"Knowledge and Attitude of the Farmers towards Raised bed and other Improved Production Technology of Pigeonpea *(Cajanus cajan)* for Climate Resilient Agriculture

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ABSTRACT

The present study was undertaken to find out the knowledge and attitude of the farmers towards raised bed and other improved technology of pigeonpea. Raised bed sowing of pigeonpea is still in its infancy in India and there is a need to make it popular among the farmers. Though there is a phenomenal growth in the area under Raised bed sowing of pigeon pea, a lot of work is still to be done to explain and convince the farmers, especially those in the dry land area about the high potentialities of this new technique. The present study was conducted in Pataudi block of Gurgaon district in Haryana, which was selected purposively. The data were collected through pre-tested schedule Form120 respondents selected randomly. The collected data were tabulated, analyzed and interpreted with the help of appropriate statistical tools. It was found that the majority of the famers adopted scientific recommendations like improved varieties, time of sowing, manual and chemical weed management while seed treatment and plant protection measures were not adopted by majority of the farmers due to lack of knowledge, high cost involved in purchasing agro-chemicals, use of sprayers in standing tall crop of for managing pod fly and food borers. Majority of farmers (58.33 %) were found having medium level of knowledge and attitude (55.84 %) towards Raised bed sowing of pigeonpea. Education and annual income had positive and significant correlation with their knowledge of improved technology of pigeonpea. Education had positive and significant association with their attitude towards raised bed sowing technique of pigeonpea.

Key words: Knowledge, attitude, improved technology, independent variables

INTRODUCTION

Pigeonpea or red gram *[Cajanus cajan (L.) Millsp.]* is a major protein-rich food supplement for most Indians. The crop is cultivated on 4.04 m ha (IIPR, 2013) mainly at subsistence level as rainfed intercrop since hundreds of years. Among pulses, pigeonpea dal is a staple food across the country and plays an important role in national economic and nutritional security. The annual production of this pulse in India is about three million tonnes; but this quantity is insufficient to meet the domestic needs; and hence a considerable amount (about 100,000 t) of pigeonpea is imported each year. To breed high yielding cultivars pigeonpea breeders deployed various methods primarily recommended for self-pollinated crops (Green *et al.,* 1981) and released dozens of varieties but without any marked improvement in its productivity, that remained unchanged over the decades at around 600-800 kg/ha (Fig 1). In the near future also, the issue of yield stagnation is likely to remain more or less the same, until a path breaking technology with exceptionally high yield potential is developed.
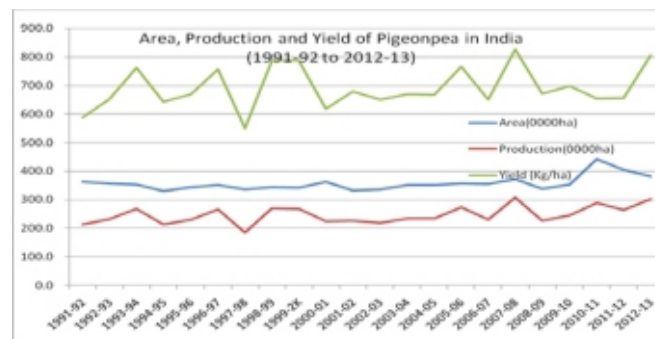

Fig 1: Area, production and productivity of pigeonpea in India

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The main purpose of this study was to get a clear-cut picture of the present situation of the knowledge and attitude towards improved production technology of pigeonpea in Haryana especially in Gurgaon district.

METHODOLOGY

The present study was purposively undertaken in the Pataudi block in Gurgaon district of Haryana state. Twelve villages were purposively selected from the selected block. From each selected village, 10 farmers were selected randomly making a sample of 120 respondents. The present study was confined to *ex-post-facto* research design. The independent variables were measured by using suitable scale and procedure adopted by various researchers in past with due modification. The dependent variables taken in this study were knowledge and attitude towards improved production technology of pigeonpea.

An interview schedule was developed according to objectives of study and the data were collected by personal interview with 120 respondents. The collected data were classified, tabulated and analyzed in order to make the findings meaningful. The statistical tools used to analyze the data were percentage, mean score, standard deviation and correlation coefficient.

