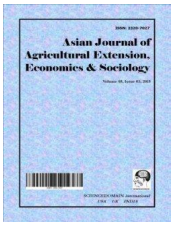

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A Study on Extent of Adoption of Organic Red Gram Cultivation Practices in Dryland Areas of Karnataka (*Cajanus cajan*)

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Authors' contributions

This work was carried out in collaboration between all authors. Author AN designed the study, performed the statistical analysis, wrote the protocol and first draft of the manuscript. Authors MS and ISR managed the analyses of the study. All authors read and approved the final manuscript.

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ABSTRACT

Red gram is commonly known as Tur or Pigeon pea in India and is the second important pulse in the country after Bengal gram. The ability of red gram to produce high economic yields under soil moisture deficit makes it an important crop in rainfed and dryland agriculture. The present study was confined to the organic red gram growers of Gulbarga district. Majority of the respondents shown fully adoption of recommended practices, like 91.66 percent of the respondents had fully adopted the practice of deep summer ploughing for pest and disease control and the practice of timely sowing, followed by (83.33%) had fully adopted the practice of allowing cattle grazing to add cow dung manure in field and for weeding. This might be due to medium training received and perceived attributes of respondents towards organic farming and a majority of the respondents in this study were young age farmers and they were more curious regarding organic farming practices. In the same manner, respondents also showing partial to non-adoption of recommended practices might be due to less formal education level, medium social economic status, extension contact and medium risk taking capacity.

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Keywords: Extent of adoption; organic farming; red gram; recommended production package of practices.

1. INTRODUCTION

Red gram (*Cajanus cajan*) is a versatile crop that is grown in almost every part of the globe today. It is the most important pulse grown in the Indian subcontinent. The use of agrochemicals coupled with the degradation of cultivable land and increasing agricultural pollution has created an unhealthy situation in agriculture production system of India. The negative consequences of the higher use of chemical fertilizers and pesticides include a reduction in crop productivity and deterioration in the quality of natural resources [1]. Some studies have pointed out that the environment will be effected by the carbon emissions of the agricultural system as agriculture releases about 10-12 percent of the total greenhouse gas emissions which is accounted for as about 5.1 to 6.1 gigatonnes (Gt) CO2 [2]. In order to overcome this situation, organic farming, which aims at cultivating the land and rising crops in such a way as to keep the soil alive and in good condition, may be an alternative to the present system of farming solely depending on chemicals.

Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity and soil biological activity. It emphasizes the use of management practices in preference to the use of on-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using wherever possible, agronomic, biological and mechanical methods, as opposed to using synthetic materials, to accomplish any specific function within the system' [3]. It is a method of farming which excludes the use of compound chemicals such as chemical fertilizers, pesticides and insecticides. Instead of that natural resources such as organic matters, mineral and microbes are used. Organic farming systems rely on large scale application of animal waste or Farm Yard Manure (FYM), compost, crop rotations, crop residues, green manuring, vermicompost, bio-pesticides and biological control of pest and diseases. In India, the use of organic manures in subsistence farming is an ancients practice.

Red gram ranks sixth among pulse production in the world and is a major pulse crop. The area under cultivation (4.5 million hectares) is stagnant. It is largely grown in the northern parts of the state especially in Gulbarga, which is called "Pulse bowl of Karnataka". In this district, Red gram occupied an area of 3,36,853 ha and production of 1,53,285 tonnes [4]. Though organic farming practices are traditional in India, little comprehensive research has been done in India in general and Karnataka in particular from farmer's perspective. Hence this study was designed to unearth the extent of adoption of recommended organic production package of practices by red gram growers.

2. MATERIALS AND METHODS

The research study was conducted in Gulbarga district of Karnataka state. This district was purposively selected as it ranks first in area and production of red gram. There are ten blocks in Gulbarga district, among these; three blocks were selected randomly for the study. From each block two villages *i.e*. a total of six villages were selected randomly. From the prepared list, 20 farmers were selected by simple random sampling procedure from each village thus the total sample for the study constituted 120 farmers. For data collection has been analysed using appropriate statistical tools. And in order to study the relationship between the extent of adoption of organic red gram practices by the respondents and their profile characteristics, the correlation co-efficient (r) values were computed and findings were furnished. The relationship between the extent of adoption of organic red gram practices by the respondents and their profile characteristics was tested by relevant null and empirical hypotheses.

