



# Effectiveness of WhatsApp Messages on Knowledge Gain of Sugarcane Cultivation Practices among the Farmers

Rahul Pawar<sup>a+++\*</sup>, S. Devendrappa<sup>a#</sup>  
and D. A. Nithya Shree<sup>b#</sup>

<sup>a</sup> Department of Agricultural Extension Education, University of Agricultural Sciences, Dharwad-580005, Karnataka, India.

<sup>b</sup> Department of Extension and Communication Management, University of Agricultural Sciences, Dharwad-580005, Karnataka, India.

## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

## Article Information

DOI: 10.9734/AJAEES/2023/v41i81978

## Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/99944>

**Original Research Article**

**Received: 17/03/2023**

**Accepted: 21/05/2023**

**Published: 30/05/2023**

## ABSTRACT

Information and communication technology in agriculture provides solutions to agricultural challenges. The present study was conducted in Athani taluk of Belagavi District in Karnataka state. 'Before-After' without control group experimental design was used to determine the effectiveness of WhatsApp messages on knowledge gain of sugarcane cultivation practices among farmers. WhatsApp messages on "Sugarcane cultivation practices" was the subject matter selected

<sup>++</sup> Research Scholar;

<sup>#</sup> Professor;

\*Corresponding author: E-mail: pawarrahul401@gmail.com;

for the study and tested for their effectiveness. WhatsApp messages acted as treatment for the study. 50 Sugarcane growers were selected for the treatment on the basis of random sampling. The effectiveness was studied in terms of knowledge gain for WhatsApp messages. The results revealed that highest mean differences 2.50 was observed in case of integrated disease management followed by weed management (2.38), micronutrients and inter cultivation (2.10). The mean knowledge score of WhatsApp messages of the respondents before exposure was 20.52 and after exposure it was 50.52, thus there was mean knowledge gain of 30.00. Farming experience, land holding, extension contact, Innovative proneness achievement motivation and Management orientation were found to be positive and significant relationship with knowledge gain. Hence, WhatsApp messages are effective to disseminate the information among the farmers.

*Keywords: Effectiveness; knowledge gain; whatsapp message; sugarcane cultivation practices.*

## 1. INTRODUCTION

Sugarcane (*Saccharum officinarum* L.) is an important commercial crop of the world and is cultivated in about seventy five countries, the leading countries being Brazil, India, China and Thailand. The sugar industry plays an important role in the agricultural economy of India. Today, sugarcane cultivation and sugar industry stands as supporting pillars of Indian economy. India occupies the second rank in production of sugarcane in the world. The area under sugarcane in India is 46.02 lakh hectares during the year 2019-20 and production of 370.50 million tonnes and yield is 80497 kg/hectare. India's annual consumption of sugar is around 28.00 million tonnes. Anonymous [1]. Karnataka is blessed with a favourable climatic conditions for the cultivation of sugarcane, hence the area under sugarcane has expanded to 6.91 lakh ha with a production of 381.81 lakh tonnes and productivity of 89000 kg/ha [2]. The leading sugarcane growing districts are Belagavi, Bagalkote, Mandya and Kalaburagi. Belagavi being one of the leading sugarcane growing district in Karnataka has an area of 2.21 lakh ha under sugarcane with production of 15.33 lakh tonnes and productivity of 102 t/ha [3].

Agriculture continues to be the occupation and way of life for more than half of Indian population even today, making single largest contribution to the GDP of our nation. Sustainable prosperity of the farmers and the agricultural labourers holds the key for improving the overall human resource development scenario in the country. Indian agriculture had been on traditional lines till the first waves of green revolution in the late 1960s. The green revolution gave a sudden boost to the production and productivity by making India self sufficient. Though India has achieved self sufficiency in food grain production, we cannot

