

variety 'Andrew Sali' performed considerably well under this condition.

Thus 'IET 9188' could be suitably transplanted both under normal (average yield 52 q/ha) and late planting up to 5 September (average yield, 34 q/ha). 'IET 6666' could be transplanted only under normal planting

up to 5 August with an average yield of 53 q/ha. 'IET 7251' may be used for only August planting with an average yield of 42 q/ha. In addition to 'IET 9188', 'IET 8002' and 'Andrew Sali' could also be grown suitably under late plantings up to 5 September with an average yield of 28 q/ha.

Indian J. Agron. 41 (3) : 490–492 (September 1996)

Effect of split application of nitrogen and plant spacing on lowland bunded rice (*Oryza sativa*)

P. M. PARAYE, V. S. KANDALKAR AND A. K. PALIWAL

Regional Agricultural Research Station, Indira Gandhi Krishi Vishwa Vidyalaya (Raipur), Waraseoni, Madhya Pradesh 481 331

Received: March 1993

Application of nitrogen in split doses according to the growth stage and plant spacing of wetland bunded rice (*Oryza sativa* L.) crop are important factors to exploit the potential of the high-yielding, improved variety by reducing the leaching of N with increasing N-use efficiency. Therefore, an experiment was conducted to find out optimum plant population and appropriate quantity of split N at different growth stages to harvest potential yield of rice.

A field experiment was conducted at Waraseoni during the rainy season (*kharif*) of 1989 and 1990. The soil (0–15 cm) of the field had pH 7.2 and available N, P_2O_5 and K_2O 315.0, 9.0 and 408.5 kg/ha respectively. The treatment consisted of 3 levels of spacing (15 cm x 10 cm, 15 cm x 20 cm and

15 cm x 20 cm) and 5 splits of 100 kg N/ha in different doses at various crop growth stages (Table 1). The experiment was laid out in split-plot design with 3 replications by keeping levels of spacing in main plot and split doses of N in subplot. A basal dose of 50 kg P_2O_5 /ha and 30 kg K_2O /ha were applied at the time of puddling in the field. N 100 kg/ha was applied as per the split levels in the treatments through urea. 'R 269' rice was transplanted 3 seedlings/hill with 30- and 25-day-old seedling on 6 August 1989 and 8 July 1990 respectively.

The crop transplanted at closer spacings S_1 (15 cm x 10 cm) and S_2 (15 cm x 15 cm) recorded significantly higher grain yield and effective tillers/m² than wider spacings S_3 (15 cm x 20 cm) in pooled analysis (Table 1). The significant increase in S_1 and

Table 1. Effect of spacing and split application of nitrogen on growth character and yield of rice (pooled data of 2 years)

Treatment	Plant height (cm)	Tillers/m ²	Effective tillers/ m ²	Panicle length (cm)	Panicle weight (g)	Test weight (g)	Grains/ panicle	Grain yield/ panicle (g)	Grain yield (q/ha)			
<i>Spacing (cm x cm)</i>												
S ₁ , 15 × 10	101.00	374.45	282.50	22.40	3.55	29.90	99.5	3.7	42.65			
S ₂ , 15 × 15	102.55	349.60	257.95	22.95	3.50	28.55	104.0	3.6	40.80			
S ₃ , 15 × 20	101.75	307.15	238.00	22.45	3.40	27.70	102.3	3.2	34.90			
CD (P = 0.05)	NS	40.61	17.04	NS	NS	NS	NS	0.2	2.13			
<i>Split N dose (100 kg/ha)</i>												
<i>Basal</i>	<i>8 DAT</i>	<i>Tillering</i>	<i>Panicle initiation</i>									
T ₁ , 30%		40%	30%	103.05	345.00	251.30	23.25	3.85	30.75	113.6	3.8	44.70
T ₂ ,	40%	40%	20%	101.00	337.30	248.30	21.70	3.30	28.10	96.4	3.5	38.00
T ₃ , 50%		25%	25%	104.20	366.00	257.70	22.95	3.55	29.50	104.4	3.6	39.40
T ₄ , 25%		50%	25%	101.50	314.55	261.75	22.65	3.35	27.75	103.4	3.5	38.80
T ₅ ,	50%	30%	20%	99.95	355.8	251.45	22.20	3.05	27.45	91.5	3.0	36.25
CD (P = 0.05)				2.85	29.76	NS	0.52	0.25	1.70	12.8	0.3	2.97

DAT, Days after transplanting

* Recommended split application of nitrogen.

S_2 treatments can be attributed to appropriate plant density in S_1 and square planting pattern in S_2 which might have utilized all available sources for better effective tillers/m² and grain yield. The present findings are in agreement with those of Rathi *et al.* (1983), Wagh and Thorat (1987) and Gupta and Sharma (1991).

Split application of 100 kg N/ha significantly influenced all the yield attributes along with grain yield except effective tillers/m² in pooled analysis. Split application of nitrogen as 30% basal + 40% at tillering and 30% at panicle initiation (T_1) gave significantly higher grain yield than the other treatments by 13.45 and 23.31% than T_3 (recommended split dose of N) and T_5 respectively. The recommended split of nitrogen dose (T_3) also gave significantly higher grain yield than T_5 treatment. T_1 and T_3 recorded significantly higher plant height, tillers/m², panicle length and weight, test weight, grains/panicle and grain yield/panicle than T_5 . The

highest grain yield in T_1 may be attributed to significantly increased panicle weight in T_1 compared with T_3 because of efficient splitting of nitrogen by increasing 15% and 5% dose at tillering and panicle-initiation over the recommended split dose at tillering and panicle initiation stage (T_3) respectively. Wagh and Thorat (1987) and Mohapatra (1992), also reported response to split application of nitrogen.

REFERENCES

- Gupta, A. K. and Sharma, R. S. 1991. Effect of plant spacing and fertility level on grain yield of early medium indica rice (*Oryza sativa*). *Indian Journal of Agronomy* 36 : 223–225.
- Mohapatra and Ashok Kumar. 1992. Response of rainfed lowland rice (*Oryza sativa*) to timing of beushaning and nitrogen management. *Indian Journal of Agronomy* 37 (1) : 159–160.
- Rathi, C. S., Patel, J. P. and Sharma, R. S. 1983. Relative performance of some dwarf varieties of rice and their response of spacing and planting pattern. *Indian Journal of Agronomy* 29 (2) : 218–221.
- Wagh, R. G. and Thorat, S. T. 1987. Effect of split application of nitrogen and plant densities on yield and yield attributes of rice. *Oryza* 24 (2) : 169–171.

Indian J. Agron. 41 (3) : 492–494 (September 1996)

Efficiency of triacontanol granules on transplanted *kharif* 'IR 50' rice (*Oryza sativa*)

G. C. DE AND F. HAQUE

Palli Siksha Bhavana (Institute of Agriculture), Visva-Bharati, Sriniketan, West Bengal 731 236

Received: August 1993

A field experiment was conducted during warm-wet (*kharif*) season of 1991 with transplanted 'IR 50' rice (*Oryza sativa* L.)

at Sriniketan located under the lateritic tract of West Bengal. The experiment consisting of 3 replications of 15 treatments was laid