Manured Palm

THE ROLE OF FERTILIZERS IN COCONUT PRODUCTION

Unmanured Palm

D. A. Nethsinghe

The coconut industry contributed about 18% or Rs. 341 millions to Ceylon's total foreign exchange earnings of Rs. 1876 million in 1964. It was our second highest source of foreign exchange in that year. During the period 1930-1940, about 57% of Ceylon's total coconut production was exported—the balance being consumed internally. But, in spite of the fact that coconut production increased from about 1800 million nuts/annum during that period to 2800 million nuts per annum during the period 1961-1964, the quantity available for export dropped to 49% of the total production during the latter period. The demands of Ceylon's rapidly increasing population will leave still less available for export in the years to come. Today, the population of Ceylon stands at 11.4 millions. With an estimated annual increase of 2.8%, our population will be 22.2 millions by 1990—almost double the figure for 1965. Unless there is an appreciable increase in coconut production we will not have any export earnings from

coconuts twenty-five years hence as the entire produce will be required for local consumption. In fact, we may even have to import coconuts to meet our internal requirements.

As a developing nation whose economy is so much dependent on her export capacity, Ceylon can ill afford to lose one of her highest sources of foreign exchange. Fortunately, there is no reason why such a situation cannot be averted. If only, as in the case of tea and rubber, the coconut industry adopts extensive application of the existing technical knowledge gathered through years of investigation by the Coconut Research Institute we should be in a position not only to maintain the present volume of coconut exports, but also to increase it.

Coconut production can be raised by increasing the acreage under coconuts, and by increasing the yields per acre. Yields per acre can be stepped up both by replanting senile lands with high yielding planting materials, and also by improved cultural practice—particularly extensive fertilizer usage. Planting new lands, and replanting, are long term projects which will begin to show results in about 15 years. On the other hand, significant increases in coconut production can be realised through wide spread fertilizer application within a relatively short period of about 5 years provided that other basic soil management practices such as moisture conservation are also adopted. In this talk, I propose to discuss the extent to which coconut production can be increased through fertilizer application, and the resulting economic benefits both to the individual producer, and the country as a whole.

Experiments carried out by the Coconut Research Institute have shown that nut production in most of our coconut soils is limited by deficiencies in nitrogen, phosphorous and potassium. In certain areas—particularly in the wet zone, magnesium has also been found to be deficient.

Field trials in the Chilaw district—which is one of the best coconut growing areas in Ceylon—have shown that without fertilizers annual yields of about 2,500 to 3,000 nuts/acre can be obtained. Fertilizer application stepped up production to about 5,000 nuts/acre per annum—an increase of 2,000 to 2,500 nuts per acre. At Madampe, in an experiment on young palms, plots which have not been treated with any fertilizers from the time of planting gave 2,400 nuts/acre per annum in their 15th year. Plots treated with $4\frac{1}{2}$ lbs. per palm per annum of CRI coconut fertilizer mixture "A" (which contains equal proportions of ammonium sulphate, muriate of potash and saphos phosphate) gave 4,200 nuts/acre, while those plots receiving 9 lbs. per palm per annum of the same mixture gave an annual yield of 5,720 nuts/acre. In another experiment on underplanted young palms at Nattandiya, unmanured plots gave 2,500 nuts per acre in their 15th year, whereas plots treated with NPK coconut fertilizer mixture at the rate of 4 lbs. per palm per annum gave 4,200 nuts per acre. At Bandirippuwa, unfertilized plots have given an annual yield of about 2,500 nuts/acre, while manuring increased yields to over 5,000 nuts per acre. Under comparatively better soil conditions at Bingiriya, where even without any fertilizer applications annual yields were in the order of 4,000 nuts/acre, production was increased to 5,500 nuts per acre by the application of fertilizers at the rate of 5 lbs. per palm per annum. These experiments have demonstrated that fertilizer application brings about appreciable increases in coconut production even in the better coconut growing districts.