be complacent with the increasing population. There is a need to increase production and productivity of agriculture. Hence, the Indian farmers need to be updated with the latest knowledge about new techniques of farming, new cultivars, farm machinery, market and trade situation, etc. The extension personnel of the department of agriculture disseminated the technologies and messages to the farmers through various extension methods. But these approaches have not been able to reach the majority of the farmers spread across the country as the ratio between farmer and extension worker is 1000:1 [4]. This gap remains a challenge for extension system even today. To reach 120 million farmers spread over more than 500 districts is an uphill task. The diversity of agro-ecological situations adds to this challenge further. Farmers' needs are much more diversified and the knowledge required to address them is beyond the capacity of the grass root level extension functionaries. In this context, WhatsApp message play an important role in reaching the unreached, supplement and reinforce the extension efforts. Keeping this in view, the present study was conducted with a specific objective to effectiveness of WhatsApp messages on knowledge gain of sugarcane cultivation practices among the farmers.

## 2. MATERIALS AND METHODS

The present experimental study was conducted in Athani taluk of Belagavi District in Karnataka state. 'Before-After' without control group experimental design was used to determine the effectiveness of WhatsApp messages on knowledge gain of sugarcane cultivation practices among farmers. WhatsApp messages on "Sugarcane cultivation practices" was the subject matter selected for the study. WhatsApp messages acted as treatments for the study.

Based on the highest area under sugarcane cultivation mangasuli village from Athani taluk of Belagavi district were randomly selected for the study. 50 Sugarcane growers were selected for treatment on the basis of random sampling. The effectiveness was studied in terms of knowledge gain for WhatsApp messages by conducting pre test and post test. This standardized interview schedule was used for data collection which was done through personal interview technique. Collected data were tabulated and analyzed using mean, paired 't' test, correlation and statistical tools were used for the study.

### 3. RESULTS AND DISCUSSION

The Table 1 depicts the gain in knowledge level of sugarcane growers on sugarcane cultivation practices due to WhatsApp messages exposure. The paired 't' test was calculated to find out the mean difference before and after the treatments.

#### 3.1 Soil and Land Preparation

The Table 1 reveals that mean knowledge gain on soil and land preparation was 1.30 after the WhatsApp messages exposure. The mean score before the treatment was 1.80 and it was increased to 3.10 after the treatment. The paired 't' value is 10.11 which is significant at 1 per cent level.

#### 3.2 Planting Season and Varieties

The Table 1 reveals that mean knowledge gain on planting season and varieties was 1.40 after the WhatsApp messages exposure. The mean score before the treatment was 1.90 and it was increased to 3.30 after the treatment. The paired 't' value is 20.00 which is significant at 1 per cent level.

#### 3.3 Seed Setts

The Table 1 reveals that mean knowledge gain on seed setts was 1.40 after the WhatsApp messages exposure. The mean score before the treatment was 1.70 and it was increased to 3.10 after the treatment. The paired 't' value is 14.77 which is significant at 1 per cent level.

#### 3.4 Organic Manure

The Table 1 reveals that mean knowledge gain on organic manure was 1.40 after the WhatsApp messages exposure. The mean score before the treatment was 1.60 and it was increased to 3.00

after the treatment. The paired 't' value is 8.80 which is significant at 1 per cent level.

#### 3.5 Chemical Fertilizer

The Table 1 reveals that mean knowledge gain on chemical fertilizer was 1.50 after the WhatsApp messages exposure. The mean score before the treatment was 1.70 and it was increased to 3.20 after the treatment. The paired 't' value is 15.65 which is significant at 1 per cent level.

#### 3.6 Green Leaf Manure

The Table 1 reveals that mean knowledge gain on green leaf manure was 1.70 after the WhatsApp messages exposure. The mean score before the treatment was 0.80 and it was increased to 2.50 after the treatment. The paired 't' value is 18.58 which is significant at 1 per cent level.

#### 3.7 Micronutrients

The Table 1 reveals that mean knowledge gain on micronutrients was 2.10 after the WhatsApp messages exposure. The mean score before the treatment was 0.80 and it was increased to 2.90 after the treatment. The paired 't' value is 17.70 which is significant at 1 per cent level.

