

## International Journal of Agriculture Extension and Social Development

Volume 7; SP-Issue 11; November 2024; Page No. 01-03

Received: 01-08-2024  
Accepted: 04-09-2024

Indexed Journal  
Peer Reviewed Journal

### Extent of use of pesticides by grape growers

<sup>1</sup>RS Karangami, <sup>2</sup>PM Chavan, <sup>3</sup>MC Ahire and <sup>4</sup>SB Bhange

<sup>1</sup>Assistant Professor, Section of Agricultural Extension Education, College of Agriculture, Sonapur, Gadchiroli, Maharashtra, India

<sup>2</sup>Agri. Advisor, One Stop Digital Agrisolutions Private Limited, Maharashtra, India

<sup>3</sup>Professor. Department of Agricultural Extension and Communication, PGI, MPKV, Rahuri, Maharashtra, India

<sup>4</sup>Associate Professor, Department of Agricultural Extension and Communication, PGI, MPKV, Rahuri, Maharashtra, India

DOI: <https://doi.org/10.33545/26180723.2024.v7.i11Sa.1277>

Corresponding Author: RS Karangami

#### Abstract

In India, agriculture is the most important economic sector (Sucheta, 2019). Different types of soil and climate in India, which comprises numerous agro-ecological areas, allow for the cultivation of large scale of horticultural crops. Pesticide overuse and indiscriminate application have resulted in residue problems in fruits, which is a major concern in most nations, including India. of tropical India. According to the agronomist origin of the grape is Asia minor. However, in India, grapes are cultivated in Maharashtra. In India out of the total area below in grapes, about 30.00 percent is shared alone in Maharashtra. 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 this research study, observed that majority of the respondents (62.50 percent) used recommended quantity of pesticides, It observed that majority of the respondents (45.84 percent) used above recommended number of sprays, It noticed that majority of the respondents (81.25 percent) sprayed pesticides at appropriate stages of crop, It is also observed that majority of the respondents (75.00 percent) sprayed pesticides in the evening, and observed that majority of the respondents (77.08 percent) sprayed the pesticides along the direction of wind. Moreover, it is very important to make awareness about residue management so as to harness the export potential of grape crop. The efforts taken in this regard will definitely result in increased socio-economic status of grape growers, decreased pesticide residue intake for consumers and will benefit forex reserves of country too.

**Keywords:** Extent use of pesticides, grape, growers

#### Introduction

In India, agriculture is the most important economic sector. Grape (*Vitis vinifera*) is one of the most significant horticultural crops which produce clusters of rounded, tiny, smooth-skinned, and edible berries of different colours It provides food and livelihood security. Different types of soil and climate in India, which comprises numerous agro-ecological areas, allow for the cultivation of large scale of horticultural crops. A United Nation study of global population trends predicts that India will surpass the China was become to most populated nation in the world by 2020. India currently supports nearly 17.84 percent of the world population, with 2.40 percent of land resources and 4.00 percent of water resources.

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 (Mooventhana *et al.*, 2020) [7].

Maharashtra is the most productive state in the country, accounting for more than 82.56 percent of total production

and the greatest productivity of grape. It is followed by Karnataka (11.70 percent). Fresh grapes are one of India's most important exports. In 2015-16, the country exported 155246 tonnes of grapes worth Rs 1541.95 crore around the world, according to the report. When it comes to growth, fresh grape exports have remained stable, but raisins (dry grape) have grown at a rate of 53.42 percent each year during the last decade. Fresh and raisins both experienced 18.70 and 61.82 percent growth in terms of export value, for a total of 20.07 percent growth per year. During the 2015-16 fiscal year, fresh grapes alone accounted for 86.76 percent of India's total grape exports.

Grapes are easily infected by fungi, bacteria, and insects, that pose a significant threat to the quality and yield of the grapes including reduced fruit set, loss of fruit integrity, and flavors that affect the taste and appearance of grapes. In addition, fungi, bacteria, and insects impact the wine's sensory characteristics, and may cause economic losses to grape growers.

Pesticide use is regulated by government bodies in each country, ensuring that the environment suffers the least amount of harm. To meet both qualitative and quantitative production standards, pests and diseases in grape cultivation

must be actively controlled by an intensive schedule of pesticide applications. The use of pesticides can have both positive and negative effects on grape production and the environment. The harmful effects of pesticides on human health, the environment, and chemical residues in food have sparked this review to focus on the pesticide circumstances in grape production globally. Information reviewed reveals that, the use of pesticides in grape production is the most efficient method for controlling pests and diseases. These

agro-chemicals tend to leave poisonous residues that pose serious problems to the environment and human health when applied in inappropriate ways. Furthermore, some fungal pathogens and other grapevine pests develop resistance to pesticides which makes it difficult to control. Additionally, the majority of grape producers' lack awareness on the impacts of chemical residues in grapes and their products.

