GAU Res. J. 1993. 19 (1) : 133-135

Spacing and Nitrogen Requirements of Rice Varieties

H. M. Virdia, H. S. Patel and M. P. Patel

Regional Sugarcane Research Station
Gujarat Agricultural University, Navsari

An experiment was conducted at the college farm, Navsari during *kharif* 1989-90 on clayey soil having 7.7 pH, low in total nitrogen, medium in available phosphorus and high in available potash. In all there were 24 treatment combinations comprising of two varieties (Masuri and 1-30-1-1) and three spacings (20 x 15, 25 x 15 and 30 x 15 cm) as main plot treatments and four levels of nitrogen (0, 50, 100 and 150 kg N/ha) as sub plot treatments and replicated thrice in split plot design. A common dose of 60 kg P_2O_5/ha was applied. Nitrogen was applied in four splits viz., 1/4 dose each at puddling 25, 55 and 75 days after transplanting. Uniform 3-5 cm standing water level was maintained except at the time of each top dressing.

Effect of varieties :- The genotype 1-30-1-1 recorded significantly more test weight, grain weight/hill and subsequently higher grain yield (4781.8 kg/ha) and net realization (Rs. 7026/ha). Whereas, variety Masuri which had registered taller plants and flowered late with longer panicles, more filled grains/panicle and straw weight/hill, produced higher straw yield. (Table 1) Such varietal difference might be due to their genetic makeup. Similar results also reported by Prajapati *et al.* (1982).

Effect of spacing :- Grain yield of rice was significantly altered due to various spacings. Closer spacing (20 x 15 cm) emerged out superior in terms of grain 5123.0 kg/ha) and straw (7745.5 kg/ha) yields as well as net realization (7858 Rs/ha) as compared to other wider spacings. But higher values of growth and yield attributes were observed under wider spacings. Lower plant productivity noticed under closer spacing might be due to acute competition between neighbouring plants for various resources which adversely affected the per plant performance but due to more number of hills per unit area under closer spacing, yield of paddy was compensated. These findings are in close confirmity with those of Singh *et al.* (1989).

Effect of Nitrogen :- The data further revealed that application of 150 kg N/ha recorded remarkably higher plant height, effective tillers/hill, straw weight/hill and finally grain (5943.0 kg/ha) and straw (9366.6 kg/ha) yields but this level of N was found at par with 100 kg N/ha in respect of panicle length, filled grains/panicle, test weight, grain weight/hill, and net realization. It indicated that 100 kg N/ha was seems to be optimum dose for paddy crop.

TABLE 1

Growth and yield of rice variteties as influenced by various treatments.

Treatment	Plant height (cm)	Days to 50% flowering	Effective tillers/hill	panicle length (cm)	Filled grains/ panicle	Test weight/ (g)	Grain weight/ hill(g)	Straw weight/ hill (g)	Yield (kg/ha)		Net realization (Rs./ha)
									Grain	Straw	
Varieties											
Masuri	106.48	84.31	9.37	25.27	241.53	13.26	15.67	36.53	4223.2	8201.9	5880.97
1-30-1-1	72.53	69.14	9.98	13.03	161.36	13.93	19.19	26.00	4781.8	5555.6	7026.03
S. Em ±	2.01	0.33	0.23	0.16	9.18	0.05	0.67	0.95	131.2	239.0	358.57
C.D. at 5%	6.33	1.03	N.S.	0.50	28.93	0.16	2.12	2.99	413.4	752.9	1129.62
Spacing (cm)											
20 x 15	91.33	75.76	8.58	21.96	194.87	13.61	14.38	26.71	5123.0	7745.5	7857.50
25 x 15	91.20	76.58	9.72	22.17	200.69	13.59	16.83	31.96	4431.9	6880.0	6348.21
30 x 15	85.99	78.13	10.74	22.32	208.78	13.59	21.08	35.13	3952.9	6010.8	5153.92
S Em ±	2.46	0.40	0.27	0.19	11.25	0.06	0.82	1.16	160.7	292.7	439.15
C.D. at 5%	N.S.	1.26	0.87	N.S.	N.S.	N.S.	2.59	3.66	506.3	922.1	1993.50
Nitrogen (kg/ha)											
0	75.79	72.60	7.02	19.59	156.16	13.38	10.11	19.56	2860.0	4160.8	23.90
50	85.17	76.28	8.24	21.94	198.72	13.48	14.78	26.67	3897.7	5684.9	4969.89
100	94.73	77.89	10.84	23.27	221.46	13.66	21.78	36.83	5294.9	8302.6	9635.04
150	102.33	80.11	12.60	23.79	229.46	13.86	23.06	42.00	5943.0	9366.6	10093.72
S. Em ±	2.49	0.29	0.16	0.24	7.98	0.07	0.87	1.17	112.7	314.7	303.58
C.D. at 5%	7.15	0.84	0.46	0.69	22.91	0.21	2.50	3.35	323.4	902.9	870.97

Similar results were also obtained by Hussain *et al.* (1989).

On the basis of one year experimentation it may by concluded that higher production and profit from *kharif* rice can be secured by tranplanting rice culture 1-30-1-1 at 20 x 15 cm row spacing and fertilizing it with 100 kg N/ha on clayey soils of South Gujarat region.

(Received on 5th Febru., 1992)

REFERENCES

Hussain, T., Jilani, G. and Ghaffer, A. (1989). Influence of rate and time of N application on growth and yield of rice in Pakistan. *IRRN* **14** (6) : 18.

Prajapati, R. M., Dhimmar, Z. R., Vashi, R. D., Patel, S. A. and Raman, S. (1987). Varietal trial (Masuri type) Seasonal Report *Kharif* 1987, N. A. R. P., GAU, Navsari.

Singh, B. K., Singh, R. P. and Thakur, R. B. (1989). Nitrogen and phosphorus requirements and suitable spacing for double transplanted rice in flood affected areas. *Oryza*, **25** (2) : 193-195.