

EFFECT OF SPRAYING OF PROSOPIS FARCTA EXTRACT, FOLICIST AND ABO NAJEMH20 ON GROWTH OF POMEGRANATE TRANSPLANT VAR. WONDERFUL CALIFORNIA

HASAN SALEEM NABI

Dept. of Horticulture, College of Agricultural Engineering Sciences, University of Duhok, Kurdistan Region – Iraq

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ABSTRACT

This investigation was carried out during growing season (2019-2020) in the lathhouse of College of Agricultural Engineering Sciences, University of Duhok, Kurdistan region, Iraq. To investigate the effect of spraying with *Prosopis farcta* (0, 100 and 200 ppm), Folicist (0, 50, and 100 ppm) and Abo-najemh20 (50, 75 and 150 ppm) on growth of Pomegranate transplant. The results show that the all studied parameters were increased by increasing the concentration of *Prosopis farcta* especially at (200 ppm) and Folicist at (100ppm) and Abo-najemh20 at (150ppm). The best interaction between *Prosopis farcta* and Folicist was (200ppm and 100 ppm) respectively. Also, the interaction of *Prosopis farcta* at 200ppm with Abo-najemh20 at 150ppm lead to enhancing most studied characteristics. And the interaction between Folicist at 100ppm + 150ppm had a significant difference in improving the studied parameters. However, in triple combinations it found that the *Prosopis farcta* at 200ppm + Folicist at 100ppm + Abo najemh20 at 150ppm was superior interaction compared with all other combination treatment including control treatment.

KEY WORDS: Pomegranate, *Prosopis farcta*, Folicist, Abo najemh20 and organic acid

1. INTRODUCTION

Pomegranate (*Punica granatum* L.), belonging to the family Punicaceae, is one of the favorite table fruits in the world, for its refreshing juice with nutritional value and medicinal purpose (Gosh *et.al.*, 2009). Cultivation of Pomegranate now a day is considered a highly profitable and productive agriculture business in the world. It is widely cultivated throughout India, Iran, China, Turkey, USA, Spain, Azerbaijan, Armenia, Afghanistan, Uzbekistan, the Middle East, Pakistan, Tunisia and Israel, dry regions of Southeast Asia, Peninsular Malaysia, the East Indies and tropical Africa. The leading countries in the world for production of pomegranate were India (Sharma *et.al.*, 2014). In Kurdistan region of Iraq, the pomegranate commercially had a significant value, even there were a wide range of preferred alternative fruits because of it uses in making shaperman (ketchup) and eating dried seeds of pomegranate fruits. *Prosopis Lagonychium farctum* genus is an underutilized legume plant

that belongs to the Leguminosae family Its importance is a small fodder, but generally viewed as not more than an invasive herbs. (Pasicznik *et.al.*, 2004). *Prosopis* genus comprises 44 species, including *P. juliflora*, *P. farcta*, *P. velutina*, *P. glandulosa*, *P. laevigata*, *P. pallida*, *P. cineraria*, etc. The range of *Prosopis farcta* is similar to that of *Prosopis cineraria* from India to Iran, but then extends to the west and north. It is widespread in the Middle East, and is also found in Cyprus, Turkey, and Ukraine and along the North African coast as far as Algeria. No specific habitat preferences were observed, with a wide climatic range. (Pasicznik *et.al.*, 2004). *Prosopis* is mainly distributed in arid, semi-arid, tropical, and subtropical countries, such as America, India, Argentina, Chile, Kenya, and Pakistan (PASIECZNIK, 2001). *Prosopis faracta* is a good source of phenolic compounds and flavonoids such as rutin, myricetin and caffeic acid derivatives (Harzallah-Skhiri & BenJannet, 2005) Folicist is used in many agricultural crops in order to improve seedling growth are required to achieve optimal growth and yield (Ziosi *et.al.*,

2013). Folicist are reported to play a significant role in pomegranate (Chaudhari and Desai, 1993). Hence, an attempt has been made to find Folicist and their doses for improving fruit set and yield in pomegranate cv. Ruby, under West Bengal conditions (Chaudhari & Desai, 1993). The most important components of organic matter have been reported in Abo-Najemh20. Which was a strong role in increasing microbial activity, it is considered as a bio-stimulant for plant growth; Promotes absorption of nutrients as a chelating agent and improves vegetative properties, nutritional status and leaf pigments (Eissa Fawzia *et.al.*, 2007).

