THE STRATEGY OF COCONUT DEVELOPMENT IN THE ROOT-WILT AFFECTED COCONUT TRACTS IN KERALA STATE

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The root - wilt disease of coconut palm has been known to exist in Kerala State since 1882. The disease, which made its first appearance in certain isolated patches, has by now spread to over 270,000 ha or roughly 40 per cent of the total area under coconut in the State. The disease, though not fatal, has been instrumental for a rapid decline in the production and productivity of coconut and its virulence has now assumed such proportions as to threaten the very existence of coconut culture and industry in the State. While no precise estimates are available on the extent of damage caused by the disease, the production figures for the year 1980-81 showed that there was a decline in production in the disease affected areas by 805 million nuts from the 1971-72 level.

The adverse effects of the disease are more keenly felt by the small and marginal farmers who predominate among the coconut growers in the State. The average size of a coconut holding in the State is less than 0.5 ha with 37.1 per cent of the total holdings falling under the category of 0.2 ha or less. Besides the limitations imposed by the size of holdings on the farm level income, the incidence and spread of the root-wilt disease which is rampant in a majority of the holdings in the affected tracts are causing considerable strain on the economy of millions of coconut growers. The preponderance of small units of cultivation coupled with the consistent decline in the productivity of coconut caused by the disease render coconut cultivation unattractive compared to other perennial crops grown in the State.

Although the onslaught of the disease has already disrupted the economic stability of the bulk of the coconut growers in the State, research findings and practical experience of enterprising growers have shown that even the small holdings which are within the grip of the devastating root-wilt disease could be rehabilitated into viable farming units through the adoption of a sound management strategy. Maintenance of optimum population of productive palms per unit area, use of precocious and high yielding planting material and the introduction of integrated farming system in coconut holdings will constitute the essential features of such a strategy. By the adoption of this strategy it would be possible to maintain the productivity of palms at a comparatively high level and to restructure the small coconut holdings which are within the grip of the disease into economically viable settlement units.

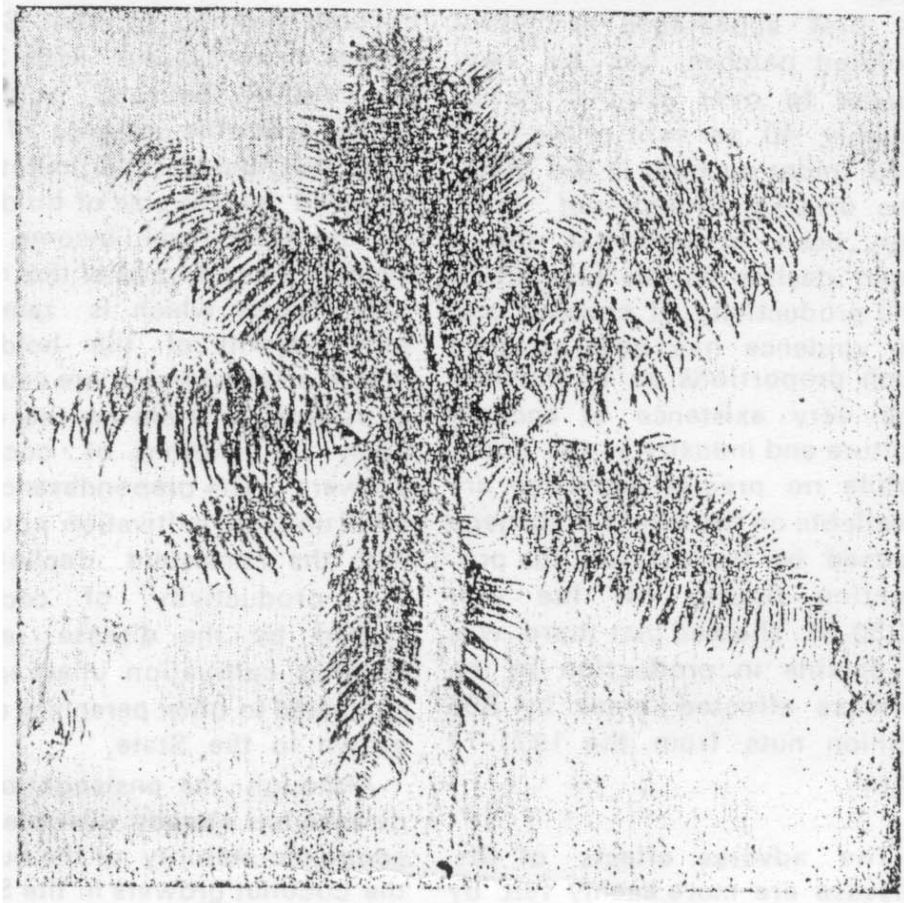
Maintenance of Optimum Population of Productive Palms.

In the root-wilt affeced holdings not all the palms will exhibit

disease symptoms. Depending on the intensity of disease incidence the percentage of palms affected will vary considerably from holding to holding. It may sometimes be a negligible number of palms in some holdings whereas in some other holdings the incidence may cover upto 80 per cent of the palm population. Notwithstanding the differential rates of disease incidence, on an average, about 15 to 20 per cent of the palm population in the disease affected holdings in the State are reckoned as diseased which are under different stages of infection. Normally, palms in the bearing group which are less than 40 years old are more susceptible to the disease. Disease free palms which grow side by side with the disease affected ones are apparently healthy and produce normal yield without showing any signs of disease infection.

