

Temporal variability of SPAD chlorophyll meter readings and its relationship to total nitrogen in leaves within a Malaysian paddy field

ABSTRACT

Recently, site-specific crop management, well-established in some developed countries, is now being considered in other places such as Malaysia. So, describing within-field variability in a typical Malaysian paddy field was conducted to show the temporal variability of SPAD readings and leaves total N. The main objective of this study was to seek appropriate tool to expedite the adoption of PF for double cropping rice cultivation. For this reason, SPAD readings data was collected at 2 different rice growth stages (55DAT and 80DAT) using a Minolta SPAD 502. Leaf samples were collected at 20 random points in each plot to compare the results from SPAD readings values. Nitrogen content was extracted from samples in a laboratory. Finally, SPAD readings and total nitrogen maps were created on the interpretation of the data. Semivariograms, visual observation and statistical analysis indicated higher sampling error and stronger spatial dependence at 80DAT and also same trends of SPAD readings and leaves total N in most areas of the field. The increasing of SPAD readings values with growth stage was observed in this study. SPAD readings at 55DAT had a better relationship to leaves total N than 80DAT. The study concluded that SPAD chlorophyll meter is able to provide a rapid and reasonably accurate estimate of leaf N content and the potential for applying principles and technology of precision farming to understand and control spatial and temporal variation in Malaysian paddy fields.

Keyword: Chlorophyll meter; Paddy field; Site-specific management; Temporal variability