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Impact of Frontline Demonstrations on Yield and Economics of Field bean

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ABSTRACT

Frontline demonstration was conducted to demonstrate the potential of improved field bean variety HA 4 in ten farmers' holdings of Dharmapuri district during Rabi season of 2015. The crop was grown with integrated crop management practices and compared with the farmers practice. The integrated crop management practices consisting of new variety i.e., HA 4, seed treatment with rhizobium, soil application of TNAU pulses micronutrient mixture @ 7.5 kg ha^{-1}, spraying of pulse wonder @ 5 kg ha^{-1} during flowering stage and integrated pest management strategies for pod borer. The results of the demonstration indicated that the demonstration of integrated crop management practices recorded the higher number of pods per plant (91.1) and green pod yield (28.3 q/ha). Farmers practice recorded the lower number of pods per plant (67.8) and green pod yield (22.8 q/ha). The per cent increase in yield under demonstration over farmers practice was 24.1. The higher net income (Rs. 33678/ha) and benefit cost ratio (2.04) was realized in demonstration of integrated crop management practices. The lower net income (Rs. 23653/ha) and benefit cost ratio (1.80) was recorded in farmers practice.

Key words: *Field bean, Demonstration, Pod yield, Net income, Benefit cost ratio*

INTRODUCTION

Field bean (*Lablab purpureus* L. Sweet) is a multipurpose crop grown for pulse, vegetable and forage[1]. It serve as a good source of vegetable proteins and its seeds contains 20-28 per cent protein[2]. Being a legume, it can fix atmospheric nitrogen to the extent of 170 kg/ha besides it enrich the soil fertility through addition of crop residues[3]. It is a drought tolerant crop and grows well in dry lands with limited rainfall. Field bean is being cultivated in 4000 hactares in Dharmapuri District. Farmers used to cultivate the crop under rainfed condition especially during *kharif* season immediately after receiving rainfall without any preparatory tillage and addition of manures. Due to the adoption of improper management practices, imbalanced and indiscriminate use of pesticides farmers getting low yield and income. Hence, the present frontline demonstration was taken up by Krishi Vigyan Kendra inorder to create awareness among the farmers and to demonstrate the impact of integrated crop management practices on increasing the yield and income.

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MATERIAL AND METHODS

To overcome the problems faced by the farmers in field bean cultivation, frontline demonstration on integrated crop management in Field bean was conducted by Krishi Vigyan Kendra, Dharmapuri during *Rabi* 2015 in ten farmers' holdings of Dharmapuri district. In the demonstration, improved variety HA 4 was grown in 0.2 ha area with integrated crop management practices and the farmers practice in 0.2 ha area for comparison. The integrated crop management practices consisting use of new variety i.e., HA 4, seed treatment with rhizobium, soil application of TNAU pulses micronutrient mixture @ 7.5 kg ha^{-1}, spraying of pulse wonder @ 5 kg ha^{-1} during flowering stage and integrated pest management strategies were demonstrated. The variety HA 4 introduced under demonstration was released from University of Agricultural Science, Bengaluru during 2007. It is a cross derivative of HA 3 and magadi local. It is photo-insensitive, non viny compact with determinate growth habit. It is suitable for cultivation throughout the year. The technological interventions followed in farmers practice and demonstration is given in Table 1. Before initiating the demonstration, the beneficiary farmers were given with skill training on various technological interventions to be followed in field bean cultivation. The performance of crop was periodically observed by the scientists of Krishi Vigyan Kendra and advisory recommendations were followed. During harvest, yield data was collected from both the demonstration and farmers practice. At the end, cost of cultivation, net income and cost benefit ratio were worked out.