2.1 Null Hypothesis

There would be no significant relationship between the extent of adoption of organic red gram practices by the respondents and their profile characteristics and both of these were independent.

2.2 Empirical Hypothesis

There would be significant relationship between the extent of adoption of organic red gram practices by the respondents and their profile characteristics and both of these were dependent.

3. RESULTS AND DISCUSSION

Adoption is the acceptance and application by a respondent to some or all the practices recommended for organic red gram production, for a continuous period of 3 to 5 years. All the practices included in a package are considered important.

The respondents were grouped into three categories as detailed below. A perusal of the results in the table 1 depicted that; 41.60 percent of the respondents had a medium extent of adoption followed by low (39.20%) and high (19.20%) [5,6].

The probable reason for this might be, the medium level of their knowledge on organic red gram practices, medium level of extension contact and medium level of risk orientation. As from the results which indicate that most of the respondents were young and medium aged group they were showing more interesting towards new technology but they were lacking knowledge on organic farming, whereas the old aged respondents were lacking interest in new farming system i.e. organic farming, and they did not believe new farming practices.

3.1 Distribution of Respondents According to the Practice Wise Adoption of Organic Red Gram Farming

The extent of adoption of organic red gram practices by the respondents was measured with the help of adoption schedule with given statements below, comprising various recommended organic red gram cultivation practices. The response of respondents on each statement was measured with the help of three point continum that is fully adopted, partially adopted and not adopted with the weightage of 3, 2 and 1 respectively. To have a clear picture of the adoption level of organic red gram practices by the respondents the practice wise distribution of respondents was done and presented in Table 2.

By analysing the Table 2 it could be revealed that (91.66%) of the respondents had fully adopted the practice of deep summer ploughing for pest and disease control and the practice of timely sowing, followed by 83.33 per cent respondents practices to allow cattle grazing to add cow dung manure in field and for weeding and post-harvest management, followed by (82.50%) of the respondents were fully adopted nutrient management practices, followed by the (75.00%) followed to apply Farm yard manure (FYM/compost application @ 6 t/ha, maintaining appropriate spacing and using right packing materials, followed by (73.33%) respondents were fully adopted the practices of seed rate (6-8 Kg/acre) and 25.00 per cent respondents were partially adopted pest management by biological practices, followed by 23.33 per cent of the respondents by cultural practices and 20.83 per cent of the respondents by mechanical practices. It was also revealed that (16.66%) of the respondents did not adopted the variety recommended for organic red gram, followed by (10.00%) seed treatment, followed by (8.33%) of the respondents did not adopted proper spacing for sowing.

It could be revealed that the respondents had fully adopted the practice of deep summer ploughing for pest and disease control and the practice of timely sowing, the practice of allow cattle grazing to add cow dung manure in field and for weeding and post-harvest management, followed by majority of the respondents were partially adopted pest management by biological practices, pest management by cultural practices, store their produce in warehouse and using seed rate (6-8 Kg/acre), followed by few of the respondents were not adopted the variety recommended for organic red gram and proper spacing for sowing.

Table 1. Distribution of respondents based on their extent of adoption of organic Red gram practices (n=120)

Sl. no	Category	Class interval	Organic Red gram farmers	
			Frequency	%
1.	Low	16-24	45	39.20
2.	Medium	25-32	50	41.60
3.	High	33-40	25	19.20
Total			120	100

Table 2. Distribution of respondents based on extent of adoption of organic red gram practices

Sl. no	Organic red gram practices	Respondents					
		Fully adopted		Partially adopted		Not adopted	
		F	%	F	%	F	%
1.	Deep summer ploughing for pest and disease control.	110	91.66	8	6.66	2	1.66
2.	Allow cattle grazing to add cow dung manure in field and for weeding	100	83.33	15	12.50	5	4.16
3.	Nutrient management	99	82.50	16	13.33	5	4.16
4.	Farm yard manure (FYM)/Compost Application @ 6 t/ha	90	75.00	28	23.33	2	1.66
5.	Variety recommended for organic red gram	80	66.66	20	16.66	20	16.66
6.	Seed rate (6-8 Kg/acre)	88	73.33	25	20.83	7	5.83
7.	Seed treatment	98	81.66	10	8.33	12	10.00
8.	Spacing	90	75.00	20	16.66	10	8.33
9.	Sowing time on 15th July	110	91.66	5	4.16	5	4.16
10.	Pest management by cultural practices	90	75.00	28	23.33	2	1.66
11.	Pest management by mechanical practices	85	70.83	25	20.83	10	8.33
12.	Pest management by biological practices	85	70.83	30	25.00	5	4.16
13.	Post-harvest management	100	83.33	15	12.50	5	4.16
14.	Packing material used	90	75.00	16	13.33	5	4.16
15.	Godowns to store red gram produce	85	70.83	25	20.83	10	8.33
16.	Certified the organic red gram produce	50	41.66	15	12.50	5	4.16

