Print ISSN 2230 – 9047
Online ISSN 2231 – 6736
Vol. 14, No. 3, September-December, 2019

Journal of Community Mobilization and Sustainable Development

Society for Community Mobilization for Sustainable Development
New Delhi - 110 012

Journal of Community Mobilization and Sustainable Development Vol. 14(3), 435-438, September-December, 2019

Evaluation of Wheat Varieties for Timely Sown Condition in District Bijnor (Uttar Pradesh) with Special Reference to the Yield Gap and their Adoption in District

K.K. Singh* and D.P. Singh
Krishi Vigyan Kendra, Bijnor-246762, Uttar Pradesh

ABSTRACT

A study was undertaken to assess the yield performance, yield gap and adoption of six timely sown wheat varieties viz. HD-2967, DBW-88, HD-3086, PBW-550, DBW-17 and PBW-343, under rice- wheat cropping system during 2014-15to 2016-17. The analysis of the data indicated that there was considerable yield increase ranging from 8.77 to 29.91 percent between varieties over farmers practice. Variety HD-2967 yielded 54.54 qt/ha with the net return of Rs. 76809.77/ha and benefit cost ratio of 2.82.

Keywords: Timely sown wheat varieties, Yield gap analysis and adoption

INTRODUCTION

Wheat is the pre-eminent among the world's crops with regard to its antiquity and its importance as a staple food of mankind. Thus wheat plays an important role in food security and poverty alleviation as a strategic crop and has an important role in economy (Anon., Cereal Annual Report 1998 ICARDA Aleppo, Syria). Blum (1988) suggested that breeding for tolerance to drought involves combining good yield potential and the selection of traits that provide drought stress tolerance. India, one of the greatest success stories of green revolution, is the second largest producer of wheat in the world after china and contributes more than 12% to the global wheat basket. Wheat is the second most important crop after rice in India. In India wheat is grown in about 314.65 lakh ha area with an average productivity of 2750 kg/ha (2014-15), according to Annual Report of Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare Government of India-2016-17. Out of which around one-third (11.0 m ha) lies in the state of Uttar Pradesh alone. The productivity of the state is close to the national average as the major constraints are cultivation of old low yielding and disease susceptible varieties, and adoption of poor wheat production technologies. In Bijnor district total area under wheat is about 1, 15,000 to 1, 18,000 ha. The choice of right varieties under timely sown condition is one of the crucial points determining the yield of wheat. The yield and productivity of timely sown wheat varieties is less or stagnant due to farmers unawareness about high yielding varieties and also non availability of varieties having significantly higher yield as compared to the existing varieties under changing climatic conditions.

Seven Timely sown wheat varieties viz. HD-2967, DBW-88, HD-3086, PBW-550, DBW-17 and PBW-343, were selected for the higher yield gap analysis and adoption in present study.

MATERIALS AND METHODS

The trial was conducted at farmer's field during *rabi* 2014-15 to 2016-17. There are eleven blocks in Bijnor district, all of the eleven blocks were selected randomly. Thus the 22 villages were selected for the study. A village-wise list wheat growers, was prepared and from that list 44 farmers were selected randomly. Six timely sown wheat varieties including farmers practice, namely HD-2967, DBW-88, HD-3086, PBW-550, DBW-17 and PBW-343 were used for evaluation. The wheat variety PBW-343 is selected as local check. These varieties are selected due their higher yield potential and suitability for the district. The source of technology is HD-2967 and HD-3086 from IARI, New Delhi, PBW-550 and PBW-343 from PAU, Ludhiana) and DBW-17 from IIWBR, Karnal. The total 44 farmers were selected with the 11 ha total land area (each demonstration

*Corresponding author email id: krishna.singh1976@gmail.com

field having 0.25 ha land). The seed yield and net returns data were analysed. For the estimation of technology gap, extension gap and technology index, the formulae were used as per method of Sagar and Chandra (2004).

Technology gap = Potential yield – Demonstration yield

Extension gap = Demonstration yield – farmers yield

Technology Index = [(Potential yield – Demonstration yield)/Potential yield] x 100

RESULTS AND DISCUSSION

From the data in Table 1 it is quite clear that the per cent increase in the yield over local check FP (PBW-343) was 29.91, 24.88, 19.13, 8.77 and 9.03 for HD-2967, DBW-88, HD-3086, PBW-550 and DBW-17 respectively. The seed yield increased significantly in the range of 46.36 to 54.54 qt/ha in timely sown wheat varieties as compared to farmers practice (42.75 qt/ha). This indicates that field demonstrations were quite successful in bridging up yield gaps between improved and farmer practices (Rana *et al.*, 2002). Singh and Rana (2006) reported that seed yield increased up to 20.70 qt/ha by Pusa Barani variety of mustard crop. Singh *et al.* (2011) reported varietal differences in the terms of seed yield and yield gaps between newly and old varieties of wheat in late sown condition. Biswas *et al.* (1998) also reported varietal differences of grain yield in scented rice. In 2011 Singh *et al.* (2011) also reported that increasing seed yield in basmati rice variety Pusa Basamti-1401.

