

EFFECT OF SPACING ON YIELD AND RELATIVE HUMIDITY IN THE MICROENVIRONMENT OF RICE

Several workers have reported ranges of spacing that do not affect yield significantly. Hukkeri *et al.* (1969) observed no significant yield difference in the spacing range of 112 to 337 cm² for IR 8. Rao (1969) indicated negligible yield difference in the spacing range of 150 to 300 cm² with dwarf *indica* (TN 1 and IR 8) Sewaram *et al.* (1973) reported that spacings of 150, 300 and 450 cm² were at par in one year while the former two were better than 450 cm² in another year, for high yielding varieties.

Two trials were conducted at CRR I during *kharif*, 1974 to find out the optimum spacing for Vijaya rice. In one trial, four spacings (15 x 10, 15x15, 15 x 20 and 20 x 20cm) were tested, at nitrogen level of 40 kg N/ha applied in three split doses 50% at basal, 25% at tillering and rest 25% at panicle initiation which was observed to give fairly high yields in earlier trials at this Institute. Randomized complete block design was adopted with six replications. Two to three seedlings of 30 days age were planted per hill on 29th July, 1974. Top dressings through ammonium sulphate were done on a drained field and was reirrigated 24 to 48 h later. Neither P nor K was applied to the crop, based on experience at CRR I indicating absence of response to these nutrients in *kharif*. Relative humidity was recorded at 3 days intervals, both at ground level and crop level two times in the day (at 8 and 14 hours) to observe if any differences exist due to spacings that might explain any variations in yield.

Results from this trial, presented in Table 1, indicated that grain yields were not affected significantly within the spacing range of 150 to 400 cm². The relative humidity was also not affected, but the plants at closer spacing were significantly taller. Taking the cost of nursery and cost of planting into consideration, a spacing of 20 x 20 cm turned out to be optimum at the nitrogen level tested.

In the second experiment different spacings were tried, but the area per plant was constant (300 cm²). The spacings 30 x 10, 25 x 15 cm (row widths are given in italics) at a nitrogen level of 50 kg N/ha, applied in three split doses. Randomized complete block design was adopted, with eight replications. Two to three seedlings of 30 days age were planted per hill on 30th July, 1974. Results of this trial, presented in Table 2 indicated that a row width of 20 or 25 cm gave identical yields but a row width of 30 cm reduced yield significantly which may be due to close spacing between plants within the row. Here also, relative humidity and height of plants remained unchanged under different row widths.

Results from these two experiments indicated that for the variety Vijaya, a spacing of 20 x 20 cm was economically optimum at a nitrogen level of 40 kg N/ha. Increasing the row width to 30 cm resulted in decreased yield significantly as

Table 1

Effect of different spacings on grain yield of rough rice, height of plant and relative humidity

Spacing (cm)	Grain yield (kg/ha)	Plant height at harvest (cm)	Relative humidity (%)			
			Ground level		Crop level	
			8h	14h	8h	14h
FIRST TRIAL						
15x 10	4019	86.3	82.3	75.6	83.2	76.6
15x 15	4196	90.7	82.7	75.4	83.3	75.9
20 x 15	4079	90.4	82.3	75.3	83.4	75.8
20 x 20	4096	91.1	82.9	75.1	84.5	75.6
C. D. (0.05)	NS	3.3	NS	NS	NS	NS
SECOND TRIAL						
30 x 10	3464	88.5	84.0	76.0	84.7	77.2
25 x 12	3688	88.0	84.1	78.1	84.7	76.8
50 x 15	3763	87.1	84.3	76.5	84.7	77.0
C.D. (0.05)	217	NS	NS	NS	NS	NS

NS = not significant

compared to a row width of 25 or 20 cm at 50 kg N/ha. It can also be the effect of decreased spacing between plants since area/plant is constant.

സംഗ്രഹം

'വിജയ' എന്ന നെൽ ജനുസ്സിന്റെ കൃഷിപരമായ ഇടയളവിനെക്കുറിച്ച് കേന്ദ്ര നെൽ ഗവേഷണശാല, കട്ടക്കിൽ ക്ഷേത്ര പരീക്ഷണങ്ങൾ നടത്തി. ഒരു പരീക്ഷണത്തിൽ നാലു ഇടയളവുകളും (അതായത് 15 x 10 സെ. മീ., 15 x 15 സെ. മീ., 15x20 സെ. മീ., 20 x 20 സെ. മീ) പ്രതി ഹെക്ടറിനു 40 കി. നൈട്രജൻ എന്ന കണക്കിലും, രണ്ടാമത്തേതിൽ ഇടയളവ് തുല്യമായും വരി വിസ്തൃതി (row width) വിഭിന്നമായുമാണ് തോറുകൾ നടത്. പരീക്ഷണത്തിലെ വരി വിസ്തൃതികൾ (അടിവരയിട്ടിരിക്കുന്നു) 30 X 10 ffirru. ffil., 25 X 12 സെ. മീ., 20 x 15 സെ. മീ എന്ന തോതിലും, നൈട്രജൻ 50 കിലോ toao മൂന്നു ഭാഗികമായി വയലിൽ നിക്ഷേപിക്കുകയാണ് ചെയ്തത്. നെൽവിള വിന്യം മറ്റു അളവുകൾക്കും പുറമേ, വയൽനിലത്തും ചെടികളുടെ ഉയരത്തിലും ദിവസം രണ്ടുനേരവും (രാവിലെ 8 മണി ഉച്ചക്കു 2 മണി) ജലതാപമാനങ്ങൾ (relative humidity) എടുക്കുകയുണ്ടായി. 'വിജയ' എന്ന ജനുസ്സിന്റെ 40 കിലോ നൈട്രജൻ/ഹെ. എന്ന തോതിൽ 20 x 20 സെ. മീ എന്ന വരിവിസ്തൃതി ഫലപ്രദമായ വിളവു നൽകുന്നു. എന്നാൽ വരി വിസ്തൃതി 30 സെ. മീ. എന്ന തോതിൽ കൂടുതലാക്കിയാൽ ഈ ജനുസ്സിന്റെ വിളവ് 25 സെ. ffit., 20 സെ. മി. എന്ന വിസ്തൃതിയേക്കാളും നിസ്സന്ദേഹമായി കുറഞ്ഞ തോതിൽ മാത്രമേ വിളവ് നൽകുകയുള്ളൂ.

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