

Performance of the Various Varieties on Growth and Yield of Wheat Crop (*Triticum Aestivum* L.)

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ABSTRACT

Wheat is the dominant crop in temperate countries being used for human food and livestock feed. Its success depends partly on its adaptability and high yield potential but also on the gluten protein fraction which confers the viscoelastic properties that allow dough to be processed into bread, pasta, noodles, and other food products. There are various factors, which are responsible for low and high yield of wheat crop in the country but among these sowing time and varietal selection are of primary importance. Wheat is the main crop of winter season and it has its own definite requirements for temperature and light for emergence, growth and flowering. Selection of suitable crop varieties according to the agro climatic condition may play crucial role in realizing the optimum production of any crop commodity. Therefore the present study was conducted to judge the performance of the various wheat varieties under late sown conditions in the field achieving novel improvements in crop management. The experiment comprised of eight treatment combination and test in randomized block design (RBD) with three replication Experiment consisted of one factors, viz. eight different varieties of wheat crop HUW-234, PBW-373, Saikedarplus, SGN-303, ML-5660, PBW-502, PBW-752, Anuradha. were sown under 22 December. Sowing date and varieties significantly influenced the growth characters of wheat crop. The crop sown 22 December variety pbw-373 recorded highest plant height (cm), number of tillers/m², dry matter accumulation (gm²), leaf area index compared to rest of sowing different varieties.

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INTRODUCTION

Wheat (*Triticum aestivum* L.) which belongs to the family Poaceae, is the world's most widely cultivated cereal crop. In India, wheat is the second most important cereal crop next to rice contributing nearly 35 per cent to the national food basket and plays an important role in food and nutritional security. It finds a major place in both time meals of common population in major wheat growing states. The cultivation of wheat has also been symbolic of green revolution, self-sufficiency in food and sustained production. As a result of technological innovation, the country is 107.59 million tones in an area of 31.45 million hectares (2019-20 Estimated data). India ranks second among wheat producing country in the world. This phenomenal increase in production is by and large attributed to adoption of high yielding varieties.

The contribution of wheat is maximum as a result of its wild adaptability occupying nontraditional rice growing area in eastern India as well as late sown and problematic areas about from the amenability to technological innovation. Wheat maintains superiority in area, production and versatility in adopting a wide range of agro climates. It occupies prime position for the nutrition of nearly 36 per cent of the world population. Nevertheless, the progress should not make us contented as the country face countless challenges in the form of population growth coupled with decreasing arable land, depleting water resources and climate change. As population is increasing leads to an increase demand of wheat with no possibility in further increase in area due to growing urbanization. As per present population growth rate population of India by 2025 will be

around 1.3 billion and assuming 20 percent more per capita requirement of food grain, due to better standard of living and increase in the demand of processing industries, requires wheat production to be around 109 million tonnes by the year 2025 AD. Wheat is mainly used as house hold cereal.

MATERIALS AND METHODS

The present investigation entitled "**Performance of the various varieties on growth and yield of wheat crop (*Triticum aestivum* L.)**". Trial was performed in session 2019-20 with one year of trial which were done at Pili-Kothi Student Research Farm, and also in the laboratory Department of Agronomy of T.D.P.G. College Jaunpur. The experimental site is situated on the right side of river Gomati at the latitude 25 43'58" N & longitude 8241'10"E and at an altitude of 83 meters. Plots of homogeneous fertility were selected from the field and well connected, keeping in view with irrigation channel and with the source of irrigation. Pili Kothi Farm is situated in Jaunpur the eastern part of Uttar Pradesh with sub tropical climate being often subjected to extremes of weather conditions, i.e., heat of the summer and cold of the winter. May and June months are the hottest months with mean maximum temperature ranging from 36 to 43.8°C. However, the coldest month is January with the average temperature varying from 4,7-10.5°C with occasional extreme the normal period for the onset of monsoon in this reason is the third week of June which lasts up to the end of the September the area occasionally experience cyclonic ranges during winter months the normal annual rain fall is 1100 mm. out which about 64.0 % is received for June to September 0,07% from October to December, 6% from the January to February and 9.3% from March to May as pre monsoon ranges. The mean relative humidity of the area is about 68% with maximum of 81% during July to September and minimum of 38% during April to early July respectively.