The economics of demonstrations are depicted in Table 2, indicate that the additional net return of timely sown wheat varieties over farmers practice ranged from Rs. 7957.50/ha to Rs. 31186.27/ha. It is high in HD-2967 (Rs. 31186.27/ha). Singh *et al.* (2013) reported about the additional net return in analysis of timely sown wheat varieties. The gross return of timely sown wheat varieties ranged between Rs. 99281.50 to 118908.90/ha and net return Rs. 55450.00 to 84050.61/ha also. The highest net return of Rs. 76809.77/ha of HD-2967 are in line with the finding. Singh and Rana (2006) reported about Rs. 13149.00/ha of net return in mustard crop. Singh and Singh (2012) also reported about Rs. 111057.84/ha, of net return in basmati rice.

The benefit cost ratio (Table 2), of timely sown wheat variety HD-2967 ranked first (2.82) followed by DBW-88 (2.62), HD-3086 9(2.49), PB550 (2.43) and DBW-17 (2.17). Hedge (2006) reported that mustard crop by nature is hardy and mostly grown under rainfed condition can impart stability of production system under harsh condition. The benefit cost ratio of HD-2967 was also higher in all the blocks in comparison to local check in district Saharanpur of Utter Pradesh (Singh and K Singh, 2015).

Technology gap (Table 1) ranged from 10.56 to 20.17 per ha, with an overall mean differences of 15.95 qt/ha. This gap was minimum in HD-2967 (10.56) and maximum in HD-3086 (20.17). The gap between potential and front line demonstrations is due to climatic, edaphic, socio-economic and management practices. Kadian *et al.* (1997) reported that technology gap can be narrowed down only by location specific technology based recommendations. Verma *et al.* (2017) reported that Technology gap ranged from 5.2 to 7.40 qt/ha, with an overall mean difference of 6.41 qt/ha in basmati rice.

Table 1 showed, that the extension gap ranged from 3.61 to 12.79 qt/ha, with an overall mean differences of 7.79 qt/ha. High extension gap (12.79 qt/ha.) was recorded from variety HD-2967, followed by DBW-88 (10.64), HD-3086 (8.18) PBW-55(3.75) and DBW-17 (3.61) qt/ha. This

Table 1: Productivity, yield gap, extension gap of timely sown wheat varieties

Varieties	No. of trials	Avg. Yield (qt./ha)			% Yield increased	Technology gap (qt./ha)	Extension gap (qt./ha)	Technological index
		PY	DY	FP				
HD-2967	50	66.10	55.54	42.75	29.91	10.56	12.79	15.97
DBW-88	15	69.90	53.39	42.75	24.88	16.51	10.64	23.62
HD-3086	10	71.10	50.93	42.75	19.13	20.17	8.18	28.36
PBW-550	10	62.40	46.50	42.75	8.77	15.90	3.75	25.48
DBW-17	10	63.00	46.36	42.75	9.03	16.64	3.61	26.41
Mean	-	-	**50.54**	**42.75**	**18.34**	**15.95**	**7.79**	**23.96**

PY = Potential yield, DY= Demonstration Yield, FP = Farmers practice

Table 2: Economics of timely sown wheat varieties

Varieties	Grain yield qt/ha	Cost of cultivation Rs/ha	Gross return Rs/ha	Net return Rs/ha	BCR	% of Additional yield over local check (qt/ha)	Additional net return over Local check (Rs/ha)
HD-2967	55.54	42099.13	118908.90	76809.77	2.82	29.91	31186.27
DBW-88	53.39	43965.00	115370.50	71405.50	2.62	24.88	25782.00
HD-3086	50.93	44118.75	110215.50	66121.75	2.49	19.13	20498.25
PBW-550	46.50	45005.50	109761.00	64753.50	2.43	8.77	19130.00
DBW-17	46.36	45700.50	99281.50	53581.00	2.17	9.03	7957.50
Mean	**50.544**	**44177.78**	**110707.5**	**66534.3**	**2.506**	**18.344**	**20910.80**
FP (PBW-343)	42.75	46312.50	91396.88	45623.50	1.97	—	—

Table 3: Adoption of timely sown wheat varieties district Bijnor

Block	Area under wheat crop (ha)	Area covered by varieties					
		HD-2967	DBW-88	HD-3086	PBW-550	DBW-17	Others
Kotwali	13898	9850	1250	320	120	110	610
Jalilpur	13030	3300	1000	180	80	60	460
Budhanpur	6520	3000	950	140	80	77	477
Najibabad	8898	2550	900	210	110	85	585
Dhampur	6725	2900	850	150	90	90	350
Kiratpur	7187	3600	765	210	110	76	276
Jhalu	13777	2450	650	130	70	70	270
Afjalgarh	12560	5300	755	170	100	67	367
Devmal	11405	2850	780	120	70	70	275
Nehtor	6536	2900	950	250	150	65	350
Noorpur	12412	3300	700	220	120	80	380
Mean	**112948**	**42000**	**9550**	**2100**	**1100**	**850**	**4400**

indicates that there is need to educate the farmers through various extension tools. Gupta and Sharma (2005) also confirmed these results. Singh and Singh (2012) reported about extension gap in basmati rice varieties. Singh *et al.* (2018) also confirmed these results. There is clear-cut and significant yield gap between farmers practice and demonstration field. The choice of late sown wheat variety is also an important factor leading to additional net return. The extension and technology gap can be bridged by sustained effort of extension agencies and by adopting location specific technologies.

