Evaluation of potential of portable chlorophyll meter to quantify chlorophyll and nitrogen contents in leaves of wheat under different field conditions

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The chlorophyll meter is a simple, non destructive and portable tool that could be used to measure the greenness or relative chlorophyll and nitrogen contents in leaves during different developmental stages for efficient nutrient management. In this study, we tried to correlate SPAD index with chlorophyll (chl)/nitrogen(N) content in leaves of bread wheat (*Triticumaestivum* L., PBW 509) and durum wheat (*Triticum durum* L. PDW 233), and to find the variable (chl concentration *i.e.* µg Chl g^{-1} tissue, content *i.e.* µg Chl cm^{-2} tissue or N content) that could be best estimated with chlorophyll meter.The leaf samples collected from four different fields varying in N and manganese fertility levels, exhibited a wide range of SPAD index (26-47).The linear model was best fitted to describe the relationship of these variables with SPAD index and it was found to be the best measure of chl concentration (R^2= 0.59) as compared to chl content (R^2= 0.49) and nitrogen content (R^2= 0.37). The correlations improved when separate calibration curves were plotted for cultivar and field. SPAD index explained 70, 87 and 71% of variation in chl concentration, chl content and N content, respectively, at field 3 from pooled data of the two cultivars and the corresponding values of variables were 94, 93 and 91% for PBW 509 and 87, 83 and 91% for PDW 233 from pooled data of four fields. The chlorophyll meter can be used with caution to develop separate calibration curves for particular cultivar, field, hybrid and treatments to develop standards for interpretations and efficient fertilizer management.

Keywords: Chlorophyll content, Nitrogen content, SPAD index, SPAD meter, *Triticum durum*, Wheat