaves) of date palm offshoots in this experiment the results in table (3) showed that using 2/3 field soil with 1/3 decomposed animals (M_2) was superior in potassium content character by registered (0.38)% compare with M_3 treatments which gave (0.28) %. also, there is a significant effect of spraying by salicylic acid between experiment treatments which S_3 (200)mg.L⁻¹ gave average (0.39)% .the results also showed a significant effect of spraying by Disper (D_0) treatment (0 mg.L⁻¹) it was superior by registered a(0.37)% and spraying by 100 concentration (D_1) has registered a lower value reached (0.23)% .

The overlap between by media and spraying by salicylic showed a significant effect of spraying , the 100mg.L⁻¹ concentration with M_2 media (M_2S_2) registered (0.48) % . The overlap of spraying by salicylic and Disper , the results in table (3) also showed the effect between treatments S_2D_0 treatment registered A height value reached (0.50) % , while the triple interferences between the three factors has a significant effect , the $M_2 S_2 D_0$)has registered a highest value reached (1.00) % compare with $M_1 S_0 D_0$ it was registered A lowest value (0.16)% .

4. Discussion

The results showed the effect of the experimental treatments on the ratio of nitrogen and potassium in addition to the

chlorophyll content of plant leaves. It is one of the major elements that are added to the plant to improve its growth, especially in many soils where the presence of these elements is limited [17].

The importance of the elements work to increase the rates of the vital processes in which they participate, also, Nitrogen works to build compounds that enter the photosynthesis process, at the same time potassium helps to form enzymes that in turn increase their readiness in the leaves [18]. The results of spraying with disper chlorophyll are consistent with studies in which biological preparations containing amino acids were used. The reason may be due to the increased absorption of elements by the plant, which increases the content of these elements in the leaves, The biological stimuli have a major role in increasing the concentration of potassium, which may be due to the reason for the decrease in the effect of sodium on the plant due to the competition between potassium and sodium for the channels in the plasma membrane for the entry of elements into the plant cells [19]. This feature helps to increase plant tolerance to salinity by reducing sodium absorption and facilitating rooting and plant growth under saline conditions [20]. The positive effect of spraying with salicylic acid on the plant is attributed to environmental stress, drought and salinity[21].

Conclusion

Results showed a reduction in Chlorophyll content percentage it was got the lowest value by using 200 mg.l⁻¹ of salicylic acid reached (1.15) mg.l⁻¹ and the D2 (spraying by 600 mg.l⁻¹ Disper got the best result of chlorophyll, nitrogen and potassium percentage it was got (1.37, 1.71, 0.39).

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