

## IMPACT OF RECOMMENDED TECHNOLOGY IN COWPEA CULTIVATION IN SIKAR DISTRICT OF ZONE II-A OF RAJASTHAN

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### ABSTRACT

An attempt has been made to assess the impact of recommended technology in cowpea cultivation and to identify major constraints in the adoption of recommended technology. For this purpose, a sample of 80 farmers was selected randomly from 4 villages of Laxmangarh tehsil of Sikar district. It was concluded that adoption of HYV seed was 23 per cent. Majority of farmers adopted optimum seed rate. Seed treatment, plant protection technology and fertilizers were adopted by few farmers in the study area. Ninety per cent farmers adopted up to 33.93 per cent improved technology. The cost and net returns increased with the level of technology adoption. The percentage net returns increased over I level of technology was 117.58 per cent for II level of technology and 200 per cent for III level of technology. In the study area, farmers were not using HYV seed of cowpea due to lack of knowledge about HYV seed and high cost of HYV seed (38.75 per cent). Seed treatment technology was not adopted by the farmers due to lack of knowledge about chemicals and quantity along with advantages of seed treatment technology. Fertilizers and plant protection measures were not adopted due to low productivity of cowpea, erratic rainfall, lack of life saving irrigation facilities and high cost of fertilizers and plant protection chemicals. Lack of technical guidance was also a major constraint for adoption of recommended technology.

### INTRODUCTION

The new agricultural technology is believed to have generated more income to the farmers. But how this increase in income is distributed among various categories of farms at various levels of technology adoption is a matter of socio-economic significance. Several available studies on technology adoption have

separately addressed either factors affecting the adoption or its impact on farm economy across the farms and regions. The studies by Rawal (1983), Agrawal (1983), Herath (1983), Henry (1983), Yadava and Gangwar (1987) revealed that economic prosperity; social mobilization and favourable psychological orientation are instrumental in the adoption of new technology.

Rajasthan state is divided into ten agro-climatic zones. Among these, zone IIa comprised of four districts viz., Sikar, Jhunjhunu, Nagaur and parts of Churu district. This zone includes the important cowpea growing areas and ranks first in area and production in the state accounting for 76.47 per cent area and 82.16 per cent of production. But the productivity

was low (400 kg/ha) of this crop in the zone is due to poor adoption of new technology by the farmers. Many technologies developed by the Agricultural Research Station, Fatehpur-Shekhawati. But the farmers are not using these technologies to the fullest extent. Hence, the present study was undertaken to assess the extent of adoption of these technologies as well as to identify the constraints faced by the farmers in adoption of recommended technology for cowpea crop.

### RESEARCH METHODOLOGY

Laxmangarh tehsil was selected purposely from Sikar district. From selected tehsil, four villages were selected randomly. From each selected village, 20 farmers were selected randomly. Thus, in all 80 farmers were included in the sample for purpose of the study.

The primary data were collected with the help of schedule by personal interview with the respondents. The enquiry was conducted by the survey method pertaining to year 2007. Cowpea is important pulse crop in Sikar district, which is grown in large area.

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The inputs used in crop production were seed, fertilizer, insecticide/pesticide and labour (human, bullock and machine). The prices of inputs and outputs were evaluated prevailing in the study area in crop season. Adoption index (TAI) of recommended technology of individual farmer was work out.

After working out the technological indices, the selected farmers were then categorized under three levels of technology viz. low adopter, medium adopter and high adopter. Costs and returns at various levels of technologies were work out on the basis of cost of cultivation prevalent in the study area and calculated at various levels of technology.

For analysis of major constraints, a dichotomous schedule was prepared and respondents were asked to provide response whether 'Yes' or 'No' and

then frequency and percentage on 'Yes' was taken for final results.

## RESULTS AND DISCUSSION

### Level of Technology Adoption

For this purpose, four levels i.e. up to 25, 26-50, 51-75 and above 75 per cent adoption level were framed. The technology wise adoption is given in Table 1 reveals that the adoption of HYV seed was found 23 per cent. About 86 per cent farmers adopted optimum seed rate, remaining 14 per cent farmers adopted below optimum level (III level). Seed treatment and plant protection chemicals used by the few farmers in the study area. Nearly 8 per cent and 1 per cent farmers in the study area adopted the optimum dose of nitrogen and phosphetic fertilizers.

**Table 1: Level of technology adoption of farmers in cowpea cultivation**

Level of Technology	HYV seed	Seed rate	Seed treatment	Fertilizer		Plant protection
				N	P	
I Level (up to 25 %)	-	-	-	-	-	1.25 (1)
II Level (26-50 %)	-	-	3.75 (3)	1.25 (1)	2.50 (2)	-
III Level (51-75%)	-	13.75 (11)	-	2.50 (2)	2.50 (2)	-
IV Level (above 75%)	-	86.25 (69)	-	7.50 (6)	1.25 (1)	6.25 (5)
Total adopter	23.00 (18)	100.00 (80)	3.75 (3)	11.25 (9)	6.25 (5)	7.50 (6)
Total non-adopter	77.00 (62)	-	96.25 (77)	88.75 (71)	93.75 (75)	92.50 (74)

Figures in parentheses are number of farmers

### Technology Adoption Index

Among the cowpea grower farmers in the study area, it was evident from Table 2 that 10 per cent farmers adopted III level of technology. Ninety per cent farmers adopted up to 33.93 per cent of improved technology. About 88 per cent farmers have adopted II level of technology.

