

Effect of Rooting Media and Planting Time on Rooting of Manzanillo and Coratina Olive (*Olea europaea* L.) Cultivars under Shaded Polyethylene Tunnel

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T HIS INVESTIGATION was conducted through 2006 and 2007 seasons in the Research Farm of the Horticulture Research Institute at Giza. Two olive cultivars (Manzanillo and Coratina) were used as plant materials to study the effect of planting date and media on rooting percentage, root length, number of roots/cutting and root weight. The cuttings were planted under shaded tunnel inside a net-house. Data showed that, cuttings of Manzanillo gave the highest rooting and survival percentage compared to Coratina cultivar. January and April were the proper time for cutting preparation. As for the planting media, sand: peat moss (2:1 v/v) resulted in good rooting characters and survival percentage after 1 and 2 months from transplanting in both seasons.

Keywords: Olive cvs., Time of cuttings, Rooting media, Rooting percentage, Survival.

The olive tree (*Olea europaea* L.) became one of the important fruit crops in Egypt for planting in new reclaimed areas, where less water and poor soil prevail. The total acreage of olive orchards increased to reach about 135,000 feddans in 2007. Rooting is generally affected by internal and external factors, i.e., cultivars, rooting media and time (Gerakakis *et al.*, 2005). Leaf is an important organ that affects rooting. Many researchers worked on olive propagation (Hartmann & Loreti, 1965; Gabr, 1976, El- Nabawy *et al.*, 1983 a, Salama *et al.*, 1987; Fouad *et al.*, 1989, El- Said *et al.*, 1990; Emtüthal El- Said *et al.*, 1995, Proietti *et al.*, 2003, Gerakakis & Ozkaya, 2005 and Turkoglu & Durmus, 2005). They used sub terminal leafy cuttings treated with IBA and planted in media of sand and peat moss (2:1, v/v) in greenhouse under mist propagation. This technique is costly whereas in areas characterized by poor facilities (electricity and equipments), propagation under white plastic tunnels is cheaper and can be used commercially.

Thus, the objective of this study was to investigate the rooting ability and survival of two olive cultivars, Manzanillo and Coratina, in response to time of cutting preparation and planting media.

Material and Methods

This study was carried out during the seasons of 2006 and 2007. Two olive cultivars, with different rooting ability namely; Manzanillo and Coratina, grown in the Experimental Orchard Station of Horticulture Research Institute at Giza, were used as a source of cuttings. Sub terminal leafy cuttings of 12 – 15 cm in length, 4 – 6 mm in diameter and with 4 leaves of each cultivar were prepared at the beginning of January, April, July and October in each season. Each group of two cultivars was distributed in four replicates with 30 cuttings/ replicate in each group and base of cuttings (5-7 cm) were dipped for 10 sec. in a prepared solution of IBA at 4000 ppm before planting then planted in various media composed of sand, peat moss, silt and combinations between them as volume to volume as follows

- 1- Sand and peat moss as 1 : 1
- 2- Sand and peat moss as 1 : 2
- 3- Sand and peat moss as 2 : 1
- 4- Sand and silt as 1: 1
- 5- Sand and silt as 1: 2
- 6- Sand and silt as 2: 1

Olive cuttings were planted in one liter black plastic container (10 cuttings/bag). The containers were filled with one of the previous 6 media under white plastic tunnels 80 micron in diameter and placed in a shaded net-house about 65 percentage porosity. Rooting percentage, root length, number of roots per cutting and root weight were calculated after 3 months of planting. Moreover, survival percentage was calculated after 1 & 2 months from transplanting. The experiment was arranged in split split plot design with four replications. The main plots were assigned to the tested cultivars. Sub plots included the four dates and the sub sub treatments were the different media of sand, peat-moss and silt. All collected data were subjected to statistical analysis for each year according to procedure outlined by Gomez and Gomez (1984) and the LSD was used to compare the treatment means.

Results and Discussion

The results from Tables (1 - 6) showed the effect of dates and media plantings of the two olive cultivars as well as their interaction on rooting characters and survival percentage during 2006 and 2007 growing seasons and will be discussed in the following order.

