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Standard of germination in *Abelmoschus esculentus* Linn. (*Bhendai or Okra*)*

by

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Synopsis: The details of a study carried out at the Botany section of the Agricultural College by the authors for fixing a standard of germination for *Abelmoschus esculentus (Bhendai or Okra)* are discussed in this paper. The authors have concluded that a standard of sixty per cent could be fixed for the *Bhendai* seeds.

Introduction: The importance of good seed is well realised in Agriculture. The quality of seed is dependent upon a number of factors such as the maturity of the seeds, purity, the method of storage adopted, the period of storage after harvest, the age of the seed and the incidence of pests and diseases during storage. For the determination of the quality of the seed and arriving at its real value two important factors are to be considered namely (1) purity and (2) germination capacity.

With the advance of modern agriculture, seed testing has become very important in most countries of the world. The Governments of most of the countries have enforced seed laws and regulations to assure their farmers of improved varieties and qualities of seeds and ultimate good stand of crops and returns.

It has been realised in our country also that it should promulgate laws regulating the sale of seeds in similar lines as in other countries. It is proposed that in the case of seeds put up for sale by seed merchants, "guarantee certificates" should be obtained by them from the seed testing stations before they sell (Pal and Mukerji, 1950). This calls for the need for first fixing up the seed standards for the different crop seeds on regional basis and with a view to contribute data on this aspect, research work is being conducted in the Botany section, Agricultural College and Research Institute, Coimbatore. The data gathered on the germination studies in *Abelmoschus esculentus* is presented here.

Review of Literature: Stone (1930) has studied the viability with reference to storage of the seeds of about forty vegetables including tomato, parsley, endive, chicory, musk melon, onion, radish etc., and has reported that at the end of ten years, the vigour was lessened. Aquatrias (1936) has determined the viability of the seeds of carrot, celery, cabbage, melon, etc. Dormancy studies on cucumber, water melon, pumpkin, carrot, musk melon, tomato, pepper, etc. have been carried out by Burke (1937). Oldland (1937) has recorded that

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Cucurbitaceous seeds underwent a period of weak germination for several weeks after harvest, and the Solanaceous plants on the other hand showed no indication of dormant period. Lowing (1957) reports that the vegeteble seeds lose viability if stored in paper packets. Recently Chopra and Amirsingh (1963) have studied the viability and purity of twelve vegetable seeds including *bhendai (Abelmoschus esculentus.)* with a total of five hundred and seventy four samples collected from different agencies in various regions of our country. The mean value of germination recorded for bhendai is sixty one per cent.

Detailed information on the germination behaviour of the crop plants especially in South India is lacking.

Materials and methods: Seeds of *Abelmoschus esculentus* collected from five different localities in Madras State from the summer crop of 1957 and stored in tin containers were subjected to fortnightly germination tests within four months from the date of collection both under sand and filter paper media in zinc germination trays at laboratory temperature for periods ranging from 17 to 26 months between 1960 and 1962. The data gathered were statistically analysed and a standard of germination that could be enforced has been arrived at (Summary table).

Results: From the statistical analysis of the data gathered, it is observed that the mean percentage of germination of five samples tested under sand and filter paper media ranges from 63·00 to 95·85 due to locality variations. On consolidated analysis of all the 403 frequencies, the general mean arrived at is 84·39 with a standard deviation of 16·20 or the co-efficient of variation being 19·31.

For *Okra (Abelmoschus esculentus)* the following are the seed standards fixed in Canada and in two States in the United States of America.

Country		*Standard of germination*
Canada	...	50%
California	...	50%
Georgia	...	50%

From the results as obtained from the present study wherein seed material has been taken from five different regions in Madras State, it is evident that the germination in this crop is quite high in the State with a general mean at 84·39 per cent. Chopra and Amirsingh *(loc. cit.)* have reported mean value of 61 per cent in the samples studied by them. With the above data, the authors are of the opinion that for *Abelmoschus esculentus* the standard of germination could be fixed safely at 60 per cent.

Summary: Seeds of *Abelmoschus esculentus* collected from five localities of Madras State were tested for germination during 1960—1962 at fortnightly intervals on sand and filter paper media and the data statistically analysed. No significant difference was obtained between the two media tried. The standard of germination for *Abelmoschus esculentus* seeds could be fixed as 60 per cent.

SUMMARY TABLE

Frequency distribution, mean germination percentage for different localities on the two media

Range	Tirur-kuppam		Thimma-puram		Parama-kudi		Perin-kulam		Amba-samudram		Total
	Sand	Paper	Sand	Paper	Sand	Paper	Sand	Paper	Sand	Paper	
1	2	3	4	5	6	7	8	9	10	11	12
16—20	...	...	...	...	...	...	...	...	...	1	1
21—25	...	...	...	...	...	...	1	...	...	2	3
26—30	...	...	...	...	...	1	0	...	...	1	2
31—35	...	...	...	...	...	1	0	...	...	...	1
36—40	...	...	...	...	1	0	0	...	...	2	3
41—45	...	...	...	...	0	0	0	...	...	3	3
46—50	...	...	...	...	1	0	1	...	...	4	6
51—55	...	...	...	...	3	2	0	...	...	4	9
56—60	1	....	...	...	0	6	0	...	1	3	11
61—65	0	3	...	...	3	4	0	1	5	5	21
66—70	0	1	...	1	1	5	1	3	2	3	17
71—75	0	0	...	0	1	2	1	3	4	3	14
76—80	1	5	...	0	4	0	2	2	4	3	22
81—85	2	12	...	0	8	0	3	2	3	3	33
86—90	7	4	4	0	2	1	9	4	10	3	44
91—95	22	12	14	8	8	6	13	16	3	3	105
96-100	16	10	15	24	12	15	7	6	1	2	108
Total	49	47	33	33	44	43	39	37	33	45	403
Mean	92·50	87·10	96·67	95·85	84·15	78·35	86·70	89·46	79·62	63·00	84·39

S. D. 16·20 Co-efficient of Variation. 19·31

REFERENCES

Aquatrias, P. 1936 Intensive culture of vegetables on the French system with a concise monthly calender of operations. *The Bazaar Exchange and Mart Office, London.*

Burke, T. W. L. 1937 Germination standards for vegetable seeds. *Proc. Assoc. of Off. Seed. Anal. N. Amer., 45—46.*

Chopra, P. and Amirsingh 1963 Viability and purity of vegetable seeds. *I. S. I. Bulletin,* **15**; (2): 72-73.

Lowing. E. 1955 Contributions to the problem of seed storage. *Hort. Abst.,* **26**; (3): 353.

Oldland, M. L. 1937 Observations on dormancy in vegetable seed. *Proc. Amer. Soc. Hort. Sci.* **35**; 562-67.

Pal, B. P. and D. K. Mukerji 1950 Seed testing, *Sci. and Cult.,* **16**: 2.

Stone, A. L. 1930 Results of ten years of germination tests of the same sample of vegetable seeds. *Proc. of Assoc. of Off. Seed analysts of N. America, 23rd meeting;* 76-80.