#### 3.8 Irrigation

The Table 1 reveals that mean knowledge gain on irrigation was 2.00 after the WhatsApp messages exposure. The mean score before the treatment was 1.70 and it was increased to 3.70 after the treatment. The paired 't' value is 15.65 which is significant at 1 per cent level.

#### 3.9 Inter Cultivation

The Table 1 reveals that mean knowledge gain on inter cultivation was 2.10 after the WhatsApp messages exposure. The mean score before the treatment was 0.70 and it was increased to 2.80 after the treatment. The paired 't' value is 21.00 which is significant at 1 per cent level.

#### 3.10 Weed Management

The Table 1 reveals that mean knowledge gain on weed management was 2.30 after the WhatsApp messages exposure. The mean score

before the treatment was 1.00 and it was increased to 3.30 after the treatment. The paired 't' value is 13.56 which is significant at 1 per cent level.

### 3.11 Integrated Pest Management

The Table 1 reveals that mean knowledge gain on integrated pest management was 1.50 after the WhatsApp messages exposure. The mean score before the treatment was 3.50 and it was increased to 5.00 after the treatment. The paired 't' value is 6.45 which is significant at 1 per cent level.

### 3.12 Integrated Disease Management

The Table 1 reveals that mean knowledge gain on integrated disease management was 2.50 after the WhatsApp messages exposure. The mean score before the treatment was 4.00 and it was increased to 6.50 after the treatment. The paired 't' value is 12.22 which is significant at 1 per cent level.

### 3.13 Harvesting

The Table 1 reveals that mean knowledge gain on harvesting was 1.00 after the WhatsApp messages exposure. The mean score before the treatment was 1.30 and it was increased to 2.30

after the treatment. The paired 't' value is 9.04 which is significant at 1 per cent level.

It is observed in Table 1 that highest mean differences 2.50 was observed in case of integrated disease management followed by weed management (2.38), micronutrients and inter cultivation (2.10). The fact that under WhatsApp message treatment the sugarcane cultivation practices focused more on integrated disease management because diseases reduce the yield of sugarcane as a result it reduces the income of the sugarcane growers. And due to more number of diseases infestation in the study area farmers has concentrated on this practice. The crucial factor in cultivation is the weed management or otherwise it will reduce the yield drastically. Hence, the farmers were motivated to get more knowledge on weed management practices to be used. Farmers realized the benefits of inter cultivation in sugarcane as it not only improve soil fertility but also provide additional income. The results are in line with the findings of Dechamma [5] and Sowjanya [6].

The data regarding the knowledge gained as a result of exposure to WhatsApp messages format are presented in Table 2. The computed 't' value was positive and significant at 0.01 level of significance for gain in knowledge. Hence, it can be concluded that there was a positive and significant difference in the knowledge levels of

**Table 1. Knowledge gain of farmers on exposure to WhatsApp messages on sugarcane cultivation practices**

Sl. No	Sugarcane Cultivation Practices	Scores	WhatsApp messages						Paired 't' value
			Before		After		Mean Knowledge gain		
			Mean	SD	Mean	SD	Mean	SD	
1	Soil and land preparation	4	1.80	0.76	3.10	0.71	1.30	-0.05	10.11**
2	Planting season and varieties	5	1.90	0.54	3.30	0.79	1.40	0.24	20.00**
3	Seed setts	5	1.70	0.65	3.10	0.71	1.40	0.06	14.77**
4	Organic manure	4	1.60	0.81	3.00	0.78	1.40	-0.03	8.80**
5	Chemical fertilizer	5	1.70	1.02	3.20	0.61	1.50	-0.41	15.65**
6	Green leaf manure	3	0.80	0.61	2.50	0.51	1.70	-0.10	18.58**
7	Micronutrients	6	0.80	0.88	2.90	0.54	2.10	-0.34	17.70**
8	Irrigation	7	1.70	1.36	3.70	0.91	2.00	-0.45	15.65**
9	Inter cultivation	3	0.70	0.65	2.80	0.40	2.10	-0.24	21.00**
10	Weed management	4	1.00	0.78	3.30	0.91	2.30	0.13	13.56**
11	Integrated pest management	8	3.50	1.04	5.00	1.01	1.50	-0.02	6.45**
12	Integrated disease management	10	4.00	0.90	6.50	0.81	2.50	-0.09	12.22**
13	Harvesting	3	1.30	0.46	2.30	0.65	1.00	0.18	9.04**

