Environment and Ecology 42 (2A) : 575—578, April—June 2024
Article DOI: https://doi.org/10.60151/envec/ZUEK2775
ISSN 0970-0420

Enhancing Productivity and Profitability of Mash through Front Line Demonstration

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Received 31 August 2023, Accepted 28 February 2024, Published on 6 May 2024

ABSTRACT

The study was carried out during *kharif* season of 2020 and 2021 in 7 villages across 2 blocks (Bhalla and Bhaderwah) of Doda district. In all 100 frontline demonstrations on Mash crop were carried out in anarea 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 ofincreasing 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 5.05 q/ha which was 34.71% higher than the obtained with farmer's practices of 3.81q/ha. In spite of increase in yield of Mash, technological gap, extension gap and technology index existed which was 4.95 q/ha, 1.23 q/ha and 49.5%, respectively.

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

INTRODUCTION

In India, pulses played a special role in meeting the protein requirement of pre-dominating vegetarian population, and form an integral part of diet. Because of their soil enriching capability and varied use as feed and fodder, these crops have additional advantage for sustainable agriculture, 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 3rd most

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important pulse crop after Gram and Arhar cultivated over an area of 5.0 mha and recorded a production of 3.56 mt at a production level of 570 kg/ha. It is largely grown in MP, Rajasthan, AP, UP, West Bengal, Tamil Nadu, Maharashtra, Jharkhand and Gujarat. Mash is one of the important pulse crop grown in *kharif* season in the district Doda covers 1150 ha of land with the average productivity of 390 kg/ha is far below average national productivity (570 kg/ha). 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, 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 front-line demonstrations conducted at farmer's field during *kharif* season of 2020 and 2021. A total of 100 demonstrations were laid on 20 ha area in 7 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 feedback 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).

Technology gap = Potential yield–Demonstration yield

Extension gap = Demonstration yield – Farmers yield

$$\text{Technology index (\%)} = \frac{\text{Technology gap}}{\text{Potential yield}} \times 100$$

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

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 2020 the average yield of 50 demonstrations was 5.24 q/ha against farmer's practice (local check) 4.18 q/ha registering the increase of 28.57%. In the year 2021, the average yield of 50 demonstrations was 4.86 q/ha which as 40.86% higher in comparison to 3.45 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

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	Technology gap (q/ha)	Extension gap (q/ha)	Technology index (%)
2020 (PU-31)	10	50	10.0	5.24	4.18	28.57	4.76	1.06	47.6
2021 (PU-31)	10	50	10.0	4.86	3.45	40.86	5.14	1.41	51.4
Mean	10	50	10.0	5.05	3.81	34.71	4.95	1.23	49.5

chemicals. Similar results have been reported earlier by Balai *et al.* (2013).

The technology gap which is the difference between potential and demonstration field was maximum in the year 2021 (5.14 q/ha) and lowest in the year 2020 (4.76 q/ha). However, overall average technological gap in the study was 4.95 q/ha. The technology gap observed may be attributed to the dissimilarity in soil fertility status and weather conditions (Mandavkar *et al.* 2012).

Depending on identification and use of farming situation, specific interventions may have greater implications in enhancing system productivity. The extension gap varied between 1.06 to 1.41 q/ha and averaged 1.23 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 Raj *et al.* (2014). Technology index in the present case varied between 47.6% to 51.4% and averaged 49.5% 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 24550/ha for both the years against local check where the variation in cost of cultivation was Rs 22628/ha. The cultivation of Mash under improved technologies gave higher net return of Rs 24250 and Rs 32820/ha as compared to Rs 14354 and Rs 18300 under local check in the corresponding years. The average benefit cost ratio of improved technology was 2.15, varying from 2.03 to 2.28 and that of local check was 1.65 to 1.79. 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 Balai *et al.* (2013) and other researchers.

Reasons of low yield of Mash at farmer's field

Optimum sowing time is not followed due to delay in mansoon. 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

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
2020	23600	22156	47850	36510	24250	14354	2.03	1.65
2021	25500	23100	58320	41400	32820	18300	2.28	1.79
Mean	24550	22628	53085	38955	28535	16327	2.15	1.72

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 loss risk bearing ability and do not dare to invest in the costly input which is a 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 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 upto 34.71%. Technology and extension gap extended which can be bridges 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.

ACKNOWLEDGMENT

The authors are thankful to the ICAR and ATARI Zone–1, Ludhiana (Punjab) for providing financial assistance towards organizing cluster frontline demonstrations.

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