



# International Journal of Research in Agronomy

E-ISSN: 2618-0618

P-ISSN: 2618-060X

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2024; SP-7(3): 291-294

Received: 02-12-2023

Accepted: 08-02-2024

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## Frequency of integrated nutrient, pest and disease management information used by the ICT tool user Farmers

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DOI: <https://doi.org/10.33545/2618060X.2024.v7.i3Sd.451>

### Abstract

The present study was conducted in Shivamogga and Chikkamagaluru districts of Karnataka state with a sample size of 120 ICT user farmers. The data was collected using pre tested interview schedule by adopting simple random sampling technique. It was found that majority of the farmers regularly used e-Krushika App (20.00%), WhatsApp (29.17%) and KMAS (63.33%) services for information on integrated nutrient management aspects like soil testing, green manuring, and fertilizer dosage respectively. Whereas, nearly two-third of the farmers regularly used KMAS (65.83%) for identification of pest and KCC (65.84%) for management practices. With respect to information on integrated disease management, 60.83 percent and 48.33 percent of the ICT tools user farmers regularly used WhatsApp for disease identification and latest information respectively. Whereas, 65.83 percent of them used KCC for information on disease management practices.

**Keywords:** Integrated nutrient management (INM), integrated pest management (IPM), integrated disease management (IDM) and ICT tools

### Introduction

Information and Communication Technology (ICT) is the powerhouse of the world economy (Ghosh *et al.*, 2022) <sup>[4]</sup>. The ICTs in recent years have witnessed major changes and are emerging as a powerful tool for accelerating agricultural growth in developing country like India. (Bansal *et al.*, 2022) <sup>[2]</sup>. The use of ICT has been recognized as an important pillar of agricultural expansion and an essential input process for imparting knowledge (information) and advice as an input for modern agriculture in the current situation of the rapidly changing world (Paroda, 2010 and Age, 2012). The unprecedented development of ICT, its application, and the emergence of a global information society are changing the way people live, learn, work and interact (Sriker Reddy *et al.*, 2020) <sup>[11]</sup>.

In agriculture, access to relevant and timely information is of paramount importance for the farmers. Timely availability and accurate information has proved very crucial in identifying and mitigating pest and disease prevalence, drought management and also knowing proper market for proper price (Fawole, 2012) <sup>[3]</sup>. The vast availability of information on various aspects of agriculture, poses a challenge to farmers in information management mainly in terms of the amount of data and the complexity of processes. To meet this pressing challenge in this digital era, technology driven smart mobile apps cater to the needs of the farmers (Patel and Thakkar, 2023) <sup>[7]</sup>. Mobile agro advisory services and application has emerged as one of such ICT tools that can be used directly in agricultural growth. Ironically, use of ICT tools in agriculture by farmers is still at a nascent stage in India as compared to other countries. Hence, considering the importance of ICT applications in agriculture, the present study was carried out to know the purpose and frequency of use of various ICT tools and agricultural apps by farmers of Shivamogga and Chikkamagaluru districts of Karnataka state.

## Martials and Methods

The study was conducted in Shivamogga and Chikkamagaluru districts of Karnataka State. In Shivamogga district the Whatsapp user farmers and Kissan Call Centre (KCC) farmers were more. Similarly, e-Krushika app and KVK KMAS users were more in Chikkamagaluru district. Hence, these districts were selected purposively. From each district, sixty farmers were selected by using simple random sampling technique. Thus 120 ICT user farmers were selected for the study.

The data was collected using pre-tested interview schedule and the response obtained from the ICT user farmers were taken with the help of 3-point scale as Regularly, Occasionally and Never with the weightages 3, 2, 1 respectively which was analyzed with the help of the frequency and percentage.

## Results and Discussion

### Frequency of Integrated nutrient management information used by the ICT tool user farmers

Table 1 indicates the information related to frequency of integrated nutrient management information used by the ICT tool user farmers.

Majority of all the four ICT tool user farmers inferred that they never obtained information with respect to soil testing aspects. The 95.00 percent of Whatsapp users, 64.17 percent of e-Krushika app users, 84.17 percent of KMAS users and cent percent of KCC tool user farmers had the same tendency of using information. The probable reason for this trend was that all the farmers may not aware about the importance of soil testing. Hence, they were not used this information.