\*\* Significant at 1% level, \* Significant at 5% level

**Table 2. Extent of knowledge gained by respondents after exposure to WhatsApp messages format**

Sl. No	Treatments	Mean knowledge score		Mean Knowledge gain	Paired 't' value
		Before exposure	After exposure		
1	WhatsApp messages (n=50)	22.50	44.70	22.20	39.40**

\*\* Significant at 1% level

**Table 3. Relationship of socio-economic characteristics with knowledge gain after exposure to WhatsApp messages**

Sl. No	Variables	WhatsApp message
1	Age	-0.097 <sup>NS</sup>
2	Education	0.114 <sup>NS</sup>
3	Farming experience	0.376**
4	Land holding	0.615**
5	Extension participation	-0.235 <sup>NS</sup>
6	Extension contact	0.443**
7	Mass media exposure	0.321*
8	Innovative proneness	0.601**
9	Achievement motivation	0.373**
10	Economic motivation	0.141 <sup>NS</sup>
11	Risk orientation	0.008 <sup>NS</sup>
12	Management orientation	0.403**
13	Scientific orientation	-0.070 <sup>NS</sup>
14	Cosmopoliteness	-0.174 <sup>NS</sup>

\*Significant at the 0.05% level

\*\*Significant at the 0.01% level

NS- Non significant

respondents before and after exposure to the treatments. The mean knowledge score before exposure to WhatsApp message was 22.50 and after exposure, score was 44.70. Thus there was a mean knowledge gain of 22.20. The WhatsApp message resulted in only 22.20 mean knowledge gain by the respondents. In WhatsApp message respondents were sent need based messages on sugarcane cultivation practices but they might not have shown much interest in understanding the messages by themselves and/or by discussing with their fellow farmers. They might not have opened or even if opened they might have read casually with no conscious effort to acquire knowledge out of it. Messages are often felt uninteresting to the reader and do not hold their attention resulting in impaired learning. Leagans [7] rightly pointed out that, combination of seeing and hearing was more effective in making impact on people and was usually necessary to promote action. Lack of these effects might be the reason for low knowledge gain by this format. Hence, it is logical to expect enhanced knowledge when video was shown in whole and/or splits.

#### 4. RELATIONSHIP BETWEEN SELECTED SOCIO-ECONOMIC CHARACTERS WITH KNOWLEDGE GAIN

It is observed from Table 3 that the variables such as farming experience, land holding extension contact, innovative proneness, achievement motivation and management orientation had positive and significant relationship with knowledge gain at 0.01 per cent level. Whereas, mass media exposure were found to be positive and significant relationship with knowledge gain at 0.05 per cent level. Other variables viz., age, education, extension participation, economic motivation, risk orientation, scientific orientation and cosmopoliteness had a non-significant relationship with knowledge gain of the respondents.

Farming experience was found to be positive and significant relationship with knowledge gain. The possible reason might be that farmers are involved in farming activities for a long time, they try to know more about new technologies with

