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Adoption of the recommended production technology regarding major pulse crop grown in a pulse based cropping system by the farmers of Chhattisgarh plains

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Abstract

The present study was undertaken in 4 pulse growing districts of Chhattisgarh plains to delineate pulse-based cropping systems, related technologies and identify the technology adoption. The study was carried out on 320 farmers those were adopted pulse based cropping system in particularly in Chhattisgarh plains to ascertain their adoption. The major pulse based cropping systems of study area are Rice-Gram-Fallow / Arhar- Mung-Fallow / Arhar- Urd-Fallow / Soybean- Urd-Fallow / Arhar- Fallow / Arhar- Mung / Urd / Rice-Gram-Mung / Rice-Pea- Fallow / Rice-Lentil- Fallow. Responses had been obtained from the selected pulse growing farmers personally with the help of a well-structured and pre-tested interview schedule. The study replicate that majority of farmers comes under age group of 36 to 50 years, education up to middle school, mostly belonged to other backward class (OBC), residing with up to medium family members, having membership in more than one organization. Most of the respondents were doing agriculture as main occupation for their livelihood. The respondents were also engaged in agricultural labour, non agricultural labour and animal husbandry; average family income was found up to ₹ 200000 per annum. Most of the farmers were having between 2.1 to 4.0 ha land. The findings reveal that average adoption and adoption index about agricultural technologies in major pulse crops was 44.04.

Keywords: Adoption, pulse based cropping system

Introduction

The Indian economy is based on agriculture. Agriculture employs over 60% of the population and generates roughly 20% of the country's gross domestic GDP. Agriculture contributes significantly to economic development, food security, poverty relief, and rural development. Pulses on account of their vital role in nutritional security and soil ameliorative properties have been an integral part of sustainable agriculture since ages. Pulses are an essential component of the Indian people's daily diet, and they are the cheapest source of protein. India has major place in world pulses production and contributes about 25 percent to the total pulse basket. India is the largest producer (25% of global production), consumer (27% of world consumption) and importer (14%) of pulses in the world. Pulses have long been an important part of the traditional cropping system. They are grown as a sole crop, intercrop, catch crop, relay crop, cover crop and green manure crop etc. Cropping system is a kind of sequence and arrangement of crops grown on a given area of land over a period of time. The main objective of study was to analyze the knowledge level of pulse based cropping System practicing farmers in plain zone of Chhattisgarh.

Methodology

Four major pulse growing districts of Chhattisgarh plains have been selected purposively. For the purpose of the study eight blocks (two blocks from each district) were selected. From each block, Four villages were selected randomly. Thus, a total of thirty-two villages were selected for the purpose of drawing the sample of respondents for the study. Ten farmers from each 32 village were selected randomly to comprise a sample of 320 respondents for the study purpose. The data were collected with the help of pre designed structured interview schedule. Information was collected through personal interview method. The purpose of interview was clearly explained to each respondent. Collected data were tabulated and analyzed using formula.

Results and Discussion

Cropping pattern

The data related with cropping pattern is presented in Table 1. The findings indicated that majority of the respondents (85%) were adopted the Rice –Gram-fallow cropping pattern with an area of 726 ha in the study area, followed by Arhar-Mung-Fallow (40.63%) with the area of 68 ha and Rice - Gram -Mung (26.56%) with 45 ha area of land.

Table 1: Various cropping pattern adopted by the respondents

S. No	Cropping patterns	F *	%	Area (ha)
1.	Rice- Gram-Fallow	272	85.00	726
2.	Arhar- Mung-Fallow	130	40.63	68
3.	Arhar- Urd-Fallow	62	19.38	65
4.	Soybean- Urd-Fallow	48	15.00	52
5.	Arhar-Fallow	51	15.93	19
6.	Arhar- Mung/Urd	38	11.87	12
7.	Rice-Gram-Mung	85	26.56	45
8.	Rice-Peat- fallow	42	13.12	17
9.	Rice-Lentil- Fallow	47	14.68	36

*Data are based on multiple responses F=Frequency%= Percentage

Further, it was found that Soybean-urd-fallow (15%) with 52 ha, and Rice-Lentil-fallow (14.68) with 36 ha. adopted by the respondents while the other cropping pattern adopted by the respondents were Rice-Pea-Fallow (13.12%) with 17 ha.

Table 2: Response of various cropping pattern adopted by the respondents

S. No.	Particular	Frequency	Percentage
1	Poor (up to 1 score)	0	0
2	Fair (2 to 3 score)	269	84.07
3	Good (Above 3 score)	51	15.93

Mean= 2.74 S.D. = 1.07

The data regarding response of cropping pattern is presented in Table 2. The findings indicated that majority of the respondents (84.07%) were showed fair response as adopted cropping pattern in kharif, rabi & zaid season followed by good response by adoption of Arhar-as a annual crop (15.93%) in the study area.

Adoption of the recommended production technology regarding major pulse crop

Data were collected from four major pulse growing districts of Chhattisgarh plains about the prevalent pulse based cropping systems and related technologie In the present study, the extent of adoption was ascertained in term of adoption index based on selected recommended production practices of pulse crops adopted by farmers engaged in adoption of different farming system. The responses of the respondents regarding extent of adoption of selected practices were recorded on three point continuum scale i.e. “Full”, “Partial” and “Nil” with score of “2”, “1”and “0”, respectively. For detailed analysis adoption index was worked out for each respondent by using the following formula:

$$A.I_i = \frac{O_i}{S} \times 100$$

Were,

A_i = Adoption index of ith respondent

O_i = Total score obtained by the ith respondent

S = Total obtainable score

Adoption index of major pulse crops

To assess the adoption level of respondents about agricultural technologies, adoption index was worked out

and the data is compiled in Table 3

Regarding gram production technology, highest adoption index (74.5%) was found about suitability of soil, storage method (73.7%), method of sowing (70.3%), seed rate and harvesting time (62.3%), improved varieties and crop yield (60.7%), preparation of land (58.5%), irrigation method (56.3%), manure and fertilizer (44.2%), insect management (43.7%), weed management (42.2%), disease management (38.6%) adoption level about seed treatment (26.3%) was found to be quite low.