The experiment was conduct out in Randomized Complete Block Design Gross Plot size of 4.0 x 4.0 m and 20.0 cm was sown row spacing .Crop was sown at recommended seed rate of 125 kg ha⁻¹.Five irrigation applied was during crop period. Nitrogen was applied @100kg through Urea, Phosphorus was applied @40kg as SSP and Potash given by MOP. All other cultural practice were applied to need.

VARIETIES

HUW- 234:

1. Year of Identification / Release: - 1984 / 1986.
2. Area of adaptation: - North Eastern Plains Zone (NEPZ).
3. One gene dwarf.

4. An excellent variety for late sown (25 November to Last week of
5. December) irrigated conditions. It also performs very well in timely sown irrigated conditions.
6. Suitable for general cultivation, zero tillage and surface seeding.
7. Grain yield per hectare 45 to 50 q/ha.
8. A very good variety for chapatti making quality.

PBW-373:

PBW-373 is a wheat variety suitable for timely and late sown and irrigated conditions. It gives an average yield of 55-60 q/ha. The variety normally takes about 126-134 days to mature. On maturity the plants of the variety attains a height of 80-90 cm. The variety is resistant to karnal bunt. Although care should be taken to save it from the attack of loose smut. Its protein contents is 12-13 % (PBW-373). Suited for cultivation in the northern and western plains of UP, Punjab, Uttarakhand and irrigated plains of Haryana. Suggested period of sowing is from 2nd week of November to 3rd week of December.

General Characteristics

- The year of release was 1996.
- The variety was developed by PAU, Ludhiana.
- The variety is widely adopted in the area NWPZ. The potential yield of this variety is 55-60 quintal per hectare.



Anuradha:

Plant height is 95-100 cm. Earheads are white in colour. Suited for cultivation in the northern plains of Punjab, Western U. P. Uttarakhand and irrigated plains of Haryana. Crop is ready for harvest in approx 125-130 days from timely sowing. Under optimum conditions, estimated yield is 45-50 quintals per hectare.

SGN-303:

- Period of Spike Emergence- 99 days.
- Average Plant Height- 88cm.
- Profuse tillering habit.
- Attractive, Lustrous & Bold Grains.
- Per 1000 grain Weight- 48 g.
- Strong tillers and tolerant to logging.
- Suitable for both early & late sowing.

Saikedarplus:

- Year of Identification / Release: - 2002\2008.
- Area of adaptation: - (NEPZ and NWPZ) in up bihar
- Strong tillers and Tolerant to logging.
- A good variety for late sown (25 November to Last week of December).
- Irrigated conditions.
- Suitable for general cultivation, medium tall plant duration (110-120DAS).
- Grain yield per hectare 45-50 q/ha.
- Gold grains coupled with good chapatti making quality.

ML-5660:

ML-5660 is a double dwarf variety with an average plant height of 101 cm.

EXPERIMENTAL FINDINGS**TABLE.1 Effect of various varieties on growth parameters of wheat crop**

Treatments	Growth Parameters			
	Plant height (cm)	Number of tillers(m ⁻²)	Dry matter accumulation (gm ²)	Leaf area index (90DAS)
HUW-234	90.10	363.66	1184.65	3.15
Anuradha	81.37	366.33	1184.39	3.13
ML-5660	83.67	361.66	1184.29	3.13
SGN-303	71.89	351.00	1288.40	3.11
PBW-373	92.46	378.00	1184.00	3.17
Saikedarplus	84.00	374.33	1286.44	3.14
PBW-752	81.32	371.00	1284.00	3.13
PBW-502	83.87	368.66	1180.67	3.13
SE(m)	0.41	3.93	0.361	0.004
CD at 5%	1.27	12.04	1.106	0.012