Effect of olive cultivars

Data in Tables (1 - 6) show significant differences among all studied traits in both seasons, except rooting percentage and root length in the first season which were insignificant. Data showed that Manzanillo cuttings gave the highest values of all parameters as compared with Coratina cuttings except root length and weight characters in both seasons.

Similar results were obtained by Nahlaw *et al.* (1975) El- Nabawy *et al.* (1983a) Salama *et al.*, (1987) Fouad *et al.*, (1989) El- Said *et al.* (1990) Emtithal El- Said *et al.*, (1995) and Proietti *et al.*, (2003) who reported that there is a wide variation between varieties concerning their ability to form roots on olive cultivars.

Effect of media planting

Results revealed that media planting has significant effect on the studied characters in both seasons except root length in 2006 and survival percentage after two months in the second season.

The planting media consisted of sand: peat moss (2:1, v/v), and (1:1, v/v) achieved the highest values of rooting percentage and root length, respectively in both seasons. The planting medium consisted of sand: silt (2:1 v/v) resulted in the highest values of root number and weight in the 1st season, whereas sand : peat moss (1:2, v/v) & (1:1, v/v) exhibited the superior values of root number and weight in the second season, respectively.

As for the survival percentage, the media composed of sand: silt or sand: peat moss (1:2, v/v) showed the highest significant values after one and two months in both seasons, respectively except in the 2nd season where the survival percentage was insignificant after two months.

Effect of planting date

The results indicated significant differences due to planting dates in both seasons for all parameters (Tables 1- 6). From Tables (1- 6) results obviously indicated that, planting in January and April gave the highest values for most parameters in both seasons, with no significant and alternative position between them in rank. In the contrast, July and October planting dates gave the lowest values for all characters except for root weight and survival percentage after 1 month in both seasons.

Effect of interaction between cultivars and planting media

The characters under study were significantly affected by cutivars and media. Data show that Manzanillo cultivar gave best results in media composed of sand: peat (2:1, v/v) for rooting percentage, root length and survival percentage after 1 and 2 month in both seasons while, Coratina cultivar gave the highest values for root number and weight in the first season with media sand : silt (2/1, v/v) and root length and weight with media sand : peat (1: 1 v/v) in the second one.

It is obvious from the data in hand that Manzanillo cultivar indicated stable performance for most traits under media sand: peat (2: 1, v/v) than Coratina cultivar which reflected unstable performance for all media and characters interactions in both seasons except rooting percentage in the first season (Tables 1 - 6). These results were consistent with those obtained by Emtithal El- Said *et al.*, (1995) and Gerakakis & Ozkaya (2005).

Effect of interaction between cultivars and planting date

The results in Tables (1 - 6) showed significant effects in all traits due to variation in olive cultivars planting in different dates in both seasons, but the effects were insignificant for root length and survival percentage after 1 and 2 month in the first season.

Generally, the planting date of Manzanillo cuttings in January 2006 and April 2007 gave the best results for all the studied traits except for root length and weight.

These results are in general agreement with Emtithal El- Said *et al.*, (1995) on olives; Abo-Taleb *et al.*, (1998) on pomegranate who reported that the varietal variations might be attributed to differences in their ability to invent naturally the essential substances required for rooting (Wazier *et al.*, 2001 and Gerakakis & Ozkaya, 2005).

Effect of interaction between media and planting date

Data from Tables (1 - 6) explained that the effect of the interaction between media and planting date in both seasons in all characters were significant.

Data revealed that, using sand and peat moss for the different mixtures for planting cuttings at January and April dates, gave better transplants than the other two dates except for root weight in the first season.

Effect of the interaction between planting date; media and cultivars

Data from Tables (1 - 6) illustrated that the effect of the interaction between planting date, media and cultivars in all properties were significant.

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Effect of the interaction between planting date; media and cultivars

Data from Tables (1 - 6) illustrated that the effect of the interaction between planting date, media and cultivars in all properties were significant.

Generally, the best results were obtained with the cuttings of Manzanillo prepared at January followed by those prepared in April of the first season planted in sand: peat moss. While, Coratina cuttings prepared in October 2007 planted at sand : peat moss had lower values of rooting percentage. In the second season, data revealed that the highest rooting percentage were obtained with the cuttings of Manzanillo prepared at January followed by April and planted in sand : peat moss.

