

## **Effect of Fe and Zn along with various sources and rate of NPK on performance of paddy cultivation under aerobic conditions**

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**ABSTRACT :** A field experiment was conducted during Kharif (rainy) season of the year 2015-16 on sandy loam soils of farmers' field as OFT programme under supervision of Krishi Vigyan Kendra, Begusarai (Bihar), to evaluate the effect of varying doses of Fe and Zn along with various sources and rate of NPK under aerobic rice in irrigated ecosystem included farmers' practice. Two foliar application of  $\text{FeSO}_4$  @ 1% and  $\text{ZnSO}_4$  @ 0.5% together along with 100% Recommended Dose of Fertilizers (RDF) under aerobic rice had recorded significantly higher yield attributing characters *viz.* panicles/m<sup>2</sup>, no. of grains/panicle and 1000 grain weight over rest of the treatments except two foliar application of  $\text{FeSO}_4$  @ 1% + 100% RDF. Eventually, yield attributing characters contributed and translated into grain yield of rice in similar pattern and further two application Fe + Zn + 100% RDF proved its importance in production of grain yield, which also touched the level of significance. The highest gross return (Rs.71376/ha) and net return (Rs.40091/ha) were associated with 100% RDF as soil application in addition to two spray of  $\text{FeSO}_4$  @ 1% and  $\text{ZnSO}_4$  @ 0.5% but benefit:cost ratio was maximum (1.31) in the treatment which involved 100% RDF + two foliar spray of  $\text{FeSO}_4$  @ 1%, and was followed by 100% RDF + (two foliar spray of  $\text{FeSO}_4$  @ 1% +  $\text{ZnSO}_4$  @ 0.5%).

**Key Words:** Aerobic rice, foliar application,  $\text{FeSO}_4$  and  $\text{ZnSO}_4$ , grain yield of rice, gross return, net return.



**Table-1:** Effect of experimental variables on yield attribute and yields of rice under aerobic conditions.

Treatments	Plant height (cm)	Panicles/m <sup>2</sup>	No. of grains /panicle	1000 grain weight (g)	Grain yield (kg/ha)
T <sub>1</sub> : Farmers' practice (Imbalance use of fertilizers & excessive urea application)	84.9	229.91	48.96	24.27	3627
T <sub>2</sub> : Recommended Dose of Fertilizer (RDF)	84.6	237.02	49.64	24.52	3854
T <sub>3</sub> : 75% Recommended Dose of Nitrogen + 100% Recommended Dose of PK + Vermicompost 2 t/ha	84.9	246.27	52.13	25.10	3931
T <sub>4</sub> : (25%N + 100% PK of RDF) + 75% N of the recommended dose given on the basis of Leaf Colour Chart (LCC)	85.2	249.13	52.70	25.20	3969
T <sub>5</sub> : RDF + (one foliar spray of NPK@1% + FeSO <sub>4</sub> @1% + ZnSO <sub>4</sub> @0.5%)	86.4	260.40	54.20	25.60	4199
T <sub>6</sub> : RDF + two foliar spray of ZnSO <sub>4</sub> @0.5%	84.2	258.90	53.30	25.40	4016
T <sub>7</sub> : RDF + two foliar spray of FeSO <sub>4</sub> @1%	91.6	270.30	58.10	25.80	4323
T <sub>8</sub> : RDF + (two foliar spray of FeSO <sub>4</sub> @1% + ZnSO <sub>4</sub> @0.5%)	92.3	275.60	60.40	26.10	4461
CD (P=0.05)	5.6	14.11	5.96	1.20	221

**Table-2:** Effect of experimental variables on economics of rice under aerobic conditions.

Treatments	Cost of cultivation (Rs./ha)	Gross Return (Rs./ha)	Net Return (Rs./ha)	Benefit: Cost Ratio
T <sub>1</sub> : Farmers' practice (Imbalance use of fertilizers & excessive urea application)	34649	58032	23383	0.67
T <sub>2</sub> : Recommended Dose of Fertilizer (RDF)	28539	61664	33125	1.16
T <sub>3</sub> : 75% Recommended Dose of Nitrogen + 100% Recommended Dose of PK + Vermicompost 2 t/ha	38239	62896	24657	0.64
T <sub>4</sub> : (25% N + 100% PK of RDF)+ 75% N of the recommended dose given on the basis of Leaf Colour Chart (LCC)	28539	63504	34965	1.23
T <sub>5</sub> : RDF + (one foliar spray of NPK @1% + FeSO <sub>4</sub> @1%+ZnSO <sub>4</sub> @0.5%)	31362	67184	35822	1.14
T <sub>6</sub> : RDF + two foliar spray of ZnSO <sub>4</sub> @ 0.5%	30739	64256	33517	1.09
T <sub>7</sub> : RDF + two foliar spray of FeSO <sub>4</sub> @ 1%	29885	69168	39283	1.31
T <sub>8</sub> : RDF + (two foliar spray of FeSO <sub>4</sub> @ 1% + ZnSO <sub>4</sub> @ 0.5%)	31285	71376	40091	1.28

Price of paddy Rs. 16/kg

