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Extent of adoption of insecticide spraying practices among brinjal growers

¹Nisha C Dadmal, ²Swati A Gawande, ³KT Lahariya, ⁴DK Nemade and ⁵PS Kadam

¹M.Sc. Student, Department of Agricultural Extension Education, Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

²Professor (CAS), Department of Agricultural Extension Education, Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

³Professor (CAS), Department of Agricultural Extension Education, Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

⁴Assistant Professor, Agricultural Economics and Statistics section, College of Agriculture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

⁵Professor (CAS), Pulses Research Unit, Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

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Corresponding Author: Nisha C Dadmal

Abstract

Brinjal (*Solanum melongena* L.) is an important vegetable crop cultivated for its nutritional and economic value. However, its production is adversely affected by several insect pests, particularly the brinjal shoots and fruit borer, causing considerable yield and quality losses. Insecticides are therefore widely used for pest management. Improper use may result in pesticide residues, pest resistance, environmental contamination and health hazards. Hence, assessment of farmers' adoption of recommended insecticide spraying practices is important for promoting safe and effective pest management. The present study was conducted during 2024–25 in Barshitakli tahsil of Akola district of Maharashtra with the objective of studying the profile of brinjal growers and their adoption of recommended insecticide spraying practices. An ex-post facto research design was adopted, and 60 brinjal growers were selected as respondents. Primary data were collected through personal interviews using a pre-tested structured interview schedule and analysed using frequency, percentage, mean and standard deviation. The findings revealed that the majority of brinjal growers (61.67%) belonged to the middle-age group of 36–50 years. About 38.33 per cent had secondary education, while 55.00 per cent had 5–8 years of farming experience. A majority (66.67%) possessed semi-medium landholdings of 2.01–4.00 ha. About 61.67 per cent had annual income up to Rs. 3,00,000 and 66.67 per cent had income up to Rs. 1,30,000 from brinjal cultivation. Most growers (85.00%) had not accessed agricultural credit, while 83.33 per cent had a medium level of source of information and 70.00 per cent had medium knowledge. Further, 80.00 per cent showed a moderately favourable attitude towards recommended insecticide spraying practices. Regarding adoption, 76.67 per cent had a medium level of adoption, followed by 16.67 per cent with high and 6.67 per cent with low adoption.

Keywords: Brinjal growers, adoption, insecticide spraying practices, pest management, IPM, Akola

1. Introduction

Brinjal (*Solanum melongena* L.) is an important vegetable crop cultivated extensively in India because of its nutritional and economic importance. During 2023–24, brinjal was cultivated on about 6.83 lakh hectares in India, producing approximately 129.98 lakh tonnes, with an average productivity of about 9.03 1tonnes per hectare. Thus, brinjal constitutes an important component of vegetable production in the country. Maharashtra is one of the important agricultural states of India, and vegetable cultivation forms an important part of its horticultural sector. During 2023–24, vegetables occupied about 9.46 lakh hectares in Maharashtra and produced approximately 150.64 lakh tonnes. Brinjal is also cultivated in different parts of Maharashtra, including the Vidarbha region and Akola district. In Akola district, brinjal cultivation is practiced in different areas, including

Barshitakli tahsil, and contributes to farm income and employment of vegetable growers. Barshitakli has an important agricultural base, and vegetable cultivation provides additional income opportunities to farming households.

2. Methodology

The study was conducted during 2024–25 in Barshitakli tahsils of Akola district of Vidharbha region in Maharashtra. An exploratory reasearch design was used. 4 villages were selected purposively and 60 brinjal growers were selected as respondents. Primary data were collected through a pre-tested structured interview schedule by personal interview. The profile characteristics studied included age, education, farming experience, land holding, area under brinjal cultivation, annual income, income from brinjal cultivation,

access to credit, source of information, irrigation facility, training received, labour availability, distance from market, knowledge and attitude towards recommended insecticide spraying practices. Data were analyzed using frequency, percentage, mean, standard deviation and correlation

analysis. The methodology and sampling procedure are consistent with the thesis research design

3. Results and Discussion

Table 1: Profile characteristics of the respondents.