RESULT AND DISCUSSION

The socio-economic characteristics of pigeonpea farmers are presented in Table 1

Table 1: Socio-economical characteristics of the respondents: The socio-economical characteristics of the respondents were studied and the data have been given.

n= 120

Age		
Category	Frequency	Percentage
Young (Up to 35 years)	18	15.00
Middle (36-50 years)	80	66.66
Old (Above 50 years)	22	18.34
Education		
Illiterate	24	20.00
Primary (up to 7th standard)	46	38.33
Secondary (8th to 10th standard)	22	16.66
Higher (11th to 12th standard)	19	15.84
College and above	11	9.17
Land holding		
Small (up to 2 Acre)	26	21.67
Medium (between 2.1 to 4.0 Acre)	66	55.00
Large (More than 4.0 Acre)	28	23.33
Annual income		
Low (up to 76,000/-)	12	10.00
Medium (76, 001/- 2, 44,000/-)	85	70.83
High (above 2, 44,000/-)	23	19.17
Social Participation		
No membership	66	55.00
Membership in one organization	20	16.66
Membership in more than one organization	31	25.83
Holding position in organization	03	2.50
Extension contact		
Low (up to 21 score)	22	18.34
Medium (between 22 to 25)	68	56.66
High (above 26 score)	30	25.00
Mass media exposure		
Low (up to 17 score)	22	18.34
Medium (between 18 to 21 score)	75	62.50
High (above 21 score)	23	19.16
Overall socio-economic status		
Low (up to 17 score)	22	18.34
Medium (between 18 to 21 score)	72	60.00
High (above 21 score)	26	21.66
Total	**120**	**100.00**
Mean = 19.43	**SD = 1.75**	

A majority (66.66 %) of the farmers were from the middle age group, followed by 18.34 and 15.00 per cent in the old and young age group, respectively. Educational level of farmers is supposed to play vital role in understanding new innovations and thereby in the acceptance of new agricultural technologies and attitude level.

It is evident from the data that more than one-third (38.33 %) of farmers had primary level education. followed by (20.00%). per cent were illiterate. Only 9.17 per cent farmers had education up to college level. More than half (55.00 %) of farmers had medium size of land holding, followed by 23.33 and 21.67 per cent of farmers who had large and small land holding, respectively. More than two-third (70.83 %) of farmers had medium annual income, while 19.17 and 10.00 per cent of farmers had high and low annual income, respectively.

It is well recognized that membership by a farmer in formal and informal organizations indicates his social participation status and credibility in his community. Social participation plays an important role in influencing knowledge and attitude of the farmers. A majority (55.00

%) of the farmers were having no membership in any organization 25.83 per cent of them had membership in more than one organization and 16.66 per cent had taken part in one social organization, whereas, only 2.50 per cent were holding position in one or more organizations. The respondents were classified in three groups on the basis of their contacts with extension agencies as shown in Table 1. About 57 per cent of respondents had medium extension contact, 25.00 per cent and 18.34 per cent respondents were under high and low category of extension contact.

The information regarding mass media exposure was collected as the nature and frequency of involvement of respondents in different mass media such as radio, television, newspaper, printed literature, agriculture exhibition and agricultural fair. A majority of the farmers (62.50 %) utilized medium mass media exposure followed by 19.16 per cent and 18.34 per cent who utilized high and low mass media exposure, respectively

It is clear from the above table 1 that (60.00%) of respondents were in medium socio-economic status category, while 21.66 per cent and 18.34 per cent respondents had high and low socio-economic status respectively.

Table 2: Knowledge of the farmers of recommended technology in pigeonpea

Knowledge level		
Knowledge about Recommended technology	**Frequency**	**Percentage**
Knowledge about field preparation		
Correct	80	66.66
Incorrect	40	33.34
Knowledge about line sowing/bed planting		
Correct	20	16.67
Incorrect	100	83.33
Knowledge about selection of Varieties		
Correct	85	70.83
Incorrect	35	29.17
Knowledge about use of chemical fertilizer		
Correct	30	25.00
Incorrect	90	75.00
Knowledge about time of sowing		
Correct	50	41.67
Incorrect	70	58.33
Knowledge about seed rate		
Correct	40	33.34
Incorrect	80	66.66
Knowledge about seed treatment		
Correct	35	29.17
Incorrect	85	70.83
Knowledge about weed management		
Correct	75	62.50
Incorrect	45	37.50
Knowledge about plant protection measures		
Correct	85	70.84
incorrect	35	29.16

