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Impact of frontline demonstrations on productivity and economics of yardlong bean, *Vigna unguiculata* subsp *sesquipedalis* (L) Verde

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ABSTRACT

The pulse vegetables play vital role in nutritional requirements of the farming community. Due to low level of dissemination of the technologies and adoption of the improved methods of cultivation the productivity of the pulses is low. Hence efforts are required to disseminate the technologies for higher productivity by adopting various extension approaches. Among them frontline demonstrations (FLDs) are the important extension methods to convince the farmers about improved varieties. The present study was conducted to assess the influence of FLDs on yardlong bean (variety Arka Mangala) in Hallakkavalli village in Shivamogga district, Karnataka during 2015-17 by involving 11 small and marginal farmers with an area of 2.50 ha. The mean results of two years revealed that improved technology recorded higher green pod yield of 15.75 tons/ha compared to farmers' practices (11.50 tons/ha). The technology gap of 9.25, extension gap of 4.25 and technology index of 37.00 were observed during the demonstration period. The improved production technology gave higher benefit-cost ratio in the FLD plots (2.65) as compared to farmers' plots (1.84).

Keywords: Yardlong bean; FLDs; farmers' practices; improved varieties; technology gap; extension gap

INTRODUCTION

Yardlong bean, *Vigna unguiculata* subsp *sesquipedalis* (L) Verde is a distinct form of cowpea grown as a vegetable crop in southern Asia and in the Far East for its immature pods. It is one of the most popular and cosmopolitan vegetable crops grown in many parts of India. It enriches soil fertility by fixing atmospheric nitrogen. The yardlong bean is a nutritious vegetable which supplies 3.50 g protein, 72 mg calcium, 59 mg phosphorus, 2.50 mg iron, 564 mg carotene, 0.07 mg thiamine, riboflavin 0.09 mg riboflavin and 24 mg vitamin C per 100 g of edible pods (Yadav et al 2004). Lack of awareness about the techniques of production technology involving suitable high yielding varieties (HYVs) as well as poor knowledge about production practices are main reasons for low productivity of yardlong bean. The productivity of yardlong bean per unit area could be increased by adopting recommended practices using suitable high yielding varieties. Keeping this in view the present investigations were undertaken to study the level of knowledge of farmers regarding yardlong bean cultivation, extent of adoption of improved practices and to find out the yield gap in yardlong bean production through frontline demonstrations (FLDs).

METHODOLOGY

The present study was conducted to assess the impact of FLDs on productivity and economics of yardlong bean in Hallakkavalli village in Shivamogga district, Karnataka during 2015-16 and 2016-17 by involving 11 small and marginal farmers with an area of 2.50 ha. The variety Arka Mangala of yardlong bean which was developed by Indian Institute of Horticulture Research (IIHR), Bangalore, Karnataka was used in the FLD programme during 2015-17. The variety Arka Mangala was tested through FLDs with recommended package of practices (Anon 2013). The material and inputs used under the study with respect to FLDs and

Table 1. Comparison between demonstration and existing farmers' practices of yardlong bean

Parameter	Improved practice in demonstration	Existing farmers' practice
Farming situation	Irrigated condition	Irrigated condition
Variety	Arka Mangala (Released from IIHR, Bangalore, Karnataka)	Local
Seed rate (kg/ha)	10	15
Seed treatment	with *Rhizobium*	No seed treatment
Spacing (cm)	60 x 45 cm	90 x 60 cm
Nutrient management (N:P:K kg/ha)	25:75:60	Imbalanced nutrient application
Plant protection	Adoption of IPDM practices	Pesticide application without technical guidance
Crop duration (days)	110	120
Harvesting	50-55 days after sowing	60-65 days after sowing
Grading	Followed	Not followed

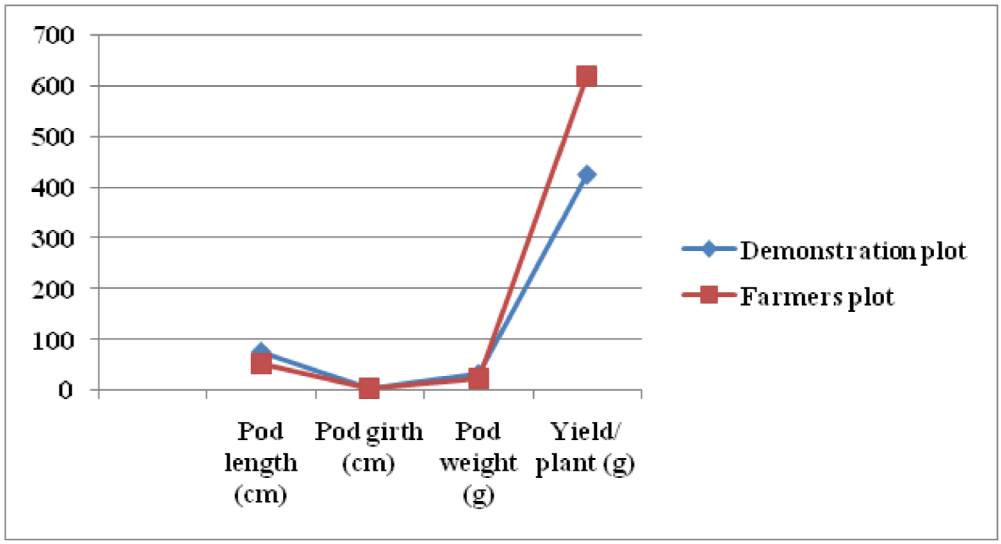

Fig 1. Comparison of major yield traits of yardlong bean in demonstration (DP) and farmers' (FP) plots

