UTILISATION OF SEWAGE FARMS FOR GROWING SUGARCANE AND PRODUCTION OF WHITE SUGAR

IN his recent report to the Indian Council of Agricultural Research, Dutt[1] has made a comprehensive survey of the sugarcane research in India and has suggested methods of developing the potentialities of sugarcane cultivation throughout the country. More recently, Ghosh[2] has given an account of sugarcane and the sugar industry in India. According to his figures, we are still deficit in production of sugar by one million tons annually, the quantity available being 5·3 million tons per annum.

One of the main problems facing the industry is on the agricultural side, and this relates largely to the manurial aspect of the crop. Nitrogen manuring every year is a necessity for sugarcane throughout India, and it has been estimated that the crop requires a minimum of 100 lbs. of nitrogen per acre.

A fairly rich source of nitrogen, phosphorus and other fertilising ingredients which has not been adequately utilised is represented by the enormous volume of sewage discharged from the various towns of the country.[3] The daily discharge of sewage from the major cities alone contains not less than 100 tons of nitrogen in organic combination (equivalent to about 500 tons of ammonium sulphate per day); if similar discharges from the smaller towns and major villages are also included, the total equivalent of nitrogen would be considerably more.

Sewage farming has been practised on a very limited scale at a number of centres in India and at a few stations (*e.g.*, Lucknow and Agra,[4] Jamshedpur,[4] Dacca,[5] and Hadapsar[6]), trials with sugarcane have also been conducted. There is, however, need for further work in this direction, and during the last five years we have been studying, under the auspices of the Indian Council of Agricultural Research, the response of different crops, including certain varieties of sugarcane to domestic sewage and mixtures of textile wastes and sewage.[7] Our observations in regard to sugarcane may be briefly summarised as follows.

Experiments with different varieties of cane (*e.g.*, H.M. 320, Co. 419, Co. 413 and P.O.J. 2878) at Bangalore, Madura and Ahmedabad, have shown that they respond well to sewage irrigation; their yields have varied from 40 to 80 tons per acre, with a maximum of 155 tons at Ahmedabad in small experimental plots. The quality of cane raised on sewage is quite satisfactory. Thus, the cane H.M. 320, grown at Bangalore, yielded juice of Brix 20·71 (17·5° C.); percentage purity, 94·14; sucrose, 19·5 per cent.; and glucose, 0·46 per cent. From this crop, *gul* of good quality and white sugar were prepared (average recovery of sugar, 6 per cent.), and were favourably reported on by experts.

The lands selected for the experiments at Madura and at Ahmedabad were under sewage irrigation continually for about twenty years and for longer periods respectively. The soils in those farms have, therefore, retained more salts from sewage, and under such conditions it was observed that while the crop yields were very high, the juices contained relatively more salts which adversely affected the setting quality of the *gul* and also imparted a saltish taste to the product. The salts in the juices did not, however, interfere with the preparation of 'Khandsari' or white sugar, since they were removed along with the molasses.

Experiments were carried out in the laboratory by adding varying amounts of chlorides of sodium, calcium and magnesium and also invert sugar to normal cane juice (as also to aqueous solutions of ordinary sugar) and processing the juices (and the solutions) for the sugar recovery. The results of these studies would show that these constituents would not