interest, thus farming experience has high significance. The findings are in agreement with the findings of Dechamma [5], Vandana [8] and Mohanakumar [9]. Land holding was found positively and significantly correlated with knowledge gain. The probable reason for this kind of results may be that farmers with larger holdings will have more opportunities and potentialities to try and adopt large number of technological innovations. As a result, it is quite possible that farmers with larger holdings evince keen interest to know about new farm practices and be more receptive to such ideas, thus leading to better acquisition of knowledge. Therefore, size of land holdings might have shown positive and significant relationship with knowledge gain. The findings are in agreement with the findings of Dechamma [5] and Mohanakumar [9]. Extension contact had positive and significant relationship with knowledge gain of sugarcane growers. The above findings could be attributed to the fact that growers with higher level of contact with extension agency are favourably predisposed to acquire more information, skills and other factors relating to enterprises, consequently raising their level of knowledge. The findings are supported by the results of Dechamma [5]. Innovative proneness had positive and significant relationship with knowledge gain. The possible reason might be due to the fact that sugarcane growers had better ability to try new practices and strive hard towards adopting those practices earlier than the others members of the society. The findings are in line with results of Sowjanya [6]. Achievement motivation was found to be significantly related, the reason might be that the interest of the individual to decide and complete the tasks in certain directions, which in turn helps in achieving the desired crop yield and income. These findings are in agreement with the findings of Chandra and Reddy [10]. The knowledge gain of sugarcane growers showed significant association with management orientation. The possible reason might be that because management orientation in the present study has been defined as the degree to which a farmer is oriented towards scientific farm management comprising of planning, production and marketing functions of the farm. It is imperative that scientifically oriented farmers will have a positive attribute towards gaining scientific aspects of cultivation. This might have contributed in the increase in knowledge gain of sugarcane growers. Mass media exposure was found to be positive and significant relationship with knowledge gain of sugarcane growers. The

possible reasons might be due to the higher levels of exposure to mass media would facilitate the farmers to develop the habit of gathering more information about new practices through radio, newspaper and other literature related sugarcane cultivation practices. Mass media also provides enormous opportunity for repeated exposure to new technologies and motivating growers. These findings are in line with the results of the studies by Vandana [8].

## 5. CONCLUSION

WhatsApp is a tool of social media which provides the platform to farmers for sharing the knowledge and asking the queries with the scientists. Present research study concludes that WhatsApp is an effective and powerful medium of information dissemination. Thus, we can conclude that WhatsApp messages are effective to disseminate the information among the farmers.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Anonymous, 2019-20, Area, Production and Productivity of Sugarcane in India. Available:<https://www.indiastat.com/table/agriculture/area-production-productivity-sugarcane-india-1930-/17414#>
2. Anonymous, 2019-20, Area, Production and Productivity of Sugarcane in India. Available:<https://www.indiastat.com/table/karnataka-state/agriculture/selected-state-wise-area-production-productivity-s/1409233>
3. Anonymous, 2017-18, Belagavi district at a glance, Government of Karnataka Available:<https://cdn.s3waas.gov.in/s382f2b308c3b01637c607ce05f52a2fed/uploads/2019/07/2019070632.pdf>
4. Chitra, Shankaraiah. ICT Initiatives in Indian Agriculture, A Newsletter of the IFIP WG 9.4 and Centre for Electronic Governance IIM, Ahmedabad. 2012; 22(3):28-29.
5. Dechamma S. Relative effectiveness of different information and communication technology (ICT) gadgets on knowledge and symbolic adoption of tomato Crop production practices among farmers of

- Karnataka-An experimental Study, M.Sc. (Agri.) Thesis, University of Agricultural Sciences, Bangalore, Karnataka (India); 2015.
6. Sowjanya S. An analysis of different electronic media in farm communication - An experimental study. Ph. D. Thesis, University of Agricultural Sciences, Bangalore, Karnataka (India); 2017.
  7. Leagans JP. The communication process", in Extension Education in Community Development. Directorate of Extension, Ministry of Food and Agriculture, Govt. of India, New Delhi; 1961.
  8. Vandana Arjun Gandroli. Effectiveness of information communication Technology in promotion of SRI method of paddy cultivation. Ph. D. Thesis, Univ. Agric. Sci., Dharwad, Karnataka (India); 2016.
  9. Mohanakumar V. Development and assessment of e-training tools for promotion of fodder crops. Ph. D. Thesis, Univ. Agric. Sci., Dharwad, Karnataka (India); 2018.
  10. Chandra KVS, Reddy R. Impact of annadata-velugubata programme on the televiewers in Chittor district of Andhra Pradesh. Indian Journal of Extension Education. 2004;40(1&2): 37-39.

© 2023 Pawar et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*  
*The peer review history for this paper can be accessed here:*  
<https://www.sdiarticle5.com/review-history/99944>