

D-D1-11

Greenness (SPAD Value) of Rice Leaves can be Evaluated by Hue Value of Digital Camera Image under Variable Irradiance Condition

Kyu-Jong Lee and Byun-Woo Lee*

Department of Plant Science, Seoul National University, Seoul 151-921. South Korea

Leaf color carries important information regarding the plant healthiness and thus is used as an indicator for diagnosing plant nutrition status. Digital camera image analysis may provide researchers and farmers with a good tool for monitoring plant nutrition status if the same leaf color can be represented by a certain index of digital camera images taken under any irradiance condition. The objectives of this study were to evaluate a range of color indices for their ability to represent rice leaf color under variable object irradiance condition. Six leaves with different SPAD values of 17.6 to 42.3 was arranged on the black paper and digital camera images were taken under four irradiance levels. Red, Green, and Blue (RGB) features were extracted from the digital images, and calculated the normalized RGB, hue and saturation. The SPAD value showed a good linear correlation with hue value when pooled across irradiance levels while poor correlation with other color indexes. In conclusion, hue value can be a good representation of actual leaf greenness (SPAD value) in digital camera images taken under various irradiance condition and would be used as a good indicator for diagnosing N nutrition status of rice plant.

* Corresponding Author Email: leebw@snu.ac.kr

이규종/02-880-4554, 017-208-2035/handal20@snu.ac.kr

D-D1-12

Using Chlorophyll Meter for Nitrogen Fertilizer Prescription for Spring Rice at Panicle Initiation Stage in Thai Nguyen Province, Vietnam

Nguyen T. Hung¹, Nguyen T. Lan¹, Le T. Khuong², and Byun-Woo Lee³

¹Thai Nguyen Univ., Vietnam; ²Institute of Applied Sciences and Technologies, Ministry of Sciences and Technologies, Vietnam; ³Dept. of Plant Science, Seoul National Univ., Korea

The objective of this study was to determine N rate at panicle initiation stage (PIS) for spring rice in Thai Nguyen Province using chlorophyll meter to obtain target grain yield. An strip-plot experiment was conducted at experiment station of Thai Nguyen University of Agriculture and Forestry, Vietnam. The experiment included two N rate at tillering (0 and 30 kgN/ha) and three N rates at PIS (0, 30, 60 kgN/ha). Two rice varieties (Khang Dan and Viet Lai 20) were used. SPAD value and Plant shoot N concentration were measured at PIS - 10 days, PIS, PIS + 10 days and heading, and yield, yield components were measured at harvest. Correlation and multiple regression among measured indicators were used for formulating N prescription equations. SPAD value of the second leaf (from the top) was significantly correlated with N concentration analyzed at the time SPAD was measured. Multiple regression equation to predict rice yield using SPAD value measured at PIS and N rate applied at PIS had high R^2 ; $R^2 = 0,91$ for Khang Dan rice variety and $R^2 = 0,86$ for Viet Lai 20 rice variety. We found that to get the highest rice yield will be 6,1 tons/ha for Khang Dang and 6.6 tons/ha for Viet Lai 20 when SPAD value and nitrogen applied at PIS are 38 and 72.8 kgN/ha for Khang Dan and 39,8 and 79.4 kgN/ha for Viet Lai 20.

*이변우 / 02-880-4544 / leebw@snu.ac.kr