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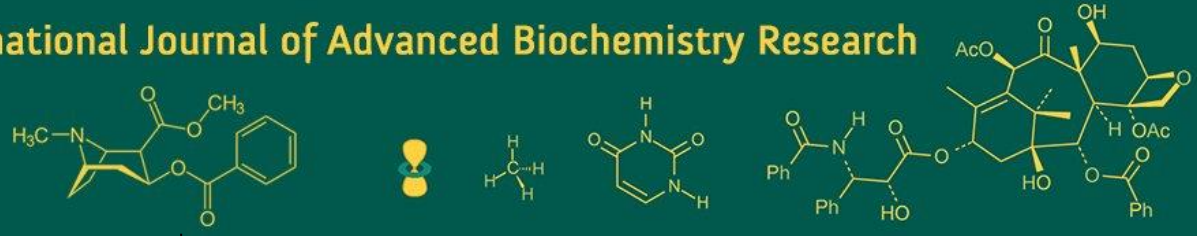

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Knowledge performance of the farmers practicing groundnut based cropping systems in Tumkur district of Karnataka

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Abstract
Groundnut is the major oilseed crop grow in Tumkur district of Karnataka. It is important to know the present scenario of adoption of improved cultivation practices to get to know the adoption gaps and knowledge gaps resulting in lower yields and higher cost of cultivation. Majority of the farmers follow groundnut solo cropping and inter cropping with redgram, sixty farmers from each cropping system were selected from sira and pavagada taluks of Tumkur district. The study revealed that, interestingly the knowledge level is quite high among the farmers practicing groundnut intercropping with redgram. The more gap exist in adoption of production technologies like gypsum application, seed treatment, soil testing and application of micro nutrients. These have to be addressed through awareness creation programmes and facilitating environment for adoption of improved cultivation practices, and reducing cost of cultivation, thereby increasing profits per unit area resulting in improvised livelihoods of the farmers in a sustainable way.

Keywords: Knowledge, adoption, groundnut cropping systems

Introduction
India is one of the world's largest producers of oilseeds and agriculture plays an important role in the Indian economy. In India, oilseeds crops are groundnut, rapeseed-mustard, soybean, sunflower, safflower, sesame, castor and linseed. While groundnut is known as 'King' of oilseeds. In India, groundnut is also considered as food and cash crops whereas in spite of having all nutrients in groundnut, it is a very low Price of food crops. Apart from being the cashew nut of the poor, it is also known as a unique nut. Groundnut coverage area in India was 6.10 million ha, production 10.24 million tonnes and productivity 1703 kg/ha in 2020-21. The six major groundnut producing states, covering about 87.38% of the national area under groundnut cultivation, include Gujarat (2.16 million ha 35.96%), Andhra Pradesh (0.87 million ha 14.46%), Rajasthan (0.86 million ha 14.23%), Karnataka (0.72 million ha. 11.99%), Tamil Nadu (0.41 million ha. 6.80%), Maharashtra (0.31 million ha. 5.14%). Karnataka is one of the largest producer of groundnut where Chitradurga, Ballary, Tumkur, Belagavi, Vijayapura, Gadag, Dharwad, Koppal, Haveri, Chikkaballapura and Davanagere are the major groundnut producing districts and Tumkur which accounts for 47.62 percent of it. The low yield of pulses and groundnuts in India needs to be tackled by adopting proven technological interventions and increasing farmers' knowledge. This study aimed to assess the differences in farmers' knowledge agricultural Practices and the adoption of Improved Agricultural Practices between the baseline and endline phases of the study. Considerably area under groundnut cultivation is decreasing due to climatic factors, lack of government initiatives and gap between knowledge and adoption. These can be countered by the proper technology dissemination by the research institutions.

Methodology
The study was conducted in Tumkur district of Karnataka in 2023. Out of ten taluks, Sira and Pavagada are purposively selected for the study since these taluks have major area under groundnut cultivation compared to other taluks.

From each taluk, three groundnut growing potential villages were selected. Further, from each village, 5 farmers practicing cropping system selected for the study are CS-I (Groundnut alone) and CS-II (Groundnut + Redgram) were selected respectively, making the sample size 30 each under category (CS-I and CS-II) from each taluk. Thus, the total sample size from these villages is 120. Ex-post facto research design was adopted. Data was collected by using pre-tested personnel interview method. Further, appropriate statistical tools were employed to analyze the collected data.

