BAND DISEASE OF THE ARECA PALM.

A note on the preliminary investigations in the Bombay State,
College of Agriculture, Poona-5.

Kibe M. M., Gokhale G. P. and Narayana N.

The term "Band" which in the local vernacular (Marathi) means "barren" is used in connection with the areca palm which suffer from a peculiar disease in the coastal districts of Ratnagiri and Kolaba in the Bombay State. The diseased trees do not bear any nuts, and if they do, they are few and under-developed. The malady can be more appropriately described as "consumption" of the palm rather than as "Band" or "Barren", because the barren-ness is the result of faulty growth and improper functioning of the palm. The palms affected by the disease do not succumb immediately as in the case of Areca palms suffering from Anabe disease. The onset, the progress and finally the death of the palm is a slow and gradual process.

The Band disease can make its appearance at any stage of growth of palm, including even the seedling stage The progress of the disease not being very rapid, can be broadly divided into three stages. In the initial stage of the disease the upper most leaf shows a dark green colour and shrivelled appearance. In the second stage, the new leaves that come out are shorter in length and exhibit the same dark green colour and shrivalled appearance. The internodes produced after the onset of the disease are shorter in length and the stem shows a constricted appearance. In the last stage of the disease, no new leaves are put forth and the growth of the teminal bud is checked. The plant may continue to live for years after this stage without producing any leaves or nuts. Recovery of the palms either natural or by treatments is possible only in the first two stages of the disease. The diseased and the healthy palms are shown in plate Numbers 1 and 2 respectively.

Many attempts have been made in the past to find out the cause of the disease, but without any success. While Coleman and his associates consider that the trouble is due to some environmental conditions, Gokhale and others are of the opinion that poor drainage and soil acidity are mainly responsible for the disease. It is now a well established fact that the disease is not of any pathogenic origin. Recently Daji has suggested that toxicity caused by large amounts of available manganese in the soil may be one of the probable causes of the trouble. The continuous growing of the palms on the same site over a period of years, proximity of sea which hinders drainage, soil erosion, deep planting of seedlings etc. are considered by the local cultivators as a few of the causal factors. Based on the local beliefs, different remedies have been tried by the gardeners in the past for arresting or curing the disease with varying amounts of success. Some cultivators stop irrigation altogether for sometime, and apply ash to the affected palms. Some others give copious irrigations with a view to washing out "toxic substances formed in the soil". Some cultivators feel that allowing the palms to grow in situ without transplanting helps in correcting the trouble. The application of compost or farmyard manure or ash is reported by some cultivators to produce beneficial effects, while some are of the opinion that draining out of sap going to the crown by

drilling a hole in the stem helps in combating the disease. From the above it will be seen that nothing definite can be said as to the cause of the trouble and its remedies, so far.

In order to investigate into the various causal factors associated with the disease and subsequently to try out some remedial measures, a scheme of investigations was undertaken by the Government of Bombay in the year 1953 under the auspices of the Indian Central Arecanut Committee.

SURVEY OF ARECANUT AREAS IN THE BOMBAY STATE

In order to obtain information on the cultivation practices, the nature of soils supporting the areca palms, the various diseases affecting this crop, a survey of the areca gardens in the Bombay State was undertaken Of the 20 and odd thousand acres under areca palms in the Bombay State, the Karwar district alone accounts for more than seventy five per cent of the total acreage, the two coastal districts of Ratnagiri and Kolaba claiming just about 4000 acres. While the gardens in the Karwar district are nearly free from the Band disease, those in the Kolaba and Ratnagiri districts are affected to the extent of 50 per cent. In general, the gardens on the plains are more severely affected than those on hill slopes. While the soils on the plains are deep, allovial in nature, and sandy loam in texture, those on the hill slopes are loamy not more than 5' in depth, and nearly free from calcium carbonate. Both the kinds of soils are poor in phosphate and potash but are fairly well-supplied with organic matter. The cultivation practices in the Karwar district differ considerably from those in the Ratnagiri and Kolaba districts. The gardens are situated on the slopes of a valley in mountainous tracts with forest vegetation all round. The soils which are derived from shales are well drained, slightly acidic, fair in nitrogen and organic matter, but low in phosphates They are periodically renewed by the soil from the adjoining hill cuttings and annually manured with leaf mould. The seedlings are raised on raised beds, and planted with wide spacing. The palms receive water through seapage, and not directly from the channels as in the other two districts. The better cultivation practices appear to account for the more or less complete absence of the band disease in the Karwar District.

Although it is difficult to locate exactly the cause or causes of the disease, it appears from the information collected so far that it may be possible to fight the trouble by improving the fertility of the soil and by trying out micronutrient applications some of which have been reported to yield good results. About 1000 feeler trials were therefore laid out in 62 different gardens in the Ratnagiri and Kolaba Districts to find out the effect of different manurial ingredients and micronutrients on the condition of the palms. The treatments were as under : —

1. One lb. of a 5:2:5 manure mixture.
2. Manure mixture plus green manure
3. ,, ,, ,, ½ lb. sulphur.
4. ,, ,, ,, 20 lbs. fresh soil.
5. ,, ,, ,, 1 tola Znso4 in soil.
6. ,, ,, ,, 1 tola Cuso4 in soil.
7. ,, ,, ,, 2 gms. Cuso4 in spray.
8. ,, ,, ,, 2 gms. Znso4 in spray.
9. ,, ,, ,, 1 gm Na. Borate in spray.
10. ,, ,, ,, 1 gm. Na. Molybdate in spray.
11. ,, ,, ,, 2 gms. Mnso4 in spray.
12. ,, ,, ,, 2 gms. Feso4 in spray.
13. 1 tola Znso4 in soil
14. 1 tola Cuso4 in soil.

The palms received in addition to the above a basic application of 20 lbs. of well rotted farmyard manure in the month of January. There were 25 palms under each of the above treatments. Monthly observations were recorded on the condition of the palms by the method of score card judging. From the observations after one year, the following indications have been obtained :—

1 The palms respond to the various treatments to a greater extent in the better cared for gardens than in the neglected gardens. There is a distinct improvement merely as a result of better management itself.

2. As regards the micronutrient treatments, there is nothing very definite than can be said about them. The differences are not very striking.

3. In general, there appears to be a periodicity in the conditions of the trees and rate of growth in relation to change in the weather conditions. Thus the months of *May to August* make a period of general improvement in the condition of the palms under all the treatments.

The above trials are being continued during this year also. Further, it is proposed to conduct statistically laid out experiments on the manuring of palms in the acquired Government garden at Shrivardhan.

Arecanut Palm affected by Band Disease.