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

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Abstract
The study was conducted on 320 pulse based cropping system practicing farmers in Chhattisgarh plains to ascertain their Knowledge. The selected pulse growing farmers have been interviewed personally with the help of a well-structured and pre-tested interview schedule. The study shows that majority of respondents fall under age group of 36 to 50 years, educated up to middle school, belonged to other backward class, 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 them were having land holding between 2.1 to 4.0 ha. The findings reveal that average knowledge and adoption index about agricultural technologies in major pulse crops was 52.81.

Keywords: Knowledge, 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 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.

Materials and Methods
The study was carried out in major 4 pulse growing districts of Chhattisgarh plains. For the purpose of the study eight blocks (two blocks from each district) were selected. Four villages were selected randomly from each block in this way total 32 villages selected for study. Ten farmers from each 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 interview schedule by approaching the farmers for personal interview to get more reliable information. Collected data were tabulated and analyzed using formula.

Knowledge about the recommended production technology regarding major pulse crop
Knowledge about innovation may be an important factor affecting the adoption behavior of farmers. Operationally knowledge was used in this study as actual knowledge of farmers regarding various cropping systems. The response of farmers engaged in different cropping systems regarding selected practices were recorded on three point continuum scale i.e. "Full", "Partial" and "Nil" with score of "2", "1" and "0", respectively. A knowledge index was worked out to assess the level of knowledge of each respondent with the help of following equation:

$$KI = \frac{O}{S} \times 100$$

Where,
KI = Knowledge index of respondent

O = Total obtained score by respondent
S = Total obtainable score

Knowledge index of major pulse crops

To assess the knowledge level of respondents about agricultural technologies, knowledge index was worked out and the data is compiled in table 1.

Regarding gram production technology, highest knowledge index (78.8%) was found about method of sowing. Good level of knowledge were also recorded suitability of soil (78.6%), seed rate (72.6%), towards preparation of land (72.4%), and crop yield (68.6%), Knowledge about harvesting time (66.5%), storage method (62.3%), improved varieties (61.4%), irrigation method (58.7%), manure and fertilizer (48.8%), insect management (46.8%), seed treatment (48.2%), weed management (44.5%) and disease management (41.3%) was found to be quite low.

The data on arhar production technique showed that 76.6 percent of people had the most understanding of soil suitability and 68.2 percent each of seed rate and field preparation. Crop yield (65.8%), storage method (65.7%), harvesting time (62.7%), method of sowing (62.4%), management of diseases (58.6%), insects (55.4%), irrigation method and seed treatment (46.5%), manure and fertiliser (43.6%), improved varieties (34.2%), and weed management (45.6%) were all extremely subpar in relation to arhar production.

The highest level of knowledge (78.3%) about the suitability of soil for mung growing was found in the findings of mung production technology. Additionally, there was evidence of high levels of expertise in the following areas: land preparation (72.6%), crop yield (66.6%), seed rate (65.2%), harvesting time (63.1%), storage technique (62.7%), and sowing method (60.3%). In contrast, there was found to be a poor degree of knowledge on the control of insects (37.06%), irrigation methods (49.3%), manure and fertiliser (47.3%), and disease management (43.2%). Seed treatment (40.6%), weed control (38.4%), and improved varieties (28.4%) were found to have low knowledge levels.

Regarding urd production technology the findings observed that highest knowledge index (77.6%) about suitability of soil for cultivation of urd good level of knowledge was also recorded towards preparation of land of urd (72.5%), harvesting time (66.3%), seed rate (64.2%), storage method (61.2%), insect management (59.4%), method of sowing (58.7%), disease management (55.3%),crop yield (53.2%), irrigation method (48.7%), seed treatment (43.8%), manure and fertilizer (42.3%),weed management (38.1%) and improved varieties (24.6%).

