Research Article

ADOPTION OF WHEAT VARIETY HD-3059 IN DISTRICT BIJNOR WITH THE SPECIAL REFERENCE TO ANALYSIS OF YIELD GAP AND THEIR PERFORMANCE

SINGH K.K.*, SINGH D.P.†, SINGH NARENDRA‡, SINGH A.V.§, YADAV S. K.*, SINGH BALRAJ**, YADAV VIVEK** AND SINGH RAJENDRA***

*ICAR-Krishi Vigyan Kendra, Nagina, Bijnor, 246 762, S. V. Patel University of Agriculture and Technology, Meerut, 250110, Uttar Pradesh
†ICAR-Rice Research Station, Nagina, Bijnor, 246762, S. V. Patel University of Agriculture and Technology, Meerut, 250110, Uttar Pradesh
‡*Corresponding Author: Email-krishna.singh1976@gmail.com

Abstract- Wheat variety HD-3059 was disseminated through on farm Testing and Front-Line Demonstrations at farmer’s field in Bijnor district. The demonstrations conducted during last three years (2014 & 2015), were considered for the study. The result indicated that average yield of wheat variety HD-3059 in IP practices ranged between 42.50 to 47.50 q/ha in different blocks of district Bijnor. The adoption of wheat variety HD-3059 was significantly increased in farmers due to higher product, which ultimately resulted in more net return.

Keywords- HD-3059, yield gap, performance and adoption


Copyright: Copyright©2018 Singh K. K., et al., This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Academic Editor / Reviewer: Dr Amit Kesarwani

Introduction

Wheat is the pre-eminent among the world’s crops with regards to its antiquity and its importance as a staple food of mankind. 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 31 m. ha area with an average productivity of 3.20/ha, out of which around one-third (11.0m 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, 18,000to 1, 20,000ha, out of that 55% ha area is under Late sown condition. Sugarcane-Wheat is the most common rotation in the district, which leads to Late sowing of wheat. The choice of right varieties under Late sown condition is one of the crucial points determining the yield of wheat. The yield and productivity of Late 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. Commonly grown late sown wheat varieties are PBW-226, DBW-16, PBW-373, PBW-154, PBW-175, Pusa Gold, and Raj-3765 in district. Old and outdated late sown wheat varieties are prone to lodging, affected by disease and very low yielding. An improvement over timely sown wheat variety, HD-3059 is released by IARI, New Delhi during 2013. The plant stature is medium dwarf (93 cm), crop duration 121 days, and resistant against rust. In terms of grain quality traits HD 3059 has excellent chapatti making quality and high protein content [1].

Materials and Methods

The On farm Testing and front line demonstrations were conducted during 2014, and 2015 in Kotwalli, Afjalgarh, Nehtor, Kiratpur, Haldaur, Dhampur, and Noopur blocks of district Bijnor, at 30 farmers field for evaluation of performance, effectiveness and adoption of HD-3059 in comparison to farmers practice. The yield data from front line demonstration, as well as farmers practice were recorded by representative samples from different locations. The following formulae have been used for estimation of technology gap, extension gap and technology index (as per methods of Samui, et al., 2000 and Sagar and Chandra 2004 [2,3].

1- Technology gap = Potential yield – Demonstration yield
2- Extension gap = Demonstration yield – farmers yield
3- Technology index = [(Potential yield – Demonstration yield)/(Potential yield)] x 100