TABLE.2 Effect of various varieties on yield and Yield Component of wheat crop

Treatment	No of Ear head/m ²	Length of spike (cm)	Test weight (g)	Grain yield (q ha ⁻¹)	Straw yield (q ha ⁻¹)	Harvest index (%)
HUW-234	319.10	8.43	35.95	42.84	64.44	40.80
Anuradha	313.66	8.41	36.63	45.58	63.87	40.10
ML-5660	322.03	8.43	36.46	43.41	58.40	39.72
SGN-303	309.29	8.30	35.85	42.71	58.18	39.44
PBW-373	344.12	10.17	38.76	53.35	69.83	41.98
Saikedarplus	341.00	10.10	36.63	48.97	67.55	40.80
PBW-752	338.52	9.13	36.39	47.06	64.73	40.94
PBW-502	325.86	9.13	35.77	49.36	68.15	40.83
SE(m)	0.253	0.039	0.256	0.40	0.214	0.433
CD at 5%	0.775	0.120	0.783	1.22	0.65	1.32

RESULT

Wheat crop sown on 22 December recorded with higher variety PBW-373, higher No of ear head (344.12/m²) than higher spike length (10.17 cm), more grain/spike (42.66) and 1000 grain weight (38.76g) that recorded under 22th December sown wheat resulted in cumulative effect of these yield attributing parameter produced (53.35q/ha) higher

It has profuse tillering Ears are medium dense and tapering in shape with white glumes. Its grains are amber, medium bold, hard and lustrous.

PBW-752: PBW-752 wheat seed plant height is 85-95 cm .suited for cultivation in the eastern part of country. Medium duration variety (105-115). It gives an average yield of 46 -50q/ha.

PBW-502:

PBW-502 wheat seed plant height is 95-100 cm. Plant growth semi-errect cultivation in the NWPZ and NEPZ eastern part of country Medium duration variety (130-135) days grain colour yellowish It is gives an average yield of 50-55q/ha straw pith medium thick it is resistant of insect pest and disease grain is yellowish white and early sowing of the wheat varieties.

grain yield as compare to Varieties SGN-303 recorded with lower No. of ear head (309.29/m²) lower spike length (8.30cm) No of grain/spike (40.00) and 1000 grain weight (35.85g) grain yield (42.71q/ha) and PBW-502, Saikedarplus, PBW-752, Anuradha, ML-5660 ,HUW-234 all various varieties. As per crop need boosting crop growth in the form of higher photosynthetic accumulation and

resulting higher yield parameters. This results also in conformity.

DISCUSSION

Wheat crop sown on 22 December recorded with higher plant height, PBW-373. percent higher dry matter accumulation by crop at 30, 60, 90, and At harvest DAS and at maturity respectively compared to that sown on 22 December.

Enhanced plant height due to sowing on 22 December as higher variety PBW-373 compared to all different varieties.

Wheat variety PBW-373 recording with higher total tillers compared to other varieties. tillers at maturity compare to mean total tillers of PBW-502, Saikedarplus, PBW-752, ML5660, HUW-234, Anuradha and SGN-303 also recorded increased dry matter accumulation compared to the other different varieties. Leaf area index of PBW-373 at 30 DAS was significantly superior over HUW-234, Anuradha, Saikedarplus, ML-5660, PBW-752, PBW-502, SGN-303 and All varieties but the varieties SGN-303 less were at par with each other among All varieties Leaf area index at 60 DAS and 90 DAS exhibits similar trend as it was in case of 30 DAS.

CONCLUSIONS

On the basis of results obtained the following conclusion can be drawn late sown wheat (22 December) give 53. 35q/ha higher yield.

The ratio various varieties Among wheat varieties, PBW-373 was found to be more suitable growth and yield of wheat crop late sown condition in agro climatic condition. PBW-373 varieties was recorded maximum grain yield over SGN-303 and various varieties of wheat crop. PBW-373 varieties was recorded for the better grain and straw ratio which was followed by SGN-303.



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