Sr. No.	Characteristics	Category	Frequency	Percentage (%)
1.	Age (Years)	Young (Up to 35)	12	20.00
		Middle (36-50)	37	61.67
		Old (Above 50)	11	18.33
2.	Education	Illiterate	00	00.00
		Primary	04	06.67
		Middle School	07	11.67
		Secondary School	23	38.33
		Higher Secondary School	14	23.33
		College and above	12	20.00
3.	Experience	Up to 6 years	06	10.00
		7 to 14 years	42	70.00
		Above 14 years	12	20.00
4.	Land holding (ha)	Marginal (Up to 1.00)	09	15.00
		Small (1.01-2.00)	18	30.00
		Semi-medium (2.01-4.00)	26	43.33
		Medium (4.01-10.00)	07	11.66
		Large (Above 10.00)	00	0.00
5.	Area under brinjal (ha)	Up to 1.48	47	78.33
		1.49 to 2.16	05	8.33
		Above 2.16	08	13.33
6.	Annual income(Rs)	Up to 300000	37	61.67
		300001 to 500000	11	18.33
		Above 500000	12	20.00
7.	Income from brinjal (Rs)	Up to 130000	40	66.67
		130001 to 210000	11	18.33
		Above 210000	10	16.67
8.	Access to credit	Credit accessed	09	15.00
		Credit not accessed	51	85.00
9.	Source of information	Low (10)	03	05.00
		Medium (11 to16)	50	83.33
		High (above 16)	07	11.67
10.	Irrigation facility	No source	00	0.00
		river	16	26.67
		Well/Tube well/Farm Pond	28	46.67
		Canal	11	18.33
		other	05	08.33
11.	Training received	Training received	04	06.66
		Training not received	56	93.33
12.	Labour availability	Timely available		
		Yes	59	98.33
		No	01	01.67
		Yes	53	88.33
		No	07	11.67
13.	Distance from market	Up to 9 km	13	21.67
		10 to 15 km	42	70.00
		Above 15 km	05	08.33
14.	Knowledge	Low	06	10.00
		Medium	42	70.00
		High	12	20.00
15.	Attitude	Less favorable	09	15.00
		Moderately favorable	45	75.00
		Highly favorable	06	10.00

Profile Characteristics of the Respondents

The profile characteristics of the respondents were studied using selected characteristics and are presented in Table 1. The findings presented in Table 1 revealed that the majority

of brinjal growers (61.67%) belonged to the middle-age group of 36–50 years, with a mean age of 42.40 years. Regarding education, 38.33 per cent had education up to secondary school level, followed by 23.33 per cent with

higher secondary education and 20.00 per cent with college education. In respect of experience, the majority (70.00%) had 7–14 years of experience, with a mean experience of 9.66 years. The majority of brinjal growers (66.66%) possessed semi-medium landholdings of 2.01–4.00 ha, with a mean landholding of 2.56 ha. Regarding area under brinjal cultivation, 78.33 per cent cultivated up to 1.48 ha, with a mean area of 1.27 ha. In terms of annual income, 61.67 per cent belonged to the low-income category up to ₹3,00,000, with a mean annual income of ₹3,05,566.60, while 66.67 per cent had income up to ₹1,30,000 from brinjal cultivation, with a mean income of ₹1,12,900. Regarding credit access, 85.00 per cent had not accessed agricultural credit. The majority (83.33%) had a low level of source of information, with a mean score of 14.00. Regarding irrigation, 46.67 per cent primarily depended on well/tube well/farm pond, followed by 26.67 per cent using river water. Further, 93.33

per cent had not received training related to insecticide spraying practices. Regarding labour availability, 98.33 per cent reported that labour was available on time. The majority (70.00%) had their farms located 10–15 km from the market, with a mean distance of 11.81 km. Regarding knowledge, 40.00 per cent had a medium level, followed by 31.67 per cent with low and 28.33 per cent with high knowledge, with a mean score of 13.40. Further, 80.00 per cent had a medium level of attitude towards recommended insecticide spraying practices, followed by 13.33 per cent with low and 6.67 per cent with high attitude, with a mean attitude score of 35.13.

Adoption of recommended insecticide spraying practices in brinjal growers

Adoption of recommended insecticide spraying practices in brinjal growers are presented in Table 2.

