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Sources of agricultural information in utilization pattern of pesticides by grape growers

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Abstract
Agricultural information provided to farmers at the appropriate time, in the right format and from reliable sources is very vital for improving agricultural production. This study aims to identify sources of and preferences towards agricultural information among grape farmers in utilization pattern of pesticides. In India, agriculture is the most important economic sector. Maharashtra is the country's largest grape-producing state. The Maharashtra government has proposed establishing an agriculture export zone that would include Nashik, Sangli, Pune, Solapur, Satara, and Ahmednagar, to export table grapes and value-added products like wine in a coordinated manner. Chemical control of pests is a common practice in agriculture. In 2016-17, the area under grapes in Maharashtra was 90000 ha. The annual production was around 2048000MT. The productivity was 22.73MT/ha. The use of pesticides in modern agriculture practices is one of the necessary measures for protecting crops from pests due to over-dependence and indiscriminate use of pesticides, which causes residues problems in fruits, one of the major concerns in most countries, including India. The research was carried out in the Nashik district. Twenty-four villages were chosen at random. A total of 240 farmers were chosen from each community, with ten grape growers chosen from each village. The information was gathered through personal interviews. In research result indicated that that 11.67 per cent of the grape growers had a high level of sources of information towards utilization pattern of pesticides, followed by 67.92 per cent of the grape growers had a medium level of sources of information towards utilization pattern of pesticides, and only 20.41 per cent of the grape growers had a low level of source of information utilization pattern of pesticides. Agriculture extension is an important tool for disseminating information to farmers, and has been highlighted as critical agent for transforming subsistence farming to modern and commercial agriculture, thereby improving household food security, incomes, and reducing poverty. Hence, more effective on ground efforts by agricultural university and agriculture department should be taken by giving right information about the same.

Keywords: sources of information**,** utilization pattern, pesticides and grape growers

Introduction
Agriculture extension is an important tool for disseminating information to farmers, and has been highlighted as critical agent for transforming subsistence farming to modern and commercial agriculture, thereby improving household food security, incomes, and reducing poverty. Although delivery of extension services was predominantly the government's role, current pluralistic system comprises of multiple sources of information. Despite this, we find that extension services are still limited in most parts of the country, and that farmers' preference for any information source is significantly influenced by various socio-economic factors. Moreover, although the public extension system has overly been criticized for its inefficiency, this is dependent on the enterprise in question. Therefore, increased investment in extension and strengthening the modalities for coordination between public and private extension service providers will improve the efficiency and quality of extension service.

The changing climatic conditions coupled with technological development have resulted in a growing demand from agricultural information. Farmers need a wide variety of information on appropriate seeds, crop and animal diseases, input and output prices, weather related information, market information, pre and post-harvest management technologies, among others. If properly utilized, agricultural information can significantly contribute towards overall economic development through improved productivity and incomes. Agriculture is the most important sector of the economy in India (Sucheta, 2019) [19]. It provides food and livelihood security. In India, different type of soil and climate comprising several agro-ecological regions, provides the opportunity to grow a variety of horticulture crops.

The grape (Vitis vinifera) is thought to have originated in Armenia, between the Black and Capsian seas in Russia, and has since expanded to temperate and tropical countries to the west and east. Grape is one of the most delicious fruits and a powerful food. It contains a variety of essential nutrients for a healthy lifestyle. It also has significant medicinal properties and has been utilised in natural medicine for ages. The Moghul invaders introduced the grape to India about 1300 AD. India's agrochemical industries are booming, and the country is now the world's fourth largest producer of agrochemicals, trailing only the United States, Japan, and China. Pesticide usage per hectare in India is currently among the lowest in the world, at 0.6kg/ha, compared to 5-7kg/ha in the United Kingdom and 13kg/ha in China (Mooventhan *et al.*, 2020) [12].

Maharashtra is the most productive state in the country, accounting for more than 82.56 percent of total production and the greatest productivity. It is followed by Karnataka (11.70 percent). In Nashik district, 56000 ha. Area was under grape cultivation and production was 1237000MT. About 60-70 per cent of total production of seedless grapes is produced in Nashik district. Out of 15 talukas from Nashik district, 90.00 per cent of grape production is from Nashik, Niphad and Dindori talukas. Plant protection is one of these components which play a vital role in successful crop production. Now a days, it is necessary to make aware the farmers about various international standards and good agricultural practices for production, types of certification required in international market, banned chemicals, pesticide residue, maximum permissible residue level (MRL) of respective chemicals and quality parameters Although the use of agrochemicals has benefited agricultural production, indiscriminate use (intensive and extensive) has led to different problems, including pollution, environmental damage (contamination of water, air and soil resources), toxicity to nontarget organisms, toxicity to humans associated with the presence of agrochemical residues in food, and decreased effectiveness of the chemicals following the development of pest resistance (Aktar *et al.*, 2009; Fountain and Wratten, 2013; Kumar, 2012) [1, 6].

