International Journal of Farm Sciences **3(2)** :41-45, 2013

Economic analysis of integrated pest management in pigeon pea (*Cajanus cajan*) production in Pratap Garh district of Uttar Pradesh

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ABSTRACT

The present research deals with the IPM techniques adoption in pigeon pea. It is concluded from the study that adoption index was 12 per cent in small farmers of low group having 29.16 percent, subsequent adoption index of medium and large groups were 48.02 and 72.11 per cent respectively which indicates the increasing trend of adoption. Although pigeon pea grows at large area yet the production per unit is very low due to attack of pests and diseases at vegetative growth to pod formation stage. It was observed that IPM techniques adoption index gradually increased as the production increased. The overall cost of cultivation decreased with the increasing adoption techniques of IPM. The overall return was increased as B:C ratio indicated 1:1.78 in increasing trend.

Keywords: Economics; IPM; pigeon pea; adoption

INTRODUCTION

Pigeon pea is a Kharif season crop which requires less irrigation especially when there is no rainfall. It is in these days considered as a cash crop due to its rising demand and continuous price hike. Although production per hectare of pigeon pea is very low due to severe attack of pests from sowing to pod formation stage yet of the total sown area under pulses 45 per cent was covered under pigeon pea. There are various techniques available to control the pests. IPM techniques are the most desirable to keep the ecological balance along with enhancement of the productivity level. The IPM techniques have been adopted by the farmers of Pratap Garh district of Uttar Pradesh to reduce the cost of cultivation and increase the yield.

MATERIAL AND METHODS

The present study was conducted in Pratap Garh district of Uttar Pradesh where farmers had been using IPM techniques for control of pests in pigeon pea crop in many villages. These villages were Bhopat Pur, Padmaker Pur, Ajmer Shah Ka Pura and Kohla of Mandhata block of district Pratap Garh. In total eighty farmers were selected. The selected farmers were divided into three groups viz small, medium and large. Of the total selected pigeon pea growers 45 were small (below 2 ha of land holding), 21 were medium (2-4 ha of land holding) and 14 were large (more than 4 ha of land holding). The data were collected wrt IPM techniques practiced by the farmers on a pre-tested schedule through bench mark purposive random sampling method during the year 2010-11. The data were analyzed with simple tabular method, composite index of IPM techniques and economics of pigeon pea production was estimated as per the method given by Vitode et al (2008). The adoption index was calculated as per the formula given as under:

$$\text{Adoption Index} = \frac{\text{Total score of respondents}}{\text{Total possible score}} \times 100$$

The respondents were given the ranking 0 for no adoption (small), 1-2 for partial adoption (medium) and 3 for full adoption (large) through composite adoption application.

RESULTS AND DISCUSSION

It is shown in Table 1 that out of 80 farmers 12 small farmers belonged to low adoption index of 29.16 per cent, 55 medium farmers belonged to medium adoption index of 48.05 per cent and 13 large farmers belonged to high 72.11 per cent. The same trend was also studied by Deoghare et al (2003).

The data given in Table 2 show that highest percentage was that of respondents (78.50%) who used tillage followed by time of sowing (77.94%), application of insecticides (74.42%) lowest being the trapping technique (14.84%).

Under small group of farmers maximum number of them adopted time of sowing (89.31%) followed by tillage (86.11%), weeding (78.44%) and insecticide application (75.76%) with trapping being the least used technique (9.05%). In medium group of farmers maximum number of them adopted time of sowing (81.91%) followed by insecticide application (80.15%), tillage (76.61%) and weeding (75.81%) with trapping being the least used technique (15.34%). Similarly in large size group tillage was the most used technique (88.49%) followed by insecticide application (82.23%), time of sowing (78.19%) and clean cultivation (65.37%) with trap crop use as the least applied technique (18.43%).

