

Effect of cultural practice on wheat (*Triticum aestivum*) under receding soil-moisture condition

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Wheat (*Triticum aestivum* L. emend. Fiori & Paol.) is one of the most important crops, popularly grown on receding soil moisture under tank-bed conditions. Due to improper soil tilth, sowing in tank bed is usually done at wider spacings resulting in low plant population. Sowing seeds in optimum quantity (Attarde and Khuspe, 1981) through proper method of sowing (Jain *et al.*, 1989) increases the yield of wheat. Therefore an experiment was conducted to find out the optimum seed rate and suitable method of sowing for wheat under tank-bed condition.

A field experiment was laid out during the winter season of 1990–91 and 1991–92 at farmer's field on the receding soil moisture under tank-bed condition. The soil was silty clay loam and alkaline, having 0.32–0.45% organic carbon. The experiment was laid out in randomized block design with 3 replications. The net plot size was 5 m × 3 m. The experiment consisted of 5 seed rates (100, 125, 150, 175 and 200 kg/ha) and 2 methods of sowing (line sowing and cross-sowing).

Wheat ('Lok 1') was sown on 27 November during 1990 and 11 November during 1991. In line-sowing treatment the crop was sown at 30 cm apart, whereas in cross-sowing the seed was divided into 2 parts and sowing was done cross-wise at 30 cm spacing. The crop was fertilized with 30 kg N/ha and 15 kg P₂O₅/ha. The fertilizers

were applied through drilling below the seed. There was only 6 mm rainfall during 1990–91. No irrigation was applied to the crop. One hoeing and weeding was done 1 month after sowing of the crop. The crop was harvested on 17 and 6 March during 1991 and 1992 respectively.

Pooled data for 2 years (1990–91 and 1991–92) revealed that grain and straw yields of wheat differed significantly due to varying seed rates (Table 1). The grain yield increased with increase in seed rate up to 150 kg/ha; however, the difference was found significant only up to 125 kg/ha. The mean data revealed that seed rate of 125 kg/ha increased the grain yield of wheat by 7.6% over 100 kg/ha. Similar increase in the yield was also reported by Singh *et al.* (1987) and Sarkar and Torofder (1992). The higher yield was owing to the additive and complimentary effect of growth and yield-attributing characters (Table 1). The major contribution in increasing the seed yield at 125 kg/ha was from number of effective tillers/m². However, further increase in number of tillers/m² significantly decreased the 1,000-grain weight and grains/ear (Table 1). The moisture content decreased with an increase in the seed rate. The increase in seed rate in turns resulted in higher number of tillers/m², acceleration in the loss of water through transpiration which finally led to low soil-moisture content. The pooled data

Table 1. Effect of seed rate and method of sowing on growth, yield and economics of wheat (mean data of 1990–91 and 1991–92)

Treatment	Effective tillers/m ²	Plant height (cm)	Ear length (cm)*	Grains/ear*	1,000-grain weight (g)*	Grain yield (q/ha)	Straw yield (q/ha)	Net return (Rs/ha)	Benefit : cost ratio	Soil moisture at harvest (%)
<i>Seed rate (kg/ha)</i>										
100	145.7	66.9	5.23	30.4	34.65	9.74	16.35	1,785	1.71	9.25
125	166.1	64.5	5.45	30.3	34.37	10.48	16.43	1,916	1.72	8.95
150	169.8	64.9	5.15	26.5	33.97	10.72	17.68	1,906	1.68	8.97
175	178.5	59.9	5.20	26.0	33.96	10.44	17.15	1,630	1.55	8.32
200	193.5	60.5	4.47	25.7	34.09	9.90	18.40	1,428	1.46	7.83
CD (P = 0.05)	12.61	4.20	0.50	1.84	NS	0.57	1.21			
<i>Sowing method</i>										
Line sowing	174.7	63.2	5.07	28.8	34.88	10.05	17.10	1,734	1.64	8.23
Cross-sowing	166.8	63.5	5.12	26.7	33.54	10.27	17.31	1,612	1.55	9.10
CD (P = 0.05)	NS	NS	NS	1.16	0.47	NS	NS			

* Data of 1991–92

for 2 years showed that the straw yield of wheat was also significantly increased over 100 kg/ha treatment by all the treatments except 175 kg/ha. The data indicated that there was a difference in trend of increase in grain and straw yields of wheat with increase in seed rate. This was due to the fact that increased number of tillers/m² increased the loss of water through transpiration, left insufficient moisture in the soil layers at the time of the reproductive phase, which might have restricted the translocation of carbohydrates to the sink and resulted in decreased grain yield under treatments of higher seed rate.

The highest net returns recorded in 125 kg/ha seed rate, being higher by Rs 131/ha over 100 kg/ha. The highest benefit : cost ratio of 1.72 was also recorded in the same treatment.

The method of sowing did not influence the grain and straw yields of wheat signifi-

cantly. However, the net returns obtained under line-sowing method were Rs 122/ha higher over cross-sowing.

It may be concluded that under tank-bed condition wheat should be sown in lines with 125 kg/ha seed rate to obtain the maximum yield and net returns.

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Effect of fertilizer level and sowing time on yield of *khapli* wheat (*Triticum dicoccum*)

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In Maharashtra *khapli* wheat (*Triticum dicoccum* Schiibl.) is cultivated on a limited areas in Kolhapur, Pune and Solapur districts. Generally, it is grown under irrigated,

late-sown conditions, particularly after the sugarcane without following any improved technology. The area under this wheat is only 1% of the total area sown under wheat

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