

How the Chemistry Section helps the farmer *

By

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One of the chief functions of the Chemistry Section is advisory. Practically every day letters are received from ryots of the Province requesting advice regarding soils, manures or waters, manurial requirements of crops, suitability of lands for various crops, reclamation of alkaline soils etc. Advice is tendered based on analysis and on experience. In addition the officers of this and other departments, manurial firms and Industrialists make use of the section for similar advice which finally reach the farmer. In this connection two to three thousand of what may be termed advisory samples of various kinds are analysed every year. It is fortunate that the section is thus brought in close contact with the problems and the needs of the ryots since it enables the designing of research programmes primarily to attack his day to day problems. How this has worked in actual practice is recounted below :—

Past Work: (a) Rice being the main food crop of the Province, the chief rice areas, namely the deltaic regions of the East Coast, the rainfed rice areas of Malabar and the Periyar Project ayacut in Mathurai were systematically surveyed for their plant food content. Based on the survey, a manurial programme for paddy was formulated for adoption and experimentation in the research stations located within these soil-climatic regions. The manurial trials in these stations, particularly those conducted in the past ten years in the internationally accepted scientific manner have shown that the manurial programme formulated then was sound. Recommendations are now being made to the ryot regarding the manurial requirements of rice with the confidence engendered by long years of research.

(b) The sudden appearance of alkalinity after a lapse of several years in some of the great project areas, such as Assuan Dam, Sukkur barrage, Nira Valley etc., gave rise to the fear that similar alkalinity may arise in the Tungabhadra Project area also. To settle this question, the area was surveyed and this has enabled us to conclude that due to the presence of a porous *garusu* layer at the lower depths, the rise of salts to the surface on application of

* Paper read at the 32nd Collage Day and Conference.

water need not be feared. This has been corroborated by the irrigation experiments conducted at the Agricultural Research Station, Siruguppa where no rise of salts was noticed even in wet lands. In addition to this all-important information, the survey has furnished much knowledge regarding the soils of the project area in various other directions, such as depth of soils, their physical, chemical and biological status, etc., all of which are finding their way to the farmers in the locality in the shape of advice.

(c) The newer knowledge of Base Exchange in soils led to the adoption of gypsum and organic matter as the agents for reclaiming alkaline lands in Tiruchirapalli district with great success. Starting from scratch on a land where not a blade of grass grew before, the land was reclaimed within three years and the crop at the end of this period yielded 3,000 lb. of paddy per acre. In view of the occurrence of extensive deposits of gypsum in Perambalur and Ariyalur taluks, this method is recommended as suitable for the speedy and economic reclamation of alkaline lands especially in the Tanjore and Tiruchirapalli districts. Many enlightened ryots are already adopting this process with advantage.

(d) Experiments with bullocks conducted by the Chemistry Section enabled the formulation of feeding standards for maintenance and for various levels of work such as mhothing, ploughing, carting etc. These recommendations are now being followed in all the Agricultural Research Stations. The adoption of these standards has resulted in much savings in the cost of maintenance of work animals. Some of the enlightened farmers are already taking advantage of the recommendations. Apart from the formulation of feeding standards, the importance of the minerals, Calcium and Phosphorus, has been brought out by these experiments. To-day the mineral mixture has become very popular with the farmer and many of the prominent manure firms carry it as an item of their regular stock.

Present Programme: As in the past, the present investigations are designed with the primary object of benefiting the farmer. The more important items are explained below :—

(e) Investigations are in progress in ryot's fields and in the Agricultural Research Station, Koilpatti, in the Tirunelveli district, with the object of rehabilitation of marginal lands in dry areas on the lines of experience and success achieved by the T. V. A. plan. In brief, the method consists in growing a legume on the

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marginal lands with the application of Super-phosphate and the seeds inoculated with their specific root-nodule bacteria prior to sowing. The first flush of the legume crop is utilised as fodder and the second growth is ploughed in. A grain or a cash crop is raised subsequently. This is repeated every year until the cumulative effect improves the productive status of the soil. The success of the plan depends upon adequate rainfall from June to September, not only for the good growth of the legume but also its quick decomposition in the soil when ploughed in.

Last year in the Agricultural Research Station, Koilpatti, the legume gave only about 500 lb. of green matter due to the failure of the South-West monsoon. Yet the analysis of soil after the harvest of the subsequent grain crop shows a small but definite improvement in its organic matter status and base exchange capacity.

(f) There are about 30,000 acres of alkaline lands in the Cauvery-Mettur Project area which need to be reclaimed. A suitable area in a ryot's field has been selected near Pattukottai to serve as a model for adoption for the reclamation of the alkaline lands. Several ameliorants, such as gypsum, green leaves, lime, molasses etc., have been included so as to afford visual demonstration of the speed and cost at which each brings about the reclamation. The farmer himself could select the ameliorant most suited to him.

(g) The cry in the Nilgiris is that the cost of production of potatoes is too high, mainly due to the heavy dosages of manure that have to be applied. The Nanjanad formula calls for 1,600 lb. of mixed manure per acre over a basal of 5 tons of cattle manure or compost. While it is admitted by all that the dosage is heavy, the laterite soils coupled with steep slopes of the Nilgiris demand heavy dosages of manure to maintain the high productive level. An experiment has been initiated this year to explore this problem to find out if the dosage could be reduced, maintaining at the same time the high yields. This is sought to be achieved by altering the proportions of N. P. and K. and by resorting to indirect phosphate manuring to the leguminous green manure crop preceding the potato.

(h) Work done on the isolation of specific root nodule organisms for leguminous plant groups has enabled the supply of the right bacterial culture for practically all South Indian legumes. Requests for cultures are being received daily from ryots indicating their appreciation of the effect of inoculation.

(i) Studies have been in progress for the past few years in Wetlands, Central Farm, to obtain information for Coimbatore-soil-climatic zone regarding the most suitable green manure for paddy. The periodic visitation of drought in this district has been kept in mind while attacking the problem. Of the four green manures studied, Dhaincha, Sunnhemp, Pillipesara and Cowpea, Dhaincha was found to be uniformly superior to others particularly in droughty years.

In these various ways the Chemistry Section has been endeavouring to reach the farmer every time an investigation is designed.

On the occurrence of *Musa balbisiana* Colla., in S. India and its importance in banana breeding

By

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Musa balbisiana Colla., has not hitherto been recorded as such in Indian literature on *Musa*. The species, however, has been found growing in certain tracts of this country for ages now and has been ranked as *Musa sapientum* (Roxburgh, 1824; Kurz., 1866), that mythical species, which is "the most confounded and confusing combination in the whole literature of *Musa*" (Cheesman, 1948a).

The classification of the bananas, more so that of the entire genus *Musa*, has been a much vexed problem; this has been discussed at some length elsewhere (Cheesman, 1934, 1947, 1948b; Venkataramani, 1946). The reasons for the existing chaos in the taxonomy of the bananas are very many indeed, but the confusion to group this seemingly distinct species as some other species may in part be due to the inaccessibility of the literature on *Musa* scattered in various journals not easily obtainable to the banana worker. Colla's original description of this species has been transcribed in a recent publication on the classification of the bananas (Cheesman, 1948a), in which is also given a generalized description of the species. It can be summarised as follows:

Plant suckering freely; pseudostems robust, green or pale green; leaf blades oblong, truncate at apex and rounded or slightly cordate at base; petioles long, their edges almost meeting over the