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Effect of Time of Planting and Auxins on Rooting of Cutting of *Ker* (*Capparis decidua* Forsk.)

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Abstract: An experiment was conducted on the response of hardwood cutting of *ker* (*Capparis decidua* Forsk.) to time of planting and auxin treatments during 1994-95. Significant differences were recorded in per cent sprouting and rooting between July-August and September-February planted cuttings irrespective of auxin treatments. Significantly higher number of roots were produced in August planting compared to September and February. Significant differences were also found under different times of planting in respect of root length. Auxins failed to cause any significant increase in rooting over the control, although beta naphthoxy acetic acid had significant influence on number and length of roots and shoots.

Key words: *Ker, Capparis decidua*, hardwood cutting, auxin, vegetative propagation.

Ker belongs to family *Capparidaceae*, and grows wild on barren soil and waste lands of arid and semi-arid parts of India. The species is drought hardy and adapted to harsh climatic conditions of arid zones. The green immature fruits, extensively used as fresh vegetables and for good quality pickle, are rich sources of carbohydrates, proteins and minerals (Chauhan *et al*., 1986), besides having several medicinal values in cardiac, gastric and asthmatic troubles.

The natural propagation is through seeds and root suckers (Pareek, 1978; Vashishtha, 1987). The propagation by seed does not produce true to type plants; therefore, an easy vegetative propagation method is necessary. Propagation by cutting is one of the easiest methods in most of the horticultural plants. Therefore, the study was conducted to see the effect of root-promoting growth regulators and time of planting on different aspects of root and shoot induction of hardwood cuttings of *ker*.

Material and Methods

The experiment was conducted at Horticulture Nursery, Central Arid Zone Research Institute, Jodhpur. Healthy and vigorously growing branches of previous season's growth were selected for making hardwood cuttings. Uniform cuttings of 15-20 cm length and 1.0-1.5 cm diameter were made. Three levels each of indole-3-butyric acid (IBA:0, 2500 and 5000 ppm), naphthoxy acetic acid (BNOA: 0, 1000 and 2000 ppm) and their combinations were used to treat the cuttings. The basal 5.0 cm portion of the cuttings were dipped in the solution for 4-5 seconds, while dipping in distilled water served as control. The cuttings were planted in first week of July, August, September and February in polyethylene tubes (10 x 25 cm), filled with a mixture of sand and powdered goat manure in the ratio of 2:1. The experiment was laid out in randomised block design with three replications and 20 cuttings in each replication.

The per cent sprouting was recorded after three months and observations on number and length of roots were taken after eight months of planting. The per cent sprouting was recorded after three months. Five rooted cuttings from each replication were taken for recording observations on different characters. The data were analysed in AxBxC factorial design in the usual way (Factor A = time of planting, B = IBA, C = BNOA).

Results and Discussion

The cuttings sprouted after 20-25 days of planting and it continued upto three months (Table 1). There were no significant differences in sprouting treatments and rooting per cent between July-August, as well as between September and February planting. Significant differences were, however, observed in sprouting and rooting between these two pairs of months. Significantly higher shoot length was recorded in July-planted cuttings compared to all other months of planting. The maximum number of roots was produced in August planting,

Table 1. Effect of time of planting and auxins on rooting and shoot growth of cuttings of ker

Time of planting/treatment	Sprouting (%)	No. of shoots	Length of shoots (cm)	Per cent rooting	No. of roots	Length of roots (cm)
July	22.5 (26.5)	4.0	21.4	19.80 (26.00)	9.6	15.1
August	20.5 (26.5)	4.5	18.9	18.14 (24.64)	10.6	11.6
September	10.7 (18.74)	4.3	14.0	6.85 (15.69)	6.9	9.9
February	10.9 (18.89)	4.2	15.3	10.00 (18.07)	7.9	13.4
C.D. at 0.05	(2.6)	N.S.	2.1	(2.59)	1.49	1.90
IBA O ppm	14.4 (21.7)	3.9	15.4	11.00 (20.12)	8.29	12.5
2500 ppm	16.6 (23.4)	4.3	21.3	12.0	4.4	12.3
5000 ppm	15.5 (22.6)	4.5	18.0	13.6 (21.9)	8.6	12.7
C.D. at 0.05	N.S.	0.5	1.8	N.S.	N.S.	N.S.
BNOA O ppm	12.8 (22.6)	4.4	16.0	13.8 (21.15)	8.8	11.7
1000 ppm	15.4 (22.3)	3.8	17.3	13.10 (20.79)	6.9	12.0
2000 ppm	15.8 (22.9)	4.5	18.9	14.2 (21.39)	10.5	3.8
C.D. at 0.05	N.S.	0.5	1.8	N.S.	1.2	1.6

Note: Figures in parentheses are angular transformed values.

Table 2. Interaction of time of planting with IBA, BNOA and their combinations on length of shoots after 8 months of planting

Time of planting	Control	IBA		BNOA		IBA 2500 + BNOA 1000	IBA 5000 + BNOA 1000	IBA 2500 + BNOA 2000	IBA 5000 + BNOA 2000
		2500	5000	1000	2000				
July	20.26	16.86	22.33	19.35	21.50	20.83	20.00	25.25	26.40
August	16.33	20.70	13.80	20.10	16.66	20.83	16.68	20.00	26.00
September	10.90	18.56	9.33	6.33	14.70	10.00	16.26	13.00	20.33
February	10.56	18.33	14.73	13.16	15.33	19.33	18.16	16.00	12.33
C.D. (0.05)	–	–	–	–	–	–	–	–	6.46

which differed significantly from the number produced in September and February planted cuttings. Significant differences were also recorded among different planting time with respect to length of roots.

IBA did not significantly increase sprouting and rooting, as well as number and length of roots. Shoot length was maximum at IBA 2500 ppm, followed by IBA 5000 ppm as compared to control. BNOA was also not effective in inducing root and shoot, but had significant influence on number and length of roots and shoots.

The interactions among time of planting and different auxin treatments were found to be nonsignificant in most of the characters. Some of the interactions were significant with respect to length of shoot (Table 2). The shoot length did not differ significantly between control and most of the rooting hormone levels when the cuttings were planted in the months of August, September and February.

The time of planting had marked influence on rooting and sprouting. *Ker* being very hard to root species, the rooting response in general was, however, very poor. High rooting in July-August might be due to high temperature (24.7°C-33.7°C) and high humidity (RH 50-98%). There may be internal factors such as lack of promoters and accumulation of inhibitors responsible for poor response to rooting. Hartman and Kester (1983) suggested inadequate carbohydrate as one of the factors for failure of the cuttings to root. Seasonal variations in rooting response supports earlier finding of Rana *et al*. (1987) in *Dalbergia sisso*.

Response of cuttings of auxin treatments depends upon several factors and varies according to plant species. In many hardy species in horticulture and forestry, the response is either very poor or absent altogether. The lack of rooting response to auxin treatments was also reported by Nautiyal *et al*. (1992) in *Anogeissus latifolia* and by Gurumurti *et al*. (1994) in *Acacia nilotica*, both being very hard to root species. Hence, it is concluded that *ker* can be propagated through hardwood cuttings with about 20% success under open conditions without any treatment with planting in the month of August. It is because of favourable climatic conditions for rooting during this period. Success rate can be increased to 40% in green house under mist.

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