Table 1: Details of the technological interventions followed under farmers practice and demonstration on field bean

S.No.	Technological interventions	Farmers practice	Demonstration (Recommended integrated crop management practices)
1	Farming situation	Rainfed	Rainfed
2	Variety	Local (Photo sensitive)	HA 4 (Photo-insensitive)
3	Time of sowing	Third week of July	First week of November
4	Seed treatment	Seed treatment practice not followed	Seed treatment with *Rhizobium* and *Phospho bacteria* @ 25g/kg; *Pseudomonas fluorescens* @ 10g/kg
5	Method of sowing	Broadcasting of seeds	Hand dibbling on ridges by following a spacing of 30 x 10 cm
6	Nipping	Nipping of terminal bud not followed	Nipping of terminal bud at 30 days after sowing
7	Fertilizer application	Basal application of 20: 20: 20 complex fertilizer @ 75 kg/ha No addition of micronutrient mixtures.	Recommended INM practices Soil application of FYM @ 12 t/ha and recommended dose of NPKS fertilizers i.e., 25:50:25:20 kg /ha Basal application of pulses micronutrient mixture @ 7.5 kg/ha Foliar spray of pulse wonder @ 5 kg/ha at peak flowering
8	Weed management	Not practiced	One hand weeding on 20-25 days after sowing
9	Plant protection	Spraying of pesticides at regular interval without proper dose	Need based usage of plant protection chemicals

RESULTS AND DISCUSSION

Growth and Yield Attributes

The performance of field bean under demonstration and farmers practice was observed (Table 2). Results indicated that, the demonstration of field bean variety HA 4 with integrated crop management practices recorded higher number of branches per plant

(10.7) and pods per plant (91.1). The lower number of branches per plant (6.4) and pods per plant (67.8) were recorded in farmers practice.

The damage incidence of pod borer was lower in demonstration (11.5 %) and higher in farmers practice (35.2%). The lower pod borer damage in demonstration might be due to the adoption of integrated pest management strategies *viz*., placing pheromone traps, need based usage of pesticides. Similar results of reduction in pest incidence due to adoption of integrated pest management practices in brinjal were reported by Govardhan Rao[4].

Demonstration of integrated crop management practices recorded the higher green pod yield (28.3 q/ha) and farmers practice recorded the lower green pod yield (22.8 q/ha). The per cent increase in the pod yield of demonstration over farmers practice was 24.1. The yield improvement in the demonstration might be due to the combined effect of high yielding ability of variety and adoption of integrated nutrient, pest and disease management practices. Similar results have been reported earlier by Mishra[5], Poonia and Pithia[6], Sharma[7] in potato, chickpea and coriander respectively.

Table 2: Performance of integrated crop management practices on yield and economics of Field bean

S.No.	Parameter	Farmers practice	Demonstration (Recommended integrated crop management practices)
1.	Number of branches per plant	6.4	10.7
2.	Number of pods per plant	67.8	91.1
3.	Pod borer incidence (%)	11.5	35.2
4.	Green pod Yield (kg/ha)	2280	2830
5.	% increase in Green pod yield over FP	-	24.1
6.	Gross cost (Rs./ha)	29195	31950
7.	Gross income (Rs./ha)	52848	67928
8.	Net income (Rs./ha)	23653	35978
9.	BC Ratio	1.80	2.11

Economics

The data on economic indicators indicated that, the higher cost of cultivation (Rs.31950/ha) was involved in demonstration as compared to Farmers practice (Rs. 29195/ha) (Table 2). The front line demonstration plots fetched higher net income of Rs. 35978/ha as compared to Rs. 23653/ha with farmers practice. On an average Rs. 12325/ha as additional income is attributed to the higher yield obtained in demonstration. Similar results of increase in net income due to adoption of integrated crop management practices were reported by Sreelakshmi[8], Sreelakshmi[9], Singh[10] in pigeonpea, moth bean and wheat respectively.

The higher benefit cost ratio (2.11) was realized in demonstration and lower benefit cost ratio (1.80) was realized in farmers practice. It showed the economic viability of the technology demonstrated through the frontline demonstration.

CONCLUSION

Results of the frontline demonstration indicated that the yield and income of the field bean growers were significantly increased by the cultivation of improved variety along with integrated crop management practices. The farmers were impressed with the performance of improved variety and encouraged the other farmers to adopt the same in large scale.

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