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Association of the socio-personal and communication characteristics of farmers with their extent of adoption of IPM practices in cauliflower cultivation

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Abstract

India's growing population, increasing demands of people and scarcity of natural resources are some of the major challenges facing the agricultural scenario in India today. The farming community faced major challenges due to the increase in production costs. Plant production and protection scientists have produced a wealth of information to combat these problems with a variety of pest control measures. However, a holistic approach considering all possible control measures coupled with domestic technical knowledge and promotion of sustainable agricultural technologies in pest management such as IPM. This study was conducted in selected Chomu and Bassi tehsils of Jaipur district, Rajasthan. Four villages were sampled from each selected Tehsil on the basis of maximum area for cauliflower cultivation. Thus, a total of eight villages were selected for the study. A comprehensive list of cauliflower growers was prepared for the selection of respondents, 15 respondents were selected from each selected municipality based on the maximum area. Thus, all 120 farmers were included in the study sample. Data were collected through an interview schedule. The findings showed that education level, gross income, caste and extended contact of all respondents were significantly related to the adoption of IPM in cauliflower cultivation. In contrast, age, land size, family size and economic motivation were not significantly associated with IPM adoption in cauliflower cultivation.

Keywords: Integrated pest management, sustainable agriculture technologies

Introduction

Cauliflower (*Brassica oleracea* var. *botrytis*) is one of the most important and popular winter vegetables and is cultivated all over the country. It is one of the oldest cultivated vegetables around the world, believed in by the Greeks and Romans since 2500 BC. It was cultivated in India since the Mughal era. In India, cauliflower is cultivated in an area of 452.59 thousand hectares and its total production in 2017-2018 was 8668.22 million tons. The total cultivated area of cauliflower in Rajasthan was 10,251 hectares and the total production was 51,708 million tons in 2017-18.

Vegetables play an important role in the maintenance of human health. These make diet nutritive and balanced. A balanced diet requires a proper quota of fresh vegetables. About 300 gm of vegetables are needed (90 gm root vegetables, 120 gm green vegetables, and 90 gm other vegetables) per day per capita for the maintenance of human health.

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IPM is a knowledge based technology. It involves the integration of different methods of disease and pest management to manage all important diseases and pests of a particular crop or to manage one important disease or pest to manage all diseases and pests in a particular cropping system. Under IPM, the use of chemical pesticides is discouraged but not prohibited. IPM modules are area-specific. They consider not only diseases and pests but also the availability of inputs. Most of the modules include too many methods, which usually frustrates farmers. They are not willing to put all their energy into pest management alone. Therefore, it is important to develop modules that contain few complex interventions.

Promoting intensive agriculture has increased pest problems. Some problems related to pest management are complicated by the overuse of pesticides, the loss of friendly insects and

microorganisms, and the development of pesticide resistance in many insects, plant pathogens, and weeds. India's growing population, increasing demand of people and scarcity of natural resources are some of the major concerns of today's agricultural scenario in India. Due to increase in cost of production, the farming community has to face major challenges. Much information has been generated by plant production and conservation scientists to combat these problems through various control measures for individual pests. However, a holistic approach that considers all possible control measures mixed with indigenous technical knowledge and promotion of sustainable techniques in pest management such as IPM has not yet become popular among farmers for various reasons. The problem associated with over-reliance on pesticides and their indiscriminate use is well known.

Material and Method

This study was conducted in Jaipur district of Rajasthan. There are 16 talukas in this district. There are 488 gram panchayats and 2400 villages in the district. Jaipur district was purposively selected for the present investigation based on the following criteria: Jaipur district had the highest area under cauliflower crop cultivation in 2016-2017 as compared to other districts of Rajasthan. The study area is close to SKN College of Agriculture, Jobner, which will facilitate data collection and save time. Jaipur district consists of sixteen talukas, of which two talukas, Chomu and Bassi, were selected on the basis of maximum area under cauliflower cultivation.

