

ASSESSMENT OF SOIL RELATED PROBLEMS IN LOW YIELDING AREAS OF GAL OYA SUGARCANE PLANTATION

D.G.P.G.C. Senavirathne¹, N.S. Abeysingha¹, M.G.T.S. Amarasekara¹, K.G.S. Nirmanee¹ and H.M.G.N.S.C. Bandara²

¹*Department of Agricultural Engineering and Soil Science, Faculty of Agriculture, Rajarata University of Sri Lanka, Puliyankulama, Anuradhapura*

²*Department of Agronomy, Gal-Oya Plantation, Hingurana*

Sugarcane has been cultivated in Sri Lanka as a commercial crop for about four decades. Sewanagala, Pelwatta, and Gal-Oya plantations grow sugarcane mainly for sugar production at present. Gal-Oya plantation was recently re-established and it is reported that some areas of the plantation such as *Neetha* zone produces comparatively lower yields than other zones. This study was conducted to assess the soil related problems of low yielding areas of *Neetha* zone. Soil samples from both poor and good yielding areas (34 blocks) were collected to a depth of 0-15, 15-30 and 30-45 cm and were analyzed for pH, electrical conductivity, available N and P, exchangeable Na, Ca, Mg and K. Exchangeable Sodium Percentage (ESP) and Sodium Adsorption Ratio (SAR) were also calculated. T test was used to check the significance of the measured parameters between the problem area and the reference area. Salinity related parameters such as EC, Na, SAR, ESP in problem areas were significantly higher ($p < 0.05$) than the reference area of the zone. Tested soil samples at block numbers 203/20, 142/24, 202/35, 202/44 and 255/43 were preliminarily identified as 'Sodic' based on the SAR, ESP and pH. The results showed that 60% of the samples in the problem area contained Na more than 100 ppm. Moreover, soil nutrient parameters such as N and K were significantly lower ($p < 0.05$) in the problem areas of the zone compared to the reference area. One major nutrient, P was found to be lower in both reference and problem areas, when compared to the soil critical level for sugarcane growth and development. This preliminary study found that soil salinity and nutrient deficiency, as soil related issues in the problem areas, and are responsible for the lower yields.

Keywords: Gal-Oya plantation, Nutrient deficiency, Soil Salinity, Sugarcane