The aim of this study was to improve the quality of pomegranate seedling to be ready for budding and grafting for next year this by using Prosopis farcta Extract, Folicist and Abo najemh20. Also, to determine the effect of Prosopis farcta for plant due to there were limited researchers on this plant.

2. MATERIAL AND METHODS

This study was carried out during growing season of 2019-2020 on Pomegranate (*Punica granatum* var Wonderful California) seedling in the lath house of Horticulture department. College of Agricultural Engineering Sciences. To improve the growth of seedlings by spraying application three concentrations of Prosopis farcta Extract with (0, 100 and 200 ppm), Folicist (0, 50 and 100 ppm) and Abo najemh20 (0, 75 and 150 ppm) in May and June 2020. The ripen fruits of Prosopis farcta plants were collected from Peromara village. Duhok, in July 2018. The fruits were dried at 75 ± 5 °C for two

days. Samples were powdered by a mechanical grinder and were stored at a refrigerated temperature in a dark environment to avoid light exposure then dissolved in alcohol to make a stock solution. The data was collected and analyzed by using factorial RCBD and Duncan's test (Al-Rawi, & Khalafalla, 2000). (3*3*3) with three blocks to become (81) experimental units each of them consists of three seedlings. The data was analyzed by using (SAS, 2015) Programme.

3. RESULTS AND DISCUSSIONS

3.1. Transplant height (cm)

The data in table (1) showed that the Prosopis farcta had a significant effect on increasing the highest of pomegranate transplant as compared with control, the same effect was found with Folicist and abo-Najem h20. The height of pomegranate transplant in interactions between Prosopis farcta and Folicist got highest value with 200 ppm Prosopis farcta and 100 ppm Folicist which was (143.22 cm) as compared with other interactions, the superior interactions that affecting transplant height was between (200 ppm Prosopis farcta + 150 ppm Abo-Najemh20) (100 ppm Folicist + 150 ppm Abo-Najemh20) which were (137.78 cm) (137.89 cm) respectively. The triple interaction between Prosopis farcta, Folicist and Abo-Najemh20 had a significant effect in enhancing the height of pomegranate transplants especially at (200 ppm Prosopis farcta, 100 ppm Folicist and 150 ppm Abo-Najemh20) which record (150 cm) compared with all other combinations treatments and control treatment which record (94.67 cm)

Table (1): Effect of Prosopis farcta, Folicist and Abo najemh20 and their interactions on Hight (cm) of Pomegranate transplant

Prosopis farcta (ppm)	Folicist (ppm)	Abo-najemh20 0 ppm	Abo-najemh20 75 ppm	Abo-najemh20 150 ppm	Prosopis farcta * Folicist	Prosopis farcta
0	0	94.67 m	99.00 lm	102.67 l	98.78 h	112.93 c
	50	111.00 k	116.33 j	119.67 h-j	115.67 g	
	100	122.33 f-i	123.00 f-i	127.67 d-f	124.33 e	
100	0	117.67 ij	121.00 g-j	121.67 g-j	120.11 f	126.93 b
	50	124.67 d-h	127.67 d-f	129.33 de	127.22 d	
	100	129.67 d	134.67 c	136.00 c	133.44 c	
200	0	119.67 h-j	124.00 e-h	126.00 d-g	123.22 e	134.33 a
	50	135.67 c	136.67 bc	137.33 bc	136.56 b	
	100	138.33 bc	141.33 b	150.00 a	143.22 a	
Abo-najemh20		121.52 c	124.85 b	127.81 a		Folicist

