Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(4): 883-886
Received: 25-05-2019
Accepted: 27-06-2019

Akhilesh Kumar Yadav
N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Singh
N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

MK Pandey
N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Saurabh Verma
N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Akhilesh Kumar Yadav
N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Front line demonstration of high yielding newly wheat variety

Akhilesh Kumar Yadav, RK Singh, MK Pandey and Saurabh Verma

Abstract
The front line demonstration is an effective tool to transfer proven technologies in farming communities of eastern Uttar Pradesh. Krishi Vigyan Kendra, Masodha, Faizabad (UP) has already been tried to overcome shortfall in adoption of new interventions through demonstrations (FLDs) that implemented in 12.0 hectare area at 60 progressive farmers' field during *rabi* 2015-16 to 2017-18. Adoption of faulty practices by majority of farmers' in eastern U.P. under rice-wheat cropping system has resulted in deterioration of soil health and environmental pollutions with hampering food security by producing lower grain yield. However, experiencing above facts from large number of wheat growers continuously three years has addressed that there is a wide gap regarding adoption of proven technology. In general, the soils under study were sandy loam to sandy clay loam in texture with neutral in reaction (6.8 to 8.0 pH). The wheat variety HD-2967 was sown in line from mid to end of November in each year. The yield of wheat fluctuated successively over the years in demonstration plot. The maximum yield was reported (43.00 q/ha) during the year 2017-18 and minimum yield was reported in the year 2016-17 (36.25 q/ha) and the average yield of three year was reported 40.05 q/ha over control (31.80 q/ha). The variation in yield in the successive years could be attributed to variation in climatic condition prevailing during the crop growth period. During three year of study, the increase in per cent of yield was ranging between 19.77 to 33.44. A wider technology gap identified during last three years of study than preceding years. However, production year 2017-18 was the only year which recorded maximum grain yield (43.0 q/ha) and productive tillers in unit area by narrowing the technological gap (1.0 q/ha) in comparison to remaining years. Actual monetary gain of Rs. 54668 per hectare was received by least investment of Rs. 30400 per hectare cultivation cost. It also indicates farmer's income can be double only by adoption of scientific practices as per their need & situations of crop from seeding to harvesting.

Keywords: Wheat, yield, variation, technology gap

Introduction
Wheat (*Triticum aestivum* L.) is world's most widely cultivated food crop. It can be grown from below sea level to 5000 m altitude and in areas where rainfall ranges between 300-1130 mm. Wheat contributes more calories (20%) and more protein to the world's diet than any other food crop. Adoption of new high yielding varieties is utmost essential to raise the productivity bar. Technology based demonstration were conducted on wheat with improved technologies against farmer's practices on farmer's field during *rabi* 2015-16 to 2017-18. It was revealed from the results that higher average grain yield of variety HD-2967 (40.05 q/ha) in compression to check PBW-343 (31.80 q/ha) with a yield advantage of 24.94%. Therefore, for enhancing the production and productivity of wheat crop, strategy should be made for getting the more and more recommended technologies adopted by the farmers, which will subsequently increase the income as well as the livelihood of the farming community. After the green revolution, the production of wheat has shown a high increases. The scenario of the past ten years has clearly indicated that the wheat production in the country has soared ahead despite area remaining the same (Kumar, 2014 and Paroda *et al*., 2013) [4, 7]. The wheat programme has released 399 wheat varieties, comprising bread wheat (335), durum (54), dicoccum (5) and triticale (5) for cultivation under different production conditions in all the wheat growing zones (Anonymous, 2012) [1]. The wheat growing major states are Uttar Pradesh, Punjab and Haryana. They account for nearly 70 percent of the total wheat production in country. Adoption of new high yielding varieties is utmost essential to raise the productivity bar (Longove *et al*. 2014) [5].