**Table 2: Distribution of sample farmers at various technology adoption index of cowpea crop**

Technology adoption index	Number of farmer
I Level (up to 9.93 %)	2 (2.50)
II Level (9.94 to 33.93 %)	70 (87.50)
III Level (above 33.93 %)	8 (10.00)

Figures in parentheses are percentage of total farmers

Note: The maximum obtained adoption index was 71.55 per cent

I Level = Low adopter, II Level = Medium adopter, III Level = High adopter

### Yield and Income

Yield and income is given in Table 3. The overall per hectare yield of grain and fodder was 6.07 and 1.64 qtls. The yield of grain and fodder increased with level of technology adoption. The gross return was highest (Rs14260) at III level of technology followed by II and I level of technology. The gross return increased with the level of technology adoption. There was significant income variation found with the level of technology adoption. The overall per hectare gross income was Rs10180.

**Table 3: Yield and gross income at various levels of technology of cowpea crop**

Particulars	Technology level			Overall
	I Level	II Level	III Level	
Grain yield (qt/ha)	3.78	5.87	8.52	6.07
Fodder (qt/ha)	1.11	1.61	2.02	1.64
Value of grain yield (Rs/ha)	6237	9686	14058	10016
Value of fodder yield (Rs/ha)	111	161	202	164
Gross income (Rs/ha)	6348	9847	14260	10180

**Impact of Technology**

It was worked out on the basis of cost incurred in cultivation of cowpea and net return obtained at various levels of technology adoption. It is evident from Table 4 that operational cost and net return increased with the level of technology adoption. Sharma *et al.* (2007) reported that the cost of cultivation and net return increased with the level of tech-

nology adoption of all Kharif pulses. The percentage net return increased over I level of technology was 117.58 per cent for II level of technology and 200 per cent for III level of technology. The net return per hectare was Rs 2815 for I level of technology, Rs 6126 for II level of technology and Rs 8445 for III level of technology. The overall per hectare net return was Rs 6255

**Table 4: Impact of technology at various levels of technology (Rs/ha)**

Level of technology	Gross income	Cost of cultivation	Net return
I Level	6348	3533	2815
II Level	9847	3722	6125(117.58)
III Level	14260	5815	8445(200.00)
Overall	10180	3925	6255

Figures in parentheses are percentage net return over I level of technology

**Constraints**

It is evident from Table 5 that sample farmers were not using HYV seed of cowpea due to lack of knowledge about HYV seed and conviction (38.75%). High cost of HYV seed (38.75 %) was the another constraint. The seed treatment technology was not adopted by the farmers mainly due to lack of knowledge about advantages of seed treatment technology (70.0 %) and lack of knowledge about available technology (75 %). The fertilizer application as per recommendation were not being adopted by the majority of farmers due to lack of knowledge about recommended dose of fertilizers (75.50 %, lack of life saving irrigation facilities (68.75 %) and low and erratic rainfall (62.50 %). Plant protection technology was not adopting due to high cost of chemicals (68.75 %), lack of knowledge about suitable plant protection measures (62.50 %) and low productivity

of cowpea (43.75 %).

Regarding socio-economic constraints, 67.50 per cent farmers sold their produce just after harvest to meet their immediate financial needs. It is also seen in the table that 56.25 per cent farmers had lack of technical guidance for cowpea production technology.

**CONCLUSION**

Based on the findings, it can be concluded that adoption of HYV seed was 23 per cent. Majority of farmers adopted optimum seed rate. Seed treatment, plant protection chemicals and fertilizers were adopted by few farmers in the study area. Ninety per cent farmers adopted up to 33.93 per cent improved technology and only 10 per cent farmers adopted more than 33.93 per cent of improved technology. The cost and net return increased with level of tech-

**Table 5: Constraints faced by the farmers in adoption of recommended technology in cowpea production**

Constraints	Percentage
<b>A. Technical</b>	
1. Seed	
Lack of knowledge about HYV seed & conviction	38.75
High cost of seed	38.75
2. Seed treatment	
Lack of knowledge about available technology	75.00
Lack of knowledge about advantages of seed treatment technology	70.00
High cost of chemicals	21.25
3. Fertilizer application	
Lack of life saving irrigation facilities	68.75
Lack of knowledge about recommended dose of fertilizer	75.50
High cost of fertilizers	47.50
Low and erratic rainfall	62.50
Lack of suitable implements for phosphetic fertilizer application	52.50
4. Plant protection	
Lack of knowledge about suitable plant protection measures	62.50
High cost of chemicals	68.75
Low productivity of cowpea	43.75
<b>B. Socio-economic</b>	
Inadequate capital	27.50
1. Marketing of farm produce	
Sold in unregulated market	25.00
Sold in regulated market	60.00
2. When sold	
Sold soon after harvest	67.50
Retained till fair price	17.50
<b>C. Other</b>	
Lack of technical guidance	56.25

nology adoption. The percentage net return increased over I level of technology was 117.58 for II level of technology and 200 per cent for III level of technology.

Seed treatment technology was not adopted by the farmers due to lack of knowledge about chemicals and quantity along with advantages of seed treatment technology. Fertilizers and plant protection measures were not adopted due to low productivity, erratic rainfall and lack of life saving irrigation faci-

ties and high cost of fertilizers and plant protection chemicals. Lack of technical guidance was also major constraint in the adoption of recommended technology.

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Received : January, 2013

Accepted : January, 2014