Prosopis farcta	0	109.33 h	112.78 g	116.67 f		
* Abo-najemh20	100	124.00 e	127.78 d	129.00 cd		
	200	131.22 c	134.00 b	137.78 a		
Folicist	0	110.67 g	114.67 f	116.78 f	0	114.04 c
* Abo-najemh20	50	123.78 e	126.89 d	128.78 cd	50	126.48 b
	100	130.11 c	133.00 b	137.89 a	100	133.67 a

Means of each factor and their interactions followed with the same letters are not significantly different from each other's according to Duncans multiple range test at 5% level.

3.2. Stem diameter (mm)

It clearly shown in table 2 that the three studied factors play a significant role in improving the diameter of pomegranate transplant stems especially at high concentration as compared with untreated seedling. The stem diameter got highest value in dual interaction between (200 ppm Prosopis farcta + 100 ppm

Folicist) which recorded (11.33mm). the third concentration of both dual interactions (Prosopis farcta + Abo-najemh20) (Folicist + Abo-najemh20) as compared with control. The high value of stem diameter (12 mm) was acquired with 200 ppm Prosopis farcta, 100 ppm Folicist and 150 ppm Abo-Najemh20

Table (2): Effect of Prosopis farcta, Folicist and Abo najemh20 and their interactions on Stem Diameter (mm) of Pomegranate transplant

Prosopis farcta	Folicist	Abo-najemh20 0 ppm	Abo-najemh20 75 ppm	Abo-najemh20 150 ppm	Prosopis farcta * Folicist	Prosopis farcta
0	0	6.17 j	7.00 i	7.83 h	7.00 f	8.00 c
	50	8.00 h	8.17 gh	8.50 gh	8.22 e	
	100	8.67 f-h	8.67 f-h	9.00 fg	8.78 d	
100	0	8.17 gh	9.00 fg	9.50 ef	8.89 d	9.96 b
	50	10.00 de	10.00 de	10.33 c-e	10.11 c	
	100	10.67 b-d	11.00 bc	11.00 bc	10.89 ab	
200	0	10.67 b-d	10.00 de	10.67 b-d	10.44 bc	10.78 a
	50	10.33 c-e	11.00 bc	10.33 c-e	10.56 bc	
	100	10.67 b-d	11.33 ab	12.00 a	11.33 a	
Abo-najemh20		9.26 c	9.57 b	9.91 a	Folicist	
Prosopis farcta	0	7.61 f	7.94 f	8.44 e		
* Abo-najemh20	100	9.61 d	10.00 cd	10.28 bc		
	200	10.56 ab	10.78 a	11.00 a		
Folicist	0	8.33 e	8.67 e	9.33 d	0	8.78 c
* Abo-najemh20	50	9.44 d	9.72 cd	9.72 cd	50	9.63 b
	100	10.00 bc	10.33 ab	10.67 a	100	10.33 a

Means of each factor and their interactions followed with the same letters are not significantly different from each other's according to Duncans multiple range test at 5% level.

3.3. Number of Branches per transplant

The obtained data indicated a significant variation of Prosopis farcta in term of number of branches of pomegranate transplant. On contrary, the effect of Folicist was significant on number of branches with the supreme value measured for transplant supplied with (100 ppm) of Folicist which was (10.11) when compared with control and (50 ppm) of

Folicist, the same effect was found in interaction between Folicist and Abo-najemh20. Regarding the triple interaction between treatments, the supreme number of branches (12.33 cm) was measured for (200 ppm Prosopis farcta, 100 ppm Folicist and 150 ppm Abo-Najemh20). As shown in (Table 3).