Wheat is an important food crop of Faizabad district of eastern Uttar Pradesh. Faizabad district has been considered as productively potential region of wheat crop due to assured irrigation facilities and favourable soil and climate conditions. However there is still a wide gap between the productions. Potential and the actual production realized by the farmers. This may be due to partial adoption of recommended package of practices by the wheat growers.

Technology gap is a major problem in increasing wheat production in Faizabad district of the State. So far, no recent systematic effort was made to study the technological gap existing in various components of wheat cultivation. Keeping in view, technology based demonstration were conducted on wheat with improved technologies against farmers' practices.

Material and Methods

The study was carried out by Krishi Vigyan Kendra, Masodha, Faizabad of Narendra Deva University of Agriculture & Technology during *rabi* season from 2015-16 to 2017-18 (three consecutive years) in the farmer's field of two adopted villages (Madhupur and Nagipur of District Faizabad). The front line demonstration conducted in an area of 4.0 ha involving 20 farmers in each year, to find out yield superiority of timely sown wheat variety with line sowing of HD-2967 against commonly grown variety PBW-343. During these three years of study, in area of 12 ha was covered with plot size 0.2 ha under front line demonstration with active participation of 60 farmers. Before conducting FLDs, a list of farmers was prepared from group meeting and specific skill training was given to the selected farmers regarding package of practices of wheat. The difference between demonstration package and existing farmers practices are given in Table 1.

In general the soils under study were silty clay loam soil in texture with a pH range in between 6.8 to 8.0. The available nitrogen is low to medium, with low phosphorous and medium potassium in nature. However, the soils were deficient in micro nutrients particularly zinc and ferrous as rice-wheat cropping system prevails in the village since last 40 years.

In demonstration plots, use of quality seeds of improved varieties, timely weeding, need based of pesticides as well as balanced fertilization, irrigation were emphasized and comparison has been made with the existing practices (Table 1). The input and output prices of commodities prevailed during the study of demonstration were taken for calculating net return and benefit cost ratio. The improved cultivation package comprises improves variety, application of fertilizer, control of insect pest and diseases by use of insecticide and fungicide at economic threshold level. All the recommended cultural practices like timely irrigation, weed management, fertilizer management, insect pest management etc. were followed to raise a good crop. The fertilizer was applied @ 150 kg nitrogen, 60 kg phosphorus and 40 kg potash per hectare. Use of 6 tone/ ha FYM for raising good production. The necessary step for the selection of site and farmers, lay out of demonstration, etc were followed as suggest by Chaudhary (1999) [2]. The tradition practices were maintained in case of local check. The data output were collected from both FLD plots as well as control plot and finally the extension gap, technological gap, technological index along with the benefit-cost ratio were calculated. (Samui *et al*., 2000) [8] as given below.

Technology gap (q/ha) = Potential yield (q/ha) – Demonstration yield (q/ha)

Extension gap (q/ha) = Demonstration yield (q/ha) – Farmer's yield (q/ha)

Technology Index (%) = (Potential yield – Demonstration yield)/Potential yield × 100

Result and discussion

Gap analysis

Selection of suitable cultural practices in different agro climatic zones can improve productive of respective crop in the zone. The gap between the existing and recommended technologies of wheat in district Faizabad is presented in table-2. Full gap in wheat crop was observed in case of use of high yielding varieties, seed treatment, sowing method, while partial gap was observed in fertilizer use, weed management, and plant protection causes the main reason of low yield. Farmer's knowledge level was less regarding the improved technologies. Farmer's in general use local or old age variety susceptible for various diseases and pest instead of the recommended high yielding disease and pest tolerant varieties. Farmer's sown wheat late in the month of late November or early December causing low productivity in the area. Timely sowing with HYVs enhanced the productivity of wheat crop in the region.

