



## **Statistical evaluation of farmers' knowledge of insects and pests in a set of villages near Dehradun Uttarakhand India**

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### **ABSTRACT**

*In order to examine the knowledge of farmers about insects and pests, a survey was conducted with 65 farmers from 8 villages in Dehradun (Uttarakhand). A suitable statistical tool (SPSS) was used to analyze the data once they had been obtained through pre-tested questionnaires. The study's findings showed that most farmers were aware of both the beneficial and detrimental consequences of insects, with the majority of farmers knowing the difference between an insect and a pest, according to the results. There is a huge potential for agricultural extension operations and connecting farmers and scientists to sensitize them to the concept of insects as biocontrol agents and encourage them to use this approach over alternative chemical ways.*

**Keywords:** *Insect, pest, farmers' knowledge, agriculture*

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### **INTRODUCTION**

For India's economy to expand, the agriculture sector is essential. Because there are frequently few other crop possibilities due to natural constraints, crop production is a key source of income for millions of farmers. Agriculture has been a key driver of economic growth in India for some time and is essential to ensuring food and nutritional security (1). Agriculture needs sustainable production that can compete with traditional methods due to the pressure that a growing human population is putting on the environment. IPM is more environmentally friendly than traditional, less eco-friendly methods, although it is not always more effective (2).

Since there is a finite amount of land that may be used for agriculture, sustainable practices that do not reduce yields are required (3). Insects can be used in integrated pest management (IPM) to promote sustainable yields in agricultural systems, and in some settings, this can be done at a cheaper cost than alternative non-sustainable techniques based on chemical pesticides. This is supported by theoretical considerations and actual facts (4). On the surface of the Earth, insects can be found almost everywhere; the only places they can't be found are in the sea and in places with extremely harsh climates, such as the poles and the highest mountain peaks (5). Due to their roles as pollinators and nutrient cyclers, they play a significant role in the majority of ecosystem activities. They all require conservation since a huge number of them affect mutualists and insect predators.

An ecosystem's diversity and stability can be studied using insects to examine the effects of land fragmentation, monoculture establishment, deforestation, and mosaic formation. Compared to man's lifespan of less than a million years, they have been on Earth for over 300 million years. During this time, they have undergone several evolutionary changes that have made them suitable for living in practically every form of habitat (6).

The goal of the current study was to evaluate farmers' understanding of insects, their opinions on whether insects are helpful or detrimental, their understanding of bio conservation practices, and their level of readiness for these non-traditional methods like IPM.

### **MATERIAL AND METHODS**

#### **Study sites and data collection**

The study was carried out in eight villages (viz. Devipur, Ummedpur, Palio, Jhiberhedi, Bhoodpur, Malhan, Simlas Grant and Sherpur) of Dehradun district based on the type of crops grown focusing on crops that use a lot of pesticide such as paddy, sugarcane and wheat. A random selection of farmers was done from

each village and a total of 65 farmers were interviewed individually using a structured and pre tested questionnaire.

### Survey questionnaire

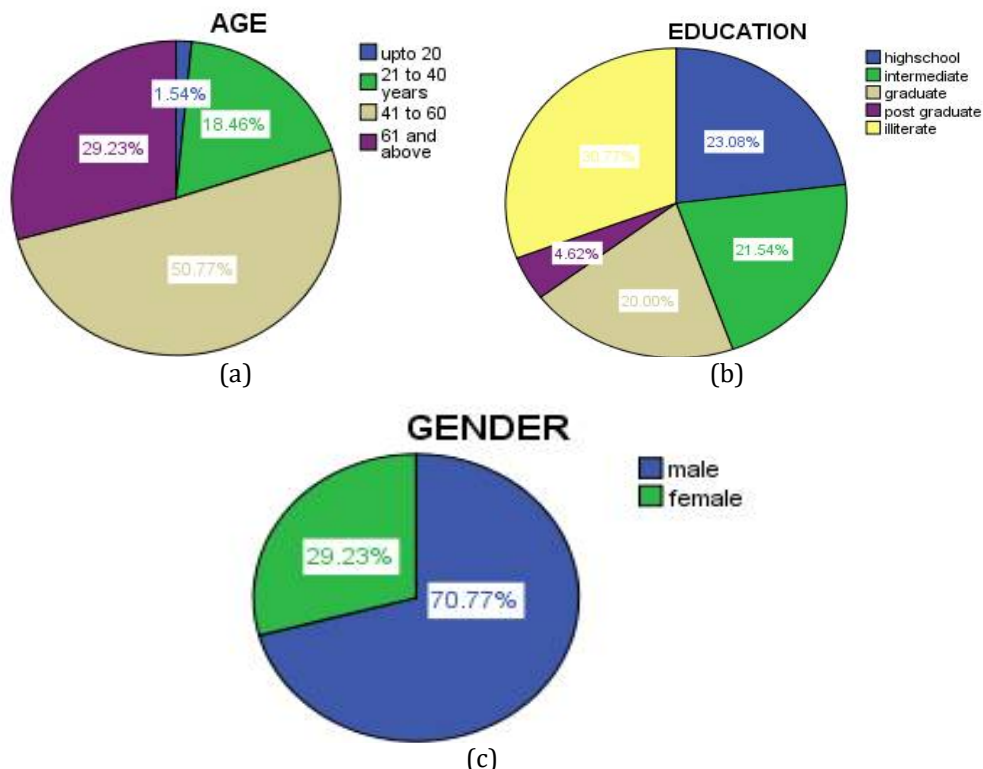
The purpose of the farmers' survey was to gather data on their understanding of the use and danger of insects, their ability to identify pests, and their perceptions of the potential value of using insects as biocontrol agents. Using the aforementioned criteria as a guide, pre-coded alternatives were used with questions. Age and educational levels of farmers were also collected together with data on their social and economic standing.

