RESEARCH AND PLANTING PROGRESS IN 1954

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Botanical Division

REPLANTATION is a topical problem as there are many estates where the yields are declining due to senility. A field trial now in its fifth year is shewing that stem formation in the young palms is worst where the old palms are all left standing and that the largest girth of stem is found where the old stand is completely removed before replanting. In order to maintain the income of estates and as a compromise under-planting with the gradual removal of the worst of the old palms is recommended.

A number of crosses of coconut produced by controlled pollination are under observation. A promising hybrid has been obtained by crossing the dwarf (green) and the typical Ceylon tall palm, where the dwarf provides the female parent; the converse is not so good.

The alienation of 200 acres of forest together, with an isolation barrier of forest vegetation 50 chains wide for the establishment of an Isolated Seed Garden for Coconuts has been completed. This land will be planted exclusively with selected coconut seedlings produced from selected seednuts obtained by the artificial and controlled pollination of high-yielding mother palms which have been recorded for many years. Subsequently, inter-pollination will be natural and limited to palms planted within the seed-garden.

Crop Protection

Recently some evidence has been advanced that soil fumigation stimulates the growth of plants. Trials with three soil fumigants at various rates of application in a coconut nursery gave negative results and the higher dosages adversely affected the germination and rate of growth.

The effect of certain insecticides in controlling the larvae of the rhinoceros beetle (*Oryctes rhinoceros*) was investigated under laboratory conditions and 100 per cent. mortality was obtained in from 2 to 5 days depending on the treatment.

Two proprietary deer repellants were tried on young coconut leaves as cattle repellants, but although the damage was less than with the control, the protection afforded was not sufficient to warrant the expense.

Soil Chemistry Division

The manurial experiments with nitrogen, phosphorous and potash at three levels have been continued. At Bandirippuwa (19th year) the effect of stepping up the levels of potash in November, 1951, is now visible in that the original Ko palms, now K1, are beginning to show a healthier

The Coconut Research Institute of Ceylon

Photo : Royal Ceylon Air Force.

green foliage and the response to potash has again reached a high level. The lack of response to phosphorous was maintained. At Ratmalagara (11th year) the response to phosphorous applications continues. The fungus disease, *Helminthosporium incurvatum* again re-appeared on the young palms in the N2 Po plots after the fertilizer applications.

The manurial experiment on underplanted palms at Letchemy (14 years) has strikingly demonstrated the need for the application of a complete NPK mixture to the young palms, whenever an estate is being replanted.

On an estate, where the land is more or less level and the soil is a loose sandy loam, manurial trials have not shewn any significant difference between the application of manures by ring-manuring or by broadcasting with subsequent harrowing. The important trial, now in its 6th year, is being continued.

The method of measuring the potash status of the soil by analyses of coconut water has been examined. It has been found that there is a slight increase in the potash concentration in the nut water after one month's storage; there is also considerable variations in the potash content in the nut water of individual palms subjected to the same potash applications. The coefficients of variation calculated for different sample sizes however indicate that a 100 nut unit will provide a satisfactory sample.

Analysis of samples of soil have proved that husk mulching conserves soil moisture during long dry spells.

Systematic soil surveys of areas of Crown jungle have been carried out to determine the suitability of new lands for coconut cultivation under various Colonisation Schemes. A total of 7,000 acres has been approved for new planting.

Technological Chemistry

An important achievement during the past year has been the successful application of the "generator" process for the conversion of coconut toddy into high-grade vinegar. This new process, which has been demonstrated to the Vinegar Producers' Association of Ceylon is quicker, more reliable, more hygienic, more efficient, less laborious and less costly than the now obsolete vat process, still used in Ceylon.

The new process has been exhaustively investigated and the overall average of 7·2 per cent of acid obtained for 25 charges is an almost theoretical recovery. As against 3 to 6 months required for production by the vat process which produces vinegar containing variously between 3·5 and 4·5 per cent. acids, the "generator" process requires only 6 days for complete acetification.

Now that it is possible to produce high-grade vinegar of uniform quality equal in all respects to the best brands of malt vinegar, serious consideration can next be given to the establishment of factories for the production of sauces, chutneys and pickles, produced from Ceylon fruits, vegetables and spices, not merely for domestic consumption but more particularly for export.

Following an inquiry regarding the manurial value of coconut poonac, complete analyses of all types of poonac produced in Ceylon, have been made.

Other investigations includes the routine examination of samples of farmyard manure from pasture-fed and pasture plus poonac fed cattle, which have not revealed any significant difference.

The copra produced from a large number of hybrid palms shewed the same average oil content as the copra obtained from the tall variety of palm, viz. 68·3 per cent. Finally although the application of coir dust to the soil has been shewn to increase its moisture retaining powers, it has not been found to check immature nut-fall which was the same as in the adjacent control plot.

Animal Husbandry Division

It has been proved conclusively that milk can be produced in the wet zone (rainfall 70 inches) at a profit from ordinary Sinhala village cattle, providing they are improved by selection, good feeding and proper management. The mixed rough pastures, herbs and legumes found growing on most coconut estates if grazed rotationally and a supplementary feed of 2 lbs. of extracted poonac per day is all that is required. A feeding trial carried out during the year has proved that animals so treated yield more milk, have a higher body weight and a longer lactation period and have less physiological disturbances. There have been no deaths or sickness in the herd which is in magnificent condition.

New grasses and legumes have been introduced under coconuts to test their resistance to drought and their palatability. *Stylothantes bojeri* from Australia and *Bracharia brizantha* from Polonnaruwa have given promising results.

Pigs and poultry are being kept for manurial purposes using the portable pen system and beehives are being maintained in the mother palm block to improve the setting of female flowers.

Planting and Advisory Division

An annual grant of Rs. 500,000 per annum for a period of 10 years for the production and sale of seedlings at subsidised prices has been approved by Government, but the demand for our selected seedlings is still greater than the supply.

Thirteen nurseries have been maintained during the year and a total of 843,000 seednuts have been laid down. In 1954, nearly 9,000 acres were planted with C.R.I. seedlings and under the 10-year plan production is to be gradually stepped up to a peak of 16,000 acres in 1958. The number of nurseries is being increased to meet the growing demand for seedlings.

There are at present only 7 advisory officers; this is not sufficient and the number is shortly to be increased to 20 so that the whole of the areas under coconuts can be properly served. The service given includes advice to individual small-holders, lectures, demonstrations and propaganda, organisation of shows, in addition to lining up and survey work.