Table 1. Distribution of farmers in different size groups based on adoption of IPM techniques

Size of land holding	Adoption Index	Average adoption index	No of farmers
Small	0-32	29.16	12 (12%)
Medium	33-59	48.05	55 (55%)
Large	60-80	72.11	13 (13%)

Table 2. Component wise adoption of IPM techniques by the farmer groups belonging to three groups (n=80)

Component	Group size			Per cent adoption
	Small	Medium	Large	(overall)
Tillage	86.11	76.61	88.49	78.50
Manuring	51.15	45.39	40.75	42.90
Crop rotation	32.80	37.67	60.22	40.84
Trap crops	16.91	20.13	18.43	17.89
Crop residues destruction	10.12	28.93	44.76	26.03
Weeding	78.44	75.81	65.17	68.57
Trapping	9.05	15.34	20.11	14.84
Insecticide application	75.76	80.15	82.23	74.42
Time of sowing	89.31	81.91	78.19	77.94
Clean cultivation	70.62	70.87	65.37	67.14
Average	52.01	54.03	57.37	54.47

Table 3 shows the cost of cultivation per hectare of pigeon pea. It can be seen that overall cost of cultivation had an increasing trend. Cost A, Cost B and Cost C were ₹ 17,321.53; 20,262.56 and 21,582.41 respectively.

It can be observed from Table 4 that maximum gross return was in large group of farmers (40,025.00) which was higher than the medium (38,581.50) and lowest in case of small group (37,375.00). The net return was highest in large group (17,396.08) followed by small (17,260.05) and medium group (16,628.14).

Overall farm family income was higher (16,403.54) as compared to family business income (15,437.33).Table 5 shows that input output ratio of small size group in Cost A was higher followed by medium and large size groups. The overall B:C ratio in Cost C was 1:1:78 which was higher than the medium and large size

Table 3. Cost-benefit analysis of IPM adoption techniques among different size groups

Particulars	Group size			
	Small	Medium	Large	Overall
Cost A (₹)	16,321.91	17,473.15	18,170.71	17321.53
Cost B ( )	19,633.24	20,012.42	21,143.21	20,262.56
Cost C ( )	20,114.95	21,933.36	22,678.92	21582.41

Table 4. Economic analysis of respondents based on the adoption of IPM techniques in pigeon pea cultivation per hectare

Particulars	Group size			Overall
	Small	Medium	Large	
Yield (tonne/ha)	14.95	15.13	16.01	15.36
Gross return ( )	37,375.00	38,581.50	40,025.00	38,660.50
Net return ( )	17,260.05	16,628.14	17,396.08	17,094.76
Farm family income ( )	16,917.76	15,591.99	16,700.87	16,403.54
Family business income ( )	16,013.18	15,319.87	16,459.24	15,437.33

Table 5. Input-output ratio of IPM adoption techniques among three size groups

Particulars	Group size			Overall
	Small	Medium	Large	
Cost A	1:2.29	1:2.22	1:2.20	1:2.24
Cost B	1:1.93	1:1.89	1:1.83	1:1.88
Cost C	1:1.86	1:1.76	1:1.74	1:1.78

groups. Similar results have been found by Tamizheniyan et al (2003).

CONCLUSION

It can be concluded that pigeon pea cultivation was profitable in Pratap Garh district. The returns from pigeon pea cultivation increased as adoption index techniques of IPM increased. The adoption of IPM techniques for pigeon pea cultivation was successful in this area. It also decreased the cost of cultivation and risk of pest and disease incidence in the study area.

REFERENCES

Deoghare B, Kukade NN and Ingade MN 2003. Economics of Integrated Pest Management in

Vidarbh region. Agresco Report, Dr PKKV, Akola, pp 33-151.

Tamizheniyan S, Umesh KB and Krishna V 2003. Integrated Pest Management in Tamil and Kerala- a resource economics analysis. Agricultural Economics Research Review **16(1)**: 1-10.

Vitode AK, Vaidkar RD and Chhorey 2008. Integrated pest management techniques in cotton production- an economic analysis. New Agriculturist **19(1,2)**: 159-162.

Received: 12.7.2012 *Accepted: 4.3.2013*