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Catering to high variability and climate change: What next in site specific nutrient management?

Site specific nutrient management (SSNM) in crops is gaining popularity due to its advantage over blanket recommended management practices (BRMPs) as it takes into account site specificity, season and crop growth variability in making soil and crop sustainable. SSNM have proved to increase yield and net profit and has been adopted by various governments and agriculture departments for scaling out. Climate change introduces new dynamics and uncertainties into agriculture production system. It affects agriculture through different means that include changes in average temperature, rainfall and climate extremes, changes in atmospheric carbon dioxide, changes in ozone concentration, changes in pest and diseases and deviations in nutritional quality. Real time climate information can help agriculturalists better manage risk, making the most of favorable climatic conditions while protecting their livelihoods from extreme events. GIS (Geographical Information System) ensures the availability of accurate forecasting of meteorological data, allow for precise predictions of crop water requirements with unprecedented spatial resolution. Remote sensing (RS) can provide the missing spatial information required by crop models for improved yield prediction. The indispensable role of GIS and RS in site-specific nutrient management (SSNM) is efficient use of nutrients for achieving the set target. Use of GIS and RS in the SSNM can do provision for mid-season correction, setting target yield based on local environment and conditions and in generating weather based advisories, leading to balanced nutrient recommendation and ultimately augmenting soil and crop productivity. Nutrient management in stress environment can be managed by the use of mid-season corrections. To improve the crop production and farmer's income appropriate achievable target yield should be set in the SSNM. Use of GIS can help to set in precise target yield. Overall, use of geo-informatics in SSNM can really boon for sustenance under changing climate and exposing variability.

Recent Publications

1. Buresh R J, M F Pampolino and C Witt (2010) Field-specific potassium and phosphorus balances and fertilizer requirement for irrigated rice-based cropping systems. Plant Soil. 335(1-2):35-64.

2. Dobermann A et al. (2003) Estimating indigenous nutrient supplies for site-specific nutrient management in irrigated rice. Agron. J. 95(4):924-935.

3. Tri D Setiyono et al. (2018) Spatial rice yield estimation based on MODIS and Sentinel-1 SAR data and ORYZA crop growth model. Remote Sensing. 10(2):293.

Biography

Sheetal Sharma is a Soil Scientist at International Rice Research Institute (IRRI). She works as an integral part of IRRI Rice Crop Manager Team. She leads the initiatives in South Asia to transform the provision of information to farmers and, to make site-specific recommendations available to small farmers. She majorly works on combining detailed information on crop performance with innovative knowledge transfer approaches and the development of ICT-based decision-support tools suited to extension workers and farmers using mobile applications or computers. The work has targeted small-scale farmers in India, and these applications are enabling farmers to improve the profitability of rice through more timely and accurate crop management. Decision tools have received government endorsement and are now adopted at State level. She is also actively involved in capacity development of local scientists and scholars. She has authored and co-authored more than 20 scientific papers in peer-reviewed journals/book chapters.

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