Knowledge about improved techonology

Four or five ploughs of pigeonpea crop are recommended. The information presented in Table 2 of knowledge about field preparation revealed that majority (66.66%) farmers had knowledge about field preparation as recommended. Line sowing by 60-70cm x 30cm for pigeonpea cultivation behind the plough or by raised bed technique is recommended. However, majority (83.33%) of the formers are not using the sowing method due to lack of knowledge and lack of raised-bed planter. Only 16.67 per cent farmers are using line-sowing technique. A perusal of the data in Table 2 on this particular aspect reveals that almost 70.83 per cent of farmers adopted recommended varieties. About 29 per cent farmers adopted or used non-identified/non descriptive due to lack of knowledge about importance of varieties. As varieties recommended, 18 Kg nitrogen and 46 Kg phosphorus per hectare should be applied as a basal dressing at the time of sowing. Only 25 per cent farmers had the knowledge about it while 75 per cent farmers had no knowledge about recommended dose of fertilizers. The reason of not using recommended dose of chemical fertilizer was mostly attributed by the farmers to the lack of knowledge about using fertilizer in pulse crop and high risk involved in pigeonpea crop, also the pulses crop are treated as secondary crop by the farmers. The recommended time of sowing of pigeonpea crop is 25 June-26 July. Table 2 showed that 41.67 per cent of farmers had knowledge of sowing their crop in recommended time. Majority (58.33%) of respondents had no knowledge about time of sowing of pigeonpea. The majority of farmers (66.66%) had no knowledge about seed rate of pigeonpea and used seed rate more than recommended. It may be due to sowing by broadcasting method which resulted poor germination and plant population. 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 majority of the farmers (70.83%) did not practice seed treatment. It is because of lack of knowledge about advantage of seed treatment and lack of bio-fungicides and Rhizobium culture. About 63 per cent farmers had knowledge about weed management, and adopted recommended. A majority of the farmers (37.50%) did not use any method for weed management. It is because of lack of knowledge about losses in productivity due to weed problem in pigeonpea crop. As

regards knowledge about plant protection measure the 70.84 per cent farmers had knowledge about it. The high cost, non-availability of effective bio fungicides, sprayer might have non availability of effective bio fungicides, insecticides, sprayer were important reason. It is a problem to operate sprayer in long standing broadcasted pigeonpea. The lack of knowledge about pest control and IPM module was the important reason behind this.

Table 3: Distribution of the respondent according to their knowledge towards raised bed sowing of pigeonpea

n=120

Knowledge Level			
Category	Knowledge Score	Frequency	Percentage
Low	Up to 10	21	17.50
Medium	11-14	70	58.33
High	Above to 14	29	24.17
Mean = 12.31		SD =1.13	

A majority (58.33%) of the farmers possessed medium level of knowledge, followed by 24.17 and 17.50 per cent of farmers possessed high and low level of knowledge about raised bed sowing of pigeon pea.

Table 4: Attitude of the farmers towards recommended technology in pigeon pea

n=120

Statement	Attitude level					WM
	SA	A	U	D	SDA	
Raised bed sowing system of pigeonpea is symbol for progressive of farmer	60	30	5	10	15	3.91
Raised bed sowing of pigeonpea is a good source of additional production	65	20	7	8	20	3.85
Raised bed sowing system is only for rich farmers	60	25	10	10	15	3.95
Raised bed technique is not very successful because the staff guidance is available	55	28	9	8	20	3.75
Only low cast people adopt raised bed technique	20	15	30	15	40	2.66
Raised bed technique is very risky and should not be adopted	15	25	35	20	25	2.87
Raised bed sowing technique of pigeonpea is highly specialized technique and hence only technical person can adopt it	50	40	5	10	15	3.83
Raised bed sowing system is best for water saving	70	25	5	10	10	4.12
Lot of money is required for purchasing raised bed planter	45	35	10	15	15	3.67
Raised bed technique is good for economic use of fertilizer	65	30	8	5	12	4.09
Govt. provide loan and subsidy for purchasing raised bed planter	75	25	5	10	5	4.29
Raised bed system is nothing, just wastage of time and money	40	25	10	20	25	3.29
Conventional sowing system is better Than raised bed system	30	15	15	20	40	2.79

Table 5: Distribution of the respondent according to their attitude towards raised bed sowing of pigeonpea

n=120

Attitude Level			
Category	Attitude Score	Frequency	Percentage
Unfavorable	Up to 26	23	19.16
Some what favorable	27-30	67	55.84
Favorable attitude	Above to 30	30	25.00
Mean = 28.94		SD = 2.53	

More than half (55.83 %) of respondents had some what favorable attitude towards raised bed sowing system of pigeonpea. While, less than one fourth (25.00%) of respondents had favorable level of attitude. Rest of them (19.16%) had unfavorable attitude towards raised bed sowing system of pigeon pea, respectively.

