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Site-specific nutrient management for enhancing nutrient-Use efficiency in rice and wheat

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ABSTRACT : Initially after green revolution, the food grain production has been boosted up tremendously, but sign of fatigueness has been emerged after 1980 with sharp decline in factor productivity, stagnation in crop yields with unstable and marginal farm incomes; all of which are now posing a serious threat to food security, agricultural sustainability, soil and environmental health and rural agricultural economy in the developing world. Growing concerns about impaired soil health, declining productivity growth and decreasing factor productivity or nutrient-use efficiency (NUE) are compelling the farmers to use higher levels of fertilizers during last two decades. Both rice and wheat are exhaustive feeders, and the double cropping system is heavily depleting the soil to its nutrient content. A rice-wheat sequence that yields 7 t/ha of rice and 5 t/ha of wheat removes more than 300 kg nitrogen, 30 kg phosphorus and 300 kg/ha of potassium from the soil. Due to excessive use of fertilizers in imbalanced ratios causing the low nutrient use efficiency and associated environmental problems, which has raised the serious concerns about the existing nutrient management practices. It is high time to develop site-specific nutrient management (SSNM) technologies, which are able to make synergy with crop–soil nutrient dynamics. The SSNM is need-based feeding of crops with nutrients in right rate and right time while, recognizing the inherent spatial variability, which enhances crop productivity, profitability, NUE and avoids nutrient wastage. This paper deals with the SSNM technologies approaches and tools, which are able to enhance NUE, crop productivity and profitability in rice-wheat cropping system.

Key Words: Site-specific nutrient management, real time N management, nutrient-use efficiency, factor productivity.