TABLE 1. Effect of planting dates; media and cultivars as well as their interaction on rooting percentage of Manzanillo and Coratina olive cvs. during 2006 and 2007 seasons.

Media	Planting dates (2006)								Varieties mean		Planting dates mean				Media
	January		April		July		October				January	April	July	October	
	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina					
Sand:peat1:1	65.83	54.17	45.63	42.71	17.13	21.88	25.00	0.00	38.40	29.69	60.00	44.17	19.50	12.50	34.04
Sand:peat 2:1	65.63	58.34	56.71	40.63	21.88	0.00	26.00	26.00	42.55	31.24	61.98	48.67	10.94	26.00	36.90
Sand:peat 1:2	63.50	53.13	55.92	37.50	20.54	19.79	0.00	25.00	34.99	33.86	58.31	46.71	20.17	12.50	34.42
Sand:silt 1:1	18.00	16.67	41.67	43.73	26.04	31.25	23.96	0.00	27.42	22.91	17.33	42.70	28.65	11.98	25.16
Sand:silt 2:1	20.33	18.33	39.92	43.75	27.09	37.50	0.00	19.79	21.83	29.84	19.33	41.83	32.30	9.90	25.84
Sand:silt 1:2	20.33	22.67	20.81	43.38	30.21	37.50	13.54	40.63	21.22	36.04	21.50	32.09	33.86	27.09	28.63
Mean	42.27	37.22	43.44	41.95	23.82	24.65	14.75	18.57	31.07	30.60	39.74	42.70	24.24	16.66	30.83
	Planting dates (2007)														
Sand:peat1:1	58.31	20.83	50.00	35.29	45.83	64.56	36.46	25.00	47.65	36.42	39.57	42.65	55.20	30.73	42.04
Sand:peat 2:1	64.66	26.04	62.48	36.46	40.27	85.42	51.04	25.00	54.61	43.23	45.35	49.47	62.84	38.02	48.92
Sand:peat 1:2	50.00	20.73	51.38	28.13	40.63	83.33	22.92	17.71	41.23	37.48	35.37	39.75	61.98	20.31	39.35
Sand:silt 1:1	19.79	19.79	64.59	54.17	43.42	39.59	28.96	14.59	39.19	32.03	19.79	59.38	41.50	21.77	35.61
Sand:silt 2:1	19.79	0.00	62.13	55.21	53.13	48.86	46.88	21.88	45.48	31.49	9.90	58.67	51.00	37.38	38.48
Sand:silt 1:2	41.67	19.79	40.63	48.58	56.25	47.92	38.54	0.00	44.27	29.07	30.73	44.61	52.09	19.27	36.67
Mean	42.37	17.86	55.20	42.97	46.59	61.61	37.47	17.36	45.41	34.95	30.12	49.09	54.10	27.91	40.18

Season 2006

LSD at 5 % for:

Planting dates (D)	4.73
Media (M)	3.34
Varieties (V)	N.C
D x M	1.82
D x V	3.64
M x V	4.45
D x M x V	8.91

Season 2007

LSD at 5 % for:

Planting dates (D)	11.51
Media (M)	4.14
Varieties (V)	16.28
D x M	4.40
D x V	8.80
M x V	N.S.
D x M x V	21.67

TABLE 2. Effect of planting dates; media and cultivars as well as their interaction on root length (cm.) of Manzanillo and Coratina olive cvs. during 2006 and 2007 seasons.