More striking responses to fertilizer application have been obtained in the poorer coconut growing districts of the wet zone which cover an area of about 350,000 acres, or 30% of our total coconut acreage of 1.1 millions. Field experiments at Veyangoda and Ahangama showed that in these areas, without manuring, annual yields were as low as 600-800 nuts/acre. Application of NPK coconut fertilizer mixtures at the rate of 3½ lbs. per palm per annum increased the annual production to 2,500 nuts/acre.—a 200% rise. In a simple trial in the Colombo district the additional application of magnesium fertilizers—either in the form of magnesium sulphate, or dolomitic limestone, was observed to further increase yields to 3,500 nuts/acre. There is no reason to doubt, that with higher rates of fertilizer application and better soil management practice, coconut production in the southern and western provinces which have been sometimes referred to as the cinderallas of the coconut industry, can be further increased. In fact, there are a few well managed lands in these areas which today boast of an annual production of over 5000 nuts/acre.

Owing to adverse economic conditions and the inevitable time lag between the application of fertilizers and the realisation of its beneficial effects, only after the coconut fertilizer subsidy scheme came into operation in 1956 did the results of these researches find practical application on an appreciable scale. This scheme, which offers fertilizers at half price to small holdings of 20 acres, and below, and at 2/3rds the price to holdings over 20 acres, has proved to be an effective instrument for promoting fertilizer usage. Prior to the introduction of the coconut fertilizer subsidy scheme in 1956, only about 10,000 tons of fertilizers were used annually on coconut lands. The acreage fertilized was about 100,000—less than one tenth the total coconut acreage of 1.1 millions. In 1956, the tonnage of fertilizers used rose to 31,000 while the acreage covered was about 300,000. By 1964, the annual fertilizer usage on coconut lands increased to 48,000 tons, the acreage covered being about 325,000. It will be observed that between 1956 and 1964 there has been no appreciable increase in the coconut acreage receiving fertilizers. The rate of fertilizer application has however increased in accordance with the recommendations of the C.R.I.

The effect of increased fertilizer usage over the last 8 years is already reflected in the production trends. Coconut production has steadily increased from 2,200 million nuts per annum during the period 1956-58, to 2,800 million nuts/annum in the period 1962-64—an 18% increase—in spite of the fact that since 1956 only an additional 200,000 acres of coconut lands have received fertilizers. The production in 1964 reached the record figure of 3,100 million nuts. It is unlikely however that production would increase much further unless there is a significant increase in the acreage using fertilizers.

At present, only about 30% of our total coconut acreage apply fertilizers. This is largely due to the fact that unlike tea and rubber, the majority of coconut lands, 70%, or 800,000 acres, are small holdings. While about 200,000 acres out of a total of 300,000 acres of coconut lands above 20 acres apply fertilizers, only 125,000 acres small holdings use fertilizers. Economic stress, ignorance, multiple ownership of land, and the non-availability of fertilizer depots in close proximity to their lands are the main obstacles to extensive fertilizer usage amongst small holders. But these are not insurmountable obstacles. Systematic fertilizer application at the rate of

7 lbs. per palm per annum, or about 4 cwts. per acre can increase production by at least 1,500 nut per acre. At today's market price of Rs. 140/- per 1,000 nuts, the increased yields would bring an additional nett income of Rs. 160/- per acre to the small holder after allowing Rs. 50/- for costs of manuring. For estate owners, the additional nett income from increased production would be about Rs. 150/- per acre. Nearly 800,000 acres of coconut lands do not use fertilizers. Through fertilizer application, the coconut industry can contribute at least a further 120 million rupees a year to Ceylon's national income.

It is estimated that by 1975, Ceylon's population would be 15.5 millions—an increase of 4 million over 1965. The local demand for coconuts would therefore increase by about 500 million nuts. If, within the next five years, fertilizer application can be extended to an additional 350,000 acres, an increased nut production of at least 525 millions can be expected, so that we would still maintain our export volume at the present levels. These are sufficient reasons for giving top priority to expanding the coconut acreage receiving fertilizers.