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Short Note

Performance of new wheat varieties (*Triticum aestivum* L.) at different nitrogen levels under rainfed conditions

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In Himachal Pradesh, wheat is the major *rabi* crop grown on 365.5 thousand hectares with productivity level of 17.3 q/ha (Anonymous 2004). Among many factors, lack of high yielding varieties and inadequate and imbalanced fertilization are major reasons for low productivity of wheat in the state. A field experiment during *rabi* 2004-05 was conducted at CSK Himachal Pradesh Krishi Vishvavidayalaya, Rice and Wheat Research Centre, Malan, to study the performance of new wheat varieties at varying nitrogen levels. The soil of the experimental site was silty clay loam in texture, acidic in reaction (pH 5.7), medium in available nitrogen (343.1 kg/ha), phosphorus (29.9 kg P_2O_5/ha) and low in potassium (115.5 kg K_2O/ha).

The treatments consisted of three levels of nitrogen viz. 40 (50 % of recommended dose), 60 and 80 kg/ha in main plots and five genotypes viz. VL 858, TL 2934, HS 240, VL 738 and VL 804 in sub plots of split plot design with three replications. The gross plot size was 8.0 m x 1.61 m and net plot size was of 7.0 m x 1.16 m was harvested for yield. All the treatments received a basal application of half of nitrogen and full dose of phosphorus and potash and the remaining half of nitrogen was applied after the receipt of first rainfall. The crop was sown on 20th November, 2004 and harvested on 14th May 2005. The crop received 385 mm rainfall. The mean weekly minimum and maximum temperatures ranged between 3.9°C to 16.3°C and 15.1°C to 31.1°C, respectively. The data on ear heads per meter row length was recorded at two spots in a plot and ear heads per meter square were computed. Ten ears were selected randomly and grains per ear were counted. Five hundred seeds were counted manually and weighed to compute the test weight. Straw yield was computed by deducting grain yield from biological yield.

The data on yield attributes, grain and straw has been presented in Table1.

Effect of nitrogen levels: Nitrogen levels had no significant effect on different yield contributing characters viz. number of ears per square meter and number of grains per ear, though 80 kg/ha nitrogen level recorded slightly higher values of these attributes compared to lower levels. The cumulative effect of though non-significant but higher yield attributes might be responsible for higher grain yield at 80 kg N/ha than other two levels. The straw yield also recorded higher value at highest N level tested. Similar results has also been reported by Negi and Mankotia (1999)

Effect of genotype: Genotypes exhibited significant variation in yield attributes viz. number of ears per m^2, 1000-seed weight and on grain & straw yield (Table1). Significantly highest number of ears per meter square, being at par with TL 2934, was recorded in HS 240.VL 738 & VL 804 produced statistically equal number of ears per meter square.

Table 1. Yield attributes, grain and straw yield as influenced by different wheat varieties and nitrogen levels

Treatment	No. of ears per m^2	No. of grains per ear	1000-seed weight (g)	Grain yield (q/ha)	Straw yield (q/ha)
Nitrogen level (kg ha^{-1})					
40	293.9	64.9	40.65	28.47	66.05
60	300.9	65.4	41.77	28.85	73.36
80	308.6	67.2	40.83	32.72	74.84
CD (P=0.05)	NS	NS	NS	2.69	NS
Varieties					
VL 858	289.2	73.2	45.05	35.85	69.29
TL 2934	318.8	64.8	40.26	29.84	71.78
HS 240	332.8	62.1	35.37	26.84	85.01
VL 738	273.7	65.2	41.42	24.04	52.74
VL 804	289.8	64.0	43.30	33.49	78.34
CD (P=0.05)	37.3	4.73	1.77	2.72	5.01

Significantly highest number of grains (73.2) per ear was observed in VL 858 and all other varieties were at par with each other. VL 858 & VL 804 being at par with each other, recorded higher 1000-

seed weight followed by TL 2939, VL 838 and HS 240. Due to higher number of grains per ear and 1000-seed weight, VL 858 produced significantly highest yield (35.85 q/ha), being at par with VL 804, followed by TL 2934, HS 240 & VL 738 which were also found statistically different from one another. Straw yield was significantly highest in HS 240 primarily due to more tillering.

Thus, VL 858 a new test entry was the highest yielder though at par with check variety VL 804 and these two varieties were significantly superior to rest of the varieties. The interaction effect between nitrogen level and varieties was not significant and the crop yield was significantly higher at highest level of N tested i.e. 80 kg N/ha. The results, therefore, point towards a definite need to go for testing of further higher nitrogen levels under mid hill conditions of the state.

References

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