### Data analysis

A questionnaire was prepared to determine the awareness of respondents regarding the insects and pests. It contained questions on awareness with two comprehensible answers, i.e. complete awareness and no awareness with scores of 1 and 0 respectively. To measure the normative knowledge, each respondent was asked to give their opinion, view or advice. Finally, data collected through questionnaires were coded, keyed and analyzed through suitable statistical technique (SPSS).

## RESULTS

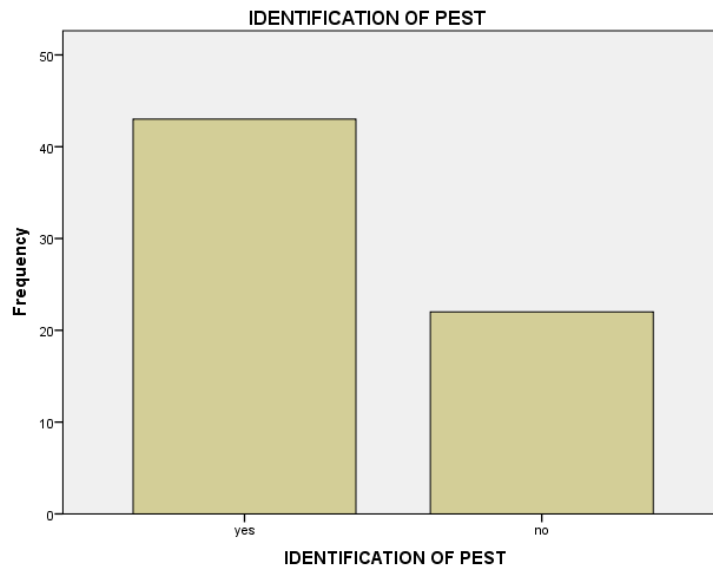
### Farmers' socioeconomic status



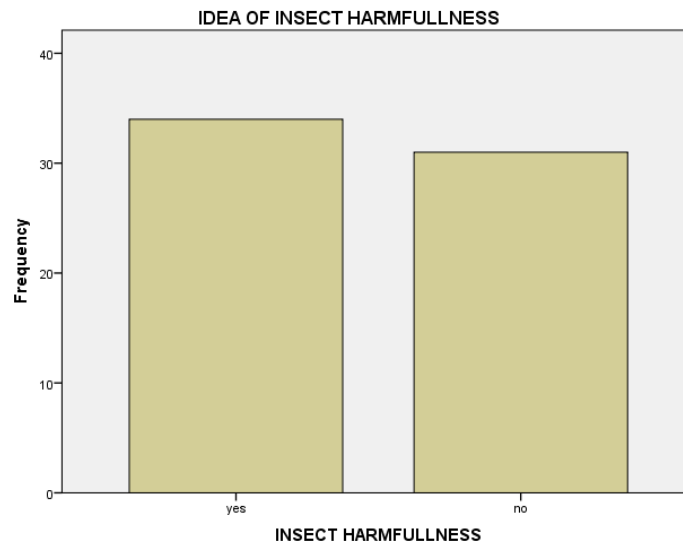
**Fig.1** Pie charts representing a) age of the farmers surveyed b) educational status of farmers C) gender of the surveyed farmers

Socioeconomic status specially education plays a very important role as it widens the vision of the farmers and exposes them to various aspects and opportunities related to agriculture and related fields. 50% of the farmers surveyed were above the age of 40 years followed by 29.23% of farmers belonging to the age group of 61 and above (fig.1a). 30% of the farmers were illiterate while 70 % were literate out of which 23.1 % studied till high school and only 4.6 % having a postgraduate degree (fig.1b). 29% of the total farmers surveyed were females (fig.1c). It was observed that literate farmers were found to be more aware about the ill effects of using pesticide on health and environment. Looking at this for comparison, in Indonesia the literate farmers reduced pesticide consumption to nearly 50% without compromising on the yields of rice in national IPM program (7).

