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VEGETATIVE PROPAGATION OF *DALBERGIA SISSOO* BY STEM CUTTINGS

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ABSTRACT

Four growth regulators viz., IAA, IBA, NAA & GA each at three concentrations of 50, 100 and 200 ppm were used for rooting of semi-hard as well as hard-wood stem cutting in *D.Sissoo*. A conjoint evaluation of all parameters brought into limelight the superiority of 200 ppm IBA. A comparison of the nature of the cuttings revealed the better performance of semi-hard wood than the hard wood cuttings. Thus for vegetative multiplication of *D.Sissoo* use of semi-hard wood stem cuttings and their immersion in 200 ppm IBA for four hours are found to be encouraging.

KEY WORDS: Vegetative propagation, *Dalbergia sissoo*

INTRODUCTION

Vegetative propagation is a rapid and simple means where forest tree crops can be multiplied without any genetic change. Vegetatively propagated trees flower and yield earlier than trees raised by seedlings. Growth regulators are applied to cuttings to induce high percent of rooting and more number of adventitious roots/cuttings (Hartman and Kester (1983). The rooting ability varies with the chemical and its concentration.

Dalbergia sissoo Roxb. commonly called as Malabar black wood is a valuable deciduous timber tree. It is in great demand for fabrication of elite furniture and cabinet. This apart it is widely used for cart frames and wheels, railway sleepers, musical instruments, bent wood furniture, sports equipments etc. (Dastur, 1963). Because of its drought resistance and strongly light demanding characteristics (Anonymous, 1952) it can be exploited for afforestation of exposed slopes which encounter severe denudation problems. The present study was designed to identify the ideal growth regulator and concentration for its vegetative propagation through stem cuttings.

MATERIALS AND METHODS

Stem cuttings measuring 30 cm long and 0.5 cm width were prepared from semi hard wood and hard wood branches of 15 year old trees during June-July at Kunjapani located on the Nilgiri hills. The basal part of the stem was given an oblique cut and dipped for four hours in different concentrations of IAA, IBA, NAA, and GA. These were then washed in running water and planted in poly bags containing equal parts of well rotten farm yard manure, sand and red soil. Cuttings treated with distilled water served as control. The poly bags were maintained in a mist chamber throughout the experimental period. The following observations were recorded on the fiftieth day after planting ;

1. The number of cuttings striking roots
2. The number of roots/cutting
3. Root length
4. Survival of cuttings, 60 days after planting.

RESULTS AND DISCUSSION

The rooting percentage was maximised under all growth regulators barring 50 ppm IAA. The magnitude of increase was the maximum under 200 ppm IBA, the increase over the control being 40%. Though 200 ppm of IAA proved the next best, its increase compared to control was only 18%. Considering the number of roots/cutting, 200 ppm IBA again reigned supreme with an increase of 17.4% over the control. In fact, it outperformed other treatments in respect of root length and survival as well, the survival was 45% more than in the control.

From a holistic perspective the superiority of 200 ppm IBA was brought into sharp focus. The better performance of IBA has also been earlier documented by several workers (Nanda *et al.*, 1969 ; Pain and Roy, 1981 ; Anon 1997).

Considering the nature of cuttings semi-hard wood cuttings were decidedly more promising than hard-wood cuttings. Except root length, where

Table 1. Effect of different harmones on rooting semi hardwood and hardwood cuttings of *Dalbergia sissoo*

Treatment	ppm	Rooting (%)			No.of roots/cutting			Root length (cm)			Surival % of cuttings		
		Semi hard wood	hard wood	mean	Semi hard wood	hard wood	mean	Semi hard	hard wood	mean	Semi hard	hard wood	mean
IAA	50	37	23	30	7.1	6.3	6.7	4.7	4.5	4.6	25.4	17.4	21.4
	100	41	26	33	6.6	6.7	6.6	5.2	4.7	4.9	28.3	17.5	22.9
	200	53	33	43	8.4	6.0	7.2	4.9	5.0	4.9	67.6	29.3	18.4
IBA	50	38	25	31	7.5	8.5	8.0	5.6	5.2	5.4	23.5	20.5	22.6
	100	46	38	42	10.2	8.5	9.3	7.3	7.0	7.1	42.4	30.6	36.5
	200	77	53	65	13.8	9.6	11.7	9.2	6.1	7.6	73.7	45.7	59.7
NAA	50	41	33	37	10.2	7.1	8.6	4.6	4.3	4.4	26.5	23.6	25.0
	100	43	31	37	8.1	9.3	8.7	5.1	4.7	4.9	24.1	27.4	25.7
	200	46	37	41	9.2	7.5	8.3	5.3	4.6	4.9	30.6	21.5	30.5
GA	50	32	27	29	9.4	8.3	8.8	5.7	5.0	5.3	24.4	21.3	22.8
	100	36	28	32	8.3	9.4	8.8	5.6	4.7	5.1	32.8	26.1	29.4
	200	36	27	31	9.6	9.5	5.3	5.3	5.3	40.3	29.4	34.8	
Control	31	20	25.5	7.2	6.3	6.7	4.4	4.3	4.3	17.3	14.4	15.8	
Mean	42.8	30.8		8.8	7.9		5.6	5.3		35.1	25.5		
CD at 0.05%													
Harmone			5.2			0.4			0.8			8.2	
Cutting			10.1			0.8			NS			16.4	
Harmone x Cutting			15.2			1.2			NS			25.0	

the two proved equally good in all other parameters, the semi-hardwood cuttings out-performed the hard-wood cuttings, the quantum of increase being 12% in rooting, 20% in survival and 11% in number of roots.

The better performance of semi-hardwood cuttings is also consistent with similar reports in *Populus gamblei* (Ghosh and Bhatnagar, 1977) *P.alba; P. tremula* and *Juniperus communis* (Al-Kinany, 1981).

Thus considering overall performance, use of semi-hard wood cuttings and dipping them in 200 ppm IBA for four hours is proved effective for vegetative mass multiplication of *D.Sissoo*.

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