With respect to green manuring category, majority 35.83 percent and 46.67 percent of the Whatsapp and KMAS tool user farmers inferred that they occasionally used green manuring information. This may be due to the farmer's presumption that the green manure crops may not help so much in crop production.

In case of fertilizer dosage information, majority (47.50%) of e-Krushika app user farmers said that they used the app regularly for fertilizer dosage information as the fertilizer dosage calculator feature of the e-Krushika app is more popular among the users and used the app regularly for fertilizer dosage application. Further, 63.33 percent of the KMAS user farmers expressed that they had used fertilizer dosage information service regularly as the KVK's disseminate need-based information by concerned subject matter specialists and location

specific information was given to that particular geographic region (Kavyashree, C., 2021)<sup>[5]</sup>

**Table 1:** Frequency of Integrated nutrient management information used by the ICT tool user farmers (n=120)

Category	ICT Tools	Frequency						
		Regularly		Occasionally		Never		
		F	P	F	P	F	P	
INM	Soil testing	Whatsapp	00	00.00	06	05.00	114	95.00
		e-Krushika App	24	20.00	19	15.83	77	64.17
		SMS services	00	00.00	19	15.83	101	84.17
		KCC	00	00.00	00	00.00	120	100.00
	Green manuring	Whatsapp	35	29.17	43	35.83	42	35.00
		e-Krushika App	21	17.50	30	25.00	69	57.50
		SMS services	17	14.16	56	46.67	47	39.17
		KCC	00	00.00	04	03.33	116	96.67
	Fertilizer dosage	Whatsapp	00	00.00	20	16.67	100	83.33
		e-Krushika App	57	47.50	18	15.00	45	37.50
		SMS services	76	63.33	41	34.17	03	02.50
		KCC	00	00.00	02	01.67	118	98.33

F = Frequency, P = Percentage

### Frequency of Integrated pest management information used by the ICT tool user farmers

The table 2 shows the data regarding frequency of integrated pest management information used by the ICT tool user farmers. More than three- fifth (65.83%) the KMAS user farmer and 53.33 percent of the KCC tool user farmers expressed that they used these tools regularly for information on identification of pests. This might be due to the fact that in any crop pest management is the important aspect as the returns of the crop depends on the quality and quantity of the crop (Pavithra, S., 2018 and Murty, 2012)<sup>[8, 6]</sup> Hence, majority of the farmers were very much interested in management of pests in their crops and might have used KMAS and KCC regularly on this aspect. Whereas, majority of Whats app (45.00%) and e-Krushika app (53.33%) user farmers said that they never used information about identification of pests.

More than half of Whats app user farmers (68.33%) and e-Krushika app (57.50%) users inferred that they never used information on management practices in integrated pest management from these platforms, because farmers were not satisfied with information given in this tool. Since Whats app is used to share general information also.

**Table 2:** Frequency of Integrated pest management information used by the ICT tool user farmers (n=120)

Category	ICT Tools	Frequency						
		Regularly		Occasionally		Never		
		F	P	F	P	F	P	
IPM	Identification of pest	Whatsapp	37	30.83	29	24.17	54	45.00
		e-Krushika App	41	34.17	15	12.50	64	53.33
		SMS services	79	65.83	29	24.17	12	10.00
		KCC	64	53.33	27	22.50	29	24.17
	Management practices	Whatsapp	26	21.67	12	10.00	82	68.33
		e-Krushika App	31	25.83	20	16.67	69	57.50
		SMS services	36	30.00	68	56.67	16	13.33
		KCC	79	65.84	34	28.33	07	5.83
	Latest Information	Whatsapp	48	40.00	41	34.17	31	25.83
		e-Krushika App	56	46.67	25	20.83	39	32.50
		SMS services	54	45.00	48	40.00	18	15.00
		KCC	38	31.67	23	19.17	59	49.16

F = Frequency, P = Percentage,

With respect to latest information in integrated pest management, 40.00 percent, 46.67 percent and 45.00 percent of the Whatsapp, e-Krushika app and KMAS user farmers regularly used these tools for information respectively. The reason for this result may be that these ICT tools had given very interesting and pertinent information about agriculture related aspects.