Media	Planting dates (2006)								Varieties mean		Planting dates mean				Media
	January		April		July		October				January	April	July	October	
	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina					
Sand:peat1:1	14.60	15.70	15.65	14.72	11.33	14.33	13.00	0.00	13.65	11.19	15.15	15.19	12.83	6.50	12.42
Sand:peat 2:1	15.60	14.90	15.75	15.67	8.67	0.00	10.50	14.00	12.63	11.14	15.25	15.71	4.33	12.25	11.89
Sand:peat 1:2	15.12	16.53	16.17	14.17	12.00	8.00	0.00	12.17	10.82	12.72	15.83	15.17	10.00	6.08	11.77
Sand:silt 1:1	14.43	12.27	10.60	14.35	10.83	9.50	13.50	0.00	12.34	9.03	13.35	12.48	10.17	6.75	10.69
Sand:silt 2:1	10.90	13.58	10.18	15.17	10.17	12.50	0.00	8.00	7.81	12.31	12.24	12.68	11.33	4.00	10.06
Sand:silt 1:2	8.73	15.65	7.47	11.73	11.17	13.43	12.00	16.90	9.84	14.43	12.19	9.60	12.30	14.45	12.14
Mean	13.23	14.77	12.64	14.30	10.70	9.63	8.17	8.51	11.18	11.80	14.00	13.47	10.16	8.34	11.50
Planting dates (2007)															
Sand:peat1:1	15.50	25.33	18.17	19.00	17.93	16.52	12.67	14.93	16.07	18.95	20.42	18.58	17.23	13.80	17.51
Sand:peat 2:1	20.33	14.00	15.37	18.42	17.07	18.32	14.00	11.97	16.69	15.68	17.17	16.89	17.70	12.98	16.18
Sand:peat 1:2	14.92	16.45	18.17	18.42	17.33	18.37	13.07	15.47	15.87	17.18	15.68	18.29	17.85	14.27	16.52
Sand:silt 1:1	9.00	15.00	7.17	12.50	10.92	17.38	13.10	10.65	10.05	13.88	12.00	9.83	14.15	11.88	11.96
Sand:silt 2:1	11.17	0.00	13.25	13.82	11.38	15.92	10.03	12.20	11.46	10.48	5.58	13.53	13.65	11.12	10.97
Sand:silt 1:2	11.83	13.00	13.83	15.00	7.75	13.40	8.30	0.00	10.43	10.35	12.42	14.42	10.58	4.15	10.39
Mean	13.79	13.96	14.33	16.19	13.73	16.65	11.86	10.87	13.43	14.42	13.88	15.26	15.19	11.37	13.92

Season 2006

LSD at 5 % for:

Planting dates (D)	4.34
Media (M)	N.S.
Varieties (V)	N.S.
D x M	1.67
D x V	N.S.
M x V	4.09
D x M x V	8.19

Season 2007

LSD at 5 % for:

Planting dates (D)	2.00
Media (M)	1.42
Varieties (V)	2.83
D x M	0.79
D x V	1.58
M x V	1.94
D x M x V	3.88

TABLE 3. Effect of planting dates; media and cultivars as well as their interaction on root number of Manzanillo and Coratina olivecvs. during 2006 and 2007 seasons.

Media	Planting dates (2006)								Varieties mean		Planting dates mean				Media
	January		April		July		October								
	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	January	April	July	October	
Sand:peat 1:1	4.33	3.33	3.17	1.67	1.67	2.33	2.33	0.00	2.88	1.83	3.83	2.42	2.00	1.17	2.35
Sand:peat 2:1	3.67	3.17	4.50	2.83	1.33	0.00	2.00	2.67	2.88	2.17	3.42	3.67	0.67	2.33	2.52
Sand:peat 1:2	3.33	2.37	3.50	2.33	2.00	1.67	0.00	2.33	2.21	2.18	2.85	2.92	1.83	1.17	2.19
Sand:silt 1:1	3.57	3.33	4.00	3.17	1.33	2.00	2.33	0.00	2.81	2.13	3.45	3.58	1.67	1.17	2.47
Sand:silt 2:1	3.83	4.67	4.00	2.83	2.00	2.67	0.00	3.33	2.46	3.38	4.25	3.42	2.33	1.67	2.92
Sand:silt 1:2	4.00	3.83	3.33	2.67	1.33	2.33	2.00	3.67	2.67	3.13	3.92	3.00	1.83	2.83	2.90
Mean	3.79	3.45	3.75	2.58	1.61	1.83	1.44	2.00	2.65	2.47	3.62	3.17	1.72	1.72	2.56
	Planting dates (2007)														
Sand:peat 1:1	6.83	8.33	6.83	5.00	4.00	3.17	2.50	3.67	5.04	5.04	7.58	5.92	3.58	3.08	5.04
Sand:peat 2:1	12.17	4.33	5.00	4.87	5.33	2.83	3.50	2.67	6.50	3.68	8.25	4.93	4.08	3.08	5.09
Sand:peat 1:2	13.67	5.67	5.17	2.83	5.50	2.67	2.83	3.50	6.79	3.67	9.67	4.00	4.08	3.17	5.23
Sand:silt 1:1	3.00	7.00	4.50	3.00	3.67	3.67	2.67	3.00	3.46	4.17	5.00	3.75	3.67	2.83	3.81
Sand:silt 2:1	2.00	0.00	6.00	5.83	4.83	3.50	3.83	2.33	4.17	2.92	1.00	5.92	4.17	3.08	3.54
Sand:silt 1:2	5.00	1.33	5.67	5.17	2.83	2.33	2.33	0.00	3.96	2.21	3.17	5.42	2.58	1.17	3.08
Mean	7.11	4.44	5.53	4.45	4.36	3.03	2.94	2.53	4.99	3.62	5.78	4.99	3.69	2.74	4.30

