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A REVIEW

Sustainable nitrogen management in rice based cropping system

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Currently used management practices which are over dependent on mineral fertilizers do not provide a good balance between soil nutrient supply, crop requirements, deteriorating the sustainable soil fertility and health on long term basis. Continuous use of fertilizers, ignoring organic sources would lead to gradual decline of organic matter content and native fertility status in the soil, which in turn reflects on the productivity of rice crop. From the sustainability point of view, alternatives have to be found out to increase the nitrogen utilization efficiency without hindering the productive capacity of rice soils. In the face of the continuing global energy crisis and progressively prohibitive cost of fertilizer nitrogen, there is renewed interest towards sustainable low cost alternatives like organic manures. Farmyard manure was considered as nutrient rich renewable source to substitute partially the fertilizer nitrogen. Instead of using higher than recommended dose of nitrogen exclusively through fertilizer, a strategy of integrated use of recommended dose of nitrogen through fertilizer in combination with any amount of cheaper organic source, which is abundantly available locally should be tried to satisfy the higher nitrogen requirement of rice crop, to produce higher yield, without impairing soil health.

Organic manures, which can supply a portion of the P and K along with the secondary and micronutrients required by crops, can help offset the negative nutrient balances and slow down nutrient depletion processes. Hence, an integrated nutrient management approach seems appropriate for sustained crop production, which involves meeting a part of nutrient needs of crop through crop residues and other organic manurial sources along with mineral fertilizers for the crops under highly intensive cropping system.

The version of crop residue incorporation is beneficial depending upon the farming situation. Grain legumes, in contrast with green manures, provide grain to augment income and protein as well as reduce the use of mineral nitrogen in rice-based cropping systems. In areas, where clear cut fallow of a short duration is available preceding the transplanted low land rice crop, crops like greengram, cluster bean, fieldbean and cowpea can be raised as preceding crops to rice and after the harvest of the saleable yield, the left over crop residues

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