Indian Journal of Extension Education

Vol.47, No. 3 & 4, 2011 (170-174)

Research Note

Extent of Adoption of Production and Protection Technologies of Field Pea by farmers of district Ghazipur of Uttar Pradesh

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Field Pea *(Pisum sativum* L.), also called as pois proteagineux in French, guisante in Spanish, *pisello* in Italian, *futterebse* in German and *matter* in *Hindi,* is an important winter season grain legume crop largely confined to cooler temperate zone. There are two types of cultivated pea i.e. garden pea and field pea. Garden peas are harvested in an immature conditions and cooked as fresh or canned for subsequence uses. Field Pea is generally grown for dry seeds which are used for a variety of snack preparation and *dal*. The mature pea is highly nutritive containing high proportion of digestive protein (22.5%), carbohydrates (62.1 %), fat (1.8%), minerals (calcium, iron) and vitamins (Riboflavin, thiamine etc.). The most probable centre of origin of pea is Mediterranean region of Europe and central Asia.

Resource – poor farmers in the rainfed ecosystem practice less – intensive agriculture, and since their income depend on local agriculture they benefit little from increased food production in irrigated areas (*Johansen, 2000*). Viable rotation of crops, one being a profitable pulse, is needed to improve the overall profitability, sustainability and diversity of the farming systems (*Joshi, 2002*).

Field Pea is the third most important crop at global level after dry *beans (Phaseolus vulgaris* L.) and Chick Pea. It is cultivated 6.5 million ha area with the total production of 10.95 million tones. Indian ranks fifth after Russain Fed., Ukraine, China and Canada. The highest productivity of 4.8 tonnes ha-I is reported from France. The average productivity of field pea in India is 900 kg ha^{-1}. The major field pea growing states are Uttar Pradesh, Madhya Pradesh, Bihar and Maharashtra. Besides these states, it is also cultivated in Delhi, West Bengal, Punjab, Haryana and Himanchal Pradesh. In U.P., it is cultivated 479 (000'ha) area with 502 (000' mt.) production. The area, production and productivity of field pea in district Ghazipur of U.P. are 7414 ha, 8711 metric tones and 11.75 q ha^{-1}, respectively.

The pulse production in the country can be sustained through productivity growth. All research effects to develop a technology are useless unless farmers adopt the technology. The technology evolved for Field Pea crop is instead to get spread among Field Pea cultivators to accelerate production process. An important task in the development programme for agriculture is to create awareness among the farmers about the improved agricultural practices. Building up a sound agricultural information and extension education programme does this. In order to as certain extent of recommended technology in Field pea cultivation, the present study was done in Ghazipur district of U.P.

METHODOLOGY

The present investigation was based on an intensive study of farmers interactive group (FIG) of field Pea growers of selected cluster villages of Ghazipur district of Uttar Pradesh. Cluster village of district Ghazipur of U.P. has been purposively selected for this study, looking to its typical and apt representation of the district with respect to Field Pea production. Four villages namely, Sabua, Laximanpur, Chochakpur and Alipur Bhatgawan of Karanda block of district Ghazipur were selected randomly. The final selection of the farmers was done from each selected village based on proportion to its size (No. of field Pea growers). The number of farmers selected were hundred with medium farmers (medium land holding) for present study.

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RESULTS AND DISCUSSION

The collected information were analysed for as creating the level of adoption of recommended technology in field Pea cultivation.

Adoption level of respondent about recommended Technology in Field Pea cultivation

The data presented in Table-l revealed that overall 55% of the total respondent were found to be in medium adoption group, whereas 31 % respondent were reported from the low adoption group and only 14% respondent could be placed in the high adoption group.

Extent of adoption of recommended technology in Field Pea cultivation

(1) **Adoption of field preparation**

Field Pea generally do not need fine seed bed. Seed bed preparation is accomplished through primary tillage which consists of ploughing, harrowing, discing, etc. A good seed bed should have friable but compact soil, adequate moisture and free from weeds and plant debris. The information presented in table-2 reveals that 25 percent farmers followed the tillage practices as recommended while rest of majority of the farmers(75 per cent) followed the over tillage practices. The reason for this over tillage practices are the common by almost all the farmers, to grow field pea after rice or keeping fallow land in Kharif.

