Indian Journal of Extension Education
Vol. 53, No. 3, 2017 (16-20)

Information Dynamics of Cotton Farmers in Akola District of Maharashtra

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ABSTRACT

Access to information is of crucial importance in the present agricultural scenario. The present study was conducted at Akola district of Maharashtra to analyse the information need and information search behavior of cotton farmers. Department of Agriculture, followed by friends and neighbours, input dealers and other progressive farmers were the major sources of information contacted by most of the farmers. Contact frequency of farmers was found to be varying widely with farmers with lower number of information sources found to be relying more on input dealers, radio, television and newspapers. Major information needs of farmers were found to be related to pest management, seeds of new varieties, seed treatment, water management and soil fertility.

Key words: Cotton, Information Need, Information Search Behaviour

INTRODUCTION

In the present day agriculture, information is the key input. Agriculture is becoming information intensive over time. According to Bertolini (2004), knowledge and information are important factors for accelerating agricultural development through increased production and improved marketing and distribution. Agricultural information is an important factor that interacts with other production factors. The productivity of these other factors, such as land, labor, capital and managerial ability, can arguably be improved by relevant, reliable and useful information (Vidanapathirana, 2012). According to Maningas *et al.,* (2000), information within the hands of the farmers means empowerment through control over their resources and decision-making processes. Information must be relevant and meaningful to farmers, in addition to being packaged and delivered in a way preferred by them (Diekmann *et al.,* 2009). Without new knowledge, farmers have been left with traditional agricultural approaches and oral recommendations from other farmers (Kalusopa, 2005). A combination of traditional practices, personal experience and trial-and-error approaches was the only one option left without access to information sources (Mittal and Tripathi, 2009). Birthal *et al.,* (2015) from their analysis of the net returns from farming by farm size and number of information sources used, observed that users of information (except sub-marginal farmers) realize significantly higher net returns per hectare and these increase with increase in the intensity of information use

The complexities of the agricultural production function imply that farmers need information on a variety of topics, at a variety of stages, before adopting a new technology (Aker, 2010). Farmers have different types of information needs during each stage, ranging from weather forecasts, pest attacks, inputs (seeds and fertilizer), improved cultivation practices, pest and disease management and prices (Aker, 2010). Moreover, farmers tend to exhibit different levels of involvement in information search an use, a better understanding of farmers' agricultural information needs and information search behaviors could help guide extension and other agricultural programs to better target specific groups of farmers (Babu *et al.,* 2012). The information requirements of farmers, the structure of the organizations involved in these activities are issues that need to be explored (Demiryurek *et al.,* 2008). The reports of situation assessment surveys (2005) conducted by National Sample Survey Office (NSSO), an organization under the aegis of Government of India, revealed that

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major source of information for Indian farmers was other progressive farmers (16.7%), followed by input dealers (13.1%) and radio (13%). The 2013 survey once again highlighted the prominence of farmer to farmer exchange of information in Indian agriculture. Traditional and modern ICTs also assume important role among information sources of Indian farmers. At all India level, around 41 percent of the cultivating households accessed technical help from any of the listed agencies/ sources. Progressive farmer and traditional as well as modern ICTs (radio/ TV/newspaper/ internet) were the two main sources accessed by the agricultural households for technical advice (NSSO,2014). The requirement of relevant and context-specific information is more in case of commercial crops where capital investment is more. Sulaiman and Sadamate (2000) has observed from their study that almost half of the farmers expressed their willingness to pay for extension services, the perceived reason being diversification towards non food crops with high investment and information requirement. The present study was conducted in Akola district of Maharashtra to understand the information need and search behavior of cotton farmers.

METHODOLOGY

The study was conducted in the Akola block of Akola district of Maharashtra state. Akola district falls in Vidarbha region, which is known as the cotton belt. Following a multi stage random sampling procedure, 120 farmers were selected. A pre-tested questionnaire was used to collect data on information need and information search behavior of farmers.