Results and Discussion

A. Knowledge of the farmers practicing CS-I

It is evident from Table 1 that, majority of the respondents had correct knowledge regarding time of harvesting (93.33%), timely weed management (86.67%) and recommended spacing (83.33%). The high percentage suggests that most of the respondents are well-informed about this aspect, possibly because it's a fundamental concept in farming, and they may have experience or access to relevant information. With respect to manures and fertilizer, equal number of respondents had correct comprehension knowledge about recommended dose of NPK fertilizer (81.67%) and quantity of FYM application followed by 80.00 percent had correct knowledge regarding the seed rate. Further, Significant percentage respondents had correct knowledge about other practices like sowing season (76.67%) followed by earthing up (71.66%), recommended time of application of FYM (70.00%) and quantity of gypsum applied (56.67%). This could be because groundnut plants benefit from proper nutrient management, which makes sure they get essential nutrients like potassium (K), phosphorus (P), and nitrogen (N) in the right amounts and at the right times. It also enhances pod formation, which helps with better seed development and results in larger, more uniform, and better-tasting seeds. The majority of respondents (68.33%) correctly identified the time to apply fertilizer, followed by the groundnut's critical growth stages (68.33%), thrips management (65.00%), groundnut varieties (61.67%), root grub (60.00%), and red hairy caterpillar (55.00%), as well as the amount of FYM (51.67%) that should be applied to maintain the optimal nutrient level. The groundnut's quality grade has a significant influence on market pricing, which might be the cause.

Further, majority of the growers had incorrect knowledge about improved cultivation practices like application of borax and sulphate (95.00%), urea application at the flowering stage (88.33%) followed by stem rot management (81.67%), seed treatment with chemical (76.67%) and bio-fertilizer (73.33%) also its importance (68.33%). Significant portion of farmers had incorrect knowledge about other practices like soil testing (65.00%) and rust management (63.33%). The lower degree of popularity and insufficient training, knowledge, and extension tactics in educating farmers about their effects on soil nutrient levels and productivity might be the cause. Resource limitations are important since certain enhanced methods, such as the use of urea, borax, or sulphate, may demand financial resources that small-scale farmers may not readily have. Furthermore, without the right assistance, it may be difficult to comprehend and apply sophisticated techniques like managing stem rot or applying certain seed treatments

Table 1: Knowledge of the farmers practicing CS-I

n_1=60

Sl. No.	Recommended Practices	Correct Knowledge		Incorrect Knowledge	
		No.	%	No.	%
1	Soil testing	21	35.00	39	65.00
2	Recommended variety	37	61.67	23	38.33
3	Recommended sowing season	46	76.67	14	23.33
4	Importance with seed treatment	19	31.67	41	68.33
5	Seed treatment with				
	a) Bio fertilizer	16	26.67	44	73.33
	b) Chemical	14	23.33	46	76.67
6	Recommended spacing	50	83.33	10	16.67
7	Recommended seed rate	48	80.00	12	20.00
8	FYM				
	a) Application of FYM	49	81.67	11	18.33
	b) Time of FYM application	42	70.00	18	30.00
9	NPK				
	a) Application of NPK fertilizer as basal dose	49	81.67	11	18.33
	b) Time of fertilizer application	41	68.33	19	31.67
10	Timely weed management	52	86.67	08	13.33
11	Pest management				
	Root grub	36	60.00	24	40.00
	Thrips	39	65.00	21	35.00
	Red hairy caterpillar	33	55.00	27	45.00
12	Disease management				
	Tikka disease	40	66.67	20	33.33
	Bud necrosis	35	58.33	25	41.67
	Stem rot	11	18.33	49	81.67
	Rust	22	36.67	38	63.33
13	Application of urea	07	11.67	53	88.33
14	Gypsum application	34	56.67	26	43.33
15	Application of borax and sulphate	03	05.00	57	95.00
16	Earthing Up	43	71.66	17	28.37
17	Critical stages of groundnut cultivation	41	68.33	19	31.67
18	Timely harvesting	56	93.33	04	06.67

B. Knowledge of the farmers practicing CS-II (Groundnut + Redgram)

Table 2 provides an overview of the production techniques and expertise of groundnut producers using the groundnut + redgram cropping combination. Based on the data, it can be inferred that most growers were correctly knowledgeable about key agronomical practices such as weed management (93.67%), recommended groundnut and redgram ratio (93.34%), recommended sowing season (91.67%), application of FYM (90.00%), spacing, and timely crop harvesting (86.33%). Conversely, only 86.67% of growers were correctly knowledgeable about recommended seed rate, followed by recommended NPK fertilizer application (83.33%) and thrips management (80.00%). The most likely their ancestors' long-standing traditions and groundnut farming enabled them to acquire precise information. A sizable portion of CS-II respondents (80.00) were correctly knowledgeable about earthing up.

