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Response of Sissoo (*Dalbergia sissoo* Roxb.) Stem Cuttings to Prolonged Dip Method of Auxin Treatments

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Dalbergia sissoo Roxb., of Papilionaceae family is a deciduous tree with a light crown and somewhat crooked bole. It is extensively cultivated in Punjab, U. P., Bengal and Assam. It is planted and often self-sown throughout India. It is also planted on roadsides and as shadetree in tea plantations (Anon. 1952). Singh (1978) reported that sissoo is important species for irrigated plantations. Wild population and seed-raised trees are genetically heterozygous. This necessiates the development of suitable methodology for mass multiplication of the clonal material. Auxins are known to induce rooting in the cutting and promote root and shoot growth and survival percentage (Nanda *et al.* 1968). With a view to study the influence of different auxins on rooting of sissoo stem cuttings and subsequent growth, present investigation was carried out with different levels of IBA, IAA and NAA.

Studies were carried out at the Instructional Farm of Aspee College of Horticulture and Forestry, Gujarat Agricultural University, Navsari during August to November of 1994. Stem cuttings were taken from 8-10 years old mother trees grown at the farm. Cuttings of uniform size (25 cm long and 3-4 cm girth) were collected from the outer portion of the crown of the mother tree. The basal ends of the prepared cuttings were kept in standing position in auxin solutions to a depth of 3.0 – 4.0 cm for a period of 24 hours under prolonged dip method. Three concentrations (100, 200 and 500 ppm) of Indol Butyric Acid (IBA). Indol Acetic Acid (IAA) and Napthalene Acetic Acid (NAA) were made along with control (Distilled water) for treatment. Ten cuttings of each treatment were planted in raised bed containing 2 : 1 :1 soil, sand and well – rotted farm yard manure. Weeding was done regularly and watering was done when there was no rain.

Total treatments for each species were ten and were replicated three times in randomized block design. Observations were recorded on rooting percentage, number of roots per rooted cutting, length of the longest root, dry and fresh weight of roots per rooted cutting after 90 days of planting. Fifty per cent of the rooted cuttings were transplanted into a field and survival percentage was recorded after 28 days.

Perusal of the data (Table 1) indicated that among the three auxins tested, IBA at all the concentration levels was found superior as compared to NAA, IAA and control with regard

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TABLE 1

Effect of IBA, IAA and NAA on rooting behaviour root biomass and survival per cent of Dalbergia sissoo Roxb. stem cuttings.

Treatment details (ppm)		*Rooting per cent*	*Length of longest root/ rooted cutting (cm)*	*Number of roots/rooted cuttings*	*Fresh weight of roots/ rooted cuttings (g)*	*Dry weight of roots/ rooted cuttings (g)*	*Survival per cent*
IBA	100	86.66	33.41	20.97	1.22	0.43	65.55
	200	70.00	25.05	18.55	0.75	0.27	58.33
	500	46.66	14.48	15.90	0.36	0.15	44.44
IAA	100	80.00	20.75	24.36	0.91	0.32	53.33
	200	60.00	18.70	19.24	0.45	0.17	49.99
	500	46.66	13.21	16.36	0.33	0.14	33.33
NAA	100	73.33	19.61	16.52	0.69	0.25	50.00
	200	50.00	17.41	12.55	0.42	0.16	47.22
	500	40.00	11.80	12.16	0.22	0.09	33.33
Control		30.00	9.00	9.16	0.19	0.08	38.88
S. Em. ±		7.74	3.14	1.65	0.04	0.018	4.03
C. D. at 5%		16.27	6.60	3.48	0.09	0.039	8.48

to rooting characters and survival percentage. The maximum 86.66 per cent rooting was recorded in IBA 100 ppm treatment. However, it was at par with IAA 100 ppm (80 per cent) and NAA 100 ppm (73.33 per cent) while only 30 per cent rooting was recorded in control.

Maximum length of longest root was recorded in IBA at 100 ppm (33.41 cm) followed by IBA at 200 ppm (25.05 cm). The effectiveness of IBA over other auxins for such character has been reported by Bala *et al.* (1969) in *Dalbergia sissoo* Negi and Tiwari (1984) in *Pongamia pinnata* and Nautiyal *et al.* (1992) in *Tectona grandis*. However, contradictory results were noted by Chauhan *et al.* (1993) in *Boerhavia platuphylla*. They observed that length of the longest root was maximum in control as compared to auxin treatments. But IBA, IAA and NAA were superior to control in respect of root length because auxins have tendency to increase cell elongation (Weaver, 1972) which is ultimately related to the number of roots per rooted cutting, length, fresh and dry matter content in the cuttings. The maximum number of roots (24.36 per rooted cutting) was recorded in IAA 100 ppm treatment followed by 20.97 in IBA 100 ppm over control (9.16). Similar trend was also reported by Shamet and Dhiman (1991) in *Grewia optiva*. It is now well established fact that rooting of cuttings is controlled by exogenous auxins. It was also noted that auxins improve the quality of root systems. Root characters of cuttings were also evaluated in terms of their fresh and dry weight. The results revealed that IBA 100 ppm was superior in its effect on these characters as compared to other treatments.

In clonal propagation through stem cuttings the most pertinent aspect is the survival of rooted plants. There are many factors associated with survival of rooted plants viz., media in which rooted plants are planted, quality and quantity of roots. Shoot growth, physiological status of the plant, climatic condition like humidity, temperature, rainfall, season etc. Among these the quality and quantity of roots on cuttings are most important reasons for survival success of rooted plants. It is observed from the data presented in Table 1 that among the different concentrations of different auxins used in treating the cuttings with IBA 100 ppm gave maximum 65.55 per cent survival followed by 58.33 per cent in IBA 200 ppm treatment. These results are in confirmity with the findings of Pal *et al.* (1993) in *Tylophora indica* and Ravichandran *et al.* (1994) in *Casuarina junghuhiana*.

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