Asian Science
Volume 7 | Issue 1 | June, 2012 | 25-27

RESEARCH PAPER

Effect of plant growth regulators on rooting in cuttings of fig (*Ficus carica* L.) cv. DINKAR

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ABSTRACT

In order to estimate the effect of plant growth regulators on rooting in cuttings of fig, the present investigation was conducted at main garden of Department of Horticulture" Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during the year 2009-2010. For the investigation 14 treatement combinations comprising two type of cutting and six treatmet of plant growth regulator with one control were used. The results of the investigation indicated that, among two type of cuttings, hardwood cutting recorded maximum root growth, percentage of rooted cuttings, survival percentage of rooted cuttings. In respect of plant growth regulators, cuttings treated with 2500 ppm IBA+2500 ppm NAA gave maximum root growth, percentage of rooted cuttings, survival percentage of rooted cuttings in both hardwood and semihardwood cuttings, thus fig can can be propagated by hardwood cuttings treated with 2500 ppm IBA +2500 ppm NAA

Key Words : Cuttings, Plant growth regulators, *Ficus carica*.

View point paper : Khapare, L.S., Dahale, M.H. and Bhusari, R.B. (2012). Effect of plant growth regulators on rooting in cuttings of fig (*Ficus carica* L.) cv. DINKAR. *Asian Sci.*, **7**(1): 25-27.

Fig (*Ficus carica* L.) is one of the most ancient fruits known to mankind which finds its mention in the Bible. It is thought to be a native to Southern parts of the Arabian Peninsula, Italy. It is good source of carbohydrates, including fibre. Fresh fruits are rich in calorie, protein, calcium and iron. Fig helps to maintain the acid-alkali balance of the body by very effective neutralizing excess acid. The fruit contains 3.02 per cent (dry-weight basis) total acids.

Fig is gaining more importance and preferred in dry land horticulture commercially cuttings are used for it's multiplication, but very less research work has so far been done on propagation of fig by cuttings using plant growth regulator. As the soil and climatic conditions are more suitable for cultivation of fig, there is an ever-increasing demand for planting material in India. This has led to find out an easy and quick method of propagation. Considering these facts in view, the present study was carried out to investigate the effect of plant growth regulators at different concentrations on rooting of cuttings of fig.

RESEARCH METHODOLOGY

The present investigation was carried out at the main garden of Department of Horticulture Dr. P.D.K.V. Akola during the year 2009-2010. The cuttings of fig (*Ficus carica* L.) cv. DINKAR used for this research were selected from 3 years old mother plant. Hardwood cuttings were taken from one year old shoots of 20-22 cm length and of about 1.0 to 1.5 cm diameter having 4-5 nodes each and semihardwood cuttings were taken from current season growth in the month of July. The basal end of the cutting was given slanting cut to expose maximum surface for effective rooting. There were 14 treatment combinations comprising of two types of cuttings and six concentration of plant growth regulator IBA (1000,2500 ppm),

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NAA (1000, 2500 ppm), their combinations (IBA 1000 ppm + NAA 100 ppm, IBA 2500 ppm + NAA 2500 ppm) with distilled water, arranged in a FCRD with three replications and 20 cuttings per treatment. The lower portion of cuttings were treated with different concentrations of plant growth regulator by quick dip method for 5 second and allowed to dry for 5 minutes in partial shade and then planted in polybags containing rooting media. Five sprouted cuttings were selected randomly from each treatment of each replication. All observations were recorded after 90 days of planting.

RESEARCH AND REMONSTRATION FINDINGS

Percentage of rooted cuttings:

Singificantly maximum percentage of rooted cuttings was observed in hardwood cutting (52.49%) followed by semihardwood cutting (47.23%) (Table 1). Singificantly maximum percentage of rooted cuttings were recorded by IBA 2500 ppm + NAA 2500 ppm treatment followed by IBA 2500 ppm in hardwood cutting (62.50%) and semihardwood (59.99%). However, the interactions among the types of cuttings and concentration plant growth regulator had given best response in hardwood cutting treated with 2500 ppm IBA + 2500 ppm NAA.The increased percentage of rooting in cuttings treated with plant growth regulator over control has been considered to be due to the fact that hardwood cutting contain more starch content which in turn bring about favourable conditions for root initiation and more rooting percentage coupled with positive response of combination of IBA and NAA attributed to their synergistic effect. The above results are in line with findings of Reddy *et al.* (2008a) in fig., Camellia *et al*. (2009) in *Jatropha curcus*.