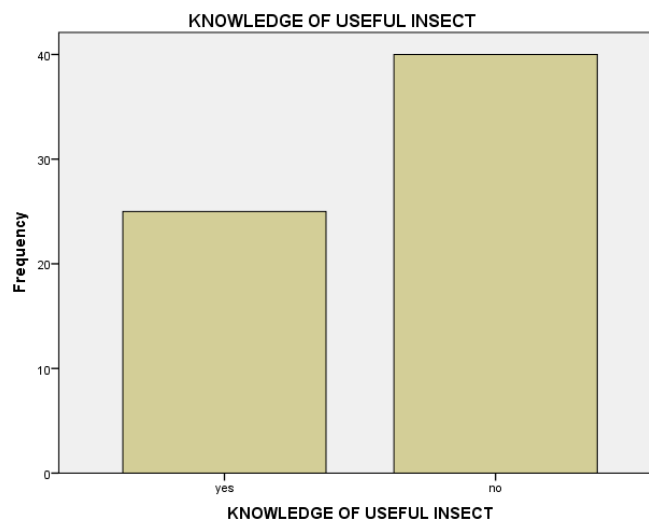
Farmers' knowledge of insects and pests



(a)



(b)



(c)

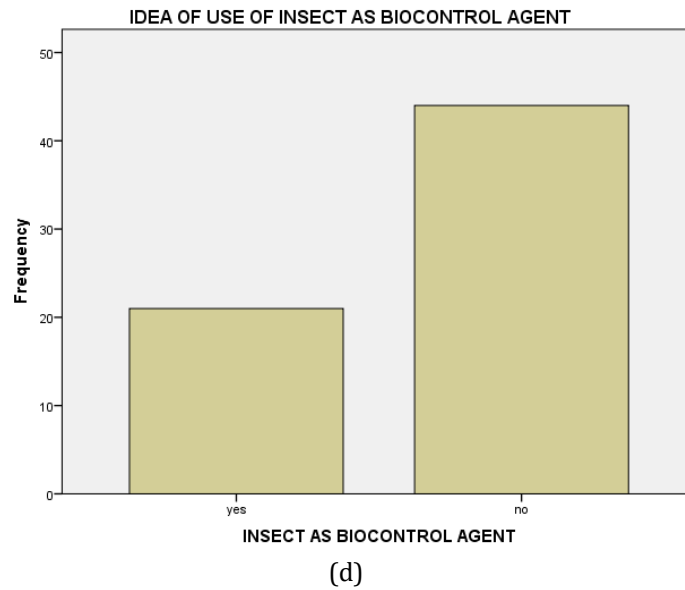


Fig.2 Bar diagrams for a) % of farmers who can distinguish between insects and pests b) proportion of farmers aware about harmful impact of pest c) % of farmers aware about usefulness of insects d) proportion of farmers having knowledge of utility of insects as bio control agent.

Farmers were asked if they were able to distinguish between insects and pest, 66.2 % were able to identify the pest (fig.2a). It was found that majority of the farmers were aware of harmful effects (fig.2b) as opposed to a small percentage who were aware of the usefulness of insects (fig.2c). 32.3% of the respondents had an idea of utilization of insects as bio control agents (fig.2d). It is important to promote integrated pest management practices to reduce the dependence on pesticide. To reduce damages, biological control of pest is a promising tool in which natural enemies regulate pest densities and reduce damages (8).

The use of IPM strategies has advantages, such as reducing adverse environmental and health effects and long-term positive effects on yields, e.g., through increased bio-control and soil fertility. These positive effects will grow in importance under climate change (9).

## CONCLUSIONS

Many plant protection techniques are being used by farmers all over the world to keep pests and diseases from wreaking havoc on their cultivated crops. The methods that farmers use to control pests are a reflection of how they view the issues and which pest control strategies seem to be working for them. Understanding the variables that affect farmers' perceptions, knowledge, and practices is essential for developing effective management strategies for maximum benefit (10). A farmer's education level plays a significant role in enhancing the farmer's vision and exposure to various aspects of opportunities related to agriculture. This research's overarching goal is to educate farmers and other land managers about the use of biocontrol methods in place of conventional chemical ones.

## Data availability statement

The datasets used in this study will be made available on reasonable request.

## Competing Interests

Authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Conflict of Interests

The authors declare no conflict of interest.

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