

## Effect of Nitrogen, Row Spacing and Seeding Rate on the Yield of Wheat under Late Sown Conditions

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A field trial was conducted for three consecutive years in rabi season of 1977-78, 1978-79 and 1979-80 at Agricultural Research Station, Durgapura to study the effect of nitrogen levels, row spacing and seeding rate on the yield of wheat under late sown conditions. Highest grain & straw yield was obtained with 90 kg N/ha and closer spacing i.e. 15cm apart. Different seed rate could not impart any significant effect on grain and straw Yield.

Sowing of wheat specially of dwarf varieties is delayed as a result of adopting multiple and relay cropping systems. Under normal sown conditions intensive studies had been carried out for increasing the wheat yield but mitigating the adverse effects of late sowings is still an important aspect to be investigated. Plant population and optimum dose of fertilizer application are among the important factors for higher wheat yield under late sown conditions. Gupta *et al* 1970 have recommended higher dose of nitrogen for late sown wheat. Seeding rate and row spacing are the important factor for maintaining proper plant population. Closer spacing for late sown wheat had been recommended by Mathur 1966 and Agrawal *et al*. 1979.

### MATERIAL AND METHODS

A field experiment was conducted for three years during rabi seasons of 1977-78, 1978-79 and 1979-80 at Agricultural Research Station, Durgapura to study the effect of nitrogen levels i.e.

60, 90 and 120 kg N/ha, row spacing i.e. 15 and 22.5 cm and seed rate i.e. 80, 100 and 120 kg/ha. The soil of the experimental site was sandy loam in texture, low in available nitrogen, medium in phosphorus and high in potash. The trial comprised of 18 treatments and conducted in split plot design with row spacing and nitrogen levels in main plots and seed rates in sub-plots. The experiment was replicated four times. The experimental crop was sown on 21st, 16th and 23rd December of 1977, 78 and 79, respectively. A basal dose of 40 kg P<sub>2</sub>O<sub>5</sub> and 30 kg K<sub>2</sub>O/ha was drilled at the time of sowing along with half dose of nitrogen as per treatment. Remaining half dose of nitrogen was applied as top dressing at 1st irrigation. Sonalika variety was used.

### RESULTS AND DISCUSSION

(A) Effect of main treatment (Row spacing x nitrogen levels)

There was significant effect of main treatment on grain and straw yield

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during all the three years except straw yield in the year 1979-80. Highest grain and straw yield was recorded with T1 i. e. 15cm row spacing and 90 kg N/ha in the year 1977-78 and 1978-79 whereas during 1979-80 the highest grain and straw yield was recorded with T3 i. e. 15cm row spacing and 120 kg N/ha. The average data of three years shows highest yield with 15cm row spacing and 90 kg/ha. All yield attributing characters also shows superiority with T2 i. e. 15cm row spacing and 90 kg N/ha which might have resulted in higher grain and straw yield. During 1st year maximum grain and straw yield 35.43 and 55.06 q/ha was obtained with T2 which was significantly higher over T1, T3 and T4 while at par with T5 and T6. While during 2nd year the grain yield of T2 was significantly higher over T1 and T6 while at par with T3, T4 and T5. Maximum straw yield 49.44 q/ha was recorded with T2 which was significantly higher over T3, T4, T5 and T6 while at par with T1 only. During third year lowest grain was obtained with T4 which was significantly lower over other treatments. Upadhyaya and Chaudhary 1971, and Agarwal *et al.* 1979 have concluded that closer spacing is better over wider spacing for getting higher yields in wheat crop. Singh *et al.* (1971) reported that 80kg N/ha is optimum dose of nitrogen beyond which there was no significant effect on the yield of wheat.

#### (B) Effect of Sub-Treatment (Seed rate) :

The difference in grain and straw yield due to different seed rates were

not found to be significant during all the three years. This was in conformity with the findings of Gupta *et al.* 1968, Shekhawat *et al.* 1975 and Barthakur *et al.* 1979. From the data presented in Table 1 and Table 2 it can be observed that seed rate could not impart level of significance though higher seed rate showed superiority over lower seed rates.

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Table 1 Effect of main treatments (row spacing (R) and Nitrogen levels (N) and sub treatment (seeding rates on the grain and straw yield of wheat kg/ha).

Treatments	Grain yield				Straw yield			
	1977-78	78-79	79-80	Mean	1977-78	78-79	79-80	Mean
Main Treatment								
T1-R1 N0	24	17	19	20	41	49	54	48
T2-R1 N90	35	18	20	24✓	55	49	56	54✓
T3-R1 N120	26	14	20	20	44	39	63	49
T4-R2 N60	20	13	15	16	37	33	50	40
T5-R2 N90	29	13	19	20	47	38	55	47
T6-R2 N120	31	16	19	22	51	40	58	50
C. D. at 5%	7.50	3.25	2.19		10.77	8.21	NS	