Hence, from the above results, it could be inferred that majority of the respondents had medium extent of adoption [7].

3.2 Relationship between Selected Independent Variables and Extent of Adoption of Organic Red Gram Practices by the Respondents

It was revealed from the table 3 that calculated 'r' values between farming experience, extension contact, perceived attributes and the extent of adoption of organic red gram practices by the respondents were greater than table 'r' value at 0.05 level of probability, whereas, the calculated 'r' value of the variable training received and input availability was greater than table 'r' value at 0.01 level of probability.

Hence, the null hypothesis was rejected and the empirical hypothesis was accepted. Therefore, it can be concluded that there was a positive and significant relationship between the extent of adoption of organic red gram practices by the respondents and training received, input availability, farming experience, extension contact and perceived attributes.

On the other hand calculated 'r' values between age, socio-economic status, risk orientation, innovativeness, market intelligence, annual income and the extent of adoption of organic red gram practices were less than table 'r' value. Hence, null hypothesis was accepted and empirical hypothesis was rejected. Therefore, it could be concluded that there was no significant relationship between the extent of adoption of organic red gram practices by the respondents age, farming experience and annual income

As revealed from the study majority of the respondents were young age group with interest towards adoption of latest scientific organic practices, so young to middle aged farmers had significant adoption of organic farming practice, it's also a good sign for the extension personnel for concentrating the different extension programmes or schemes, training programmes *etc.,* towards young farmers for adoption of organic red gram practices [8].

The medium number of trainings received and extension contacts by the farmer enhances the respondents capacity to understand the intricacies involved in various organic red gram cultivation practices and applying them in the field situation hence a positive and significant relationship observed between the extent of adoption of organic red gram practices and the extension contact and training received. The input availability shows a positively significance

Table 3. Relationship between independent variables and extent of adoption of organic red gram practices by the respondents (n=120)

Sl. no.	Variable no.	Characteristics	Correlation coefficient (r)
1.	X_1	Age	-0.292**
2.	X_2	Education	0.074NS
3.	X_3	Farm size	0.004NS
4.	X_4	Farming experience	0.192*
5.	X_5	Socio-economic status	0.77NS
6.	X_6	Annual income	0.009NS
7.	X_7	Training received	0.237**
8.	X_8	Risk orientation	0.030NS
9.	X_9	Innovativeness	0.123NS
10.	X_{10}	Extension contact	0.289*
11.	X_{11}	Input availability	0.185*
12.	X_{12}	Market intelligence	0.023NS
13.	X_{13}	Perception on attributes	0.251*

** Significant at 0.05 level of probability*

*** Significant at 0.01 level of probability NS –Non significant*

relationship with the extent of adoption of organic red gram practices, the above result might be due to the fact that most of the inputs were easily available from the local sources, within the farms and inputs were also old through Department of Agriculture which were available in sufficient quantity, in time and with subsidized rate and this opportunity the farmers are utilizing properly and thus helps them to adopt the practices [9,10].

The low to medium farming experienced respondents were eager to know the new farming practices in organic red gram because majority of the respondents in this study comes under young age farmers. So the respondents were having less experience and due to this reason the adoption of the respondents also medium.

4. CONCLUSION

The study shows that majority of the organic red gram growers belonged to young age group (50.00%) followed by middle age group (33.33%) and were educated up to primary standard. Most of the organic red gram growers had small farm size (54.20%). Majority of them had medium socio-economic status (54.20%) and medium risk orientation (55.00%), There is a necessity to conduct more research on organic crop protection and cultivation practices and the present paper, it is clear that organic red gram farming is practical intention to maintain soil health and there is a urgent need to involve more and more scientists to identify the thrust area of research for the development of eco-friendly production technology *i.e* organic farming and adequate attention is paid for more adoption of organic farming cultivation.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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