In the absence of effective control measures against the disease and of cultivars or varieties which are resistant to the disease, the only positive approach to the problem is to maintain an optimum population of productive palms by resorting to a regular system of under planting or replanting in the disease affected holdings with precocious and high yielding cultivars. A certain percentage of the new palm population may suffer from the onslaught of the disease at some stage or other. But prompt replacement of the diseased ones at regular intervals is likely to help maintain the desired density of productive palms per unit area. Similarly the precocious and high yielding cultivars would have also produced sufficient nuts by the time some of them reach the irreemable stages of infection compared to the ordinary local cultivars.

Normally, a 15 to 20 per cent replacement / under planting in the disease affected holdings is considered adequate to maintain the desired density. Provision of a slightly high palm population in the beginning is expected to take care of the possible casualties at subsequent stages and, thus, may help to maintain the desired density of disease free palms. Besides this, a higher palm population per unit area than the normal level may prove useful in obtaining a better yield per unit area. In Kerala the average density per hectare is 229 palms. The corresponding figures for Tamil Nadu and Karnataka, the other major coconut growing States in India, are 325 and 125 palms respectively per hectare. While the productivity of coconut per hectare in Kerala is 4558 nuts, it is 9762 nuts in Tamil Nadu and 5176 nuts in Karnataka. It is interesting to observe that the per palm productivity in Karnataka is the highest at 54 nuts per palm per year, whereas it is only 46 nuts in Tamil Nadu and 32 nuts in Kerala. Despite the higher per palm productivity, the productivity per unit area in Karnataka is much lower than that in Tamil Nadu and is only slightly higher than that in Kerala where there is a consistent decline in productivity consequent on the widespread prevalence of the



A root (wilt) affected Palm

root - wilt disease. The same situation prevails in the nearby coconut growing areas such as Pondicherry and Lakshadweep Islands. In Lakshadweep where the average density is 251 palms per hectare, the per hectare productivity is 7709 nuts, whereas the per palm productivity is only 38 nuts. In view of these observations it is desirable to adopt a palm density 10 per cent higher than the present average of 229 palms per hectare in all the disease affected coconut holdings in Kerala.

Among the different cultivars available in Kerala the hybrids (TxD and DxT) are precocious and high yielding. But they are also susceptible to the disease and are in no way different from the other types in the degree of susceptibility. However, under proper management conditions the hybrids come to bearing early and outyield the other common types when free from disease infection. These characteristics of precocity and high productivity are definitely encouraging and in the absence of any other cultivar or type which is resistant to the disease, the hybrids are to be preserved for the normal under planting and replanting programmes in the disease affected areas. Screening of coconut cultivars including different hybrid combination is under way in the State and it may be possible to identify some combinations possessing the desired degree of resistance or tolerance to the disease. Progenies of *inter se* crosses between selected palms belonging to the apparently healthy group found growing in the midst of diseased palms are likely to exhibit genotypic variability for the resistance or tolerance to the disease and it may be possible to evolve some combinations possessing the desired characteristics Till dependable results are obtained from the ongoing research projects, the coconut hybrids already evolved in the State and those cultivars, particularly exotic ones, which have proved to be better yielders than the ordinary local types under identical situations will have to be made available to the coconut growers for regular use.

Introduction of Integrated Farming in Coconut Holdings

Traditionally coconut is grown as a monocrop in most parts of Kerala. Consequently the small units of cultivation do not provide adequate income and employment to the dependent families At the current price level a 0.5 ha disease free coconut holding under proper management provides an average annual gross income of not more than Rs. 4,200/- and only 50 or less man-days of employment. The income would be drastically cut when the holding is affected by the root-wilt disease. It is, therefore, important to devise such measures as would help increase the income and employment from small coconut holdings. In most of the coconut holdings adequate inter and intra row spaces would be available for profitable utilisation. A variety of compatible crop combinations and other enterprises could be introduced in the vacant spaces of such holdings for maximising the income and employment from unit area, time and inputs. An integration of crops, animals and energy sources with organic recycling or the repeated use of farm wastes acting as the essential link or bonding force between each and every practice is the most appropriate innovation for introduction in coconut holdings to achieve the desired objectives. In the root-wilt affected holdings the introduction of this type of integrated farming techniques may also exercise an ameliorative influence on the disease.

The practice of intercropping and mixed farming in the disease affected coconut holdings under irrigated conditions and recycling organic wastes have proved to be effective in improving the productivity of both coconut palms and holdings under coconut A combination of multi-species cropping including fodder and energy crops and other enterprises such as dairying, poultry rearing, apiculture and pisiculture, wherever feasible, linked with bio - gas units to ensure the repeated use of farm wastes is the most efficient and dependable method for augmenting the income from small units of coconut cultivation, particularly in the root-wilt affected tracts. With the successful introduction of integrated farming even a 0.5 ha coconut holding could be restructured into a viable farming unit generating adequate income and employment for a dependent family.

Adoption of Other Agronomic Practices

Agronomic measures such as the use of organic manures including river silt, balanced fertilization, summer irrigation and provision for drainage are effective in checking the decline in productivity of diseased palms to a considerable extent. The adoption of such measures improves the general condition of the disease affected palms and also helps prevent the incidence of the disease in healthy palms.

A coconut rehabilitation programme involving the maintenance of an optimum population of productive palms per unit area, the adoption of appropriate agronomic management and the introduction of integrated farming in coconut holdings, wherever feasible, is, therefore, the major developmental effort for improving the production and productivity of coconut and the holdings under coconut in the root-wilt affected tracts in Kerala.