

Determination of Effects of Different IBA Doses on Rooting of the Hardwood Cuttings of Some Fig Cultivars

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Abstract: The aim of study was to determine the effects of different doses of IBA (Indole 3-butyric acid) on the rooting performances of the hardwood cuttings of some fig cultivars. Cuttings 15-20 cm in length and 10-15 mm diameter were taken from Nazareth, Banana, Noire de Crompt and Morgüz cultivars. The cuttings were dipped in to the solution containing 0, 250, 500 and 1000 ppm IBA doses and planted into rooting media. At the end of the study the best IBA doses were determined for rooting rate and quality.

Keywords: Nazareth, Banana, Noire de Crompt, IBA, rooting.

Introduction

Nowadays, the fig cultivation for earliness has expanded significantly in Turkey-Mediterranean Region particularly in Antalya province. Therefore, interest in own-rooted fig plants has increase, especially in fig growing areas. The demand for his plants has led nurserymen to look for effective means of propagation large number of plants rapidly and easily.

The production of fig more quickly and cheaply would be considerable commercial value, and growing cuttings on their own roots could achieve this purpose by eliminating the need for producing rootstock as well as for budding and grafting. Previous research shown that fig cuttings are characterised by a variable rooting ability (Pinheiro, 1984; Dolgun et al., 2004).

Bench heating, mist, temperature control, growth substance and hormone treatments are always required to obtain satisfactory rooting (Chalfun et al., 2003).

Material and Methods

In this study, the hardwood cuttings of figs taken from Nazareth, Banana, Noire de Crompt and Morgüz cultivars.

The research was carried out in the "Mist Propagation Unit" at Batı Akdeniz Agricultural Research Institute. Hardwood cuttings were taken to be 15-20 cm in length and 10-15 mm diameter and planted into the rooting media. In the research, 0 ppm (control), 250, 500 and 1000 ppm IBA (Indole 3-butyric acid) doses were tested. In practice, in the form of sheaves of hardwood cutting, 1-2 cm of the bottom parts were dipped in IBA solution for a period of 5 seconds and we waited for short time for the alcohol to release. Then cuttings were

planted in a rooting media (including perlite) by 10x10 cm row and plant spacing (Kalyoncu, 1996; Ersoy *et al.* 2010).

This experiment was carried out in a randomise block design with 4 replicates. Each replicate consisted of 20 hardwood cuttings. Analysis of variance and LSD multiple range test ($p < 0.05$) were used to determine differences in rooting rate (%), root number, maximum root length (cm), average root length (cm), shoot length (cm) and shoot diameter (mm).

Results and Discussion

All hardwood cuttings were decayed 80 days after planting. Following treatment with IBA, IBA increased rooting rate. But there were not significant differences between IBA doses on rooting rate. The 1000 ppm IBA dose gave the highest mean value for rooting rate in all cultivars (Table 1).

Cultivars	Doses	Rooting rate
Nazareth	0	85.00
	250	82.50
	500	86.25
	1000	92.50
		LSD _{5%}
Banana	0	100.00
	250	95.00
	500	97.50
	1000	100.00
		LSD _{5%} <i>n.s</i>
Noire de Crompt	0	92.50
	250	97.50
	500	97.50
	1000	100.00
		LSD _{5%} <i>n.s</i>
Morgüz	0	97.50
	250	97.50
	500	95.00
	1000	97.50
		LSD _{5%}

Table 1. Effects of IBA doses on rooting rate of Nazareth, Banana, Noire de Crompt and Morgüz cultivars.

The effect of IBA treatments on root number, maximum root length, average root length, shoot length and shoot diameter are shown in Table 2.

The average root length for the treatments of 0, 250 ppm, 500 ppm on Nazareth varieties were observed as 9.56 cm, 8.68 cm, 5.80 cm and 5.98 cm, respectively. Accordingly, the highest rate was obtained for control and low concentration of IBA. In Nazareth fig cultivars, sapling quality characters were not positively affected by IBA treatments (Table 2).

In Banana cultivars, root number, average root length and shoot diameter positively affected by IBA treatments. The highest root number was determined for 1000 ppm IBA treatment (with 36.43). This rate was found to be 28.05 for control (Table 2).

Cultivars	Doses	Root number	Max. root length	Average root length	Shoot length	Shoot diameter
Nazareth	0	15.65	16.78	9.56 A	11.58	7.08 A
	250	13.98	16.48	8.68 AB	13.35	4.83 B
	500	14.18	12.93	5.80 B	9.58	4.38 B
	1000	12.73	14.40	5.98 B	8.60	5.00 B
	LSD _{5%}	<i>n.s.</i>	<i>n.s.</i>	2.93	<i>n.s.</i>	1.01
Banana	0	28.05 B	17.40 A	8.05 A	17.35 AB	5.73 A
	250	21.85 C	17.08 A	6.80 AB	16.25 B	5.03 B
	500	25.70 BC	13.82 B	5.95 B	15.35 B	4.55 B
	1000	36.43 A	16.33 AB	7.20 AB	19.43 A	5.20 AB
	LSD _{5%}	5.95	2.78	1.91	2.85	0.67
Noire de Crompt	0	24.60 B	14.28	5.55 B	17.18	4.75 AB
	250	24.63 B	15.30	8.95 A	19.30	5.90 A
	500	21.15 B	14.00	5.58 B	16.90	4.50 B
	1000	35.55 A	13.25	6.23 B	18.20	4.08 B
	LSD _{5%}	6.79	<i>n.s.</i>	2.28	<i>n.s.</i>	1.38
Morgüz	0	13.78 B	13.78	8.26	16.58	6.38
	250	19.86 B	18.60	10.53	14.98	6.50
	500	19.65 B	17.98	8.50	16.68	5.05
	1000	28.95 A	16.13	8.18	16.48	5.18
	LSD _{5%}	8.14	<i>n.s.</i>	<i>n.s.</i>	<i>n.s.</i>	<i>n.s.</i>

Table 2. Effects of IBA doses on root number, maximum root length, average root length, shoot length and shoot diameter of Nazareth, Banana, Noire de Crompt and Morgüz cultivars.

While Banana cultivar was showed high rooting rate (98.13 %), root number (28.00 roots/sapling), maximum root length (16.62 cm) and shoot length (17.89 cm), Nazareth cultivar was showed low rooting rate (81.56 %), root number (14.13 roots/sapling), maximum root length (15.14 cm) and shoot length (10.78 cm) (Table 3).

Cultivars	Rooting rate	Root number	Max. root length	Average root length	Shoot length	Shoot diameter
Nazareth	81.56 B	14.13 C	15.14 AB	7.50 B	10.78 B	5.32 AB
Banana	98.13 A	28.00 A	16.62 A	7.00 B	17.89 A	5.13 B
Noire de Crompt	96.88 B	26.48 A	14.21 B	6.58 B	17.09 A	4.81 B
Morgüz	96.88 B	20.56 B	16.16 A	8.86 A	16.17 A	5.78 A
LSD _{5%}	8.74	3.78	1.86	1.28	1.99	0.59

Table 3. Root and shoot quality characteristics of Nazareth, Banana, Noire de Crompt and Morgüz cultivars.

In conclusion, root quality were improved in the rooting medium added with IBA compared with control medium. The best cultivar was found to be Banana in terms of rooting behavior.

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