farmers' practices are given in Table 1. The data were collected through personal interview, tabulated and analyzed to find out the findings and draw the conclusion. Suitable statistical tools were employed to analyze the data. The expenditure incurred on different crop inputs viz seed, seed treatment, land preparation and pesticides were considered for calculating the cost of cultivation whereas gross returns were calculated on the basis of actual market sale price of the produce availed by the farmers and expressed as B:C (gross return/cost of production). The extension gap, technology gap and the technology index were worked out with the help of formulae given by Samui et al (2000) as mentioned below:

Extension gap (tons/ha)= Demonstration yield (tons/ha) - Yield under local check (tons/ha)

Technology gap (tons/ha)= Potential yield (tons/ha) - Demonstration yield (tons/ha)

Technology index (%)= Potential yield (tons/ha) - Demonstration yield (tons/ha)/Potential yield (tons/ha) x 100

RESULTS and DISCUSSION

The data given in Table 1 depict the comparison between demonstrations and farmers' practice. Recommended variety Arka Mangala was demonstrated at farmers' fields with the local variety as farmers' practice. Demonstrations were laid out by

Table 2. Comparison of yield, economics and extension/technology gap of yardlong bean in demonstration (DP) and farmers' (FP) plots

Year	Number of demonstrations	Yield t/ha		Per cent increase over farmers' plots	Potential yield (t/ha)	Extension gap	Technology gap	Technology index	B:C	
		DP	FP						DP	FP
2015-16	5	15.00	11.00	36.00	25.00	4.00	10.00	40.00	2.68	1.85
2016-17	6	16.50	12.00	37.50	25.00	4.50	8.50	34.00	2.63	1.83
Mean	11	15.75	11.50	36.75	25.00	4.25	9.25	37.00	2.65	1.84

following recommended package of practices for cultivation.

It was observed that farmers applied higher quantity of nutrients and did not follow the integrated nutrient and pest management. They were using the local seeds for the production and imbalanced doses of other nutrients in their fields. They did not use the recommended pesticides for insect pest management in the crop. The farmers also used higher seed rate of 15 kg/ha and did not practice the seed treatment.

The difference in green pod length of two varieties Arka Mangala and local variety was observed and maximum pod length and girth were recorded in Arka Mangala (76.00 and 3.20 cm respectively) followed by local variety (52.00 and 2.50 cm respectively). The average pod weight was also recorded higher in Arka Mangala (30-35 pod /kg) than the local variety (50-60 pod/kg) (Fig 1).

Yield gap analysis: Higher crop yield was recorded in FLD plots as compared to check plots. The highest mean yield (15.75 tons/ha) in FLD plots was recorded during 2015-17. The per cent increase in yield of FLD plots over check plots was 36.75. The results are in conformity with the findings of Tomar et al (2003) and Tiwari and Saxena (2001). The results clearly indicate the positive effects of FLDs over the existing farmers' practices toward enhancing the productivity of yardlong bean. Yield and potential yield of the frontline demonstrations were compared to calculate the technology and extension gaps (Table 2). The technology gap of 9.25 tons/ha was observed. Extension gap of 4.25 tons/ha was observed which emphasized the need to educate the farmers through various extension means like FLDs for adoption of improved production and protection technologies to revert the trend of wide extension gap. These findings are in conformity with the findings of Meena et al (2012), Adivappar et al (2015) and Teggelli et al (2015).

The mean technology index was 37.00 (Table 2) which shows the feasibility of the demonstrated technology at the farmers' fields. These findings corroborate with the observations of Mokidue et al (2011) and Tomar et al (2003).

Cost-benefit analysis: Economic returns from FLD plots were compared with farmers' plots. The benefit-cost ratio (B:C) was higher in demonstration plots

(2.65) as compared to farmers' plots (1.84). These results are in agreement with the study of Chauhan et al (2013) and Kumar et al (2015).

CONCLUSION

On the basis of the results obtained in the present study it is concluded that the yield gap between conventional practices and improved production technology of yardlong bean (variety Arka Mangala) cultivation can be reduced by organizing further FLDs at farmers' fields in different areas. Availability of high yielding varieties and low technical knowledge were found as major constraints in the study. The results of the study indicate the positive effects of frontline demonstrations over the existing practices towards enhancing the productivity and profitability of yardlong bean.

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