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SITE SPECIFIC NUTRIENT MANAGEMENT PROGRAM FOR PRECISION AGRICULTURE

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Abstract

Efficient application of nutrients to the soil helps to modify the agricultural structure by enhancing the fertilizer use efficiency and improving soil quality. The calculation of site-specific nutrient requirement is a tedious work and difficult task for farmers. The study was aimed to develop a WINFORM windows application created with the help of Objective-C using Visual studio 2019, which was named as Site-Specific Soil Nutrient Calculator (SSSNC) to calculate fertilizer requirement based on the soil nutrient availability (site specific) in the area. The study was carried out in the Kelappaji College of Agricultural Engineering &Technology (KCAET) campus, Malappuram District, Kerala. This calculator is very user friendly and easily calculates the nutrient requirement. Site specific nutrient recommendations were obtained using SSSNC and compared with Package of Practice (PoP) recommendations for coconut and banana and ad hoc recommendation of Kerala Agriculture University (KAU) for vegetables. The application of site-specific nutrient recommendations through the SSSNC tool resulted in reduced fertilizer usage compared to traditional methods. Specifically, site-specific recommendations led to a decrease in overall fertilizer usage because they optimized the quantity and placement of nutrients based on local soil conditions. This approach is more efficient than the PoP and ad hoc recommendations, which apply fertilizers on a per-hectare basis, regardless of soil variability. About 5% of nitrogen, 25% of phosphorous and 19% of potassium could be saved by using site-specific nutrient recommendation compared to PoP/adhoc recommendation in the study area. Site specific nutrient recommendations are very useful for farmers to improve nutrient use efficiency and avoid excessive application of fertilizers.

Key words: nutrient use efficiency, precision agriculture, site-specific nutrient calculator, site-specific nutrient management

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