

DEVELOPMENT OF AN ON-FARM ANALYTICAL KIT TO ASSESS SOIL/ PLANT NUTRIENT STATUS IN TEA GROWING REGIONS

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Site Specific Fertilizer Recommendations (SSFR) is a concept of applying fertilizer specific to the site. It allows better management of nutrients in order to optimize the yield. This concept is important for coping with field variability, particularly spatial variability of soil properties. Soil analysis is a prerequisite for SSFR to establish nutrient recommendations. The conventional procedure is to perform laboratory soil analysis, which is costly and time consuming. In order to avoid these constraints, field soil analytical kits are being used. However, commercial kits are very expensive and not appropriate for tea growing soils. Objective of this study was to develop a photometer which is based on Beer and Lambert's law for field soil analysis to assess the nutrient requirement of tea growing soils. The concentration of the solution was determined by transmittance of light beam going through the solution. Silicon photodiode array sensor was used to determine the transmittance and light emission diode was used to develop light beam. Readings taken by developed prototype were compared with the readings of existing methods. Very high correlations were found

between prototype and traditional methods in determination of pH ($r=0.804$), organic carbon content ($r=0.811$), available P ($r=0.965$), available S ($r=0.977$) and exchangeable Al ($r=0.980$). In addition, very high correlation was found between traditional method of determination of leaf N concentration and chlorophyll extraction in prototype determination. Therefore, it can be concluded that Prototype developed in this study can be used to determine the nutrient requirement of tea growing soil.

Key words: Analytical kit, Photo meter, Prototype, Site Specific Fertilizer Recommendations (SSFR)