Results and Discussion

The field performance and yield gap of the HD-3059 along with the local check, were evaluated and data are given in [Table-1]. From the data given in [Table-1] it is quite clear that seed yield increased significantly in the range of 42.50 to 47.50 qt./ha in different blocks of Bijnor district, as compared to local check. In 2006, Singh and Rana reported seed yield increase up to 20.70 qt. / ha by Pusa Barani Variety of mustard crop under irrigation condition [4]. In 1998, Biswas, et al., reported varietal differences of grain yield in scented rice [5]. The benefit cost ratio of HD-3059 was also higher in all the blocks in comparison to local check. It varied from 2.22o to 2.87. In 2006, Hedge reported that mustard crop by nature is hardy and mostly grown under rainfed condition and can impart stability of production system under harsh condition [6,7]. The benefit cost ratio of HD-3059 was also higher in all the blocks in comparison to local check in district Saharanpur of Uttar Pradesh [8]. The result obtained clearly indicate the technology gap range between 11.90 to 16.90 with an overall mean difference of 7.60 qt. / ha. In 1997, Kadian, et al., reported that technology gap can be narrowed down only by location specific technology-based recommendations [9]. Adoption of HD-3059 has significant impact on seed yield vis a vis yield gap. Yield increased in...
demonstration field due to adoption of newly released variety. Adoption percentage ranged between 7.50 to 17.50 with a mean percent increase of 11.42% as compare to local check. Rana et al., (2002) reported that the demonstration is quite successful in farmer practice [10]. In 2011 Singh, et al., 2011, also reported that the adoption of basmati variety Pusa Basmati-1401 in farmers practice [11].

| Table-1 Yield, Extension Gap, Technology gap, Adoption and Economics of Wheat variety HD-3059. |
|----------------------------------|---------------------------------|----------------|---------------|-----------------|----------------|-----------------|-----------------|
| Name of Block                   | No. Of Demo. | Duration study (Years) | Avg. Yield (qt/ha) | % Yield increased | Net Return (Rs/ha) | BCR | Technology gap (qt/ha) | Extension gap (qt/ha) | Technological index | Adoption % within 3 years |
| Kotwal                      | 12          | 2                      | 59.40            | 47.50            | 39.29            | 28.89           | 56318.63         | 2.42            | 11.90            | 8.21             | 12.45           | 17.00           |
| Allahgarh                    | 07          | 2                      | 59.40            | 45.71            | 40.53            | 12.76           | 52900.00         | 2.33            | 13.69            | 5.18             | 23.04           | 14.00           |
| Nehtor                       | 02          | 2                      | 59.40            | 45.00            | 38.75            | 16.12           | 54725.00         | 2.39            | 14.40            | 6.25             | 24.24           | 9.50            |
| Kirtipur                     | 02          | 2                      | 59.40            | 42.50            | 36.87            | 15.26           | 47562.50         | 2.22            | 16.90            | 5.63             | 28.45           | 10.00           |
| Haldaur                      | 02          | 2                      | 59.40            | 47.50            | 42.50            | 11.76           | 55937.50         | 2.39            | 11.90            | 5.00             | 12.45           | 8.50            |
| Dhampur                      | 02          | 2                      | 59.40            | 45.00            | 41.25            | 9.00            | 51625.00         | 2.32            | 14.40            | 3.75             | 24.24           | 7.50            |
| Noopur                       | 02          | 2                      | 59.40            | 46.20            | 32.40            | 24.20           | 63100.00         | 2.87            | 13.20            | 13.80            | 22.22           | 13.50           |
| Mean                         | 36          | 2                      | 59.40            | 45.63            | 38.79            | 18.33           | 54695.52         | 2.42            | 13.77            | 6.64             | 21.01           | 11.42           |

P = Potential yield, IP= Improved practice, FP = Farmers practice

Conclusions
The wheat variety HD-3059 led to higher adoption due to higher yield and higher cost benefit ratio in late sown condition. The area under this variety has now spread to more than 5500 ha in just three years and successfully 100% area of PBW-373 was replaced in district by this variety. The demand of quality seed of this variety is also increasing which has led to participatory seed production at farmer’s field.

Application of research: This research is helpful for increasing income of the farmers as selection appropriate technology (variety) play a vital role to increase production and productivity.

Research Category: Technology evaluation and dissemination

Acknowledgement / Funding: We are thankful to S. V. Patel University of Agriculture and Technology, Meerut, Uttar Pradesh for providing us a platform for conducting research work.

*Principle Investigator: Dr K K Singh
University: S. V. Patel University of Agriculture and Technology, Meerut, Uttar Pradesh, 250110

Research project name or number: KVK work for transfer of technologies in operational area

Author Contributions: All author equally contributed

Author statement: All authors read, reviewed, agree and approved the final manuscript

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors

References