Research Note

Indian Journal of Extension Education
Vol. 59, No. 1 (January–March), 2023, (174-176)

ISSN 0537-1996 (Print)
ISSN 2454-552X (Online)

Knowledge Level of Citrus Grower's Regarding use of Integrated Pest Management Strategies in Punjab

Dharamjeet Singh Grewal[1*], Priyanka Sharma[2] and Tariq Iqbal[2]

[1]Research Scholar, [2]Assistant Professor, PG Department of Agriculture, Khalsa College, Amritsar-143002, Punjab, India
*Corresponding author email id: grewaldharamjeet@gmail.com

ARTICLE INFO

Keywords: Knowledge level, Pest Management, Citrus growers, Strategies, Fazilka

http://doi.org/10.48165/IJEE.2023.59138

Conflict of Interest: None

ABSTRACT

The study was carried out in Punjab's Fazilka District in 2021–2022 as it is major citrus growing district of Punjab. A total 100 respondents (citrus growers) were selected randomly from Fazilka district by using simple random sampling method. The interview schedule was prepared for collection of the data. To gauge the farmers' level of familiarity with the various IPM tactics, a knowledge test was developed. The respondents had good educational level, bulk of the respondents fall under large category of land holding. Knowledge level of the respondents regarding Integrated Pest Management strategies found to be less. More efforts need to be done to aware the citrus growers regarding Integrated Pest Management strategies.

INTRODUCTION

India with more than 28.2 million tones of fruits and 66.0 million tons of vegetable production ranked next after Brazil and China in the world. It has a prominent place among other countries in the globe for the production of the foods and is the source of a wide variety of fruits and vegetables. It is the world's leading producer of fruits such the mango, banana, papaya, guava, sapota, acid lime, grapes, etc. and contributes around 10 per cent of the world's total fruit production. Vegetable production is the highest of all horticultural crop production, followed by fruit production (Singh et al., 2015).

Punjab has 52,836 hectares of citrus farmland, producing 10,49,997 tonne of citrus annually in 2017. The area used for kinnow mandarin cultivation is 49,356 hectares, and its yearly production is 10,21,719 tonnes. Kinnow Mandarin is best produced in Punjab due to its favourable agroecological conditions (Anonymous, 2017). Kinnow cultivation is well known in Punjab's South-West area, which includes Fazilka, Ferozpur, Bathinda, Muktsar, and Faridkot. Fazilka district, which makes up 58 per cent of all kinnow output in Punjab, tops these areas in kinnow cultivation, accounting for 55 per cent of the state's kinnow-growing land (Anonymous, 2014). Insecticides are used to control insects among other chemical pest control techniques, herbicides to control plants, fungicides, fungi, rodenticides, rodents, avicides, birds, and bactericides to control bacteria. Chemicals like Monocrotophos (0.025%), Malathion (0.03%), Dimethoate (1.5%) are used to control citrus psylla. Methyl Dementon (0.03%) and Phosphamidon (0.035%) for citrus leaf minor (Kedar, 2013). There are various other chemicals which are used to suppress the activity of the pests and to kill them. Insecticides can contaminate soil, water, turf and other vegetation. Pesticides can be poisonous to a variety of different organisms in addition to insects and weeds, such as birds, fish, helpful insects, and non-target plants (Anonymous, 1999). To avoid the overuse of insecticides for pest control, the new era should be of IPM. IPM is applied to citrus plants during all growth stages, including pre-planting, planting, vegetative growth and fruiting (Anonymous, 2020c). It is a practical and environmentally conscious method of pest management that combines a number of common sense procedures. IPM programmes make use of up-to-date, thorough data on pest life cycles and how those life cycles interact with the environment (Anonymous, 2020b).

Received 25-11-2022; Accepted 28-12-2022

METHODOLOGY

The study was conducted in Fazilka District of Punjab during the year 2021-2022. The sample of the study was based on simple random sampling technique. Fazilka district was selected purposively as it was major citrus growing district of Punjab. A total 100 respondents (citrus growers) were selected randomly from Fazilka district by using simple random sampling method. The interview schedule was prepared for collection of the data. A knowledge test was prepared on similar line as of Kumar et al., (2016) & Vijayan et al., (2022) to measure the knowledge of the farmers on the various aspects of IPM strategies.

In all 15 statements about recommended varieties of Citrus, recommended methods for adoption of IPM strategies were designed. The responses were dichotomized as correct/ incorrect with scores of 1 and 0 respectively.

To analyse the item difficulty index, the item with p values more than 20 were considered for final test. To find out item discrimination index, E 1/3 technique was used and those items with E 1/3 values above 0.20 were considered for inclusion in the final test. The validity of the test was ascertained with the method of the content validity which is "a kind of validity by assumption,". The reliability of a measuring tool was ascertained with split half method. The test was divided into two halves on the base of odd and even numbers of the items of the knowledge test. Scores obtained from both the halves were obtained and Pearson Product Moment Correlation Coefficient was calculated out for the scores for each of the half. The correlation coefficient gave the reliability of the half of the test. The equation which is referred as Spearman Brown Correlation formula for split half reliability (Guilford, 1954) was used to find out the reliability coefficient for the full scale. Reliability of the total test was worked out by applying Spearman-Brown Prophecy formula which is as follows:

$$r_{tt} = \frac{nr}{(n-1)+r}$$

Where, r_{tt} = Reliability coefficient of the test, n = 2, r = Correlation coefficient between two half tests

RESULTS AND DISCUSSION

The knowledge level of respondents about the IPM strategies in citrus cultivation presented in Table 1 and results revealed that 31 per cent of respondents were having low level of knowledge, 42 per cent of respondents were having medium level knowledge and rest 27 per cents were having high level of knowledge regarding IPM strategies in citrus cultivation. It might be due to the lack of training programmes and awareness regarding IPM strategies. Same results were also founded by (Choudhary & Bangarva, 2013).

Table 1. Distribution of respondents on the basis of their knowledge level regarding the use of IPM strategies in citrus cultivation

Knowledge level	Percentage
Low (9-11)	31.00
Medium (11-13)	42.00
High (13-15)	27.00

Relationship between knowledge level of citrus growers and socio-economic variables

The data regarding the relationship between the knowledge level and socio-economic variables is given in Table 2 that represents that age, education, training and mass media exposure has significant and positive correlation at the 0.01 level. Wason et al., (2009) in his study revealed that adoption of integrated management by the farmers was affected significantly by the factors like level of education environmental orientation (+) scientific orientation (+) and extension contact (+). So, the factors like education extension contacts, training of the farmers they are too important for increasing the knowledge of farmers and further in adoption of the IPM Practices. Kumar et al., (2022) also received similar relationship.

Table 2. Relationship between knowledge level and the selected independent variables

Independent variable	Correlation coefficient (r value)	p-value
Age	.582**	.000
Education	.642**	.000
Land holding	.001	.988
Training	.410**	.000
Mass media	.431**	.000

**Correlation is significant at the 0.01 level (2-tailed)

CONCLUSION

The knowledge level of the respondents was medium and after studying all other factors it can be concluded that there should be more proper training facilities related to IPM practices. Government should also arrange more awareness campaign related to IPM. Use of the bio-pesticides and bio-control agents in pest management should be promoted. Related institutions and state agricultural universities should encourage famers to use various ecological sustainable pest management approaches. By making these efforts the costs of cultivation for citrus can be reduced. Quality of citrus fruits can also be improved. Reduction in use of chemical methods will also reduce the harm to soil, environment as well as humans.

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