

Original Research Article

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Frontline Demonstrations on Wheat (*Triticum aestivum* L.) Yield Under Rainfed Temperate Kashmir Conditions

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ABSTRACT

Keywords

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The present study was carried out by Mountain Research Centre for Field Crops, Khudwani, Anantnag SKUAST-K under the AICRP-Wheat & Barley programme to identify the yield gaps between improved package and practices in the Front Line Demonstration (FLD) and farmer's practice (FP) of wheat crop under rainfed temperate Kashmir conditions. Front line demonstrations (FLDs) were conducted on farmers' fields over an area of 8.1 hectares covering four districts, namely Anantnag, Kulgam, Pulwama and Baramulla during *rabi* seasons of two consecutive years i.e. 2015-16 and 2016-17. The technologies validated in FLDs documented additional yield over farmers practice. Wheat grain yield was increased by 18.5 percent over the FP. Our study demonstrated that with the adoption of better-quality package of practices wheat productivity could be increased therefore improving the livelihood of farmers.

Introduction

Wheat is one of the most imperative and consumed principal foods at global level. Particularly the wheat species *Triticum aestivum* (L.) accounts for one-fifth of the total calories delivered to the world population (Reynolds *et al.*, 2010). Wheat has a surfeit of uses nowadays including making different types of bread, biscuits, cakes, pasta, noodles and grain alcohols. Wheat is second most important staple food crop after rice in India and generally provides about 50 percent of the calories and proteins requirement to a vast majority of India's population. Increased

population together with eating preferences has resulted in a considerable upsurge in mandate for wheat in last 50 years (Kajla *et al.*, 2015). Consequently, wheat is now grown more widely than any other crop with global wheat production pegged at 748 million tons (FAO 2017). However, wheat production and yield need improvement to feed the continually increasing world population, and biotic and abiotic stresses are major limiting factors for wheat production as they decrease the crop yield considerably. Therefore, finding ways to improve crop tolerance to

abiotic stresses will be essential to improve agricultural production further and achieve the food security. The major wheat producing states are Uttar Pradesh, Punjab, Haryana, Madhya Pradesh, Rajasthan, Bihar, Maharashtra, Gujarat, Karnataka, West Bengal, Uttarakhand, Himachal Pradesh, and Jammu and Kashmir. These states contribute about 99.5% of total wheat production in the country. Remaining states contribute only 0.5% of total wheat production in the country (Directorate of Wheat Development). The overall average production of wheat in India and J&K were 71.63 MT and 0.40 MT respectively. The overall average productivity of wheat was 2677.34 Kg/Ha and 1541.13 Kg/Ha in India and J&K respectively (Sharma and Sehgal 2015). There are several constraints of low productivity of wheat in India, out of which poor extension of improved agronomic practices is on the top (Singh, 2017). Moreover, poor agronomic practices such as higher seed rate, unsuitable varieties, faulty nutrient management as well as weed control etc. are responsible for low productivity of wheat in India (Tiwari *et al.*, 2014). Frontline demonstration is the recent perception with the aim to prove recently released crop production and protection technologies and its management practices at farmer's fields. In the FLD programme stress is laid on documenting of various factors contributing higher crop yield, constraints in field production and thus creating production data and feedback information (Singh 2017). With this concept in mind, FLDs of amended production technology on wheat were conducted to augment the productivity and improve the livelihood of farmers of the state of Jammu and Kashmir.

Materials and Methods

Mountain Research Centre for Field Crops, Khudwani, SKUAST-Kashmir has been sanctioned with All India Coordinated Research Project on Wheat and barley

(AICRP W&B) improvement from Directorate of Wheat Research Karnal, (ICAR) India. The Frontline Demonstrations (FLDs) on Wheat under the supporting agency (AICRP W&B) over an area of 8.1 ha during 2015-16, and 2016-17 for demonstrating the yield potential of the wheat varieties (*Shalimar Wheat 2 and VL 907*) and its improved package of practice to the farmers (Table 2). The demonstration of the trials was conducted in four districts of Kashmir valley viz., Pulwama, Anantnag, Kulgam and Baramulla in collaboration with Scientists from respective KVKs.

Results and Discussion

The results have indicated that the average yield superiority of 18.5 % (Table 1) was realized from the improved varieties and improved package of practice in comparison to Local variety / local package of practice practiced by the farmers.

The benefit cost ratio of demonstration plots were more than the farmer's practice in both the years which indicates that the cultivation of VL-907/Shalimar Wheat 2 varieties of Wheat are more profitable (1:1.76) than check variety (farmer's variety) and also the adoption improved package of practice of Wheat crop recommended by SKUAST (Table 2) resulted in increased yield and compared to farmers practice.

Similar results were observed in various studies in wheat (Verma *et al.*, 2016; Singh *et al.*, 2017), rapeseed Mustard (Iqbal *et al.*, 2017) and other crops (Hiremathand Nagaraju, 2009; Sharma 2003, Singh *et al.*, 2007). Besides, the area expansion programme may be undertaken by the Department of Agriculture Kashmir with public-private-partnership mode by involving NGOs, Corporate sectors etc. for economic benefit for farmers.

Table.1 Results of frontline demonstrations conducted under AICRP-W &B from 2015 to 2017.

Component	Ecosystem	Variety	Area (ha)	Year	Yield improvement over farmers practice(%)	Benefit Cost ratio
Whole Package Component	Rainfed	VL-907	4.1	2015-16	14.25	1: 1.50
		SW-2	4.0	2016-17	22.9	1: 2.02
Average performance over the years					18.5	1: 1.76

Table.2 Production technologies developed by SKUAST-K under AICRP-W &B

Technology Developed	Details of Technology
Sowing Time	last week of October to 10 th of November
Spacing (cm)	22 cm Row to Row
Seed rate (Kg Ha ⁻¹)	100
Fertilizer responsiveness	80:45:30:20 N;P;K;Zn
Harvesting	3 rd week of May to 10 th of June
Weeding	Pendimethalin @.75 to 1.0 kg ai per ha pre- emergence

Thus, it may be resolved that the yield and returns in wheat crop augmented noticeably with the adoption of improved varieties released by SKUAST Kashmir and improved production technologies.

Though, the yield level under FLDs was better than the farmer practice and yield of these varieties might be additionally enhanced by embracing suggested production technologies. Hence, it is prerequisite to publicize the improved wheat production technologies among the farmers with operative extension approaches such as training and field demonstrations.

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