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NOTES

ROOTING OF *SHOREA PAUCIFLORA* STEM CUTTINGS FROM COPPICE SHOOTS

Aminah Hamzah

Forest Research Institute Malaysia (FRIM), Kepong 52109 Kuala Lumpur

Successful rooting of stem cuttings of several *Shorea* species has been reported (Lo 1985, Siagan *et al.* 1989, Aminah 1991, Smits *et al.* 1994), but there is no record of the rooting ability of *Shorea pauciflora* (meranti nemesu) cuttings. The present experiment tested the rooting ability of different sized stem cuttings of *S. pauciflora* taken from coppice shoots.

A total of 79 single node cuttings were taken from coppice shoots of six 7-y-old stock plants planted in the nursery of FRIM. A 30 cm^2 leaf area was retained on each cutting. The length and diameter of each cutting were recorded. The base of each cutting was cut at right angle to the stem and dipped into powdered hormone Seradix 3 (0.8 % indole butyric acid). The prepared cuttings were planted in a medium of river sand. The whole rooting bed was covered with a transparent plastic sheet and shaded with two layers of plastic netting which gave an irradiance of about 15% of full sunlight. These cuttings were kept moist by an automatic mist sprinkler system which operated at hourly interval with each duration of spray at one minute. These cuttings were assessed fourteen weeks after planting in rooting medium. Rooting was grouped according to length and diameter of cuttings and correlation analysis was carried out to find the relationship between these variables.

The assessment showed a high success of rooting, ranging from 80 to 95% (Tables 1 and 2). Correlation analysis showed that the rooting percentage of *S. pauciflora* was not positively correlated to cutting size used. A similar relationship was obtained between rooting and cutting length of *Prosopis juliflora* (Dick *et al.* 1991), and between rooting and cutting diameter of *Acacia tortilis* (Dick & East 1992). However, in some species such as *Eucalyptus grandis* (Hoad & Leakey 1993) and *Triplochiton scleroxylon* (Leakey 1983), longer cuttings tend to produce better rooting than shorter cuttings. Leakey and Mohammed (1985) also indicated that when cuttings were cut to the same length, thicker diameter cuttings rooted better. Their results imply that rooting of cuttings depends on the stored carbohydrates in the stem.

Table 1. Effect of cutting length on mean rooting percentage and mean number of roots of *S. pauciflora* stem cuttings at fourteen weeks

Cutting length (cm)	Number of cuttings planted	Number of cuttings rooted	Rooting % ±SE	Mean number of roots per rooted cutting ± SE
2.5 - ≤ 4.5	18	15	83.33 ± 8.85	4.93 ± 0.38
4.5 - ≤ 5.5	20	16	80.00 ± 8.94	5.69 ± 0.44
5.5 - ≤ 6.5	20	19	95.00 ± 4.87	5.95 ± 0.67
6.5 - ≤ 9.0	21	20	95.24 ± 4.76	6.90 ± 0.51

Table 2. Effect of cutting diameter on mean rooting percentage and mean number of roots of *S. pauciflora* stem cuttings at fourteen weeks

Cutting diameter (mm)	Number of cuttings planted	Number of cuttings rooted	Rooting % ± SE	Mean number of roots per rooted cutting ± SE
1.50 - ≤ 2.25	17	16	94.12 ± 5.76	4.50 ± 0.29
2.25 - ≤ 3.00	25	21	84.00 ± 7.33	5.43 ± 0.41
3.00 - ≤ 3.75	20	17	85.00 ± 7.98	6.53 ± 0.55
3.75 - ≤ 7.26	17	16	94.12 ± 5.76	7.44 ± 0.68

SE = standard error of mean.

In contrast to rooting percentage, the number of roots was positively correlated to the cutting size. Longer and bigger cuttings produced a greater number of roots (Tables 1 and 2). This may indicate that the carbohydrate reserves in the stem influenced further root development of cuttings. Veierskov (1978), and Poulsen and Andersen (1980) also reported that the cutting length was generally more correlated with the number of roots per rooted cutting than the percentage of rooting.

This preliminary study showed that stem cuttings of *S. pauciflora* could be rooted using coppice materials. Longer and bigger cuttings produced more roots which may be of advantage for anchorage of cuttings when planted in the field.

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THE EFFECT OF SOURCE OF NITROGEN AND FREQUENCY OF MOISTURE SUPPLY ON GROWTH AND MACRONUTRIENT DISTRIBUTION IN SEEDLINGS OF THE AFRICAN LOCUST BEAN, *PARKIA BIGLOBOSA*

A.M. Awodola

Department of Forestry and Fisheries, Faculty of Agriculture, Usmanu Danfodiyo University, Sokoto, Nigeria

The semi-arid northern region of Nigeria is being threatened by the encroaching Sahara Desert. Consequently, afforestation programmes are being embarked upon to enhance rapid vegetation cover. *Parkia biglobosa,* an indigenous legume recognised as a multipurpose tree in the Sudan savanna of Nigeria, is a potential tree for such programmes. To enhance production of seedlings of high morphological and physiological grade, information on moisture and nutrient requirements is needed.

This study was designed to investigate the effect of source of nitrogen and frequency of moisture supply on the growth and chemical composition in seedlings of *Parkia biglobosa* grown in a semi-arid environment in Nigeria.

A split-plot experimental design with three replications was used with three sources of nitrogen: urea (N1), calcium ammonium nitrate (N2), and cowdung (N3), as the main plot treatment, and daily watering (F1), 2-day interval (F2), 4-day interval (F3), and 6-day interval as the sub-plot treatments. The quantities of each source of nitrogen used (0.11 g urea, 0.77 g calcium ammonium nitrate and 4.0 g air dried cowdung per seedling) were optimal values obtained for *Parkia biglobosa* in a semi-arid zone (Awodola & Nwoboshi 1990). *Parkia biglobosa* seedlings germinated in acid-washed sands at 4-6 leaf stage were transferred to the polypots of size 23 by 12 cm (one seedling per pot) and watered daily for two weeks to enhance establishment. At the commencement of the third week after transplanting, seedlings under each source of nitrogen were divided into four groups. Each group was subjected to varying frequency of moisture application (F1, F2, F3, F4) to pot capacity. The experimental treatments lasted for twelve weeks. During the growth period, measurements of plant height and collar diameter were taken at two-weekly intervals while leaf number was counted. Leaf area was estimated by direct planimetry of traced outlines. The seedlings were harvested and separated into leaves, stems and roots. Total fresh weights of the seedling component parts were obtained. Dry weights were obtained after oven drying at 80 °C for 24 h. The various component parts were prepared and analysed for nitrogen, phosphorus, potassium, calcium and magnesium.

Source of nitrogen significantly ($p < 0.5$) influenced important seedling morphological characteristics. Levels of nitrogen, phosphorus, potassium, calcium and magnesium in