

# BREEDING IN ARECANUT

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Bagged Inflorescence

ARECANUT, as it is understood, is essentially a cross fertilized crop. Due to this reason the existing palms will have to be considered as heterogenous in their genetic constitution. Consequently, the progenies from any one palm shows considerable variation. Under such a circumstance, the scope for selection is highly limited. Due to the heterogeneity of the material, the scope for crop improvement by breeding also has its limitation in this crop.

Before taking up any hybridization programme, it is highly essential that a genetically pure material is first secured. This can only be done by inbreeding (selfing) for atleast three to four generations. With a view to raise such inbred lines, it was proposed to start selfing of a few selected palms. The technique of hybridization had, therefore, to be standardised.

The male flowers of the inflorescence soon after its emergence from the spadix are removed and the female flowers bagged (Photo 1).

Both, bags made out of thick 'kora' cloth or thin muslin cloth, were found to be effective in preventing the fertilization of female flower by entry of foreign pollen. The bagged female flowers are, therefore, examined for their opening. Two methods of dusting pollen were tried. One consisted of collection of dusting pollen in petridishes and transferring the same to the stigmatic surfaces by means of a camel-hair brush. In this method, it was observed that collection of sufficiently large quantity of pollen from the opening male flowers was rather difficult, and as such, large number of female flowers could not be covered. The other method consisted of taking individual male flowers with a fine pointed small tip-bent forceps and dusting the pollen on the stigmatic surface of the female flower (Photo 2). In this method, the pollination was found to be better. Moreover, it was found easy to sterilize forceps in alcohol and using it in pollination work with more speed than camel-hair brush. Soon after the pollination, the inflorescence is re-bagged. After a month, the bags are removed.

Fruit-set in arecanut was found to range between 32 and 43 percent of the total female flowers produced under the conditions existing in South Kanara. During the course of natural pollination, it is quite possible that a certain percentage of female flowers may fail to get properly pollinated and thus may subsequently drop down. Raghavan and Baruah (1956) while studying on the factors influencing fruit-set and sterility in arecanut has observed that the fall of female flowers during pre-mature stages is due to failure in pollination and fertilization. It was, therefore, thought worthwhile exploring the possibility of increasing fruit-set by pollinating the flowers of *areca* under controlled conditions. With this object in view, inflorescences opened on the same day were marked out and after removing the male flowers, the bunch

was divided into three portions each having approximately 1/3 of the total female flowers. Two portions were bagged with one cloth bag each, leaving the third for open pollination. The flowers were examined periodically for their opening and one portion was selfed with pollen collected from the adjoining inflorescence of the same palm and the other portion was cross-pollinated with pollen gathered from another palm, so as to compare the influence of selfing and crossing on fruit-set with open pollination. The fruit-set was recorded one month after pollination. The study was undertaken for three years and the mean fruit-set for selfing, crossing and open pollination was found to be 28%, 34.7% and 37.6% respectively. The nuts from all the three treatments were collected when they were fully tree ripe and sown for germination separately. The percentage of germination recorded by open pollinated nuts, cross and self pollinated nuts, was 91.6, 87.9 and 92.6 respectively.

From the above observation, it is seen that pollination under controlled condition has not improved fruit-set. It, therefore, appears that lack of pollination is not the main cause for shedding of buttons. Physiological and environmental factors appear to influence fruit-set to a very great extent. The viability efficiency of seednuts obtained from the above crosses was found not to show much variation.

#### References

1. Hayes, Immer and Smith (1955) Methods of plant breeding. Mc Graw Hill Book Co., Inc. New York.
2. Raghavan and Baruah (1956) On factors influencing fruit-set and sterility in arecanut (*Areca catechu* Linn.) I-Studies on pollen grains. J. of the Indian Bot. Soc., Vol. XXXV, 2, 1956.