Number of roots:

The maximum numbers of roots per cutting (23.61) were recorded in hard wood cutting which was significantly superior over semihardwood cutting (17.14) The number of roots per cutting differed significantly with different treatments over control in both type of cuttings.

The data from Table 1 revealed that treatment (2500 ppm IBA + 2500 ppm NAA) significantly increased the number of roots per cutting (31.50) followed by 2500 ppm IBA (26.83) An interaction among the type of cuttings and plant growth regulators recorded maximum root number when hardwood cutting were treated with combination of IBA 2500 ppm and NAA 2500 ppm. This might be due to fact that hardwood cutting contained more stored carbohydrate which was responsible for more root production coupled with positive response of IBA + NAA due to their synergistic effect. The results are in conformity with Purohit and Shekharappa (1985) in pomegranate. Reddy *et al.* (2008a) in fig.

Table 1: Effect of type of cuttings and plant growth regulators on percentage of rooted cuttings, number of roots, length of roots and survival percentage of rooted cuttings

Treatments	Percentage of rooted cuttings	Number of roots	Length of roots	Survival percentage of rooted cuttings
Type of cutting				
C_1 Semi hardwood	47.23(43.70)	17.14	17.11	71.72 (58.33)
C_2 Hardwood	52.49(46.72)	23.61	21.78	82.29(65.58)
S.E. (m)±	0.10	0.32	0.32	0.19
C.D. at P=0.05	0.31	0.94	0.94	0.55
Plant growth regulator				
P_1	45.01(42.12)	17.66	13.48	71.97(58.18)
P_2	59.99(50.49)	26.83	25.11	87.39(69.30)
P_3	40.42(40.44)	14.16	15.05	68.72(56.06)
P_4	50.56(45.41)	18.33	19.16	77.34(61.64)
P_5	55.63(48.23)	22.83	21.90	82.53(65.39)
P_6	62.50(52.24)	31.50	29.66	89.73(71.41)
P_7	36.66(37.25)	11.33	11.78	61.47(51.73)
S.E.(m)±	0.18	0.56	0.56	0.33
C.D. (P=0.05)	0.59	1.63	1.63	0.96
Interaction(AxB)				
S.E.(m)±	0.26	0.79	0.79	0.47
C.D. (P=0.05)	0.76	2.30	-s	1.36

Length of roots :

The data from the Table 1 showed that length of root per cutting was recorded maximum (21.78 cm) in hardwood cutting which was significantly superior over semihardwood Cutting (17.11cm). The highest root length was recorded in treatment (2500 ppm IBA + 2500 ppm NAA) followed by 2500 ppm IBA which might be due to the fact that auxins had stimulated elongation of roots of many species. The results are in conformity with results recorded by Panda and Das (1990) in pomegranate and Reddy *et al.* (2008a) in fig.

Survival percentage of rooted cuttings :

The highest survival percentage of rooted cutting was recorded in hardwood cutting (82.29%) which was significantly superior over semihardwood cutting (71.72%) (Table 1). Among plant growth regulator treatment IBA 2500 + NAA 2500 ppm recorded highest survival percentage (89.73%) followed by IBA 2500 ppm. In respect of interaction effect significantly maximum survival percentage of rooted cuttings was recorded when hardwood cuttings were treated with 2500 ppm IBA + 2500 ppm NAA. Highest survival percentage of rooted cuttings was observed in hard wood cuttings treated with 2500 ppm IBA + 2500 ppm NAA which might be due to hardwood cutting contained more stored carbohydrate which in turn increased root number and root length coupled with IBA and NAA treatment which developed effective root system and increased the uptake of nutrients and water. The above results are in conformity with Purohit and Shekharappa (1985) in pomegranate, Camellia *et al.* (2009) in *Jatropha curcus.* Reddy *et al.* (2008b) in fig.

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Received : *21.01.2012;* **Revised :** *30.02.2012;* **Accepted :** *28.03.2012*