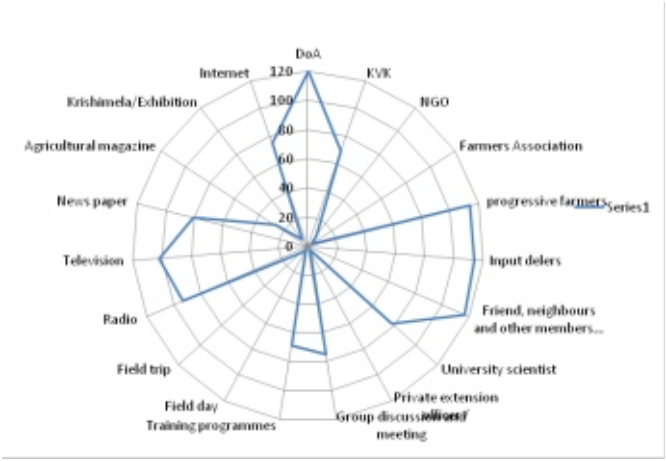
A five-point Likert type scale ('Not important' to 'Highly Important')was used to collect information needs of farmers on various aspects related to cotton cultivation. Information search behaviour of farmers was assessed based on the number of sources of information used and mean frequency of use of the information source (6=daily, 5=weekly, 4=fortnightly, 3=monthly, 2=seasonally, 1=yearly, 0=none). In addition to the descriptive statistics computed from the data, cluster and factor analyses were used. Ward's hierarchical clustering was used to categorize similar information search behaviors of farmers into sensible groups.

Factor analysis was applied to the different information needs related to cotton cultivation. Factor analysis was performed using principal component factor's method in SPSS 21 to reduce the information variables to broad categories.

RESULTS AND DISCUSSION

A quick review of the major sources of information revealed that Department of Agriculture (100%), followed by friends and neighbours (97%), input dealers and other progressive farmers (95 percent each) were the major sources of information contacted by most of the farmers. The finding is in line with Foster and Rosenzweig (1995) who have pointed out that information from fellow farmers being as important as the information from public extension workers. Babu *et al.,* (2011) have reported significant role of input dealers in dissemination of agricultural information owing to of large-scale purchase of inputs by farmers. Traditional and modern ICTs (Mobile/Internet, Radio, Television, Newspapers and Magazines) were also accessed by large proportion of the farmers for information. Krishi Vigyan Kendra, despite their limited outreach and human resource constraints, was accessed by more than half of the respondents.

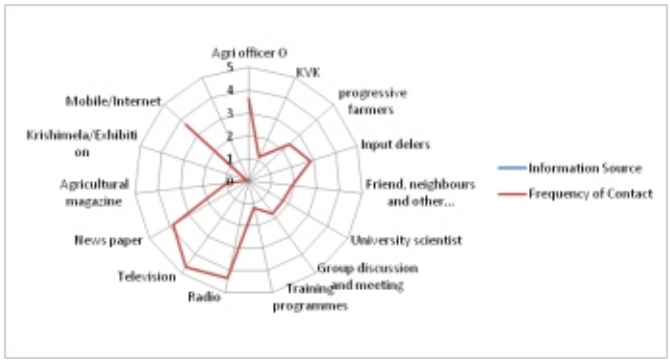
Figure 1: Major Sources of Information Accessed by Cotton Farmers.



A further analysis of frequency of access of different information sources by cotton farmers revealed that ICTs (Mobile/Internet, Radio, Television, Newspapers and Magazines) dominate the spectrum, followed by Department of Agriculture and Input dealers. Frequency of contact with KVK and university scientists was found to be very low. The result figures out the fact that sources which are in the proximity, of the farmers were accessed more than the sources which are away.

Information sources which are in the possession of farmers like, Mobile/Internet, Radio, Television, Newspapers and Magazines were more frequently accessed followed by agricultural assistant (*Krishi Sahayak*) and Input dealers (*Krishi Seva Kendras*).

Figure2: Frequency of contact to Information Source by Farmers



Ward's hierarchical clustering was used to categorize the farmers into meaningful categories based on their information search behaviour. Cluster analysis categorised farmers according to the similarity or dissimilarity of the number of sources used and frequency of use. The three information search patterns that emerged were high searchers, medium searchers, and low searchers. High search group contacted 11.56 sources on an average, while Medium and low searchers accessed fewer sources (9.57 and 6.9). Contact frequency of medium and low search groups was also found to be lower than high search group.