Regarding arhar production technology the data revealed that 72.1 per cent of adoption level was highest about suitability of soil, 68.7 per cent, preparation of land (62.7%), crop yield (62.3%), storage method 61.8 per cent, harvesting time (60.2%), disease management (59.5%), method of sowing (58.4%), seed rate (52.2%), insect management (47.5%), manure and fertilizer (42.3%), irrigation method (42.2%), weed management (38.9%), improved varieties (32.4%), seed treatment (22.4%).

Regarding mung production technology the findings observed that highest adoption index (70.3%) about suitability of soil for cultivation of mung. Good level of adoption was also recorded pertaining to preparation of land (66.4%), crop yield and method of sowing (60.1%), harvesting time (59.8%), seed rate (59.6%), storage method (52.4%), (60.3%). while the adoption about insect management (47.9%), irrigation method (43.3%), manure and fertilizer (42.6%), and disease management (38.6%) was found to be low level. Poor adoption level was found for the practices of weed management (33.2%), improved varieties (28.4%) seed treatment (28.2%).

Regarding urd production technology the findings observed that highest adoption index (70.4%) about suitability of soil for cultivation of urd good level of adoption was also recorded towards preparation of land of urd (65.4%), harvesting time (63.2%), method of sowing (52.6%), seed rate(52.1%), insect management (51.4%), disease management (48.9%), storage method (48.2%), crop yield (47.2%), irrigation method(45.3%), manure and fertilizer (40.6%), weed management (36.5%), seed treatment (25.4%), and improved varieties (22.8%).

Regarding lathyrus production technology the findings observed that highest adoption index preparation of land of lathyrus (44.5%), good level of adoption was also recorded harvesting time (46.2%), seed rate and suitability of soil for cultivation of lathyrus (40.2%), storage method (38.6%), method of sowing (38.3%), irrigation method and crop yield (34.2%), manure and fertilizer (26.4%), insect management (20.2%), disease and weed management (18.6%), seed treatment (10.5%), improved varieties (10.2%).

Regarding lentil production technology the findings observed that highest adoption index about suitability of soil for cultivation of lentil (55.3%), good level of adoption was also recorded preparation of land of lentil (50.2%), harvesting time and method of sowing (48.6%), crop yield (48.5%), storage method (42.6%), irrigation method and seed rate (38.4%), weed management (34.2%), manure and fertilizer (30.4%), insect management (22.3%), improved varieties (20.3%), disease management (19.6%), seed treatment (18.3%),

Regarding pea production technology the findings observed that highest adoption index about suitability of soil for

cultivation of pea (66.6%), good level of adoption was also recorded preparation of land of pea (62.4%), harvesting time (52.6%), method of sowing (52.2%), seed rate (44.3%), crop yield (42.3%), irrigation method (38.6%), storage method

(38.4%), weed management (32.4%), manure and fertilizer (28.6%), insect management (26.4%), disease management and seed treatment (22.4%), improved varieties (18.6%).

Table 3: Adoption index of major pulse crops grown by the respondents

S. No.	Practices	Adoption index						
		Gram (n=320)	Arhar (n=229)	Moong (n=197)	Urd (n=255)	Latyrus (n=124)	Lentil (n=155)	Pea (n=96)
1	Suitability of soil	73.75	72.1	70.3	70.4	40.2	48.5	66.6
2	Preparation of land	58.5	62.7	66.4	65.4	42.3	50.2	62.4
3	Seed treatment	26.3	22.4	28.2	25.4	10.5	18.3	22.4
4	Seed rate	62.3	52.2	59.6	52.1	40.2	38.4	44.3
5	Method of sowing	70.3	58.4	60.1	52.6	38.3	48.6	50.2
6	Improved variety	60.7	32.4	24.6	22.8	10.2	20.3	18.6
7	Manure & Fertilizer	44.2	42.3	42.6	40.6	26.4	30.4	28.6
8	Irrigation Method	56.3	42.2	43.3	45.3	34.2	38.4	38.6
9	Weed management	42.2	38.9	33.2	36.5	18.6	34.2	32.4
10	Insect management	43.7	47.5	47.9	51.4	20.2	22.3	26.4
11	Disease management	38.6	49.5	38.6	48.9	18.6	19.6	22.4
12	Harvesting Time	62.3	60.2	59.8	63.2	44.5	48.6	52.6
13	Crop Yield	60.7	62.3	60.1	47.2	34.2	55.3	42.3
14	Storage Method	74.58	61.8	52.4	48.2	38.6	42.6	38.4
	Adoption Index	55.31	50.45	49.07	47.85	29.78	36.83	39.01

Overall Average Adoption of Agricultural Technologies about major crops = 44.04

Conclusion

Extent of adoption

The extent of adoption index, the data revealed that highest adoption index was found about Suitability of soil (73.75%) in gram, While, highest adoption level in storage method of product was having in gram (77.58%), in gram production technology highest adoption index (70.3%) was found towards method of sowing; whereas, overall average adoption of agricultural technologies in major crops were 44.04 per cent.

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