Table 6: Relationship between the selected socio-economic characteristics and knowledge of raised bed sowing of pigeonpea

n= 120

Knowledge level	
Variables	Correlation coefficient ('r' value)
Age	-0.05670^{NS}
Education	0.25383**
Land holding	-0.16760*
Annual income	0.29672**

*= Significant at 0.05 level of probability.
**= Significant at 0.01 level of probability.
NS= Non Significant

It is apparent from the data presented in the Table 6 that age had negative and non-significant correlation ($r = -0.05670$) with knowledge of the respondents towards improved production technology of pigeonpea. This indicates that knowledge of farmers was not influenced by their age. Irrespective of their age, farmers from the entire age groups *i.e.* young, medium and old aged farmers were similar in their knowledge of raised bed system positive.

Correlation implies that as the education increases, the overall knowledge of the respondents increases, but up to the level of significance and hence, Education plays any role in building up their favourable knowledge of raised bed sowing system. The probable reason for the above fact might be that both categories of respondents i.e. educated and non-educated availed the benefit under raised bed sowing system of pigeonpea equally. The land holding had negative and significant correlation (r = -0.16760) at 0.05 level of significance association. It was observed that higher the land holding; higher was the

knowledge of raised bed system. Farmers' was having large size of land holding had wide scope to spare their land under raised bed sowing of pigeonpea technique. The annual income had Positive and significant correlation (r = 0.29672) with the knowledge of respondents towards raised bed sowing system of pigeonpea. It was observed that higher the annual income higher the knowledge of raised bed system. Farmers' having higher annual income had wide scope to spare their income under raised bed sowing of pigeonpea technique.

Table 7: Relationship between the selected socio-economic characteristics and Attitude of raised bed sowing of pigeonpea

n= 120

Attitude Level	
Variables	Correlation coefficient ('r' value)
Age	0.01584^{NS}
Education	0.19671*
Land holding	-0.23798**
Annual income	-0.19815*

*= Significant at 0.05 level of probability.
**= Significant at 0.01 level of probability.
NS= Non Significant

The age had positive and non-significant correlation (r = 0.01584) with attitude of the respondents towards raised bed sowing system of pigeonpea. This indicates that, attitude of farmers was not influenced by their age. Irrespective of their age, farmers from the entire age groups i.e. young, medium and old aged farmers were similar in their attitude towards raised bed sowing system of pigeonpea. The level of education had positive and significant correlation (r = 0.19671) with attitude of respondents towards raised bed sowing system of pigeonpea. It implies that as the education increases, the overall attitude of the respondents increases, but up to the level of significance and hence, education does play any role in building up their favourable attitude towards raised bed sowing system of pigeonpea. The probable reason for the above fact might be that both categories of respondents *i.e.* educated and non-educated availed the benefit under improved production technology of pigeonpea. The land holding had negative and significant correlation (r = -0.23798) with the attitude of respondents towards raised bed sowing system of pigeonpea. It was observed that higher the land holding; more favorable attitude towards raised bed sowing system of pigeonpea. Farmers' having large size of land holding had wide scope to spare their land under raised bed sowing technique of pigeonpea. The annual income had negative and

significant correlation (r = -0.19815) with the attitude of respondents towards raised bed sowing system of pigeonpea. It was observed that higher the annual income more favorable attitude towards raised bed sowing system of pigeonpea. Farmers' having large annual income had wide scope to spare their income under raised bed sowing technique.

CONCLUSION

The study revealed that there was knowledge gap in pigeonpea cultivation in area of seed rate and seed treatment. Though they had knowledge about plant protection measures due to tall crop, pest management is a problem. The long standing crop affect as the movement of sprayers. Further, only one- fourth of farmers had favorable attitude towards pigeonpea cultivation. It is not desirable   state as India regularly faces shortage of pulses. Extension strategy a needs to be oriented towards promotion of pigeonpea cultivation.

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