Yield analysis

A comparison of productivity levels between improved practices in demonstration trail and local check is shown in table 2 & 3. The data showed that the yield of wheat fluctuated successively over the years in demonstration plot. The maximum yield was reported (43.00 q/ha) during the year 2017-18 and minimum yield was reported in the year 2016-17 (36.25 q/ha) and the average yield of three year was reported 40.05 q/ha over control (31.80 q/ha). The variation in yield in the successive years could be attributed to variation in climatic condition prevailing during the crop growth period. During three year of study, the increase in per cent of yield was ranging between 19.77 to 33.44. The results are similar with the findings of Tomer *et al*. (2003) [11] and Joshi *et al*. (2014) [3]. During the study of period it was observed that the adaptation of improved production technologies in demonstration trails has increased the yield over the local check. Adaptation of new variety with recommended cultural practices will increase 25.94% yield compare to conventional cultivars.

Economics analysis

The comparative profitability of demonstrated wheat variety has been studied by estimating input cost, total cost, gross returns, net returns and benefit cost ratio and depicted in Table 2. The benefit cost ratio of new variety under improved cultivation practices gives higher net return of Rs.24268/-. The demo plot was able to got good market price of Rs. 54668/-. The total cost of cultivation was calculated as Rs. 30400/-. The B: C ratio 1.80 respectively as compared to farmers practices (1.43). It might be attributed to quantity wise highest increased in yield with improved techniques over conventional system. These results showed that investment on improved cultivation techniques is more profitable on wheat in Faizabad district of Uttar Pradesh. These findings are similar to the findings of Mandavkar *et al*. (2012) [6] in front line demonstration trials on rice increased the yield over the respective check (control) varieties. The crops, which gave higher profitability, proved economically beneficial.

Technology gap analysis

The technological gap i.e. the difference between potential yield and yield of demonstration plot were 3.10, 7.75 and 1.00 during the year 2015-16, 2016-17 and 2017-18, respectively. The average technology gap in all the years was 3.95 q/ha. However, demonstrations were conducted under close

supervision of scientists but the technology gap was still found there. It might be due to varied agro-ecosystems, soil fertility status and weather conditions of the area. Though technology gap decreases from 7.75 q/ha to 1.0 q/ha in due course of demonstrations conducted.

The extension gap ranged from 7.1 to 10.25 q/ha during the period indicates that there is a gap existed between the yield of demonstrations and local check (farmers' practice). The farmers were failed to adopt recommended package of practices under conventional system and lead to extension gap (Table 3). The extension gap in the yield indicates that there is big scope to increase the yield of wheat at farmers' fields by adopting the recommended package of practices. Therefore, to bridge the extension gap, there is a need to give due emphasis on transfer of improved technologies and management practices of wheat through strengthening of extension network. The extension gap for crop was higher as compared to the technology gap, which also indicates that there is a need to train and educate to the farmers about improved technologies. More and more use of latest production technologies during further years with high yielding varieties will subsequently change this alarming trend of galloping extension gap. The new technologies will eventually lead to the farmers to discontinue the old existing practices and to adopt new technology.

The technology index shows the feasibility of the evolved technology at the farmers' field (Table 3). The lower the value of technology index more is the feasibility of the technology. Technology index was minimum (2.27%) during the later year of demonstrations (2017-18) compared to early demonstration programme of 2015-16 (7.04%). Technology index shows the feasibility of the demonstrated scientific technological interventions at the farmers' field. Similar findings were also observed by Joshi *et al*. (2014) [3].

Table 1: Comparison between demonstration and existing practices under wheat crop

Particulars	Existing practices	Improve practices demonstrated	Gap analyzed
Farming situation	Irrigated upland	Irrigated upland	Nil
Variety	Old variety	HD-2967	Full gap
Sowing method	Broadcasting	Line sowing	Full gap
Seed treatment	No seed treatment	Thiram or bavistin 3 gm/kg seed	Full gap
Fertilizer use	Unbalanced fertilizer use	60 q/ha FYM, 150:60:40 (N.P.K.)	Partial gap
Weed management	No weeding or delayed manual weeding	Integrated weed management	Partial gap
Plant protection	Indiscriminate use of pesticides as prescribed by local pesticide retailers	Integrated pest management	Partial gap