Table (3): Effect of *Prosopis farcta*, Folicist and Abo najemh20 and their interactions on Number of Branches of Pomegranate transplant

<i>Prosopis farcta</i>	Folicist	Abo-najemh20 0 ppm	Abo-najemh20 75 ppm	Abo-najemh20 150 ppm	<i>Prosopis farcta</i> * Folicist	<i>Prosopis farcta</i>
0	0	3.33 k	5.00 i-k	6.33 f-j	4.89 d	6.93 b
	50	5.00 i-k	6.00 f-k	7.33 e-i	6.11 cd	
	100	8.33 d-g	9.67 b-e	11.33 a-c	9.78 b	
100	0	3.67 jk	5.33 h-k	5.33 h-k	4.78 d	7.04 b
	50	7.33 e-i	7.33 e-i	7.67 e-i	7.44 c	
	100	6.33 f-j	9.00 c-e	11.33 a-c	8.89 b	
200	0	5.67 f-j	7.67 e-i	8.00 e-h	7.11 c	9.22 a
	50	7.67 e-i	9.00 c-e	10.00 a-e	8.89 b	
	100	10.67 a-d	12.00 ab	12.33 a	11.67 a	
Abo-najemh20		6.44 c	7.89 b	8.85 a	Folicist	
<i>Prosopis farcta</i>	0	5.56 d	6.89 cd	8.33 bc		
* Abo-najemh20	100	5.78 d	7.22 c	8.11 c		
	200	8.00 c	9.56 ab	10.11 a		
Folicist	0	4.22 e	6.00 d	6.56 d	0	5.59 c
* Abo-najemh20	50	6.67 d	7.44 cd	8.33 c	50	7.48 b
	100	8.44 c	10.22 b	11.67 a	100	10.11 a

Means of each factor and their interactions followed with the same letters are not significantly different from each other's according to Duncans multiple range test at 5% level.

3.4. Number of leaves per one branch

Results in table (4) revealed a significant difference of *Prosopis farcta* concentrations of (200ppm) in term of number of leaves per transplant. The same thing was true for the Folicist spraying influence and the leaf number was significantly differed from leaf number of control treatment. The Abo-najemh20 impact on number of leaves per transplant obtained a maximum average of number of leaves per transplant (134.70) in comparison with other treatments. Binary interaction of 200 ppm

Prosopis farcta + 100 ppm Folicist lead to produce a maximum number of leaves. The interaction between *Prosopis farcta* and Abo-najemh20 had a significant effect of increasing the number of leaves per transplant compared with control treatment. The same is true for the interaction between Folicist and Abo-najemh20. The interaction among (200 ppm *Prosopis farcta* + 100 ppm Folicist + 150 ppm Abo-Najemh20) creates a maximum average of number of leaves which counted (147.00) as compared with all other combination treatments.

Table (4): Effect of *Prosopis farcta*, Folicist and Abo najemh20 and their interactions on Number of Leaves of Pomegranate transplant

<i>Prosopis farcta</i>	Folicist	Abo-najemh20 0 ppm	Abo-najemh20 75 ppm	Abo-najemh20 150 ppm	<i>Prosopis farcta</i> * Folicist	<i>Prosopis farcta</i>
0	0	118.33 m	124.67 kl	125.33 i-l	122.78 h	125.48 c
	50	125.00 j-l	125.00 j-l	128.33 g-i	126.11 g	
	100	125.00 j-l	127.67 g-k	130.00 f-h	127.56 fg	
100	0	124.33 l	128.00 g-j	132.67 ef	128.33 ef	129.44 b
	50	127.33 h-l	128.00 g-j	133.67 e	129.67 de	
	100	127.33 h-l	130.67 e-g	133.00 ef	130.33 d	
200	0	130.00 f-h	133.00 ef	137.33 d	133.44 c	140.44 a
	50	140.67 c	143.33 bc	145.00 ab	143.00 b	
	100	142.00 c	145.67 ab	147.00 a	144.89 a	
Abo-najemh20		128.89 c	131.78 b	134.70 a	Folicist	
<i>Prosopis farcta</i>	0	122.78 h	125.78 g	127.89 ef		

* Abo-najemh20	100	126.33 fg	128.89 e	133.11 d		
	200	137.56 c	140.67 b	143.11 a		
Folicist	0	124.22 e	128.56 d	131.78 c	0	128.19 c
* Abo-najemh20	50	131.00 c	132.11 c	135.67 b	50	132.93 b
	100	131.44 c	134.67 ab	136.67 a	100	134.26 a

Means of each factor and their interactions followed with the same letters are not significantly different from each other's according to Duncans multiple range test at 5% level.

