

EVALUATING THE APPLICABILITY OF TCS34725FN COLOUR SENSOR FOR SITE SPECIFIC NITROGEN MANAGEMENT IN PADDY

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This study was conducted to evaluate the applicability of TCS34725FN colour sensor for site specific nitrogen (N) management in paddy. Bulk soil (Low Humic Gley) samples (0 -30 cm) were collected from the research paddy field, Faculty of Agriculture, Rajarata University of Sri Lanka and analysed for initial soil properties. A greenhouse experiment was conducted using modified missing element technique to observe leaf colour variations of rice plants (Bg352) at five soil N levels (25, 50, 75, 100, and 125 ppm) while other nutrients were maintained at optimum level. The experiment was arranged in Completely Randomized Design (CRD) with two factors (factor 1: different soil N levels and factor 2: time). Leaf colour of the rice plants were measured using TCS34725FN colour sensor and SPAD meter in five-day intervals. Correlation analyses were done between R (Red), G (Green) and B (Blue) values measured by TCS34725FN colour sensor vs. SPAD meter readings. Statistical analyses were performed using ANOVA and mean separation was done using Tukey's post hoc test to determine significant differences of treatments and time. Analysis of collected soil samples revealed deficiency in available N, phosphorous and exchangeable K in them but were sufficient of other nutrients. Then the moderate negative correlations were observed between the TCS34725FN colour sensor readings; R ($R=0.5, p<0.05$) G ($R=0.58, p<0.67$) and B ($R=0.46, p<0.05$) and SPAD meter readings. The measured R, G, B values were significantly influenced by the treatment effects indicating high sensitivity of the sensor at low concentration of N levels. The measured R and G values were significantly different over the investigated time period. It can be concluded that there is a moderate applicability of TCS34725FN colour sensor for site specific N management for the selected paddy soil based on the existing results. Further research works are suggested to verify these results.

Keywords: Paddy soil, Site specific nitrogen management, TCS34725FN colour sensor