Table 2: Comparative productivity and economics of wheat cultivation

Crop / Enterprise				Wheat			
Technology demonstrated				New variety of Wheat (HD-2967) + line sowing + INM			
Particulars	Yield(q/ha)			Cost of Cultivation (Rs/ha)	Gross Return (Rs/ha)	Net Return (Rs/ha)	B:C Ratio
	H	L	A				
Demonstration	43.00	36.25	40.05	30400	54668	24268	1.80
Local check	-	-	31.80	30400	43407	13007	1.43

Table 3: Productivity, technology gap, extension gap and technology index in Wheat (HD 2967) under Front Line Demonstration

Year	Area (ha)	No. of farmers	Seed yield (q/ha)			% increase over control	Technology gap (q/ha)	Extension gap (q/ha)	Technology index (%)
			Potential	Demonstration	Control				
2015-16	4.0	20	44.0	40.90	30.65	33.44	3.10	10.25	7.04
2016-17	4.0	20	44.0	36.25	28.85	25.65	7.75	7.40	17.61
2017-18	4.0	20	44.0	43.00	35.9	19.77	1.00	7.10	2.27
Total/Av.	12.0	60	44.0	40.05	31.80		3.95	8.25	

Conclusion

On the basis of the result obtained in present study it can be concluded that use of improved method of wheat cultivation can reduced the technology gap to a considerable extent thus leading to increase productivity of wheat in the district. Extension gap ranged between 7.10 to 10.25 q/ha which emphasise the need to educate the farmers through various means like village level training, on campus training, method demonstration, front line demonstration, etc. The productivity gain under FLD over existing practices of wheat cultivation created greater awareness and motivated the other farmers to adopt suitable production technology of wheat crop in the district.

References

1. Anonymous. Indian Wheat Database, Directorate of Wheat Research, Kernal, 2012.
2. Chaudhary BN. Krishi Vigyan Kendra- A guide for KVK managers. Division of Agricultural Extension, ICAR, 1999, 73-78.
3. Joshi NS, Bariya MK, Kunjadia BB. Yield gap analysis through front line demonstration in wheat crop. International Journal of Scientific and Research Publications. 2014; 4(9):1-3
4. Kumar R. Crop technology demonstration: An effective communication approach for dissemination of wheat production technology. Agricultural Science Digest-A Research Journal. 2014; 34(2):131-133.
5. Longove MA, Akbar F, Baqa S, Hidayatullah, Azam S. Performance Evaluation of Different Wheat Varieties under Agro-Ecological Conditions of Quetta (Balochistan). Journal of Biology, Agriculture and Healthcare. 2014; 4(8):39-44
6. Mandavkar PM, Sawant PA, Mahadik RP. Evaluation of front line demonstration trials on rice in Raigad district of Maharashtra. Rajasthan Journal of Extension Education. 2012; 20:4-6
7. Paroda R, Dasgupta S, Mal B, Singh SS, Jat ML, Singh G. Proceedings of the Regional Consultation on

Improving Wheat Productivity in Asia, Bangkok, Thailand; 26-27 April, 2012, 2013, 224.
8. Samui SK, Maitra S, Roy DK, Mandal AK, Saha D. Evaluation of front line demonstration on groundnut. Journal of Indian Society for Coastal Agricultural Research. 2000; 18(2):180-183
9. Singh D, Patel AK, Baghel SK, Singh A, Singh AK.. Impact of front line demonstration on the yield and economics of chickpea (*Cicer arietinum* L.) in Sidhi district of M.P. Journal of Agrisearch. 2014; 1(1):22-25.
10. Soni SN, Mishra PC, Kurmvanshi SM. Economics of technical change of wheat production in Sagar district M. P. Crop Research, Hisar. 2000; 19(3):452-456.
11. Tomer LS, Sharma BP, Joshi K. Impact of front line demonstration of soybean in transfer of improved technology. Journal of Extension Education. 2003; 22(1):139.