Short Note: Seed Source Variation in Storage Life of Teak Seeds

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Summary

Variation exists in the storage life of teak seeds within moist type and between moist to very moist type. One seed source has shown no effect of storage, whereas two seed sources have given best results under polythene bag storage when stored for two years at room temperature.

Key words: Seed source, Provenance trial, Storage life, Storage.

Provenance trial is one of the methods used to bring improvement in tree crops and is the first step in any tree improvement programmes. Storage life of seeds play an important role when such trials are laid out on International level. KEIDING (1973) has reported that low germination due to longer storage period has resulted into failure of teak provenance trials at certain places. Foresters too face the same problem while raising new plantations as the seeds years are not regular in teak. The literature survey showed that teak seeds can be kept viable for a year and later on looses its viability (TUGGERSE, 1928; EDDMANN, 1934; RATANAKOSES, 1967; BHUMIBHAMON, 1973).

In this study air dried seeds were used from three southern states of India to find out the variability in the storage life under three storage conditions viz. cold storage, gunny bag storage and polythene bag storage. The cold storage was set at 5 °C and the rest at room temperature. The germination was recorded each month using 150 seeds in each treatment under three replications. The seeds were sown without any pretreatment in germination trays under field condition in a net house. The experiment had to be discontinued after twenty one months due to breakdown in cold storage.

Details of seed sources are as follows:

Seed Source	Teak Forest Type	Longitude	Latitude	Rain fall in m.m.
Karnataka (Dandeli)	Moist	74° 35'E	15° 07'N	2030
Tamil Nadu (Top slip)	Moist	76° 48'E	10° 26'N	1800
Kerala (Wynad)	Very Moist	75° 5'E	11° 40'N	2741

In all the three storage treatments Tamil Nadu seeds have given best results followed by Karnataka and Kerala in first two treatments. and in third treatment Kerala seeds have given better results as compared to Karnataka (*Table 1*).

Table 1. — Effect on germination between seed source and method of storage.

Storage	Seed source			Total	Average
	Karnataka	Tamil Nadu	Kerala		
Cold	132	464	87	683	227.67
Gunny bag	129	524	117	770	256.67
Polythene bag	130	562	155	847	282.33
Total	391	1550	359		
Average	133.33	516.67	119.67		

Seeds collected from Karnataka seems to have no effect of storage, whereas seeds from Tamil Nadu and Kerala have given best results under polythene bag storage. Under cold storage germination was found variable; under gunny bag and polythene bag storage similar trends in germination were observed (*Table 2*).

KEIDING and KNUDSEN (1974) when accidentally left the germination trays exposed to winter climate in Denmark found an increased germination per cent both in dry and moist type teak seeds. This they have attributed to the winter exposure of seeds between germination seasons. DITLEVSEN (1985) has also mentioned that teak seeds can remain viable for 2 to 3 years, but admits that there is no precise data on it. Based on present study it can be concluded that variation does exist in the storage life of teak seeds and can be stored for nearly two years.

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Table 2. — Effect of germination between

Month	a) Seed Source			b) storage		
	Karnataka	Tamil Nadu	Kerala	Cold	Gunny bag	Polythene bag
Jan.	47	260	67	116	94	164
Feb.	62	142	41	85	107	53
March	31	106	24	44	83	34
April	69	133	34	101	42	93
May	30	56	23	34	38	37
June	35	211	46	102	100	90
July	53	199	31	76	80	127
August	52	281	60	94	136	163
Sept.	12	162	33	31	90	86
Total	391	1550	359	683	770	847
Average	43.44	172.22	39.89	75.89	85.56	94.11

a) Seed source and month of sowing, and b) method of storage and month of sowing.

Table 3. — Analysis of variance.

Source	df	S.S.	M.S.S.
Rep	2	28.7493	74.3746
State	2	11369.49	5684.745**
Storage	2	166.2308	83.1154*
Months	8	2228.601	316.0751
State x storage	4	100.807	25.2018
State x months	16	2655.251	165.9532**
Storage x months	16	1358.0655	84.8791**
State x storage x months	32	2328.825	72.7758
Error	160	4548.586	28.4287
Total	242	25094.685	

*) Significant at 10% level
**) Significant at 1% level

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Buchbesprechungen

Biotechnology in Agriculture and Forestry. Volume 8. Plant Protoplasts and Genetic Engineering. I. Edited by Y. P. S. Bajaj. 1989. Springer Verlag, Berlin, Heidelberg, New York, London, Paris, Tokyo, Hong Kong. Hardcover, DM 378,—.

This volume covers recent developments in protoplast research, an area which is undergoing critical evaluation for its utility in agricultural crops and forest tree improvement. Whether plants regenerated from protoplasts are true-to-type needs to be fully examined. The questions regarding the genetic stability of protoplast regenerants still remain unresolved. After all every one is not always looking for somaclonal or protoclonal variation. Relative genetic stability is important for recovery of clonal material. In this respect technological advances will be necessary for control of genotypic stability in regenerants obtained from cultured plant protoplasts.

This volume is divided in three sections. Section I deals with isolation, culture and preservation of protoplasts, and includes 6 chapters. Section II deals with regeneration of plants from protoplasts in a variety of different species and includes 12 chapters. Section III reviews protoplast fusion and somatic hybridization in several plant species. But none of these have any economic importance. This section consists of 10 chapters. Only future developments in protoplasts research will show whether protoplasts are indeed required for genetic manipulations in plants, or plant cells themselves are just as amenable to genetic engineering.

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Biotechnology in Agriculture and Forestry. Volume 9. Plant Protoplasts and Genetic Engineering. II. Edited by Y. P. S. Bajaj. 1989. Springer Verlag, Berlin, Heidelberg, New York, London, Paris, Tokyo, Hong Kong. Hardcover, DM 398,—.

Recent advances in molecular biology and cell culture technology have made it possible to attempt genetic engineering in plants. At one point it was considered that protoplasts are essential for gene transfer and genetic modification of plants. However, by employing *Agrobacterium tumefaciens* as a vehicle for transfer of alien genes into plant cells, the protoplasts may have lost some of their importance in genetic engineering. Furthermore, protoplasts from a number of economically important agricultural crops and tree species are still very difficult to grow and differentiate *in vitro*.

The present volume contains 28 chapters on use of protoplasts in genetic engineering of plants. Transformation, sorting of protoplasts, electrofusion, integration of alien DNA by microinjection, introduction of spheroplasts, transfer of mitochondria, chloroplasts, and viruses in plant protoplasts are reviewed.

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Sexual Reproduction of Tree Crops. By M. Sedgley and A. R. Griffin. 1989. Academic Press, Harcourt Brace Jovanovich Publishers, London, New York, Sydney. 378 pages. Hardbound.