The research on lathyrus production technology found that the method of sowing had the highest knowledge index (60.1%), and that good levels of knowledge were also recorded for seed rate and irrigation method (58.9%), crop yield (58.6%), preparation of land for lathyrus cultivation (50.6%), storage method (48.4%), and (48.2%) about suitability of soil for lathyrus cultivation. while knowledge about harvesting time (46.2%),seed treatment (38.9%), manure and fertilizer (32.4%), disease management (28.1%), insect management (26.4%),weed management (22.4%), improved varieties (11.2%).

The findings in relation to lentil production technique showed that the greatest knowledge score regarding lentil cultivation suitable soil (46.2%), good level of knowledge was also recorded method of sowing (60.1%), crop yield (58.6%), seed rate (46.2%), harvesting time (46.2%), preparation of land of lentil (50.6%), irrigation method (58.9%), storage method (48.4%), insect management (26.4%), weed management (22.4%), disease management (28.1%), manure and fertilizer (32.4%), seed treatment (38.9%), improved varieties (11.2%).

The research found that 73.3 percent of respondents of pea grower had the highest knowledge about whether a certain soil is suitable for growing peas. good level of knowledge was also recorded preparation of land of pea (69.7%), crop yield (68.4%), harvesting time (62.4%), method of sowing (60.2%), seed rate (55.3%), irrigation method (54.6%), storage method (48.6%), insect management (39.8%), weed management (38.6%), seed treatment (38.4%), manure and fertilizer (35.9%), disease management (35.4%), improved varieties (20.4%).

To assess the knowledge level of respondents about agricultural technology, knowledge index was worked out and the findings depicted that highest knowledge index about suitability of soil for gram (78.6%) and mung (78.3%). Maximum knowledge level was found about preparation of land in mung (72.6%), gram (72.4%), whereas, overall average knowledge of agricultural technology in major crops were 52.81 percent.

Table 1: Knowledge index of major pulse crops

S. No.	Practices	Knowledge Index						
		Gram (n=320)	Arhar (n=229)	Mung (n=197)	Urd (n=255)	Latyrus (n=124)	Lentil (n=155)	Pea (n=96)
1	Suitability of soil	78.6	76.6	78.3	77.6	48.2	68.4	74.3
2	Preparation of land	72.4	68.2	72.6	72.5	50.6	54.2	69.7
3	Seed treatment	48.2	46.5	40.6	43.8	38.9	38.6	38.4
4	Seed rate	72.6	68.2	65.2	64.2	58.9	58.9	55.3
5	Method of sowing	78.8	62.4	60.3	58.7	60.1	62.8	60.2
6	Improved variety	61.4	34.2	28.4	24.6	11.2	22.3	20.4
7	Manure & Fertilizer	48.8	43.6	47.3	42.3	32.4	46.2	35.9
8	Irrigation Method	58.7	46.5	49.3	48.7	58.9	50.6	54.6
9	Weed management	44.5	45.6	38.4	38.1	22.4	44.5	38.6
10	Insect management	46.8	55.4	52.1	59.4	26.4	45.4	39.8
11	Disease management	41.3	58.6	43.2	55.3	28.1	42.6	35.4
12	Harvesting Time	66.5	62.7	63.1	66.3	46.2	58.7	62.4
13	Crop Yield	68.6	65.8	66.6	53.2	58.6	60.2	68.4
14	Storage Method	62.3	65.7	62.7	61.2	48.4	48.2	48.6
Average knowledge Index		60.67	57.14	54.86	54.7	42.09	50.11	50.14

Overall Average Knowledge of Agricultural Technologies about major crops = 52.81

Conclusion

To assess the knowledge level of respondents about agricultural technology, knowledge index was worked out and the findings depicted that highest knowledge index about suitability of soil for gram (78.6%) and mung (78.3%). Maximum knowledge level was found about preparation of land in mung (72.6%), gram (72.4%), whereas, overall average knowledge of agricultural technology in major crops were 52.81 percent.

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