

## Impact of Front Line Demonstration on Mash Crop in Temperate Area of Jammu and Kashmir

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### ABSTRACT

The study was carried out during *kharif* season of 2018 and 2019 in 6 villages across 2 blocks (Bhalla and Bhaderwah) of Doda District. In all 100 frontline demonstrations on Mash crop were carried out in an area of 20.0 ha with the active participations of farmers with the objective to demonstrate the latest technology of Mash production potential, technological gap, extension gap, technology index and economic benefit of improved technologies. Cluster frontline demonstration is one of the important tools for transfer of technology and this program is being implemented through Krishi Vigyan Kendra's of country. CFLD's are organized on improved production technology at farmer's field. This process not only helps in demonstrating the ways and means of increasing productivity but helps in obtaining feed back for further refinement of the production technology. The results revealed that CFLD recorded higher yield as compared to farmer's practices over the two years of study. The improved technologies recorded average yield of 4.84 q/ha which was 29.81% higher than the obtained with farmer's practices of 3.79 q/ha. In spite of increase in yield of Mash, technological gap,

extension gap and technology index existed which was 5.16 q/ha, 1.04 q/ha and 51.60%, respectively.

**Keywords** Cluster frontline demonstration, KVK, Extension gap, Technology gap, Technology index.

### INTRODUCTION

Pulses in India have a special role in meeting the protein requirement of pre-dominating vegetarian population. They form an integral part of diet as source of protein. These crops have additional advantage for sustainable agriculture, because of their soil enriching capability and varied use as feed and fodder, while being hardy crop act as crop insurance for farmers against natural calamities. Also, their limited input requirements, suitability for growing under moisture deficit conditions. Early maturing cultivars fit well in various cropping systems without any adverse effect on main cereal crops. However, the full potential of pulse crops is yet to be harnessed in developing sustainable agricultural system.

Mash or urdbean (*Vigna munga*) is the 3<sup>rd</sup> most important pulse crop after Gram and Arhar cultivated over an area of 5.44 m ha and recorded a production of 3.56 mt at a production level of 655 kg/ha. It is largely grown in MP, Rajasthan, AP, UP, Tamil Nadu, Maharashtra, Jharkhand and Gujarat. Mash is one of the important pulse crop grown in *kharif* season in the district Doda covers 1100 ha of land with the average productivity of 380 kg/ha is far below average national productivity (655 kg/ha).

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**Table 1.** Performance and gap analysis of frontline demonstration on Mash.

Year	Area (ha)	No. of farmers	Potential	Yield (q/ha) Improved	Local check	% increase in yield over local check	Techno- logy gap (q/ha)	Exten- sion gap (q/ha)	Techno- logy index (%)
2018	10	50	10.0	4.78	3.84	28.35	5.22	0.94	52.2
2019	10	50	10.0	4.9	3.75	31.28	5.10	1.15	51.0
Mean	10	50	10.0	4.84	3.79	29.81	5.16	1.04	51.6

The potential expected from improved technologies due to erratic rainfall, rainfed farming, small land holdings, adoption of local cultivar, low and imbalanced use of fertilizers, no use of plant protection measures and weed management practices. Yield of mash crop can be enhanced at least 30% with adoption of improved technologies such as, improved cultivars, recommended dose of fertilizers and control of pest (Charak *et al.* 2010), fertilizer and plant protection are most critical inputs for increasing yield (Singh *et al.* 2012). Realizing the situation, cluster frontline demonstrations on mash production technology were planned and conducted to show the production potential, economic benefits of improved technologies under real farmer's conditions.

## MATERIALS AND METHODS

In the present study performance of improved technologies of Mash against local check was evaluated through cluster frontline demonstrations conducted at farmer's field during *kharif* season of 2018 and 2019. A total of 100 demonstrations were laid on 20 ha area in 6 villages across 2 blocks (Bhalla and Bhaderwah) of Doda District. The soils of the study area are mostly sandy loam to clay loam in texture with low nitrogen, medium phosphorus and high in available potassium.

The improved technologies include improved variety PU-31 and plant protection chemicals were supplied free of cost to the farmers. Crop was sown after receiving sufficient rainfall, between first fortnight of June with crop geometry of 30 × 10 cm and seed rate of 20 kg/ha. The total amount of phosphorus (90 kg/ha) was applied as basal dose before

sowing. Hand weeding was done once at 20–30 days after sowing. The total number of hundred beneficiary farmers were associated under this program. The demonstration of improved technologies was taken in an area of 0.2 ha of each farmer. In each demonstration one control plot was kept where farmers practices were carried out. The critical inputs such as seed and plant protection chemicals were supplied to the farmers free of cost for demonstration purpose. Adoption of improved technology by the farmers and guidance was ensured through regular visits by the KVK scientists to the demonstrations field. Field days and group meetings were organized at the site of demonstration to provide the opportunities for other farmers to see the benefit of demonstrated technologies. The feed back from the farmers were utilized for further improvement in research and extension program (Dalei *et al.* 2016). The crop was harvested between first and second week of October. Data were collected from the CFLD's farmers and analyzed with statistical tools to compare the performance of farmer's field and CFLD's field. Further study on technology gap, extension gap and technology index were calculated by the formula as suggested by Samui *et al.* (2000).

$$\begin{aligned} \text{Technology gap} &= \text{Potential yield} - \text{Demonstration yield} \\ \text{Extension gap} &= \text{Demonstration yield} - \text{Farmers yield} \\ \text{Technology index (\%)} &= \frac{\text{Technology gap}}{\text{Potential yield}} \times 100 \end{aligned}$$

Tabular analyzing involving simple tools line mean was done by standard formula to analyze the date and draw conclusions and implications.

