Short Communication

Influence of Collection Methods and Treatments of Seeds on the Germination and Seedling Vigour of Teak

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Teak (*Tectona grandis* Linn. f) is one of the most well-known versatile timbers in the world. Its large scale cultivation is much hampered by various factors. Among them poor germination of drupes (fruit with seed) is a major constraint. The causes of poor germination are many such as emptiness, prolonged and protracted germination, season and method of seed collection, age of mother tree and innate problems prevailing in the seed itself (Dharmalingam 1995). Several informations exist on method and season of seed collection of many tree species. But such informations are scanty in teak. Against this backdrop, a study was made to find out the influence of collection methods on germination and seedling attributes of teak.

Teak drupes were collected from 55 years old seed production area in Top slip (15°7' N, 74°34' E; 750 m above sea level) of Tamil Nadu in the month of December, 1996. Drupes were collected directly from the crown of the tree as well as from the ground. The drupes were preconditioned (soaking in water for 24 hours followed by drying for 72 hours, the cycle repeated for six times). The preconditioned drupes were compared with control (without preconditioning).

Following the treatments, the drupes were sown in sand filled earthen pots and kept under open sunlight. The trial was laid out in a Completely Randomised Block Design with 30 drupes in each treatments, and replicated 10 times. After 28 days of sowing (ISTA 1985) the normal seedlings (one or more) produced by single drupe were counted as one and germination experssed in percentage. The total number of seedlings produced by 30 drupes were also counted and mean value experssed as number/100 drupes. For the estimation of dry matter production, 10 seedlings were selected at random and kept in an oven maintained at 85° C for 24 hours after measuring their root and shoot length. Then the vigour index was calculated. The results were subjected to analysis of variance and tested (t-tested) for significant difference (P=0.05) (Panse and Sukhatme 1967). Percentage values were transformed into arc sine values prier to statistical analysis.

The results on the collection methods and treatments revealed that the ground collected preconditioned drupes gave 32% germination against 2.75% in crown collected ones. Futher ground collected drupes enabled early germination (within 19 days) and gave rise to more number of seedlings/100 drupes (42.0), longer root (3.64 cm) and shoot length (3.35 cm), higher dry matter production (23.13 mg) and computed vigour index (232). Whereas. in crown collected control drupes cent percent failed to germinate. The ground collected control drupes gave 7.5% germination with

Table 1. Effect of collection methods and treatments of seeds on the germination and seedling vigour of teak.

Treatments	Germination (%) 100 drupes	Number of seedlings/ emergence	Days taken for seedling (cm)	Root length (cm)	Shoot length (mg)	Dry matter production	Vigour index
T_1 -Ground collection (Control)	7.5 (15.49)	10.88	23.00	2.61	2.15	18.75	35.38
T_2- Ground collection and then soaking in water for 24 hrs. followed by drying for 72 hrs., the cycle repeated for six times.	32.0 (35.05)	42.00	19.00	3.64	3.35	23.13	232.00
T_3 -Crown collection (Control)	-	-	-	-	-	-	-
T_4 -Crown collection and then soaking in water for 24 hrs. followed by drying in 72 hrs., the cycle repeated for six times.	2.75 (8.15)	4.75	19.00	1.95	1.83	13.38	13.50
CD (P =0.05)	6.14	14.0	NS	0.80	0.74	5.30	51.56

Note : Figures in parentheses indicate arc sine values.

moderate seedling vigour (Table 1). The crown collected drupes might be more after-ripening and longer period of drying than the ground collected ones. The highest germination of and least damage to the seed are always obtained from the drupes collected from the ground (Hedegart 1975). Among the treatment, the pre-conditioned drupes gave positive influence on germination and seedling vigour. Increased germination following soaking-drying treatments has been reported in teak (Muthaiah 1975), Ngulube 1986, Masilamani 1996). The above results clearly suggest that the collection of teak drupes from the ground improves seed germination and seedling quality. Before seed fall, the ground should be cleared off weeds so that the identity of trees from which fruits have fallen is easily recognised.

References

Dharmalingam, C. 1995. Certain new approaches in bringing out the innate germination problems of teak (*Tectona grandis* Linn. f) seeds. Paper presented to the Seed Technology Workshop at the Institute of Forest Genetics and Tree Breeding, Coimbatore, during July 19-22, 1995.

Hedegart, T. 1975. Seed collection of teak. *In* : FAO/ DANIDA Training Course on Forest Seed Collection and Handling 11 : 274-279.

ISTA (International Seed Testing Association) 1985. International rules for seed testing. *Seed Science & Technology* 13 : 229-355.

Masilamani, P. 1996. Seed technological studies in teak (*Tectona grandis* Linn. f). Ph.D. Thesis, Tamil Nadu Agricultural University, Coimbatore.

Muthaiah, S. 1975. Some data on teak seed and further pre-germination treatment trials. *Sri Lanka Forester* 12 : 25-36.

Ngulube, M. R. 1986. Preliminary study on germination of pretreament seed of teak (*Tectona grandis* Linn. f) under nursery conditions in Zambia, Malawi. *Ecology and Management* 17 : 147-151.

Panse, V. G. and Sukhatme, R. V. 1967. *Statistical Methods for Agricultural Workers.* ICAR Publication, New Delhi.