The next step in this sampling process was the selection of villages. For this specific purpose, a separate list of major cauliflower growing villages, Chomu and Bassi was prepared from these selected taluks with the help of Patwari and Agriculture Supervisor. From the prepared list, four villages from each identified taluka were selected based on the maximum area under cauliflower cultivation. Thus, eight

villages were selected for the study purpose. From the selected villages, a comprehensive list of cauliflower growers was prepared with the help of the Patwari and the concerned village agriculture supervisor. From the list, 15 farmers with the largest area under cauliflower cultivation in the village were selected. Thus, a total of 120 farmers were selected for the present investigation. The research design adopted in the present study was correlational to find the relationship.

Results and Discussion

This part shows the association between the adoption level of cauliflower growers about IPM practices with farmers selected personal variables, viz. age, education, size of landholding, income level, size of family, caste, economic motivation, and extension contact.

A Karl Pearson correlation coefficient test was conducted to determine the relationship between these personal characteristics and adoption rates. The results are shown in the table.

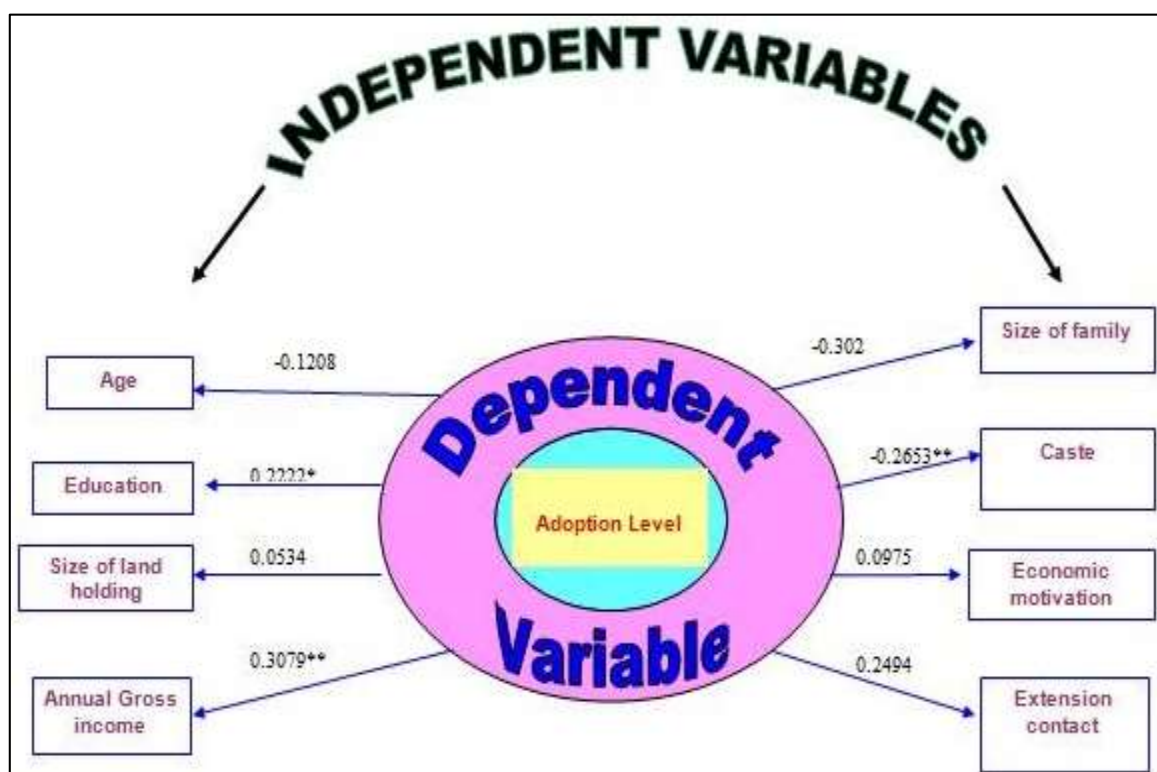
Table 1: Association of selected personal variables of cauliflower growers with their extent of adoption of IPM practices in cauliflower cultivation

