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SCREENING OF NEWLY RELEASED WHEAT (*TRITICUM AESTIVUM* L. EM THELL.) VARIETIES IN THE CATCHMENT OF KURNA RIVER IN THE FOOTHILLS OF THE HIMALAYAS

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Wheat (*Triticum aestivum* L. em Thell.) is an important staple food crop of India. It is cultivated in a wide range of agroclimatic conditions. According to Singh *et al.* (2002), there are a large number of wheat varieties specifically recommended for cultivation in the five wheat growing mega zones. Wheat varieties have been recommended for state-wise cultivation by Tiwari *et al.* (2006). Performance of varieties may also vary according to local variations in the soil fertility, soil moisture, pollution load and local farming practices within a zone. Therefore, to find out the suitable varieties for specific farm conditions, one has to test the performance of these varieties. In the present paper, we report the performance of four newly released wheat varieties that were tested here at our college farm against commonly cultivated standard check variety PBW 343. The college farm comes under both the lowland and upland conditions in the lower catchment of the Kurna river.

River Kurna receives pollutants from three main sources of pollution situated in its upper catchment: 1. Urban waste from Deoria city, 2. Sugar and paper factories and 3. agricultural waste with run off water. An effort is made to check whether the polluted water of the Kurna river could be used for fertigation purposes. In fact, according to Singh and Shahi (2002), "organic and inorganic mixed materials of sugar mill pollutant were not injurious but enhanced the yielding ability in the wheat plants along with improved quality of protein". However, according to some farmers, mustard crop suffers serious injuries when irrigated with the polluted water of the Kurna river. Therefore, our objectives were: 1. to test the performance of newly released wheat varieties in flooded (upland and lowland) and non-flooded fields (or farmers' field = control plots) of the Kurna catchment, and 2. to demonstrate the farmers about right package of practices to be followed in the cultivation of these varieties.

In compliance to the above stated objectives, a varietal trial of wheat was conducted during 2006-07 rabi season. The research material constituted K 9107 (Dewa), K 9423 (Unnat Halna), HUW 468 & K 9533 (Naina) varieties of wheat. The breeder seeds of these varieties were procured from the Economic Botany Rabi Cereals section of Chandra Shekhar Azad University of Agriculture & Technology, Kanpur. PBW 343 is the most popular variety in this region and hence it was used as a standard check variety. The details of these varieties are given in Table 1.

The trials were conducted at three places: 1. Flood affected zone (=lowland), 2. Non-flooded zone (=upland) and 3. Control plots on the farmer's field. Land preparation and other standard cultural practices were adopted. The recommended time of sowing for K 9107 and HUW 468 is second to third week of November. Therefore, these varieties were sown on 20th November 2006. K 9533 and K 9423 are late sown varieties and the recommended time of sowing for these varieties is mid December. Therefore, these varieties were sown on 15th December 2006. Farmers were involved in the demonstration of the package of practices. Sulphur dusting at the rate of 25 kg/ha was done to control the yellowing of plants. The data were recorded on parameters like plant height, ear-bearing tillers (EBT), ear length, flag leaf area, test weight and the economic yield. The experiment was repeated during 2007-08 rabi season. A number of farmers also tried these varieties at their farms during this season.

These trials have proved to be a great success as bumper crops have been harvested both at the college farm as well as at farmers' fields. Farmers and the college staff are happy with the performance of these

Table-1 : The details of the standard check and the selected varieties.

Variety	Release year	Conditions	Recommended region(s)
K 9107 (Dewa)	1996	Irrigated, timely sown	Eastern U.P. and eastern north India
K 9423 (Unnat Halna)	2004	Irrigated, late and extremely late sown	All U.P.
HUW 468		Irrigated, timely sown	NEPZ
K 9533 (Naina)	2002	Irrigated, late sown	All U.P.
PBW 343 (Standard check)		Irrigated, timely sown	NEPZ and NWPZ

Table 2 : The summary of the recorded data on the standard check and the selected varieties.

Variety	Plant height (cm)	Ear-bearing tillers/(plants)	Ear length (cm)	Flag leaf area (cm^2)	Test weight (g)
K 9107	99.30	5.44	11.38	37.07	45
K 9423	74.75	4.24	9.32	28.55	41
HUW 468	76.21	4.21	10.83	31.71	43
K 9533	90.55	5.57	10.61	28.19	44
PBW 343	84.86	4.8	9.84	24.44	40

Table-3 : Analysis of wheat yield (kg/ha) during 2006-07, 2007-08 and pooled data.