With respect to pest and disease management, good number of respondents had correct knowledge on management of root grub (65.00%) followed by tikka (61.67%), bud necrosis (56.67%) and stem rot (53.33%) management, respectively. Whereas, equal number of the respondents had correct understanding about mosaic virus (50.00%) management.

Table 2: Knowledge of the farmers practicing CS-II (Groundnut + Redgram)

n_2=60

Sl. No.	Recommended Practices	Correct Knowledge		Incorrect Knowledge	
		No.	%	No.	%
1	Soil testing	28	46.66	32	53.33
2	Recommended variety	46	76.66	14	23.33
3	Recommended sowing season	55	91.67	05	08.33
4	Importance of seed treatment	23	38.33	37	61.67
5	Seed treatment with				
	a) Bio fertilizer	18	30.00	42	70.00
	b) Chemical	22	36.67	38	63.33
6	Recommended spacing	53	88.33	07	11.67
7	Recommended seed rate	52	86.67	08	13.33
8	FYM				
	a) Application of FYM	54	90.00	06	10.00
	b) Time of FYM application	43	71.67	17	28.33
9	NPK				
	a) Application of NPK fertilizer as basal dose	50	83.33	10	16.67
	b) Time of fertilizer application	43	71.67	17	28.33
10	Timely weed management	56	93.67	04	06.33
11	Pest management				
	Root grub	39	65.00	21	35.00
	Pod borer	19	31.67	41	68.33
	Thrips	48	80.00	12	20.00
	Red hairy caterpillar	19	31.67	41	68.33
12	Disease management				
	Wilt	26	43.33	34	56.67
	Leaf spot	24	40.00	36	60.00
	Mosaic virus	30	50.00	30	50.00
	Tikka disease	37	61.67	23	38.33
	Bud necrosis	34	56.67	26	43.33
	Stem rot	32	53.33	28	46.67
	Rust	21	35.00	39	65.00
13	Application of urea	06	10.00	54	90.00
14	Gypsum application	42	70.00	12	30.00
15	Application of borax and sulphate	04	06.67	56	93.33
16	Earthing Up	48	80.00	12	20.00
17	Recommended ratio of groundnut and redgram	56	93.34	04	6.66
18	Timely harvesting	53	88.33	07	11.67

Table 2 shows that the majority of CS-II farmers (93.33%) were misinformed about how much borax and sulphate should be applied. This was followed by misapplied urea (90.00%), seed treated with chemicals (63.33%), seed treated with bio-fertilizer (70.00%), importance of seed treatment (61.67%), and soil testing (53.33%), respectively. This might be due to farmers' misunderstanding of extension programs, training courses, and awareness efforts, all of which failed to tell farmers of the advantages they would have on crop yields and soil nutrient levels. However, the same percentage of farmers (68.33%) misunderstood how to control pod borer and redhairy caterpillar.

More than three-fifths of the farmers practicing CS-II had an incorrect understanding of rust management (65.00%), leaf spot management (60.00%), and wilt management (56.67%). This significant knowledge gap may be due to a lack of information available to farmers and the shortcomings of extension services, training programs, and awareness campaigns, which have failed to effectively communicate the benefits of these practices for crop yields and soil fertility. Factors such as limited awareness of the technology, insufficient contact with extension personnel, lack of resources, and low motivation to learn new methods have all contributed to this gap in understanding.

Conclusion

The non-adoption of key agricultural practices stems from a mix of challenges. Farmers often lack sufficient knowledge about the importance of these practices, particularly regarding micronutrient application and effective disease and pest management. Limited awareness of the long-term benefits these techniques offer for crop yields and soil health further hampers their uptake. Additionally, market constraints, such as the availability and cost of necessary inputs, make it difficult for farmers to adopt these methods. Another barrier is the lack of access to timely information and guidance from extension services, which leads to misunderstandings about the value and correct application of improved practices. This gap is compounded by resource limitations, which prevent farmers from investing in new technologies or techniques. To address these issues, targeted education and training programs are needed to raise awareness of the benefits of these practices. Outreach initiatives, coupled with improved access to essential inputs and resources, can motivate farmers to adopt these practices. Strengthening extension services and making inputs more readily available could play a crucial role in bridging these knowledge gaps, ultimately leading to improved agricultural productivity and sustainability.

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