Note on Effect of Time of Irrigation and Nitrogen on Yield of Wheat 'J 1-7'*

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A field experiment consisting of eighteen treatment combinations involving six different irrigation treatments viz., I_1-irrigation at 70%, 60% (I_2), 50% (I_3), 40% (I_4) available moisture I_5-as per departmental recommendation of irrigations of 5 ha cm at 14 days interval and I_6-irrigation by local method as followed by cultivators by appearance of soil and crop together in the main plot and three times of application of nitrogen (T_1-full dose at sowing, T_2-$\frac{1}{2}$ at sowing + $\frac{1}{2}$ at tillering stage and T_3-$\frac{1}{3}$ at sowing + $\frac{1}{3}$ at tillering + $\frac{1}{3}$ at flowering) as sub-plot treatments was laid out in a split plot design with four replications on the farm of the Gujarat Agricultural University, Junagadh campus, during the *rabi* season of 1972-73. The soil was clay with high organic matter content and fair amount of total nitrogen, available phosphorus and potash. The field capacity, permanent wilting point and bulk density of the field was 25·60 and 10·0 per cent and 1·32 g/cu cm for 0-15 cm depth, respectively. A common dose of 125 kg nitrogen, 60 kg phosphorus and 40 kg potash per hectare was applied. Wheat variety 'J 1-7' was used as test crop. The quantity of irrigation water was measured at the field head with the help of a portable 7·5 cm Parshall flume.

Response to irrigation:

The grain yield (Table 1) data indicated significant influences or irrigation treatments. The treatment I_1 (70% available moisture) produced significantly higher grain yield than the rest of the treatments, except the treatment I_2 (irrigation at 60% available moisture) and I_3 (irrigation at 50% available moisture) which were on par. The treatment I_5 (as per departmental recommendation of 7 irrigations) was significantly lowest in its response among all the treatments except the treatment I_4 (Irrigation at 40% available moisture). The increasing effect of grain yield under the treatment I_1 was due to the fact that it received the maximum number of irrigations to which the new wheat variety responded well that resulted in favourable growth, higher number of productive shoots per unit area, longer earheads, higher grain number and 1000 grain weight which increased grain yield. The results are in agreement with those reported by Dastanae and Singh (1964). Similar trend was also observed in respect to straw yield.

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TABLE 1

Effect of different treatments on yield.

Treatments	*Yield kg/ha*	
	Grain	*Straw*
Irrigation (I)		
I1 (Irrigation at 70% A.M.)	4985	7902
I2 (Irrigation at 60% A.M.)	4620	7216
I3 (Irrigation at 50% A.M.)	4566	4949
I4 (Irrigation at 40% A.M.)	3996	5946
I5 (Departmental recommendation at an interval of 14 days).	3757	5519
I6 (Local method of irrigation)	4475	6716
S.Em.±	152·332	263·33
'F' test	Sig.	Sig.
C.D. at 5%	461·98	793·41
Time of nitrogen application (T)		
T1 (Full dose at sowing)	4302	6374
T2 ($\frac{1}{2}$ at sowing + $\frac{1}{2}$ at tillering)	4514	7691
T3 (1/3 at sowing + 1/3 at tillering + 1/3 at flowering)	4384	6556
S.Em.±	15·555	53·33
'F' test	Sig.	Sig.
C.D. at 5%	44·65	153·04

A.M. = Available Moisture Sig.= Significant.

Time of nitrogen application:

The grain yield was significantly affected due to different time of nitrogen application (Table 1). Significantly highest grain yield was recorded under treatment T_2 in which nitrogen was applied in two splits ($\frac{1}{2}$ at sowing + $\frac{1}{2}$ at tillering). Treatment T_1 (full dose at sowing) proved significantly inferior among all the treatments. Treatment T_2 produced more productive shoots per unit area, grain number per ear head and 1000 grain weight which resulted in increased grain yield. Treatment T_3 ($\frac{1}{3}$ at sowing + $\frac{1}{3}$ at tillering + $\frac{1}{3}$ at flowering) stood second in its response. The results are in confirmity with those reported by Patel *et al.* (1968) and Sandhu and Gill (1972). Similar response was also noted in case of straw yield.

Irrigation × Time of nitrogen application:

The interaction $I \times T$ in respect of total shoots, plant height, length of ear head, number of grains per ear head, 1000 grain weight and grain yield was significant. Maximum grain yield (5131 kg/ha) was recorded under the treatment combination I_1 T_2 where in irrigation was applied at 70% available moisture and nitrogen was applied in two splits ($\frac{1}{2}$ at sowing + $\frac{1}{2}$ at tillering).

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