**Table 1:** Export of Grapes (Fresh) from India

| Country              | 2015-16   |           | 2016-17   |           | 2017-18   |           |
|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|
|                      | Qty       | Value     | Qty       | Value     | Qty       | Value     |
| Netherland           | 50390.44  | 58588.51  | 55010.43  | 61224.15  | 58456.97  | 64753.35  |
| Russia               | 12445.66  | 12705.38  | 22340.94  | 23466.83  | 27434.39  | 27734.44  |
| United Kingdom       | 17598.08  | 20654.35  | 13580.14  | 15544.22  | 18594.24  | 22193.56  |
| Germany              | 4222.37   | 4994.07   | 10467.38  | 11913.54  | 16449.51  | 18091.76  |
| United Arab Emirates | 11692.60  | 9794.17   | 14597.00  | 11694.64  | 13574.90  | 10971.59  |
| Saudi Arabia         | 5486.93   | 4681.37   | 7308.91   | 6306.15   | 9482.96   | 7116.90   |
| Thailand             | 3146.12   | 4011.81   | 4509.70   | 5922.65   | 5043.03   | 6554.06   |
| Finland              | 1574.50   | 2013.04   | 2079.88   | 2532.52   | 2131.87   | 2854.18   |
| Hong Kong            | 1056.33   | 1424.45   | 2094.50   | 3060.31   | 1969.32   | 2832.70   |
| Belgium              | 41.60     | 43.25     | 4651.57   | 4900.95   | 2331.45   | 2534.07   |
| Sri Lanka            | 1732.15   | 2284.91   | 1776.37   | 2313.58   | 2196.06   | 2441.11   |
| Others               | 23260.82  | 15030.27  | 60054.49  | 29291.84  | 30556.46  | 21917.14  |
| Total                | 132647.60 | 136225.58 | 198471.31 | 178171.38 | 188221.16 | 189994.86 |

Source: APEDA website accessed on 11.9.2018

### 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 tehsil, 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. The data were collected through personal interview method. The *ex-post-facto* research design was used for the present study.

### Results and Discussion

The quantity of pesticides used, the number of times pesticides are sprayed, the time of spraying, and the number of times pesticides are sprayed, the time of spraying, and the direction of spraying. The data on the extent to which the respondents used pesticides was gathered, collated, and examined.

**Table 2:** Distribution of the respondents according to extent of use of pesticides

| Sr. No. | Pesticides                                  | No. of respondents (N=240) | Percentage |
|---------|---|----------------------------|------------|
| I       | Quantity of chemicals                       |                            |            |
| 1       | Below recommended quantity                  | 12                         | 05.00      |
| 2       | Recommended quantity                        | 150                        | 62.50      |
| 3       | Above recommended quantity                  | 78                         | 32.50      |
|         | Total                                       | 240                        |            |
| II      | No. of spays applied                        |                            |            |
| 1       | Below recommended no. of spays              | 45                         | 18.75      |
| 2       | Recommended                                 | 115                        | 47.91      |
| 3       | Above recommended no. of spays              | 80                         | 33.34      |
|         | Total                                       | 240                        |            |
| III     | Stages of crop                              |                            |            |
| 1       | Sprayed at appropriate stages of the crop   | 195                        | 81.25      |
| 2       | Sprayed at in-appropriate stage of the crop | 45                         | 18.75      |
|         | Total                                       | 240                        |            |
| IV      | Time of spraying                            |                            |            |
| 1       | Morning                                     | 60                         | 25.00      |
| 2       | Evening                                     | 180                        | 75.00      |
|         | Total                                       | 240                        |            |
| V       | Spray direction                             |                            |            |
| 1       | Along the wind direction                    | 185                        | 77.08      |
| 2       | Against the wind direction                  | 55                         | 22.92      |
|         | Total                                       | 240                        |            |

Table 02 shows that 62.50 percent of respondents used the recommended amount of pesticides, 32.50 percent used more than the recommended amount, and 05.00 percent used less.

Furthermore, 47.91 percent of respondents used the required amount of sprays, followed by 33.33 percent who used more than the suggested number of sprays, and 18.75 percent who used less.

From the study with regards to any stage of spraying, it was also noticed that 81.25 percent of the respondents sprayed pesticides at appropriate stages of crop, followed by 18.75 percent of the respondents sprayed pesticides at inappropriate stages of crop.

In case of spraying time, It was also observed that three-fourth of the respondents (75.00 percent) sprayed pesticides in the evening, followed by 25.00 percent of the respondents sprayed pesticides in the morning.

Regarding wind direction, it is observed that 77.08 percent of the respondents sprayed the pesticides along the direction of wind, followed by 22.92 percent of respondents sprayed the pesticides against the direction of wind.

### Conclusion

The present indicated that Grape is an important commercial fruit crop of India, which contributes to the maximum share of export of fresh fruits from India to Europe and other parts of the world. Grapes have a significant role in providing considerable employment opportunities for millions of people living in rural areas. As a result, it deserves Majority of respondents used above recommended quantity of pesticides, above recommended number of sprays, sprayed pesticides at inappropriate stages of crop, sprayed pesticides in the evening period and sprayed the pesticides along the direction of wind. Near about half of the grape growers sprayed pesticides above recommended quantity and more than recommended no. of sprays. This is increasing residual effects in the grape produce and ultimately resulting in higher cost of production which further leads to lowering of profitability in the crop. Hence, more effective on ground efforts by agricultural university and agriculture department should be taken by giving right information about the same. Moreover, it is very important to make awareness about residue management so as to harness the export potential of grape crop. The efforts taken in this regard will definitely result in increased socio-economic status of grape growers, decreased pesticide residue intake for consumers and will benefit forex reserves of country too.

### Acknowledgement

The authors thankful to the Department of agricultural Extension and Communication, Post Graduate Institute, Mahatma Phule Krishi Vidyapeeth, Rahuri Maharashtra for providing all the inputs and facilities to carry out this study.

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