		Upland			Lowland			Control	
Variety	**2006-07**	**2007-08**	**Mean**	**2006-07**	**2007-08**	**Mean**	**2006-07**	**2007-08**	**Mean**
K 9107	4712	4840.25	4776.5	4776.25	4823.25	4800.3	4668.5	4712.25	4690.5
K 9423	4026	4131	4078.75	4124	4163.75	4144	4134.5	4159	4147
HUW 468	5006.75	5042.75	5024.75	4874.5	4914.75	4894.8	4785.25	4821.75	4803.75
K 9533	5201.75	5231.75	5217	4973.5	5005.75	4990	4818.25	4843	4831
PBW 343	4617	4505.25	4561.25	4596.75	4658.75	4628	4611.75	4651.75	4631.75
SE ±	70.27	97.11	75.36	131.23	124.27	127.31	113.53	114.05	113.32
CD (P = 0.05)	149.74	206.94	160.58	279.64	264.81	271.29	241.93	243.03	241.48

trials. On the basis of performance during 2006-07, a number of farmers, distributed over a few districts of eastern Uttar Pradesh, were also given these seeds during 2007-08. The results at both the places viz., at college farm and at farmers' fields are quite encouraging. Yield performance of these varieties is roughly in the sequence of K 9533 (5217 $kgha^{-1}$) > HUW 468 (5024.75 $kgha^{-1}$) > K 9107 (4776.50 $kgha^{-1}$) > PBW 343 (4561.25 $kgha^{-1}$) > K 9423 (4078.75 $kgha^{-1}$) in the upland condition. The most preferred and demanded variety is K 9533. However, K 9107 is preferred for its high biomass as straw and high protein content in grain. HUW 468 is being preferred amongst dwarf varieties especially for combine-harvesting where straw is not considered important by large farmers. K 9423 is being preferred as a short duration late sown variety especially by sugarcane farmers.

The summary of the recorded data on parameters like plant height, ear-bearing tillers (EBT), ear length, flag leaf area, test weight are given in Table 2. An analysis of wheat yield during 2006-07, 2007-08 and pooled data is given in Table 3. These are only rough idea of economic yield because the bumper crop suffered setback from crop predation by Nilgai and pilferage by locals. Naina and Dewa are performing very well in this region. Therefore, we strongly recommend the extension workers to suggest adoption of these varieties by farmers of this area in place of PBW 343. It is important to note that sometimes PBW 343 shows total failure of seed-setting (locally called ***farra*** disease). The plants of Unnat Halna were yellow in all the three places and became normal green after sulphur dusting. Therefore, farmers should be instructed for proper sulphur dusting in cultivation of this particular variety. The crop stand in these trials was so appealing that almost all the crop produce was sold in advance for next year's seed.

The reaction of different genotypes in various environments varies and our objective of screening

these newly released varieties in the catchment of Kurna river is fulfilled. As per the achievements of the trial, we strongly recommend Deva and Naina varieties for cultivation in this region. Other two varieties are also being preferred by some farmers under certain conditions. A number of farmers especially a few teachers of our college have already adopted these varieties and are getting benefited by better harvests of grain and straw. Deva & Naina are likely to replace the most popular variety PBW 343 of this region gradually. Judging by crop stand and farmers' preference, the polluted water of Kurna river could fruitfully and easily be used for fertigation purposes in the lowlands of its lower catchment.

CONCLUSION

Four newly released wheat (*Triticum aestivum* L. em Thell.) varieties *viz.,* K 9107, K 9533, HUW 468 and K 9423 were tested in a replicated yield trial under upland, lowland and control conditions for two consecutive years during 2006-07 and 2007-08 for their performance in the catchment of Kurna river in the foothills of the Himalayas. The most popular variety of this area, *i.e.*, PBW 343, was used as a standard check. Yield performance of these varieties under upland condition was in the sequence of K 9533 > HUW 468 > K 9107 > PBW 343 > K 9423. The most preferred and demanded variety was K 9533. However, K 9107 was preferred for its high biomass as straw and high protein content in grain. HUW 468 was preferred amongst dwarf varieties especially for combine harvesting where straw is not considered important. K 9423 was preferred as a short duration and late sown variety especially by sugarcane farmers.

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