3.5. Total Chlorophyll (SPAD)

The chlorophyll content in pomegranate transplant leaves had a significant difference with three studied factors especially at third concentration (200ppm, 100ppm and 150ppm) (Prosopis farcta, Folicist and Abo-Najemh20) respectively. The Chlorophyll content in leaves in interaction between Prosopis farcta and Folicist got highest value with 200 ppm Prosopis farcta and 100 ppm Folicist which was (57.86 SPAD) as compared with other interactions, the

superior interaction that affecting Chlorophyll was between (200 ppm Prosopis farcta + 150 ppm Abo-Najemh20) (100 ppm Folicist + 150 ppm Abo-Najemh20) which were (56.96 SPAD) (50.61 SPAD) respectively. The combined influence of the three factors on total chlorophyll percentage was profound and the record of the highest chlorophyll percentage in leaves (58.97 SPAD) belonged to (200 ppm Prosopis farcta + 100 ppm Folicist + 150 ppm Abo-Najemh20) treatments as seen in table (5)

Table (5): Effect of Prosopis farcta, Folicist and Abo najemh20 and their interactions on Chlorophyll content in leaves of Pomegranate transplant

Prosopis farcta	Folicist	Abo-najemh20 0 ppm	Abo-najemh20 75 ppm	Abo-najemh20 150 ppm	Prosopis farcta * Folicist	Prosopis farcta
0	0	34.73 r	35.70 qr	39.37 op	36.60 h	39.17 c
	50	39.83 op	39.20 op	37.73 pq	38.92 g	
	100	41.10 m-o	43.53 k-m	41.33 m-o	41.99 f	
100	0	39.10 op	42.53 l-n	44.73 j-l	42.12 f	45.21 b
	50	40.83 no	45.57 i-k	46.40 h-j	44.27 e	
	100	47.47 hi	48.73 gh	51.53 ef	49.24 d	
200	0	53.53 c-e	55.33 b-d	55.93 bc	54.93 b	55.36 a
	50	50.57 fg	53.30 de	55.97 bc	53.28c	
	100	57.03 ab	57.57 ab	58.97 a	57.86 a	
Abo-najemh20		44.91 c	46.83 b	48.00 a	Folicist	
Prosopis farcta	0	38.56 g	39.48 g	39.48 g		
* Abo-najemh20	100	42.47 f	45.61 e	47.56 d		
	200	53.71 c	55.40 b	56.96 a		
Folicist	0	42.46 e	44.52 d	46.68 c	0	44.55 c
* Abo-najemh20	50	43.74 de	46.02 c	46.70 c	50	45.49 b
	100	48.53 b	49.94 a	50.61 a	100	49.70 a

Means of each factor and their interactions followed with the same letters are not significantly different from each other's according to Duncans multiple range test at 5% level.

3.6. Number of Roots per transplant

The data in below table (6) show that the Prosopis farcta, Folicist and Abo-najemh20 with their concentrations lead to increase the number of roots per transplant. Also, the high concentration had a significant difference in dual interactions between the studied factors. In case

of triple combination, it clearly found that the 200 ppm Prosopis farcta + 100 ppm Folicist + 150 ppm Abo-najemh20 was superior combination treatment affecting the number of roots per pomegranate transplant which recorded (12%) compared with control that was (3.67%).

