Development of on-the-go soil nitrogen mapping system for site specific management

ABSTRACT

Site specific management can potentially improve both economic and ecological outcomes in agriculture. Effective site specific management requires strong and temporally consistent relationship among identified management zones; underlying soil physical, chemical and biological parameters, and crop yield. Those requirements are possible to be obtained through the use of specific equipment and state-of-the art technology. This study was carried out to develop an on-the-go system to provide accurate soil nitrogen map by using an electrical conductivity sensor. The result from this study has proven the merit of the developed system in terms of its performance and its reliability. The soil nitrogen map produced via this system was almost similar to a kriging map produced via ArcGIS software and it was shown to be reliable for use in the site specific application for best management practices. This finding shows that the soil nutrient variability map was possible to be produced in real-time basis without engaging any tedious work in the field. The use of this mapping system as a basis of identifying the soil nutrient variability proved to be a good technique for the farmers to better manage their paddy fields.

Keyword: Apparent soil electrical conductivity (Eca); Nitrogen (N) fertilizer; Paddy field; Rice yield; Variability map