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# Studies on the development of coconuts during the different months of the year

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## INTRODUCTION

THE coconut palm is peculiar in that when once it begins to bear it continues to bear all through the year and all through its life extending for a period of 60 years or more. In a regular bearing palm every leaf axil will have an inflorescence and the production of inflorescences is a continuous process in successive leaf axils at intervals of about a month. The female flowers will take about 12 months to develop into mature forms and at any particular time there will be found on the tree 12 or more fully opened bunches in different stages of development from the button stage to the ripe nut. Every bunch of coconut is subjected to a full weather cycle of 12 months and the final yield as also the quality of nuts will bear the imprint of the cumulative effect of this impact. Hence the actual conditions encountered by the different bunches at similar stages of development will be quite different. All these indicate the need to study the development of nuts produced in the different months of the year in order to be able to measure the effects of different seasons on nut development. This paper records the preliminary results of an investigation in progress since 1958 at this Research Station. Studies on nut development reported by Patel (1938) and Gangolly *et. al.* (1953) relate only to the different stages available at a particular time.

## MATERIALS AND METHODS

Six regular and heavy bearing palms were selected and the date of stigmatic receptivity of the female flowers on the inflorescences

produced in the successive leaf axils were noted. At intervals of two months one nut at random was selected from each bunch of the selected trees for detailed study of nut characteristics. The character of husked coconut could be studied only from the sixth month onwards as proper husking was not found possible before that period. Copra was made only from nuts 10 months old and over. Though a number of characters have been studied, discussion in this paper is confined to the more important of them, viz., volume and weight of unhusked and husked nut and copra content per nut.

## RESULTS

A perusal of the detailed data collected showed that maximum development of the nut was at 10 months' stage and that later on there was a decline in weight showing the onset of maturity. This stage was, therefore, thought to be best for comparison among nuts of different months in respect of characters such as weight and volume of unhusked and husked nuts. Comparison of copra was however made based on 12 months old nuts. The data are summarised in Table 1.

TABLE 1.

*Average weight, and volume of unhusked and husked 10-month-old nuts and copra content of 12-month-old nuts fertilised in different months*

| Month of receptivity | Husked nut | | Unhusked nut | | Wt. of copra (gms) |
|---|---|---|---|---|---|
| | Wt. (gms) | Vol. (c. c) | Wt. (gms) | Vol. (c. c.) | |
| March, 1958 | 732 | 651 | 1956 | 3099 | — |
| April, 1958 | 639 | 591 | 1933 | 2991 | 139 |
| May, 1958 | 674 | 643 | 2010 | 2988 | 208 |
| June, 1958 | 646 | 557 | 1795 | 2943 | 192 |
| July, 1958 | 554 | 580 | 1446 | 2122 | 176 |
| August, 1958 | 527 | 585 | 1539 | 2260 | 145 |
| September, 1958 | 625 | 560 | 2291 | 2957 | 150 |
| October, 1958 | 591 | 517 | 1658 | 2260 | 174 |
| November, 1958 | 598 | 557 | 1826 | 2587 | 168 |
| December, 1958 | 557 | 562 | 1743 | 2697 | 168 |
| January, 1959 | 559 | 561 | 1798 | 2830 | 158 |
| February, 1959 | 623 | 618 | 1653 | 3063 | 171 |

It is seen that in general the weight and volume of the unhusked and husked nuts were higher in those inflorescences which reached the stage of stigmatic receptivity during summer months than those of rainy or cold weather periods. Copra content per nut was also high in the summer months. This is in general agreement with the findings roported by Patel (1928). Inter-relations among the different characters were also calculated. The results are summarised in Table 2 below.

TABLE 2

| *Characters* | *Total correlation* |
|---|---|
| 1. Weight of copra and wieght of husked nut | 0.4693 |
| 2. Weight of husked nut and volume of husked nut | 0.6054‡ |
| 3. Weight of unhusked nut and volume of unhusked nut | 0.6915‡ |
| 4. Weight of husked nut and weight of unhusked nut | 0.6040‡ |
| 5. Volume of husked nut and volume of unhusked nut | 0.5256 |

‡ Significant at 5 per cent level.

There is indication to show that the effect of season is not operating in the same way or to the same extent in the different characters. Probably this is why the amount of variation explained on the basis of association of characters is less than 50 per cent even where significance has been attained. Admittedly more data are required to draw definite and valid conclusions.

In order to have a rough idea of the effect of some meteorological factors affecting the development of nuts of inflorescences produced in the different months of the year, the data on weight and volume of husked coconuts recorded at 10 monthsstage were examined for possible correlation with hours of sunshine and maximum temperature at different periods of growth. There was an indication of differential relationship according to the stage of development. Maximum temperature and hours of sunshine appear to be negatively correlated in the earlier stages of development while they are positively correlated with development towards the later stages. Active formation and deposition of kernel takes place during the latter half of development and this process may be favourably influenced by the prevalence of longer hours of sunshine and higher maximum temperatures at that stage.

This study is being followed up on a large scale to verify earlier findings and also to gather more data for a critical appraisal of the part played by different meteorological factors in bringing about the differences in nut development seen in the coconut palms.


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