Table (6): Effect of *Prosopis farcta*, Folicist and Abo najemh20 and their interactions on Root Number of Pomegranate transplant

Prosopis farcta	Folicist	Abo-najemh20 0 ppm	Abo-najemh20 75 ppm	Abo-najemh20 150 ppm	Prosopis farcta * Folicist	Prosopis farcta
0	0	3.67 n	5.67 kl	6.33 jk	5.22 f	5.85 c
	50	4.33 mn	6.33 jk	7.33 g-j	6.00 e	
	100	4.33 mn	6.33 jk	8.33 e-g	6.33 e	
100	0	4.00 mn	5.00 lm	6.67 i-k	5.22 f	6.63 b
	50	5.00 lm	7.67 f-i	8.33 e-g	7.00 d	
	100	6.67 i-k	7.67 f-i	8.67 d-f	7.67 c	
200	0	7.00 h-j	7.67 f-i	8.67 d-f	7.78 c	9.30 a
	50	8.00 e-h	9.00 de	9.67 cd	8.89 b	
	100	10.33 bc	11.33 ab	12.00 a	11.22 a	
Abo-najemh20		5.93 c	7.41 b	8.44 a	Folicist	
Prosopis farcta	0	4.11 h	6.11 f	7.33 de		
* Abo-najemh20	100	5.22 g	6.78 e	7.89 cd		
	200	8.44 c	9.33 b	10.11 a		
Folicist	0	4.89 e	6.11 d	7.22 c	0	6.07 c
* Abo-najemh20	50	5.78 d	7.67 c	8.44 b	50	7.30 b
	100	7.11 c	8.44 b	9.67 a	100	8.41 a

Means of each factor and their interactions followed with the same letters are not significantly different from each other's according to Duncans multiple range test at 5% level.

3.7. Root length (mm)

Table (7): Effect of *Prosopis farcta*, Folicist and Abo najemh20 and their interactions on Root length of Pomegranate transplant

Prosopis farcta	Folicist	Abo-najemh20 0 ppm	Abo-najemh20 75 ppm	Abo-najemh20 150 ppm	Prosopis farcta * Folicist	Prosopis farcta
0	0	11.00 p	15.00 o	18.00 n	14.67 f	20.48 c
	50	21.00 lm	23.33 i-l	24.67 h-j	23.00 d	
	100	22.33 j-m	22.00 k-m	27.00 e-h	23.78 d	
100	0	12.00 p	17.33 n	20.67 m	16.67 e	22.85 b
	50	23.67 i-k	25.33 g-i	27.33 e-g	25.44 c	
	100	24.67 h-j	26.33 f-h	28.33 ef	26.44 c	
200	0	12.00 p	26.67 f-h	28.67 ef	22.44 d	30.04 a
	50	29.33 e	31.67 d	33.33 cd	31.44 b	
	100	34.67 bc	36.33 ab	37.67 a	36.22 a	
Abo-najemh20		21.19 c	24.89 b	27.30 a	Folicist	
Prosopis farcta	0	18.11 f	20.11 e	23.22 d		
* Abo-najemh20	100	20.11 e	23.00 d	25.44 c		
	200	25.33 c	31.56 b	33.22 a		
Folicist	0	11.67 g	19.67 f	22.44 e	0	17.93 c
* Abo-najemh20	50	24.67 d	26.78 c	28.44 b	50	26.63 b
	100	27.22 bc	28.22 b	31.00 a	100	28.81 a

Means of each factor and their interactions followed with the same letters are not significantly different from each other's according to Duncans multiple range test at 5% level.

The length of pomegranate transplant roots was strongly affected by spraying of *Prosopis farcta*, Folicist and Abo-Najemh20. The dual and triple interactions also play a significant role in

improving the length of roots especially at third levels (high concentrations of studied factors)

4. DISCUSSION

It is clear from data that in above tables, the effect of Folicist on growth of pomegranate transplant characteristics was positive effect in all studied parameters, the results may be due to the role of essential elements in transplants such as photosynthesis reactions, DNA metabolism, and protein and carbohydrate biosynthesis due to increased mineral content in leaves (Hafez & El-Metwally, 2007). Furthermore, folicist Enhances N uptake as well as improving photosynthesis in fruit trees. Nitrogen is known to be an essential component of many compounds in plants such as chlorophyll, nucleotides, proteins, alkaloids, enzymes, hormones, and vitamins. (Marschner, 2011; Saeed & Mayi 2016)

