

ON-FARM NUTRIENT MANAGEMENT IN RICE UNDER FIELD-TO-FIELD CANAL IRRIGATION SYSTEM OF SONE COMMAND, BIHAR

K. RAJAN, S.S. SINGH, U.S. GAUTAM AND A.B. PAL

*ICAR Research Complex for Eastern Region
P.O. Phulwari Sharif, Patna-801 505, Bihar*

Bihar agriculture is rice agriculture having 3.8 million hectare area under rice. The Sone canal command is 125 years old system with high rice productivity (2.0-3.0 t/ha) in eastern India. Here, field-to-field irrigation is common due to lack of irrigation channels owing to fragmented holding, poor on-farm development and no roster system. They apply high doses of nitrogenous fertilizer neglecting other nutrients. Application of higher dose of nitrogen fertilizer alone invites number of pests and diseases which reduced rice yield. An experiment was under taken to show the effect of application of balanced dose of fertilizer over farmer's method.

On -farm experiments were carried out during 2000 and 2001 at ten sites in four villages viz, Veeranchuk, Virpur, Doisatola and Belurampur under Majhouli distributary of Sone command, Patna-Bihar. Soil of the study area was Clay loam. The fertility status was medium (272-544 kg N/ha), low (<22.5 kg P₂O₅/ha) and low (<136 Kg K₂O/ha) in case of nitrogen, phosphorus and potassium respectively. There were three treatments namely, farmers practice (165:0:0), soil test based

application (dose varied depending upon soil test value) and general recommended dose (120:60:40 kg NPK/ha and ZnSo₄ 25Kg/ha), Soil samples were analyzed for nitrogen, phosphorus and potassium. The data was used for soil test based recommendation.

A clear-cut difference in rice yield was noticed among three types of nutrient management. The highest yield was obtained in GRD followed by STBA and farmer's practice. The yield increase in GRD was 25 percent (1.18 t/ha) over farmer's practice. Yield ranged from 4.6 t/ha to 7.5 t/ha in GRD followed by farmer's practice and STBA. The yield increase in STBA is 22 percent over farmer's practice (Table 1).

The average amount spent on fertilizer in GRD was 193 per cent of EP and profit is 1.6 times over farmer's practice. Profit in STBA was Rs. 4746/ha by spending Rs.304 over the amount spent on farmer's practice. The excess amount spent on STBA is meager (16%). The amount spent on fertilizer on STBA varies because it depends on the status of the soil (Table 1).

Table 1. Economics of rice yield under GRD and farmer's practice (Mean of 2000 and 2001)

Farmers	Village	Farmer's Practice (AP)			General Recommended Dose (GRD)			Project over Farmers production (Rs.)	
		Grain yield (t/ha)	Income (Rs)*	Amount spent on fertilizer (Rs.)	Grain yield (t/ha)	Income (Rs)*	Amount spent on fertilizer (Rs.)	in CRD	in STB
1	Veeranchuk	4.5	21339	1815	5.0	21750	3500	246	6354
2	Virpur	5.0	23710	1815	6.0	26100	3500	2617	3246
3	"	4.5	21339	1815	5.5	23925	3500	2617	5880
4	B. Rampur	4.0	18968	1815	5.8	25230	3500	6411	5690
5	Virpur	5.7	27029	1815	6.5	28275	3500	1667	1342
6	Veeranchuk	3.7	17545	1815	4.6	20010	3500	2143	6258
7	B. Rampur	5.6	26318	1815	6.2	26970	3500	957	1549
8	Doisatola	4.5	21339	1815	5.5	23925	3500	2617	5514
9	Veeranchuk	6.0	28452	1815	6.7	29145	3500	1194	2146
10	Virpur	4.0	18968	1815	7.5	32625	3500	1447	9484
Mean		4.75	22501	1815	5.93	25796	3500	3994	4746

Grain price of MTU - 7029=Rs. 435/Q, Straw price=Rs.28/Q, *Including income from straw

K. RAJAN *et al.*

It has been proved that the farmer's practice of applying only nitrogenous fertilizer in higher dose is inferior. Both GRD and STBA are beneficial over farmer's practice. The cost involvement in STBA is only 14 percent of GRD. This is due to the reason that in case

of STBA, soil available nutrients is taken in to account and because of this a considerable quantity of different nutrients are not applied (Suri and Verma, 1999). The mean values of yield were 4.75, 5.81 and 5.93 t/ha for farmer's practice, STBA, and GRD respectively.

REFERENCES

Chaudhary, T.N. 1997. Water Management in Rice for Efficient Production. *Research Bulletin No 1. DWMR, Patna*, 46.
Suri, V.S. and Verma, T.S. 1999. Targeted Yield Concept for efficient

and economic fertilizer use in a Maize-Wheat cropping system and Built-up of native fertility in Typic Hapludalf. *J. Indian Soc. Soil Sci.* 47:67.