(2) **Adoption of method of sowing**

Planting of field pea is done by drilling seeds manually in furrows opened by tube (Pora); or seeding through tractor or bullock operated seed drills. Line sowing is beneficial over broad casting as it ensures uniform distribution of seeds, placement of seeds at proper depth, better plant stand, easy in cultural operations and also improved drainage. Line sowing by 25 x 10 cms in field Pea maintaining the plant population as 30-40 plants m^{-2} was recommended. But majority of the farmers (85 per cent) were not using the recommended sowing method due to lack of knowledge and lack of sowing implements. Only 15 per cent farmers were using line sowing techniques.

Table 1- The level of adoption of respondent about recommended technology in field Pea cultivation.

S.No.	Adoption level	No. of farmers (100)	
		Farmers	Percentage
1	Low	31	31
2	Medium	55	55
3	High	14	14

(3) **Adoption of recommended varieties**

The recommended varieties for Field Pea are Rachna, Pant P-5, Malviya Matar-2, JP-885, Apama, KFP-I03, Alankar, HFP-8909, KPMR-144-1, Jayanti, Malviya Matar- 15, VFPD-24, Azad Pea-l etc. The perusal of data in table-2 on this particular aspect rveals that almost 70 per cent of the farmers adopted recommended varieties Malviya Matar-15, Malviya Matar-2, Azad Pea-L Lower adoption of other recommended varieties i.e. Alankar, Apama, Rachna, JP-885 was due to non availability of the seeds in time and lack of knowledge about other improved varieties. About 30 per cent farmers were adopted or using non-identified/ non descriptive varieties due to lack of knowledge about importance of varieties.

(4) Adoption of fertilizer use

Application of the various fertilizers should be recommended only on the basis of soil test. However, in absence of soil fertility data, application of 20:40:0:20 (N: P_20s:K_20 and S) kg ha-I. Rainfed as well as in irrigated situation as basal application are recommended on the basis of response obtained in trials. Only 25 per cent farmers followed the recommendation of balanced fertilizer application while 75 per cent farmers were not using balanced fertilizer application. The reason of not using recommended dose of balanced fertilizer application were mostly attributed by the farmers as a lack of knowledge behind using of any fertilizer in any pulse crop and high risk involved in field pea crop, pulses crop treated as a secondary crop by the farmers.

(5) **Adoption of time of sowing**

The optimum times for planting field pea is generally sown with a pre-plant irrigation and follow a regular Kharif crop, lies between end of October to first fort night of November. Table 2 expressed that 15 per cent farmers were sown their crop before time, 75 per cent in recommended time, while rest 10 percent have been sown after recommended time. The decision of sowing before time was observed to be based on the fallow land in Kharif season whereas the sowing after recommended time was observed to be based on the standing crop of preceding rice crop in same field in last week of October or First week of November.

(6) **Adoption of seed rate**

Seed rate is the key determinant of plant population. To achieve a desired plant density, seed rate is decided on the basis of seed size, seed purity and germination percentage. In field pea, 50-60 kg ha" seed rate for

Table 2. Extent of adoption of recommended technology in Field Pea cultivation.

S.N.	Adoption level	No. of farmers (100)	
		Farmers	Percentage
1	Preparatory tillage		
	(i) As recommended	25	25
	(ii) Above recommended	75	75
2	Line sowing/Bed planting! Planting method or method of sowing		
	(i) As recommended	15	15
	(ii) Nil(Broad casting)	85	85
3	Varieties		
	(i) As recommended	70	30
	(ii) Non-descriptive local Var.	70	30
4	Chemical fertilizer/Balanced fertilizer application		
	(i) As recommended	25	25
	(ii) Below recommended	75	75
5	Time of sowing		
	(i) Before recommended	15	15
	(ii) In recommended time	75	75
	(iii) After recommended time	10	10
6	Seed rate		
	(i) As recommended	30	30
	(ii) Above recommended	60	60
	(iii) Below recommended	10	10
7	Seed treatment		
	(i) Treated	Nil	Nil
	(ii) Un treated	100	100
8	Weed Management		
	(i) Manual	20	20
	(ii As chemical recommended	10	10
	(iii) No weed management	70	70
9	Water management		
	(i) As recommended	20	20
	(ii) Nil	80	80
10	Plant protection measures		
	(i) As recommended	15	15
	(ii) Below recommended	45	45
	(iii) Nil	40	40

small seeded genotype (13-16 *gl100* seeds) and 80-90 kg ha-I for bold seeded (20 *gl100* seeds) has been found optimal. The data in table-2 indicated that the majority of the farmers (60 per cent) was used rate more than recommendation. It may be due to sowing by broadcasting method resulted poor germination and plant population.