### Frequency of integrated disease management information used by the ICT tool user farmers

The Table 3 provides the information on frequency of integrated disease management information with respect to disease identification, management practices and latest information on disease management used by the ICT tool user farmers.

The bird eye view of Table 3 shows that more than two-fifth (42.50% & 45.83%) Whatsapp and e-Krushika app user farmers never used these tools for information on identification of diseases, the reason for this result that probably these tools provided information on new up comings and latest information in agriculture and allied fields. Hence, with respect to identification of disease farmers might never use information on this piece. Whereas, majority of KMAS (60.83%) users and KCC (57.50%) user farmers inferred that they regularly used information on Identification of diseases. The probable reason for this might be that the KVK's and KCC specially provide message particularly to solve the burning problems of crop cultivation, so these tools might concentrate on solving burning problem particularly diseases in the crops.

**Table 3:** Frequency of Integrated disease management information used by the ICT tool user farmers (n=120)

Category	ICT Tools	Frequency						
		Regularly		Occasionally		Never		
		F	P	F	P	F	P	
IDM	Identification of disease	Whatsapp	33	27.50	36	30.00	51	42.50
		e-Krushika App	38	31.67	27	22.50	55	45.83
		SMS services	73	60.83	34	28.34	13	10.83
		KCC	69	57.50	31	25.83	20	16.67
	Management practices	Whatsapp	38	31.67	48	40.00	34	28.33
		e-Krushika App	36	30.00	24	20.00	60	50.00
		SMS services	36	30.00	68	56.67	16	13.33
		KCC	79	65.83	34	28.33	07	5.84
	Latest Information	Whatsapp	58	48.33	36	30.00	26	21.67
		e-Krushika App	56	46.67	21	17.50	43	35.83
		SMS services	54	45.00	48	40.00	18	15.00
		KCC	38	31.67	23	19.17	59	49.16

F = Frequency, P = Percentage,

With respect to management practices in integrated diseases management, Majority 40.00 percent of the Whatsapp users and 56.67 percent of KMAS user farmers expressed that they had occasionally obtained information on this aspect the reason for this result may be that Whatsapp users personally enquired with the other members to solve the diseases problems in the crops. Similarly, KMAS user farmers were also made a same correspondence to solve the disease problems in their crops. So, as they occasionally used the information from these two ICT tools. Further, half (50.00%) the of e-Krushika app user farmers expressed that they never used information with respect to management practices. The reason for this was due to the e-Krushika app might had given information about mechanization in agriculture and latest technologies in agriculture. Whereas, majority of the KCC (65.83%) user farmers expressed that they used disease management practices information regularly. The reason for this might be that the farmers particularly made phone

calls to solve the problem of diseases in their crops and most of the farmers might had habit of getting information from KCC about this information (Pujar, S. S., 2021)<sup>[9]</sup>

Nearly half of the farmers expressed that they obtained latest integrated disease management information from Whatsapp (48.33%), e-Krushika app (46.67%) and KMAS (45.00%). The probable reason for this was that these tools in one or the other way keep providing latest farming information to the farming community. The same tendency was observed in all ICT tool user farmers. Hence majority of the farmers regularly used latest information.

### Conclusion

In India in recent years have led to widespread capacity for dissemination of knowledge and information to the rural community. However, rural population in our country still have issues in accessing essential information in the forms they will perceive to form timely decisions for better farming. In previous couple of years innovative ideas came in to existence (Vivek M. C., 2021)<sup>[13]</sup>. Indian farming community is at present facing multitude of problems to maximize crop productivity, ICT tools are the solutions to over the problem.

The ICT tools which are generally used in transfer of technologies among farmers and extension workers are computer, the internet and digital media which can be used to support decision making process. INM, IPM and IDM related information on websites and mobile apps can be used as identification guides information on identification of problem, its damage, market news and agriculture statistics which provide information on economic injury thresholds as well as information on monitoring and scouting. Today there are abundant ICT tools which provide information on various aspects of farming and assist farmers at various stages of production. Despite of this, many farmers are unaware of these tools and very few farmers make potential use of these tools. Even though there are many ICT tools related to agriculture their credibility is doubted and many are outdated. Hence, these tools need to be updated made farmer friendly and awareness should be made among the farming community to make full potential use of these tools.

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