5. CONCLUSIONS

Based on the results in this study it found that the *Prosopis farcta* at 200 ppm had a significant difference compared with control affecting on all studied parameters. The spraying of Folicist and Abo-Najemh20 with their concentration also make high enhancement in most of studied parameters. The best dual interaction affecting studied parameters founded when using high concentration of three factors. Then, the interaction among 200 ppm of *Prosopis farcta*, 100 ppm of Folicist and 150 ppm of Abo-najem h 20 had a significant effect of all studied parameters.

So according to the obtained results it highly recommended to use the *Prosopis farcta* with other fruit trees or plants due to its positive effect on growth and it don't lead to contaminate the environment.

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کارتیکرنا ره شاندا دهرخستیی رووهکی خورنپفکی و فولیسیت وئه بونه جم لسه رگه شه یا نه مامکین هناری جوری و وندر فول

پوخته

ئه ف شه کولینه هاته ئه نجامدان ل وهرزی گه شی (2019 – 2020) ل خانیی داری یی پشکا بیستانکاری کولیژا زانستین ئه ندازیاریا چاندنی ل کوردستانا عیراقی بو هه لکولینا کارتیکرنا ره شاندا دهرخستیی رووهکی خورنپفکی ب سی تیره یا (0 و 100 و 200 ppm)، فولیسیت (0 و 50 و 100 ppm) وئه بونه جم (0 و 75 و 150 ppm) لسه رگه شه یا نه مامکیت هناری. ئه نجاما دیارکر کو هه می ساخله تین هاتینه وهرگرتن هاتنه زیده کرن ب کارئینانا تیره یا بلند یا ههرسی کاریگه ری ب کارئیناین (خورنپفک و فولیسیت وئه بونه جم). کرلیکا دنافه را خورنپفک 200 ppm و فولیسیت 100 ppm باشتین کارلیک بو کو کارتیکرنا لسه ر ساخله تان کری و کارلیک دنافه را 200 ppm خورنپفک و 150 ppm وئه بونه جم بو ئه گه ری چاک بونا ساخله تین هاتینه وهرگرتن و ههروه سا تیره یا بلند ژ فولیسیت 100 ppm وئه بونه جم 150 ppm بو ئه گه ری په دابونا چاک بونه کا بهرچا ف ل ساخله تین هاتینه تیست کرن. و ههروه سا دهر ئه نجامدا کارلیکا سیانی یا خورنپفک 200 ppm + فولیسیت 100 ppm + وئه بونه جم 150 ppm کارلیکه کا توپ بو بهراورد دگه ل هه می کارلیکین دی و ههروه سا دگه ل کارلیکا کونترولی ژی.

تأثیر الرش مستخلص نبات الخرنوب و فولیسیت و أبونجم اتش 20 علی نمو شتلات الرمان صنف وندر فول

الخلاصة

أجريت هذه الدراسة في موسم النمو 2019 – 2020 في ظللة الخشبية تابعة ل قسم البستنة، كلية علوم الهندسة الزراعية، جامعة دهوك، إقليم كردستان، العراق. ل معرفة تأثير الرش ب مستخلص نبات الخرنوب بتراكيز (0 100 200 جزء من المليون) و فوليسيت بتراكيز (0 50 100 جزء من المليون) و أبونجم 20 بتراكيز (0 75 150 جزء من المليون) على شتلات الرمان صنف وندر فول. أظهرت النتائج بانه جميع الصفات المدروسة تحسنت تحسنا معنويا ب تراكيز العالية من العوامل المأخوذة وفي التداخل الثنائي والثلاثي أيضا هنالك تحسین في الصفات المدروسة ب استعمال التراكيز العالية من الخرنوب و فوليسيت و أبو نجم