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Research Note

Evaluation of Cluster Frontline Demonstration on Urd for Enhancing Productivity

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ABSTRACT

Urd or Black gram (*Vigna mungo* L.) is an important pulse crop cultivated in Erode district of Tamil Nadu but due to improper adoption of improved technologies the productivity is far below (680 kg/ha) against the average productivity of the state (861 kg/ha). Attempts were made to improve the productivity of black gram through KVK, Myrada and conducted cluster frontline demonstration with improved production technologies in 25 farmers' field during *rabi* 2019-2020. The improved production technologies comprising of high yielding variety namely Vamban 6 (VBN 6), seed treatment with bio-fertilizers and bio agents, integrated pest management technologies and foliar application of micronutrients. By adopting these technologies, the farmers harvested an average yield of 7.79 q/ha with a yield advantage of 19.85 per cent over the farmer practices. The improved practices gave higher net return of Rs. 23134.5/ha and benefit cost ratio of 2.03 where as benefit cost ratio of 1.65 was observed in farmer practices. The average extension gap, technology gap and technology index were 1.29 q/ha, 0.79 q/ha, and 8.35 per cent respectively. The results indicated that, adoption of improved production technologies minimizes the yield gap and provided higher return to the farming community.

Keywords: Cluster demonstration, Economics, Yield, Urd

INTRODUCTION

Pulses are important to low income countries where the major sources of protein are non-animal products. It is cultivated mostly on the marginal lands, under rain-fed situations. Many times pulses are cultivated as a mixed / intercrops and the productivity of black gram is very low when compared to the yield potential of the crop. Important reason for low productivity is biotic stresses, uncertainty of rainfall and poor fertility levels of the soil. The problem is compounded by the fact that the majority of the farmers in the rain-fed regions lack of awareness on new and high yielding varieties, resource poor with low risk bearing capacity and they generally do not apply recommended practices. Policy attention to fit the pulse crops in new and non-conventional cropping systems along with provision and assurance of support prices are some of the key areas of intervention (Nain *et al.*, 2015). The productivity of black gram per unit area could be increased by adopting improved practices in a systematic manner along with high yielding varieties (Rai *et al.*, 2015). Frontline demonstration is the key concept of field demonstration evolved by Indian council of Agricultural Research, New Delhi with the main objectives of demonstrating new varieties or technologies and its management practices in the farmers' field. The constraints faced by the farmers in obtaining higher productivity are being documented and the frontline demonstrations are designed to overcome the problems in a scientific way in order to show the worth of the new

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variety and improved practices for enhancing productivity and same is true for the black gram.

METHODOLOGY

The study was carried out in Erode District of Tamil Nadu during *rabi* 2019-20. The variety Vamban 6 (VBN 6) was selected for conducting the demonstrations. The special features of the selected variety are resistant to yellow mosaic virus diseases, synchronized maturity and duration of 65-70 days with the production potential of 850 kg/ha. Before starting of the demonstrations, the farmers were trained on scientific cultivation practices. Each demonstration was laid out in an area of 0.4 ha area and adjacent to the farmers' fields in which the crop was cultivated with farmers' practice/variety. Scientific interventions under frontline demonstrations were taken as recommended by Tamil Nadu Agricultural University, Coimbatore.

To study the impact of frontline demonstrations, data from FLD and farmers' practices were analyzed. The extension gap, technology gap and technology index were calculated using the formula suggested by Samui *et al*. (2000) as :

$$\text{Extension gap } \left(\frac{\text{qtl}}{\text{ha}}\right) = \text{DY (q/ha)} - \text{LY (q/ha)}$$

$$\text{Technology gap } \left(\frac{\text{qtl}}{\text{ha}}\right) = \text{PY (q/ha)} - \text{DY (q/ha)}$$

$$\text{Technology Index (\%)} = \frac{\text{PY (q/ha)} - \text{DY (q/ha)}}{\text{PY (q/ha)}} \times 100$$

Where,

DY = Demonstration yield, LY = local check yield, PY = Potential yield of variety

The fields were regularly monitored and periodically observed by the scientists of KVK. At the time of harvest, yield data were collected from both the demonstrated plots as well as from the farmers' practice. The cost of cultivation and profit details of both the systems were collected from the farmers for working out the benefit cost ratio.

RESULTS AND DISCUSSION

The results of the demonstrations conducted in the farmers' field are presented in Table 1. The data depicted that the productivity of high yielding black gram variety with improved practices recorded the yield ranges from 870 kg/ha to 665 kg/ha with the mean yield of 779 kg/ha with yield advantage of 19.85 per cent over the existing variety. The findings of the present study are in line with Kumar *et al*. (2010); Kumbhare *et al*. (2014) and Rai *et al*. (2015). From these results it is evident that the performance of improved variety along with improved practices was found better than the local check under local conditions.

Table 1: Grain yield of black gram as influenced by improved and local practices

Demonstration plot yield	
Maximum yield (q/ha)	8.70
Minimum yield (q/ha)	6.65
Average yield (q/ha)	7.79
Farmers practice yield (q/ha)	6.50
Additional yield over farmers practice (q/ha)	1.29
Percent yield increase over farmers practice	19.85

Yield of frontline demonstration trials and potential yield of the crop was compared to estimate the yield gap, further, it was categorized into extension gap, technology gap and technology index. The extension gap shows the gap between the demonstration yield and local yield and it was 129 kg/ha. The technology gap shows the gap of the potential yield of the crop over demonstrated yield and it was 71 kg/ha. The observed extension gap and technology gap may be attributed to dissimilarities in soil fertility levels, pest and disease incidence, improper usage of manures and fertilizers in this region. Hence, to narrow down the yield gaps location specific technologies needs to be adopted. Technology index shows the feasibility of the variety at the farmers' field. The lower the value of the technology index more is the feasibility. Table 2 reveals that the technology index values were 8.35 per cent. The findings of the present study are in line with the findings of Hiremath and Nagaraju (2009) and Dhaka *et al*. (2010).

Table 2: Yield, Extension gap, Technology gap and Technology index of the demonstration

Variables	Yield (q/ha)	Extension gap (q/ha)	Technology gap (q/ha)	Technology index (%)
Farmers practice	6.50			
Improved practices	7.79	1.29	0.71	8.35

Table 3: Cost of cultivation, Gross return, Net return and Benefit cost ratio as influenced by improved and local practices

Economic attributes	Improved practices	Farmers practice
Cost of cultivation (Rs./ha)	22413.00	23474.00
Gross Return (Rs./ha)	45547.50	38620.10
Net Return (Rs./ha)	23134.50	15146.10
B C R	2.03	1.65

The economic feasibility of improved practices over farmers' practices was calculated depending upon the prevailing prices of inputs and output cost were presented in Table 3. It was found that the cost of production of black gram under improved practices comes to Rs. 22413.00/ha and an average of Rs. 23474.00/ha in farmers practice. Economic analysis of yield performance revealed that frontline demonstrations recorded the higher gross return of Rs. 45547.50/ha and net return of Rs. 23134.50/ha with the benefit cost ratio of 2.03 over local checks. The results are in line with the findings of Sreelakshmi *et al*. (2012).

CONCLUSION

The results from the present study clearly indicated that the combination of high yielding varieties along with adoption of improved practices enhanced the black gram production and economic gain of the farming community. Hence, improved production technologies in black gram have the broader scope for increasing the productivity per unit area.

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