Season 2006

LSD at 5 % for:

Planting dates (D) 0.34

Media (M) 0.24

Varieties (V) 0.48

D x M 0.13

D x V 0.27

M x V 0.33

D x M x V 0.65

Season 2007

LSD at 5 % for:

Planting dates (D) 0.52

Media (M) 0.37

Varieties (V) 0.73

D x M 0.21

D x V 0.43

M x V 0.52

D x M x V 1.05

TABLE 4. Effect of planting dates; media and cultivars as well as their interaction on root weight (g.) of Manzanillo and Coratina olive cvs. during 2006 and 2007 seasons.

Media	Planting dates (2006)								Varieties mean		Planting dates mean				Media
	January		April		July		October								
	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	January	April	July	October	
Sand:peat 1:1	0.35	0.39	0.33	0.45	0.47	0.89	0.55	0.00	0.42	0.43	0.37	0.39	0.68	0.27	0.43
Sand:peat 2:1	0.33	0.29	0.31	0.33	0.39	0.00	0.48	0.42	0.38	0.26	0.31	0.32	0.19	0.45	0.32
Sand:peat 1:2	0.35	0.38	0.35	0.37	0.58	0.80	0.00	0.38	0.32	0.48	0.36	0.36	0.69	0.19	0.40
Sand:silt 1:1	0.38	0.46	0.46	0.59	0.24	0.48	0.44	0.00	0.38	0.38	0.42	0.52	0.36	0.22	0.38
Sand:silt 2:1	0.56	0.71	0.52	0.76	0.53	0.53	0.00	0.63	0.40	0.66	0.64	0.64	0.53	0.32	0.53
Sand:silt 1:2	0.49	0.66	0.46	0.45	0.52	0.33	0.52	0.53	0.50	0.49	0.57	0.46	0.43	0.52	0.49
Mean	0.41	0.48	0.41	0.49	0.46	0.51	0.33	0.33	0.40	0.45	0.45	0.45	0.48	0.33	0.43
Planting dates (2007)															
Sand:peat 1:1	0.58	1.24	1.01	1.17	0.47	0.59	0.27	0.34	0.58	0.84	0.91	1.09	0.53	0.31	0.71
Sand:peat 2:1	0.75	0.43	0.82	0.91	0.56	0.53	0.29	0.35	0.61	0.56	0.59	0.87	0.55	0.32	0.58
Sand:peat 1:2	0.78	0.34	0.92	0.86	0.50	0.51	0.34	0.41	0.64	0.53	0.56	0.89	0.51	0.37	0.58
Sand:silt 1:1	0.25	0.47	0.37	0.71	0.46	0.72	0.48	0.40	0.39	0.58	0.36	0.54	0.59	0.44	0.48
Sand:silt 2:1	0.13	0.00	0.71	0.81	0.53	0.84	0.41	0.55	0.45	0.55	0.07	0.76	0.69	0.48	0.50
Sand:silt 1:2	0.29	0.16	0.58	0.62	0.39	0.52	0.51	0.00	0.44	0.32	0.22	0.60	0.46	0.26	0.38
Mean	0.46	0.44	0.74	0.85	0.49	0.62	0.38	0.34	0.52	0.56	0.45	0.79	0.56	0.36	0.54

Season 2006

LSD at 5 % for:

Planting dates (D) 0.02

Media (M) 0.01

Varieties (V) 0.02

D x M 0.01

D x V 0.01

M x V 0.01

D x M x V 0.02

Season 2007

LSD at 5 % for:

Planting dates (D) 0.01

Media (M) 0.01

Varieties (V) 0.02

D x M 0.01

D x V 0.01

M x V 0.01

D x M x V 0.02

TABLE 5. Effect of planting dates; media and cultivars as well as their interaction on survival percentage after 1 month of Manzanillo and Coratina olive cvs. during 2006 and 2007 seasons.

