

Some Observations on Seed Germination in Mangosteen (*Garcinia Mangostana*)

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Low germination in mangosteen seeds has been the experience of nurserymen in all lands. To improve this a series of studies has been undertaken at the Government Fruit Station, Kallar (Madras) during the past few years. Blossom, biological and pollination studies on that station have revealed that mangosteens can set and mature fruit without the aid of pollination i. e., parthenogenetically, which fact also explains the absence of any horticultural varieties of the fruit. This feature is mainly due to the fact that the flowers are all hermaphrodite with sterile male organs. The segments in the mature fruit do not also all contain seeds; and among those that have seeds, only a few possess well-developed and plump seeds. Because of the incidence of a physiological disease, called gambog, which is typified by the exudation of a yellowish liquid on the rind, pulp and seed of the fruit, it was thought that even the few plump seeds might have their germination capacity adversely affected by the gambog. The testing of these various classes of seeds in different media was one of the items of work taken up at Kallar with the object of improving the germination percentage and to secure the maximum number of healthy and robust seedlings. These have shown that the well-developed, plump, and healthy seeds when sown under normal nursery bed conditions in November 1942 gave a germination percentage of 30. In a separate trial, similar seeds free of gambog recorded a germination percentage of 40, while those with signs of gambog incidence on the arils gave only 32.5% germination. The ill-developed leathery seeds were found useless, as none produced a seedling.

Further observations on the growth and development of seedlings brought out certain contrasting features between the healthy and gamboged seeds. A month after germination it was clear that the later, produced contorted leaves and weak plants on 92.4 percent of the seedlings, while in the former only 6.3 percent of the seedlings suffered from similar defects. There was also a distinctly stunted appearance in the seedlings in the bed allotted to gamboged seeds. Within the second month, however, when the second pairs of leaves began to emerge out, the above stated disparity between the two lots disappeared appreciably, such that no difference between them could be noticed from a distance. These led to the inference that

gamboged seeds are not to be discarded as seed material, even though the seedlings therefrom may not look apparently healthy and sound in the first one or two months of germination. In both the cases, however, it is necessary for the nurserymen to endeavour to select only the plump and well-formed seeds for sowing purposes.

That the germination percentage is possible of marked improvement by selecting the proper media for sowing, is clear from the results of yet another trial. Peaty soil with its high organic matter content and high water-holding capacity has been found to be the best medium for mangosteen seeds at Kallar, giving as high as 80% germination with plump, well-developed seeds, as against the maximum of 50% recorded in soils of different types.

There is a wide-spread belief among the mangosteen growers that the slightest damage to the seed affects its germination capacity adversely. On that account, sowing the seeds with pulp intact has been widely advocated as a desirable practice. Observations from the preliminary tests with pulpy and pulp-free seeds denote that the adhering pulp in the course of disintegration in the soil attracts insect pests, which in turn might inhibit or prevent germination. In the case of gamboged fruit, however, the pulp being astringent in taste, does not possibly get affected adversely to the same extent. The germination was also higher and quicker in pulp-free seeds than in those with pulp attached to seeds, the figures being 50% germination and 20 days for the first signs of germination in the former, and 17% and 31 days in the latter respectively.

In the course of the afore-said trials, it was found that mangosteen is slightly polyembryonic - a feature which does not seem to have been recorded in extant literature. In a lot of 120 seeds sown in August 1945 at Kallar, seven per cent of the seeds produced two seedlings per seed. There is some evidence to show that only the healthy or gambog-free seeds exhibit this polyembryonic phenomenon.

To summarise, it is found necessary to select only well-developed, plumpy seeds, free of gambog and sow them in a peaty soil medium after carefully removing all pulp. Such of these seedlings which arise at the rate of more than one per seed, can be easily separated out by splitting the seed into two exact halves, and planting each seedling out separately in a bed or pot.

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