Table 1: Information search behaviour patterns identified from ward's cluster analysis

Search Behaviour	Sources Accessed		Frequency of Contact	
	Mean	S.D	Mean	S.D
High Search Group (47%)	11.56	1.364734	2.351974	0.221402
Medium Search Group (21%)	9.57	1.718249	1.541353	0.435831
Low Search Group (32%)	6.9	1.814086	1.267943	0.401834
Kruskal-Wallis test statistics	21.532 (Significance=0)		24.822 (Significance=0)	

Table 2: Search behavior by Information Sources-Results of Kruskal-Wallis test

Information Sources	Test Statistics	Sign ificance	High Search Group		Medium Search Group		Low Search Group	
			Mean	SD	Mean	SD	Mean	SD
Agri. Officer/assistant	13.50	0.00	4.38	1.147	3.86	1.069	2.45	0.934
KVK	6.19	0.05	1.56	1.548	1.57	1.134	0.55	1.214
Progressive farmers	3.96	0.14	2.75	1	2.57	0.787	1.91	1.136
Input dealers	2.13	0.34	2.88	1.258	2.57	1.718	3.45	1.128
Friends and neighbours	3.54	0.17	2.13	0.5	1.86	0.378	1.73	1.009
University scientist	7.50	0.02	2.56	1.413	1.71	1.604	0.91	1.221
Group discussion and meeting	2.58	0.27	1.75	1.732	2	0	1.18	1.834
Training programmes	8.08	0.02	1.56	1.031	1.86	0.9	0.45	1.036
Radio	20.08	0.00	5.81	0.403	0	0	5.09	1.758
Television	14.49	0.00	5.81	0.403	2.71	2.563	4.09	2.663
Newspaper	16.34	0.00	5.75	0.447	2	2.517	2.09	2.914
Agricultural magazine	5.14	0.08	1.5	2.033	1	1.732	0	0
Internet/Mobile	25.50	0.00	5.56	1.504	5.57	0.787	0	0

More clearly, High, medium and low search groups exhibited significant difference both in terms of number of sources used and frequency of access to different sources as revealed from the Kruskal-Wallis-test statistics (Table 1).

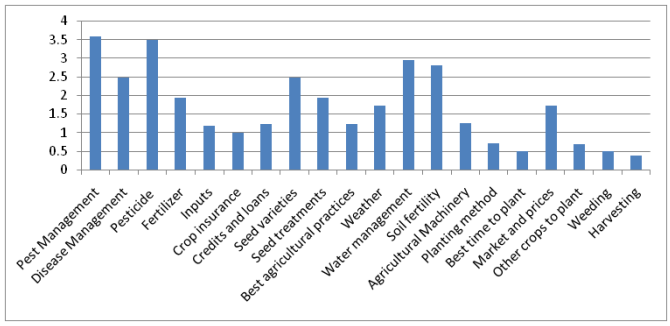
A look into the difference in search behavior of different groups pointed out that significant difference exists in relation to sources like department of agriculture, KVK university scientists, training programmes, radio, television, newspaper and internet/mobile. Farmers in the high search group have found to have more contact with these sources rather than their counter parts.

Contact frequency of low search group is found to be more than that of medium search group in case of radio, television and newspaper. Further, the low search behavior group has highest contact frequency in case of input dealers. Birthal *et al.,* (2015) have also found out that the households using fewer number of information sources rely mostly on social networks, followed by private sources and mass media for their information needs.

Frequent access to traditional ICTs and input dealers by farmers in low search group indicate that they are making lesser use of cosmopolite sources compared to other groups. This in turn point out the needed interventions to enhance the outreach of agencies like Department of Agriculture, Krishi Vigyan Kendras and Agricultural Universities on one hand and capacity of the farmers to demand for the information and services on other hand.

Farmers' importance of information needs for cotton cultivation was assessed using a five point Likert scale. The most important information needs for cotton are: pest management and pesticide usage followed by water management and soil fertility. Seed varieties and seed treatment were also considered important. (Figure 3). The information given the lowest importance was related to cultivation and post cultivation practices like –harvesting, weeding, best time to plant etc.