Media	Planting dates (2006)								Varieties mean		Planting dates mean				Media
	January		April		July		October								
	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	January	April	July	October	
Sand:peat1:1	81.45	73.91	75.27	68.54	66.22	50.00	83.11	0.00	76.51	48.11	77.68	71.90	58.11	41.56	62.31
Sand:peat 2:1	82.78	80.00	80.13	62.50	73.33	0.00	84.96	77.26	80.30	54.94	81.39	71.32	36.67	81.11	67.62
Sand:peat 1:2	79.64	75.55	79.14	63.33	50.00	50.00	0.00	83.11	52.20	68.00	77.60	71.24	50.00	41.56	60.10
Sand:silt 1:1	66.66	63.33	58.82	55.56	83.11	84.21	75.00	0.00	70.90	50.77	65.00	57.19	83.66	37.50	60.84
Sand:silt 2:1	76.74	67.56	59.38	61.11	75.00	80.00	0.00	66.22	52.78	68.72	72.15	60.25	77.50	33.11	60.75
Sand:silt 1:2	81.91	82.05	50.00	54.20	77.24	83.11	83.11	84.32	73.06	75.92	81.98	52.10	80.18	83.71	74.49
Mean	78.20	73.73	67.12	60.87	70.82	57.89	54.36	51.82	67.63	61.08	75.97	64.00	64.35	53.09	64.35
Planting dates (2007)															
Sand:peat1:1	76.00	64.39	71.16	68.99	50.11	27.33	87.17	72.08	71.11	58.17	70.15	70.07	38.72	79.63	64.64
Sand:peat 2:1	81.25	64.30	81.49	75.00	61.27	28.40	87.27	83.10	77.82	62.70	72.77	78.25	44.83	85.19	70.26
Sand:peat 1:2	80.79	68.41	74.40	69.56	57.82	58.57	77.27	83.13	72.57	69.99	74.60	71.98	58.20	80.35	71.28
Sand:silt 1:1	69.23	69.18	79.21	72.36	18.28	88.47	84.04	67.22	62.69	74.31	69.20	75.78	53.38	75.63	68.50
Sand:silt 2:1	76.93	0.00	82.15	78.27	69.22	75.31	87.12	61.01	78.85	53.65	38.47	80.21	72.26	74.06	66.25
Sand:silt 1:2	79.40	76.92	78.79	72.17	63.10	50.27	78.21	0.00	74.88	49.84	78.16	75.48	56.69	39.10	62.36
Mean	77.27	57.20	77.87	72.73	53.30	54.73	83.51	61.14	72.99	61.44	67.23	75.30	54.01	72.33	67.22

Season 2006

LSD at 5 % for:

Planting dates (D) 10.13

Media (M) 7.16

Varieties (V) 14.32

D x M 6.40

D x V N.S.

M x V 15.67

D x M x V 31.35

Season 2007

LSD at 5 % for:

Planting dates (D) 5.91

Media (M) 4.18

Varieties (V) 8.35

D x M 2.52

D x V 5.04

M x V 6.18

D x M x V 12.35

TABLE 6. Effect of planting dates; media and cultivars as well as their interaction on survival percentage after 2 month of Manzanillo and Coratina olive cvs. during 2006 and 2007 seasons.