| S. No. | Variables | Coefficient of correlation (r) | | |
|--------|---------------------|--------------------------------|--------------|------------|
| | | Chomu Tehsil | Bassi Tehsil | Overall |
| 1. | Age | -0.1318 | 0.1169 | -0.1208 |
| 2. | Education | 0.1542 | 0.1232 | 0.2222 * |
| 3. | Size of landholding | 0.0198 | 0.0185 | 0.0534 |
| 4. | Gross Annual Income | 0.5461 ** | 0.0718 | 0.3079 ** |
| 5. | Size of family | -0.0118 | 0.0208 | -0.0302 |
| 6. | Caste | -0.1030 | 0.1528 | -0.2653 ** |
| 7. | Economic motivation | -0.0393 | 0.2310 | 0.0975 |
| 8. | Extension contact | 0.0344 | -0.045 | 0.2494 ** |

** Significant at 1% level of significance

* Significant at 5% level of significance

NS=Non-significant, r= Correlation coefficient



** significant at 0.05 level probability

Fig 1: Association of selected personal variable of cauliflower growers with their extent of adoption of IPM practices in cauliflower cultivation

Age of the cauliflower growers and adoption level

As can be seen from the data presented in the table in Chomu tehsil, Bassi tehsil, and overall farmers, a non-significant association exists between the age of the cauliflower growers and their adoption level. Hence, the null hypotheses H03.1, H03.2, and H03.3 were accepted, and alternate hypotheses were rejected, which leads to the conclusion that the age of the cauliflower growers of Chomu tehsil, Bassi tehsil, and overall cauliflower growers exert a non-significant effect on their adoption level regarding IPM practices of cauliflower cultivation.

All farmers, regardless of their age, may adopt the IPM practices because nowadays, both young and old farmers read agricultural magazines, listen to the radio and watch agricultural programs. Due to this, they might be convinced about the worth of the IPM practices.

Education of the cauliflower growers and adoption level

The data presented in the table shows that 5% of cauliflower growers in the study area have a positive association, thus rejecting the null hypothesis H04.3 and accepting the alternative hypothesis. This shows that there is a significant positive relationship between the level of education and IPM practices among flower growers in the study area. The data also showed a positive significant relationship between education and the level of adoption of cauliflower in Chomu and Bassi tehsils. This leads to accepting the null hypothesis H04.1 and H04.2 and rejecting the alternative hypothesis.

This is because educated people are believed to be more innovative and flexible in their outlook. Education levels may result in IPM practices having greater exposure to agricultural information sources and channels, which may increase adoption rates.

Landholding of the cauliflower growers and adoption level

It is observed from the data presented in the table that in Chomu tehsil, Bassi tehsil, and overall farmers, there exists a non-significant association between land holding of the cauliflower growers and their adoption level. This leads to accepting the null hypotheses H05.1, H05.2, and H05.3, which leads to the conclusion that there was a positive non-significant association between the land holding of the cauliflower growers as the adoption level of Chomu tehsil, Bassi tehsil, and overall cauliflower growers.

This may be because the farmers may be the good adopters regardless of their landholding size. All the farmers, regardless of their size of land holding, may try to adopt more recommended IPM practices of cauliflower because all the farmers, regardless of their size of land holding, want to get more production from the crops they are raising.

Annual gross income of the cauliflower growers and adoption level

It is apparent from the data presented in the table that in the case of the cauliflower growers of Chomu tehsil and the overall farmers, a positively significant association at a 1% level of significance was found, which leads to rejecting the null hypotheses H06.1 and H06.3 and accepting the alternate hypotheses. Hence, it can be concluded that there was a positive, non-significant association between the overall cauliflower growers of the study area. It is further evident from the data that there exists a positively significant association between income and adoption level of the cauliflower growers of Bassi tehsil, which leads to accepting

the null hypothesis H06.2 and rejecting the alternate hypothesis. Hence, it can be concluded that the gross income of the cauliflower growers of the Bassi tehsil exerts a positively significant influence on their adoption level. It might be because those farmers with high income due to having high risk-bearing ability as compared to less income farmers might have adopted the IPM practices compared to low-income cauliflower growers.