In Nashik district, Thompson Seedless, Tas-A-Ganesh, Sonaka, Manik chaman, Sharad Seedless and Flame Seedless major varieties of grape use for the cultivation. Important pests of grape are Mealy bug, Flea Beetles, Thrips and Mites. Important diseases of grape are Downy Mildew, Powdery Mildew and Anthracnose.

Consumption of different pesticides in India

Table 1: Consumption of different pesticides in India (In M.T. Tech. Grade)

Sr. No	Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
1	Insecticides	20331.35	15574.48	10107.62	12203.65	6740.02	7121.50	11556.23
2	Fungicides	7561.04	7949.94	4869.97	6949.15	6322.64	7399.90	8775.70
3	Herbicides	5322.20	5356.98	2927.57	3796.76	3678.83	2747.02	3290.87
4	Rodenticides	311.15	346.08	368.43	388.74	270.73	274.55	409.39
5	Plant Growth Regulator	115.60	96.23	65.52	58.80	48.32	42.14	105.19
6	Other Chemical pesticides	198.50	487.80	66.46	55.70	-	37.33	59.45
7	Bio pesticides	7295.31	6909.95	2881.95	2643.07	2941.93	2999.23	4385.79
8	Grand Total Pesticides	41135.15	36721.46	21287.51	26095.88	20002.47	20621.67	28582.62

Source: Ministry of Agriculture and Farmers Welfare, Govt. of India. (ON2419) & Past Issues Dated 3/5/2021.

In India, majorities of population are engaged in agriculture and is therefore exposed to the pesticides use in agriculture. While, Indian average consumption of pesticides is far lower than many other developed economics, the problem of pesticide residue is very high and has also affected the export of different commodities ofagricultural in the last few years (Abhilash and Singh, 2009). India is currently the largest manufacturer of essentials pesticides among the South Asian and African countries, with the exception of Japan. Nashik is well known as Grape city in Maharashtra state.

Methodology

The present study was conducted in Nashik district of Maharashtra state, as it is one of the most important grape producing regions in Maharashtra state. The district's soil and climatic conditions are highly suitable for grape cultivation. Two tahsils namely Niphad and Dindori selected purposively for this study on the basis of maximum area under cultivation of grape crop. From each selected tahsil, 12 villages were selected on the basis of higher production of grape crop. Total twenty four villages were selected randomly. From each selected village 10 grape growers were selected from each village making a total sample of 240 farmers.Field survey, group discussion, questionnaire methods are used for data collection. Then, the data collected were tabulated and statistically analyzed using simple statistical tools like range, frequency and percentage to interpret the results. The ex-post-facto research design was used for the present study.

Result and Discussion

Sources of Information

It was observed from Table 2 that 67.92 per cent of the grape growers were having a ‘ medium’ level of use of information sources, 20.41 per cent of the respondents were having a ‘low’ level of use of information sources of utilization pattern of pesticides. 11.67 per cent of the respondents had ‘ high’ level sources of information about grape cultivation concerning the utilization pattern of pesticides.

Table 2: Distribution of the respondents according to their Sources of Information

Sr. No.	Sources of Information	Respondents (N=240)	
		Number	Percentage
1	Low (Up to 35)	49	20.41
2	Medium (36 to 42)	163	67.92
3	High (43 and above)	28	11.67
	Total	240	100.00
	Maximum: 48	Minimum: 30	

Details about information sources for utilization pattern of pesticides

Individual contact methods

The information regarding the extension personnels as the information sources was obtained from the respondents.

It was observed from Table 3 that 73.33 per cent of the respondents were getting the information from friends, neighbours/relatives. As a source of information followed by progressive farmers (72.92 per cent), grape consultants (52.50%) and agro service centres (39.58per cent). Nearly three-fifths (64.42%) occasionally use agro service centres as a source of information, followed by the grape grower association (55.41%).