Table 3 showed, that the Adoption level of timely sown wheat varieties in district Bijnor. It has significant impact on seed yield vis a vis yield gap. Yield increased in demonstration field due to adoption of newly released variety. Adoption level of wheat variety HD-2967 ranged between 2450 to 9850 in different blocks of district with a mean of 42000 ha. Presently district status about timely sown newly wheat varieties range between 2100 to 42000 ha. It is maximum in HD-2967 (42000 ha) followed by DBW-88 (9550 ha) Rana *et al.* (2002) reported that the demonstration is quite successful in farmer practice. In 2011, Singh *et al.* (2011) also reported that the adoption of basmati rice variety Pusa Basamti-1401 in farmers practice. Singh *et al* (2018) also confirmed these results.

CONCLUSION

From the above findings, it can be concluded that use of appropriate scientific methods and better technology of cultivation under front line demonstrations on large scale reduced the technological gap to a considerable extent thus leading to increased productivity. Better and maximum, extension programmes of the district need to provide more technological support to the farmers through

demonstrations, training programmes, exposure visit to other demonstration field and field day programme which increased the horizontal spared of the technology between maximum number of farmers in the district. The demand of quality seed of these varieties is also increasing which has led to participatory seed production at farmer's field.

REFERENCES

Annual Report of Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare Government of India-2016-17. pp 3.

Anonymous. 1998. Germplasm Programme cereal (Annual Report for, ICARDA Aleppo, Syria.

Biswas, J.K.; M.A. Hossain; B.C. Sarkar; M. Hassan and M.Z. Haque. 1998. Yield performance of several rice varieties seeded directly as late aman crops. *Bangladesh J. Life Sci.*, 10: 47-52.

Blum, A. 1988. Heat tolerance. In: *Plant breeding for stress environments*. CRC Press. Inc., Boca Raton, F1.

Gupta, N.K. and A.K. Sharma. 2005. Impact of front line demonstration on Gobi sarson and its adoption in Jammu District of Jammu and Kashmir state. *Environ. And Ecol.*, 23(Spl. 1): 198-193.

Hedge; D.M. 2006. Oil seed crop diversification In: Extended summarise of National Symposium on Conservation agricultural and environment October 26-28, 2006 held at Banaras Hindu University, Varanasi.

Kadian, K.S.; R. Sharma and A.K. Sharma. 1997. Evaluation of front line demonstration trial on Oilseed in Kangra Valley of H.P. *Annals Agril. Res.*, 18(10): 40-43.

Rana, V.S.; A.C. Malik and L.K. Midha. 2002. Evaluating gaps in transfer of dryland technology in mustard front line demonstration in Haryana. *Haryana J. Agron.*, 18(1&2): 1148-1149.

Sagar R.L. and G. Chandra. 2004. Evaluation of front line demonstration on mustard in Indian *J. of Extension Education*, 40(3&4): 96-97.

Singh, K.K. and P.K. Singh. 2012. Evaluation of Basmati Varieties for yield assessment and economics under farmers field situations. *New Agriculturist*, 23(1): 11-14.

Singh, K.K. and P.K. Singh. 2015. Yield gap analysis, performance and adoption of wheat variety HD-2967 in district Saharanpur. *New Agriculturist*, 26(2): 193–195.

Singh, K.K. P.K. Singh and Ashok. 2011. Analysis of yield, performance and adoption of Basmati variety Pusa Basmati-1401 in Saharanpur district. *New Agriculturist*, 22(1): 41-43.

Singh, K.K.; D.P. Singh; N. Singh; A.V. Singh; S.K. Yadav; B. Singh; V. Yadav and R. Singh. 2018. Adoption of wheat variety HD-3059 in district Bijnor with the special reference to analysis of yield gap and their performance. *International Journal of Agriculture Sciences*, 10(7): 5663-5664.

Singh, K.K.; P.K. Singh and Ashok. 2013. Analysis of timely sown wheat varieties for yield and yield gap at farmers field Saharanpur district. *New Agriculturist*, 24(2): 197-200.

Singh, T. and K.S. Rana. 2006. Effect of moisture conservation and fertility on Indian mustard (*Brassica juncea*) and lentil (*Lensculinaris*) intercropping system rainfed condition. *Ind. J. Agron.*, 51(4): 267-270.

Singh, V.P.; G.S. Khus and N. Dela Cruz. 1997. Variability and quality indces in aromatic rice germplasm. *IRRN*. 22: 22.

Verma R.C.; P.K. Singh; Shripal; S. Arya and V. Kumar. 2017. Evaluation of basmati rice varieties for yield performance and economics under farmers field situation in Muzaffarnagar District, India. *Int. J. Curr. Microbiol. App. Sci.*, 6(12): 1552-1555.

Received on May, 2019, Revised on October 2019