Figure 3: Important Information Needs of Cotton Farmers



Factor analysis, using Principal components method was used to reduce the information needs to four comprehensive groups. Factor analysis, reduced the information topics into four factors. Eigen values for each factor was greater than one. Variables with a minimum loading of 0.5 were selected for inclusion in each factor. Four factors emerged from the analysis and were named 'Input and Services, 'Plant Protection, 'Seed Related' and 'Natural Resources Management' (Table 3).

Table 3: Factors derived from information needs of cotton farmers

Inputs and Services
Fertilizer (0.598), Insurance (0.736), Credit (0.663),Weather (0.715), Market and Prices (0.627),
Plant Protection
Pest Management(0.7), Pesticide(0.65)
Seed related
New Varieties (0.564), Seed treatment(0.569)
Natural Resource Management
Water Management(0.73), Soil fertility(0.831)

The information search behavior groups identified by cluster analysis were further used to investigate differences in information needs. But, it was observed that there was no significant difference in the information needs of different search behavior groups except in the case of credit and loan. Information need score of low search group was found to be much higher than medium and high search group (Table 4). While, Babu *et al.,* (2012), observed significant differences between importance given to many information by the different clusters of information search behaviors of rice farmers in Tamil Nadu.

Table 4: Importance of information needs by search behaviour groups

	Kruskal-Wallis Test Statistics	Significance	High Search Group		Medium Search Group		Low Search Group	
			Mean	SD	Mean	SD	Mean	SD
Pest Management	2.21	0.43	3.438	1.0308	4.000	0.0000	3.455	.9342
Disease Management	0.14	0.93	2.563	1.1529	2.714	1.3801	2.727	1.2721
Pesticide	2.19	0.42	3.375	1.1475	4.000	0.0000	3.455	.9342
Fertilizer	1.59	0.46	2.188	1.3769	2.000	1.5275	1.545	.9342
Inputs	0.89	0.65	1.438	1.2633	1.286	.7559	1.000	.4472
Crop insurance	2.08	0.37	1.0626	0.938	1.429	1.2724	1.1677	.818
Credits and loans	5.73	0.05	1.563	1.4127	1.571	1.2724	.545	.5222
Seed varieties	1.22	0.55	2.688	1.3525	2.714	1.4960	2.091	1.6404
Seed treatments	1.98	0.38	1.875	1.4083	2.429	1.3973	1.545	1.2136
Best agricultural practices	0.69	0.72	1.375	1.1475	1.4639	1.143	1.273	.9045
Weather	0.71	0.71	1.938	1.2894	1.571	1.2724	1.727	.7862
Water management	1.25	0.55	2.688	1.4477	3.429	0.7868	3.000	1.0954
Soil fertility	0.97	0.63	2.500	1.4606	3.143	0.8997	2.909	1.0445
Agricultural Machinery	0.85	0.67	1.313	1.2500	1.000	0.8165	1.545	1.2136
Planting method	0.601	.618	1.0646	0.750	0.7559	0.714	1.1362	0.909
Best time to plant	0.382	.767	1.0878	0.625	0.5345	0.429	.5222	0.455
Market and prices	0.798	.503	1.938	1.1236	2.000	1.5275	1.273	0.9045
Other crops to plant	0.888	.457	1.1475	0.875	0.571	0.534	.727	0.4671
Weeding	1.200	.324	1.1255	0.750	0.4880	0.286	.6876	0.455
Harvesting	1.430	.251	1.1383	0.688	0.3780	0.143	.4671	0.273

The forgoing discussions, it is clear that, there is no significant difference in the importance of information needs of different search behavior groups with respect to different aspects(except credit and loan). But, number of information sources they contact and frequency of contact found to differ. The difference was found to be wider in case of access to new ICTs like internet and mobile phones.

CONCLUSION

Important information needs of cotton farmers in Akola district of Maharashtra was found to be related to pest management, new varieties, soil fertility and water management. In order to address these information needs farmers were accessing number of sources. But, pattern of access –in terms of number of sources and frequency of sources-found to be vary widely. In the present scenario, where agriculture has been information intensive and net return was found to be increasing with intensity of information use, it is important to enhance the information search capacity of farmers.

Paper received on : March 03, 2017
Accepted on : March 17, 2017

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