

## **Development of Soil Fertility Map for Paddy Cultivating Areas of Mahaweli System B in Polonnaruwa District**

R.P.G. Chathuranga<sup>1</sup>, R.M.C.W.M. Rathnayake<sup>1</sup>, W.M.U.K. Rathnayake<sup>2</sup>,  
H.M.S.K. Herath<sup>1</sup>

<sup>1</sup>*Department of Export Agriculture, Uva Wellassa University, Badulla, Sri Lanka.*  
<sup>2</sup>*Rice Research and Development Institute, Batalagoda.*

Paddy is a major cultivation crop in Polonnaruwa District. In recent time a considerable gap has appeared between the potential yield and the real yield. Though several factors contribute to this effect, imbalanced soil fertility is one of the major factors. Therefore, survey of soil fertility was carried out in the area of Mahaweli system B in Polonnaruwa district to identify the status and spatial variability of plant nutrients in paddy cultivating areas to recommend management practices to enhance productivity. Sampling points were identify using 1:50000 topographic maps of Polonnaruwa, Wakaneri, Elahera and Aralaganwila. Geographical Position Systems (GPS) coordinates were used to record the geographic position. Sampling area was divided in to 2.5 x 2.5 km grid sizes and two samples were taken from one grid and 110 samples covering the total land area. In each sampling point, soils were augured up to 15 cm and composited. Soil samples were air dried and analyzed for pH, electrical conductivity, available P and Zn, exchangeable K and Na. The pH value varied from place to place but most of the area covering the irrigation scheme had pH below 5.5. All the area had low EC value (<0.125 dS/m). It indicates the low level of salinity. Soil available P content was considerably lower (<10 ppm) than the recommended value in almost of sampling the area. Available Zn concentration was between 1-5 ppm in all the area while the soil exchangeable Na value was above the recommended value (>100 ppm). There was a low concentration of exchangeable K value (<78 ppm) in most of the area. It is concluded that inverse distant weighted is the most suitable interpolation technique for mapping soil pH, EC, available P, Zn and exchangeable Na and K as regard to the lowest Root Mean Squire Error (RMSE) and Mean Error (ME) values. The soil fertility characteristics of the Mahaweli system B in Polonnaruwa district are not at optimal level to achieve maximum potential of rice yields. Therefore, development and adoption of suitable management practices are needed to enhance and sustain the rice production in this area.

Keywords: Soil suitability, Soil fertility, Interpolation, Geographical position system, Mahaweli B