(7) **Adoption of seed treatment**

Seed is to be treated by bio-fungicide i.e. Trichoderma and Rhizobium culture for wilt management and better nodulation (nitrogen fixation); respectively. The analysis reveals that cent percent farmers not done seed treatment as per recommendation. It is because of lack of knowledge about advantage of seed treatment and lack of availability of viable bio-fungicide and Rhizobium culture.

(8) **Adoption of weed management**

Weed competes with crop plants for various production resources such as nutrients, moisture, sunlight and space. In field pea, Critical crop wheat competition period is 40-60 days and crop suffers from a severe weed infestation which causes in drastic reduction in yield. Therefore, it is advisable to keep the field free from weeds by giving one hand weeding about 20-25 days after sowing of the crop. Where hand weeding is not possible, use of Lasso (AlacWore) @ 3.0 kg ha- as pre-emergence or Basaline @ 1.0 litre ha-I as pre-sown incorporation in soil may be done. By using herbicides the field will be weed free up to 50 days of sowing and least damage of crop will take place. Other herbicides are Metalachlore, Oxadiazone and Pendimethalin @ 1.0 kg *ai.* ha- as a pre-emergence.

The data from table-2 reveals that 10 per cent farmers are adopting recommended weedicides as a chemical weed control, 20 percent farmers are applying manual weed management by Khurpi (a hand weeding small equipment) and majority of the farmers (70 per cent) not applying any method of weed management in field pea crop it's because of lack of knowledge about losses in productivity due to weed problem in field pea crop.

(9) **Adoption of water management**

Field pea needs relatively better moisture regime than chick pea. One irrigation at flowering initiation stage (50 DAS) was found most beneficial in North-East Plains i.e. Faizabad, U.P. whereas in central India (Jabalpur, M.P.), two irrigations, one each at branching and flowering were found optimum (Rathi *et al.; 1995)*. Dwarf genotypes like Aparna respond better to irrigation than tall genotypes.

The data from table-2 reveals that only 20 per cent farmers are adopting water management schedule as per recommendation, whereas majority of the farmers (80 percent) were not using any water management schedule. It is because of the farmers are misguiding as there is no requirement of irrigation in any pulse crop; pulses are treated totally as rain fed crop by farmers.

(10) **Adoption of plant protection measures**

Insect-pest causing damage to pea crop is stem fly, leaf minor, aphid and pod borer. For leaf minor and aphid control, 750-1000 ml of Metasystox 25 EC (Demeton-O-Methyl) or 400-500 ml of Dimecron 85 SL (Phosphamidon) in 1000 litre of water per hectare and for pea stem fly and pod borer management, 1.5 litre of Endosulfan 35 EC, or Rogor 30 EC (Dimethoate) or 400-500 ml of Phosphamidon 85 SL in 1000 litre of water per hectare is quite effective.

As regards plant protection measures the data revealed that 45% farmers followed plant protection measures below recommended, 15% farmers followed plant protection measures as recommendation for plant protection measures in field pea crop. The high cost, non availability of effective fungicides, insecticides might have important reason. The lack of knowledge about pest control, IPM and IDM module in field pea crop was the important reason behind this.

CONCLUSION

In terms of adoption of various component technologies of the package of practices of the farmers were studied and it can be concluded that the adoption of time of sowing has been 75 per cent as well as adoption of recommended varieties about 70 percent amongst all the component technologies. No any farmer using seed treatment due to lack of knowledge about this and lack of availability of the viable bio fungicide and Rhizobium culture. Most of the farmers were not using plant protection measures, water management and weed management practices due to high cost involved in agro-chemicals, lack of knowledge about irrigation requirement in any pulse crop and lack of knowledge about losses in productivity due to weed problem in field pea crop. Therefore, for enhancing the production and productivity of field pea, strategy should be made for getting the more and more recommended technologies adopted by the farmers.

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