Table 3: Details about sources of information for utilised by the respondents

Sr. No.	Information source	Regularly used	Occasionally used	Not used
A.	**Individual**			
1.	Scientist from Agriculture University/ICAR	38(15.83)	72(30.00)	130(54.17)
2.	Agril.Assistants	35(14.58)	50(20.84)	155(64.58)
3.	Dealers/Agro-service Centres	95(39.58)	145(60.42)	0(0.00)
4.	Progressive farmers	175(72.92)	34(14.16)	31(12.92)
5.	Grape Consultants	126(52.50)	18(7.50)	96(40.00)
6.	Grape Growers Association	29(12.08)	133(55.41)	78(32.50)
7.	Local leaders	75(31.25)	93(38.75)	72(30.00)
8.	Friends/Neighbour/Relatives	176(73.33)	64(26.67)	0(0.00)
B.	**Group**			
1.	Demonstrations	0(0.00)	177(70.83)	63(26.25)
2.	Meetings	163(67.92)	77(32.08)	0(0.00)
3.	Group discussions	144(60.00)	70(29.16)	26(10.84)
4.	Field visits	145(60.42)	95(39.58)	0(0.00)
C.	**Mass**			
1.	News papers	152(63.34)	88(36.66)	0(0.00)
2.	Farm magazines	52(21.66)	153(63.75)	25(10.41)
3.	Radio	0(0.00)	53(22.08)	187(77.92)
4.	T.V.	69(28.75)	171(71.25)	0(0.00)
5.	Exhibitions	48(20.00)	152(63.34)	40(16.66)
6.	Farmers rally	32(13.33)	137(57.08)	71(29.58)
7.	Internet	136(56.67)	77(32.08)	27(11.25)

Group Contact Methods

Grape farmers rely on group interaction methods to learn about pesticide usage patterns. Demonstrations, meetings, group discussions, and field trips are examples of these types of activities.

Table 3 shows that 70.83 per cent of grape growers attended the demonstrations (occasionally). The meeting was attended by 67.92 per cent of the responders regularly. 60.00 per cent of grape growers regularly attended group discussions, while 60.42 per cent of grape growers regularly attended field trips to gather information on pesticide usage patterns.

Mass contact methods

Mass contact methods are important and increase the sources of information used by the grape growers to obtain information about the utilization pattern of pesticides.

It observed from Table 3 that 63.34 per cent of the respondents were regularly taking information from newspapers followed by 56.67 per cent (Internet), 71.25 per cent of the respondents were occasionally taking the data from television, followed by 63.75 per cent (farm magazines),63.34 per cent of and 57.08 per cent(Farmers rally).

Conclusion

The growers have medium level of sources of information. To increase the percentage of these categories the KVK and SAU should arrange the exhibitions in village level. The extension workers should regularly visit to villages and creates trust in growers about agriculture department. Provide new information which release by government KVK and SAU's. The provision of agricultural information to farmers at the appropriate time, in the right format and from the reliable sources is very vital for improving agricultural production in both developed and developing countries. The choice of sources of information regarding use of recommended pesticides in grapes and its dissemination to farmers remains an important factor in determining the extent to which farmers adopt or reject new agricultural practices and technology. However, inspite of the numerous sources of information available to farmers the issue of low adoption of innovations has became an issue of concern to agricultural policy makers. This paper has analysed the pesticide use pattern of selected grape growers, Major insect pests reported in the study area were Flea beetle, Mealy bug, thirips, jassids and Diseases are powdery mildew, Downey mildew and anthracnose. To control them farmers used conventional to new molecules which are available in market. Increased investment in extension is necessary to achieve the desired objective of transforming smallholder subsistence farming into a modern commercial agriculture, which will promote household food security, improve income and reduce poverty. For instance, there is need to increase the number of qualified extension officers in both private and public sectors and providing them with the necessary support to increase coverage. It is also important to understand the nature of the target farmers in terms of their socioeconomic characteristics and the specific needs before developing the extension content. Effective dissemination of new and existing technologies requires a combination of various appropriate dissemination channels that are gender sensitive. Integration of ICT, especially the use of mobile phones in extension is a potential disseminating channel which when effectively used, can create a significant impact. Other ICT platforms like internet can also be used to improve delivery of agricultural information. However, adoption of such technologies requires adequate capacity building for both extension staff and the end users (farmers).

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