**Table 2.** Cost of cultivation, Gross return net return and B : C ratio as affected by improved and local practices.

Year	Cost of cultivation (Rs/ha)		Gross return (Rs /ha)		Net return (Rs /ha)		B:C ratio	
	Improved technologies	Local check	Improved technologies	Local check	Improved technologies	Local check	Improved technologies	Local check
2018	22540	21725	45391	35554	22851	13830	2.01	1.64
2019	22540	21725	46520	35615	23980	13890	2.06	1.64
Mean	22540	21725	45955.5	35584.5	23415.5	13860	2.03	1.64

## RESULTS AND DISCUSSION

Perusal of data indicated that the adoption of improved technology in demonstrations increased the yield over the farmer's practice in both the years. An analysis of Table 1 shows that during the year 2018 the average yield of 50 demonstrations was 4.78 q/ha against farmer's practice (local check) 3.84 q/ha registering the increase of 28.35%. In the year 2019, the average yield of 50 demonstrations was 4.90 q/ha which as 31.28% higher in comparison to 3.75 q/ha of local check.

The higher yield of Mash under improved technologies was due to the latest high yielding varieties, balanced use of fertilizers and plant protection chemicals. Similar results have been reported earlier by Jeengar *et al.* (2006), Dhaka *et al.* (2010), Balai *et al.* (2013).

The technology gap which is the difference between potential and demonstration field was maximum in the year 2018 (5.22 q/ha) and lowest in the year 2019 (5.10 q/ha). However, overall average technological gap in the study was 5.16 q/ha. The technology gap observed may be attributed to the dissimilarity in soil fertility status and weather conditions (Mandavkar *et al.* 2012).

Mukharjee (2003) has also opined that depending on identification and use of farming situation, specific interventions may have greater implications in enhancing system productivity. The extension gap varied between 0.94 to 1.15 q/ha and averaged 1.04 q/ha during the period of study, emphasized the need to educate the farmers through various means for adoption of improved technologies to reverse the

trend of wide extension gap. Similar results were reported by Sharma *et al.* (2011).

Technology index shows the feasibility of evolved technology at the farmer's field and lower the value of technology index more is the feasibility of the technology (Jeengar *et al.* 2006, Raj *et al.* 2014). Technology index in the present case varied between 52.2 % to 51.0 % and averaged 51.6% during the period of study.

The inputs and output prices of commodities prevailed during each year of demonstrations were taken for calculating cost of cultivation, gross return, net return and benefit cost ratio (Table 2). The investment on production by adopting improved technologies was Rs 22540/ha for both the years against local check where the variation in cost of cultivation was Rs 21725/ha. The cultivation of Mash under improved technologies gave higher net return of Rs 45391 and Rs 46520/ha as compared to Rs 35554 and Rs 35615 under local check in the corresponding years. The average benefit cost ratio of improved technology was 2.03, varying from 2.01 to 2.06 and that of local check was fixed as 1.64. This may be due to higher yield obtained under improved technologies compared to local check (farmers practices). This findings is in corroboration with the finding of Mokidue *et al.* (2011), Tomar (2010), Balai *et al.* (2013).

### Reasons of low yield of Mash at farmer's field

Optimum sowing time is not followed due to delay in monsoon. Sometimes non availability of quality seed of suitable variety and farmers go for the local seed in hand. More than 90% of farmers sow

Mash seed in closer spacing by using higher seed rate and in most of the situation the plant population at farmer's field is high than recommended stand. The use of inadequate and imbalance dose of fertilizer and no plant protection chemicals against insect-pests and diseases causes substantial yield loss in Mash crop.

### Constraints with marginal and small farmer's

**Small holding :** Small and marginal farmers are resource poor having less risk bearing ability and do not dare to invest in the costly input which is an obstacle in adoption of proven technology.

**Farm implements and tools :** Traditional implements and tools of poor working efficiency are still in practice due to small holding. The lack of modern implements and tools for small holding is also a hindrance to the adoption of improved technology.

### CONCLUSION

Thus the cultivation of Mash with improved technology has been found more productive and grain yield might be increased up to 29.81% t. Technology and extension gap extended which can be bridged by popularizing package of practices with emphasis of improved high yielding hybrid variety, use of proper seed rate, balanced nutrient application and proper use of plant protection measures. Replacement of existing local variety with newly released varieties will increase the production and net income. PU-31 variety was found to be suitable since it fit well to the existing farming situation and also it had been appreciated by the farmers

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