Media	Planting dates (2006)								Varieties mean		Planting dates mean				Media
	January		April		July		October								
	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	Manzanillo	Coratina	January	April	July	October	
Sand:peat 1:1	81.48	73.91	73.17	62.88	34.33	50.00	77.26	0.00	66.59	46.70	77.70	68.03	42.22	38.63	56.64
Sand:peat 2:1	82.48	80.00	80.13	62.50	73.33	0.00	84.96	77.26	80.30	54.94	81.39	71.32	36.67	81.11	67.62
Sand:peat 1:2	87.96	75.55	79.14	58.62	33.33	33.33	0.00	83.11	50.11	62.65	81.76	68.88	33.33	41.56	56.38
Sand:silt 1:1	66.66	63.33	52.94	55.56	66.81	84.21	66.26	0.00	63.17	50.77	65.00	54.25	75.51	33.13	56.97
Sand:silt 2:1	76.74	67.56	59.38	55.55	50.00	60.00	0.00	66.22	46.53	62.33	72.15	57.47	55.00	33.11	54.43
Sand:silt 1:2	65.68	82.05	50.00	54.20	66.63	66.66	83.11	84.32	66.35	71.81	73.86	52.10	66.64	83.71	69.08
Mean	76.83	73.73	65.79	58.22	54.07	49.03	51.93	51.82	62.18	58.20	75.31	62.01	51.56	51.88	60.19
Planting dates (2007)															
Sand:peat 1:1	76.00	57.13	69.79	68.96	50.11	23.27	85.33	72.07	70.31	55.36	66.57	69.38	36.69	78.70	62.83
Sand:peat 2:1	81.25	64.29	81.49	75.00	61.27	28.44	58.27	83.11	70.57	62.71	72.77	78.24	44.85	70.69	66.64
Sand:peat 1:2	80.76	68.42	74.40	66.69	42.97	50.30	77.26	77.26	68.85	65.67	74.59	70.55	46.63	77.26	67.26
Sand:silt 1:1	61.42	61.54	77.39	72.37	18.27	88.45	84.03	55.19	60.28	69.39	61.48	74.88	53.36	69.61	64.83
Sand:silt 2:1	76.93	0.00	82.81	78.26	65.07	68.25	87.09	61.04	77.98	51.89	38.47	80.53	66.66	74.07	64.93
Sand:silt 1:2	79.40	76.92	75.77	72.50	60.61	50.27	78.19	0.00	73.49	49.92	78.16	74.14	55.44	39.10	61.71
Mean	75.96	54.72	76.94	72.30	49.72	51.50	78.36	58.11	70.25	59.16	65.34	74.62	50.61	68.24	64.70

Season 2006

LSD at 5 % for:

Planting dates (D) 10.83

Media (M) 7.66

Varieties (V) 15.31

D x M 4.73

D x V N.S.

M x V 11.58

D x M x V 23.16

Season 2007

LSD at 5 % for:

Planting dates (D) 7.06

Media (M) N.S.

Varieties (V) 9.99

D x M 2.85

D x V 5.70

M x V 6.98

D x M x V 13.95

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تأثير بيئة التجذير وموعد الزراعة على تجذير صنفى الزيتون المنزانيللو والكوراتينا تحت الأنفاق البلاستيكية المظلمة

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تم تنفيذ هذا البحث فى المزرعة البحثية بمعهد بحوث البساتين فى الجزيرة على صنفى الزيتون المنزانيللو والكوراتينا بهدف دراسة تأثير وسط بيئة الزراعة وموعد تجهيز العقل والصنف على النسبة المئوية للتجذير وطول الجذور وعدد الجذور ووزن الجذور ونسبة البقاء وكانت النتائج كالآتى:

- ١- كانت بيئة الرمل : البيت موس بنسبة (٢ : ١) حجم/حجم أفضل البيئات تحت الدراسة من حيث الثبات والتأثير الإيجابى فى جميع الصفات بالمقارنة بالبيئات الأخرى.
 - ٢- كان أفضل موعد زراعة للحصول على أعلى قيم لجميع الصفات تحت الدراسة هو شهر يناير يليه شهر أبريل وذلك خلال الموسمين.
 - ٣- يفضل زراعة عقل صنف المنزانيللو فى شهرى يناير وأبريل يليها عقل صنف الكوراتينا.
 - ٤- أوضحت النتائج أن استخدام بيئة الرمل : البيت موس بالنسب المختلفة أن زراعة العقل فى يناير وأبريل أعطت أفضل الشتلات.
- يفضل استخدام زراعة عقل المنزانيللو فى بيئة الرمل والبيت موس بنسب (٢ : ١) حجم/حجم، فى شهرى يناير وأبريل تحت انفاق بلاستيكية فى صوب مظلمة حيث تعطى أعلى نسبة نجاح للعقل وشتلات ذات صفات جيدة.