
EDITORIAL

Sweet Orange Decline Problems

ALTHOUGH Sweet Orange does not constitute a major perennial crop in this country, it is grown on a "backyard" plantation scale over nearly 10,000 acres. In certain concentrated areas like Bibile-Moneragala in the Lower Uva, trade in oranges forms a major source of income to the peasant.

Diseases of citrus came into prominence in Ceylon about the year 1946 in the Wellassa (Bibile area). Although the commoner citrus fungus diseases like Mildew, *Oidium tingeninum*, Pink disease, *Corticium salmonicolor* and deficiency diseases like folio cellosis were known for a long time and control measures taken, there was a tendency for the orange trees to be progressively chlorotic and unthrifty. The steady decline of orange groves during this period and the resultant drop in yields caused grave concern and the citrus crop began to receive considerable attention from both local and foreign specialists.

The symptoms exhibited by the declining trees were typically that of neglect, malnutrition and inadequate water supply and any other cause of the decline remained obscure for some time. In 1946 a decline of orange budgrafts was established by Wallace in U. S. A. to be due to a virus disease and this was subsequently found to be present also in Africa, Hawaii, Australia, New Zealand, etc. In these countries, however, there were no indications that citrus seedlings suffer from this disease. But in Ceylon, however, over 98 per cent. of the sweet orange plants grown were seedlings and they were showing symptoms of decline.

In the meanwhile certain experiments were initiated by the Plant Pathologist in 1956 to investigate the citrus decline problem and these were beginning to show some interesting results. Scions from apparently healthy orange seedlings were budded on sweet orange seedlings and were showing normal growth whereas scions from declining trees on the same stock growing side by side showed symptoms of disease. Based on these observations and the presence of symptoms on lime plants growing in citrus groves which were reminiscent of Tristeza virus Dr. T. B. Kiely, C. Plan Citrus Pathologist, posed the hypothesis that the decline in sweet orange seedlings in Ceylon was associated with a virus of the Tristeza type. Proof of

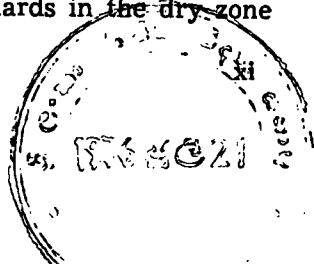
SWEET ORANGE DECLINE PROBLEMS

the existence of Tristeza was established by Dr. J. W. L. Peiris the following year and the aphid *Toxoptera citricidus* demonstrated as the carrier of the virus as has been observed in other countries.

Peiris and Kiely are of opinion that the Tristeza virus is the dominant cause of the decline of sweet oranges in the various parts of the Island. This being a debilitating disease, plants growing under adverse conditions of poor soils, malnutrition and water stress are liable to suffer from it much more than those growing under more favourable conditions.

More recently Dr. Kurt Mendel, Citrus Specialist of Israel studied the problem of decline of sweet oranges in Ceylon. He is doubtful whether Tristeza could represent the primary cause of decline of our orange grafts. He believes that the decline of sweet oranges in this country is much more a problem of unsuitable soils and water conditions as well as a lack of nutrition and disease control practices than a decline caused by the virus itself. This is a feasible argument since the cultivation of citrus and other foodcrops in general have not been attempted on a commercial scale nor with due attention to suitable soil types, nutrition, light requirements and routine control of pests and diseases by the cultivators. Even in the traditionally accepted citrus growing areas in Bibile and Moneragala large extents of suitable deep soil for commercial production of citrus are not frequently found and the desirable soil types are only found in small pockets. Even those areas which originally had good soil when the land was first cleared for planting citrus 20 to 25 years ago have now lost their top soil by erosion and their fertility by leaching owing to the lack of soil conservation measures and fertiliser practices.

The Mendel report has necessitated a restatement of the sweet orange problem with increased emphasis on suitable soils, correct nutrition, and cultivation practices. The adverse effects of the virus undoubtedly exist, but Mendel believes that the extent of its contribution to the decline can only be correctly assessed if all other conditions are at the optimum level. A rehabilitation programme must take into consideration both these aspects of the problem. New plantations of sweet orange should only be established in soils which are at least six feet deep, free from a gravelly layer and with a water table that does not rise nearer than four feet from the surface during the wet season because sweet orange is acutely susceptible to "wet-feet". For large scale commercial production, such desirable soils are found mostly in the dry zone, viz., the Puttalam-Mannar and Mullaitivu areas, but the establishment of orchards in the dry zone



makes irrigation a necessity. Thus Dr. Mendel suggests that the government should establish a pilot project of 150-200 acres to determine the economic prospects for future development.

In the meantime every effort must be made to save the existing plantations, particularly in those areas where suitable soils and weather conditions are obtained by stepping up extension activity in respect of modern cultivation methods. To induce the grower to use fertilizers and agro-chemicals it may be necessary to provide credit facilities through local co-operative societies at least in those places where sweet orange is an important crop in the village economy.

In most countries where the problem of Tristeza virus exists on citrus a solution is sought by the testing and selection of citrus varieties which are tolerant of the virus. The Department of Agriculture embarked on a series of stock-scion trials at Bibile from 1959, and the first report on these trials was presented by Dr. D. V. W. Abeygunewardena and Mr. H. M. E. Herath in the previous issue of the "Tropical Agriculturist". Of the various stock-scion combinations tested, Liyangolla orange on rough lemon stock and Liyangolla orange on Liyangolla stock appear to be the best so far. The orange varieties Caipera, Valencia Late and Omanthai were superior to the Bibile Sweet Orange. Observations on this experiment will have to be carried out for many more years but the present indications are that under uniform conditions of environment different varieties show different degrees of susceptibility to the virus. This is in accordance with what has been observed in other countries where citrus is grown at a high level of cultivation. The search for tolerant varieties must therefore be continued.

Due to the intensive studies made on this subject during the last few years the future holds good prospects for citrus cultivation in the Island. Some evidence is already available that in deep soils where citrus has been cultivated with proper attention to irrigation, nutrition and other agricultural practices, plantations nearly twelve years old are giving good yields even with the older varieties of clones. On the other hand, we have some information on varieties that are showing more tolerance to Tristeza than the Bibile Sweet Orange. We also know the correct soil types for citrus and where they are located for production of citrus on a commercial scale provided that irrigation could be provided. This information augurs well for the pilot citrus project to be started by the Government this year at Iranamadu which should go a long way to demonstrate the economic production of citrus for the future.