Table 2: Adoption of recommended insecticide spraying practices in brinjal growers

Sr. No	Adoption Statement	Brinjal(n=60)		
		CA	PA	NA
1.	Accurate identification of major insect pests is essential for effective pest management in brinjal and tomato crops.	50 (83.33)	08 (13.33)	02 (3.33)
2.	Insecticides are selected based on correct pest identification.	38 (63.33)	15 (25.00)	07 (11.66)
3.	Insecticides are applied strictly as per recommended dose for brinjal and tomato.	42 (70.00)	13 (21.67)	05 (8.33)
4.	Correct insecticide quantity is mixed per 10 liters of water as per crop stage.	40 (66.67)	14 (23.33)	06 (10.00)
5.	Which sprayer is used for insecticide spraying recommended sprayers are used.	35 (58.33)	17 (28.33)	08 (13.33)
6.	The respondent carries out insecticide spraying according to the recommended schedule.	44 (73.33)	12 (20.00)	04 (6.67)
7.	Insecticide spraying must be avoided during high wind velocity to reduce spray drift and ensure target coverage.	39 (65.00)	15 (25.00)	06 (10.00)
8.	Pre-harvest intervals (PHI) are strictly followed before harvesting brinjal and tomato fruits.	30 (50.00)	20 (33.33)	10 (16.67)
9.	Systematic insecticide rotation improves the sustainability of chemical pest management programs.	33 (55.00)	18 (30.00)	09 (15.00)
10.	Use of personal protective equipment significantly reduces dermal and inhalation exposure to insecticides during spraying operations.	32 (53.33)	18 (30.00)	10 (16.67)
11.	Avoiding food- and water-related containers for insecticide storage eliminates risks of accidental ingestion.	45 (75.00)	12 (20.00)	03 (05.00)
12.	I adopt environmental and health safety measures while handling and spraying insecticides.	43 (71.67)	13 (21.67)	04 (6.67)
13.	Conservation of natural enemies enhances ecosystem balance and reduces the need for chemical insecticides.	23 (38.33)	20 (33.33)	17 (28.33)
14.	IPM incorporates biopesticides and eco-friendly methods to reduce environmental contamination and ensure food	25 (41.67)	22 (36.67)	13 (21.67)
15.	The grower reads and follows the label instructions on insecticide toxicity before use.	22 (36.67)	23 (38.33)	15 (25.00)
16.	I spray insecticides specifically for the target pests mentioned on the insecticide label.	29 (48.33)	20 (33.33)	11 (18.33)

CA- Complete Adoption, PA- Patial Adoption, NA- NO Adoption

The data presented in Table No. 2 revealed that the majority of brinjal growers adopted recommended insecticide spraying practices to a considerable extent. The highest adoption was observed for accurate identification of major insect pests (83.33%), followed by avoiding food- and water-related containers for insecticide storage (75.00%), following the recommended spraying schedule (73.33%), adopting environmental and health safety measures (71.67%), applying insecticides as per the recommended dose (70.00%), maintaining the correct insecticide quantity per 10 litres of water according to crop stage (66.67%), avoiding spraying during high wind velocity (65.00%), and selecting insecticides based on correct pest identification (63.33%). Thus, the findings indicated better adoption of basic pest identification, recommended insecticide application, safe

storage and spraying practices among brinjal growers.

4. Conclusion

The findings revealed that the majority of brinjal growers were middle-aged (61.67%), had secondary-level education (38.33%), possessed 7–14 years of experience (70.00%) and had semi-medium landholdings (66.66%). Most respondents had low income, limited access to information, no training on insecticide spraying, medium knowledge and medium attitude towards recommended practices. Regarding adoption, Regarding adoption, the majority of brinjal growers (76.67%) had a medium level of adoption of recommended insecticide spraying practices. The highest adoption was observed for accurate identification of major insect pests (83.33%), followed by safe storage of insecticides

(75.00%), following the recommended spraying schedule (73.33%), adopting environmental and health safety measures (71.67%), and applying insecticides as per the recommended dose (70.00%). Thus, growers showed better adoption of basic pest management and safe insecticide-use practices. This indicates the need for further extension education, practical demonstrations and technical guidance to enhance the adoption of recommended and safe insecticide spraying practices among brinjal growers. Overall, training and extension guidance are needed to improve the adoption of safe and eco-friendly insecticide spraying practice.

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