Size of family of the cauliflower growers and adoption level

From the data presented in the table in Chomu tehsil, Bassi tehsil, and overall farmers, there exists a non-significant association between the size of the family of the cauliflower growers and their adoption level. This leads to accepting the null hypothesis H07.1, H07.2, and H07.3 and rejecting the alternate hypotheses, which leads to the conclusion that there was a negative non-significant association between the size of the family and the adoption level of the cauliflower growers of Chomu tehsil, Bassi tehsil and overall cauliflower growers and the size of the family exerts a non-significant effect on their adoption level of IPM in cauliflower cultivation.

The findings might be so due to the reason that the farmers, regardless of their size, may adopt the IPM practices because most of the farmers belong to small families or large families. Want to get more production so that they may adopt more participation regardless of their size of family.

Caste of the cauliflower growers and adoption level

The data presented in the table shows that the cauliflower growers of the study area had a negatively significant association at a 1% level of significance, which results in rejecting the null hypothesis H08.3 and accepting the alternate hypothesis. This leads to the conclusion that there exists a positively significant association between the caste and the adoption level of cauliflower growers in the study area. The data further indicate a non-significant association between caste and adoption level of the cauliflower growers of both Chomu and Bassi tehsils. This leads to accepting the null hypotheses H08.1 and H08.2 and rejecting the alternate hypotheses.

Findings might be because, in Chomu tehsil, OBC farmers (Jat) were in the majority. In Bassi tehsil, ST farmers, i.e., Meena, are the majority. Hence, within the tehsils, the variation in the caste of the farmers is very low, which might result in their non-significant association with their adoption level. When we consider all the farmers of both Chomu tehsils, the variation in the caste is more. Hence, the caste of the cauliflower growers might have exerted a significant influence on the adoption of IPM practices. It might also be because farming is a parental occupation in most OBCs, especially Jat's and Kumawat's caste. That is why their adoption of IPM practices might be more, resulting in a significant association between the caste and their adoption.

Economic motivation of the cauliflower growers and adoption level

From the data presented in the table, in Chomu tehsil, Bassi tehsil, and overall farmers, a non-significant association exists between the economic motivation of the cauliflower growers and their adoption level. Hence, the null hypotheses H09.1, H09.2, and H09.3 were accepted, and alternate hypotheses were rejected, which leads to the conclusion that there was a non-significant effect of economic motivation on the adoption

level of IPM in cauliflower cultivation by the cauliflower growers of Chomu tehsil, Bassi tehsil, and overall cauliflower growers.

As per the findings, economic motivation did not play a significant role in the adoption of IPM practices, which might be due to the reason that farmers with low or high economic motivation may perform agriculture activities to the best extent of their knowledge and experience. Hence, the farmers with any level of motivation may try to get more production by adopting IPM practices. Since adoption is a mental process and depends only on knowledge and information the particular farmer receives, economic motivation is not a hindrance. Hence, the farmers with either low or higher economic motivation may adopt the IPM practices more or less as per their knowledge and satisfaction about the practices and not depend on the economic motivation of the farmers.

Extension contacts of the cauliflower growers and adoption level

The data shown in the table shows that cauliflower growers in the study area have a positive association at the 1% level, thus rejecting the null hypothesis H010.3 and accepting the alternative hypothesis. This shows that there is a significant relationship between extension communication and cauliflower farmers in the study area. Furthermore, the data showed a significant correlation between the adoption rate and extension of florists in Chomu and Bassi tehsils. This leads to accepting the null hypothesis H010.1 and H010.2 and rejecting the alternative hypothesis.

This may be because cauliflower growers with larger contacts have more opportunities to interact with extension workers working in different capacities and with different organizations implementing IPM practices, which leads to more discussions about IPM practices in cauliflower cultivation.

Conclusion

This study found that all respondents' educational level, total income, category and communication were significantly associated with the adoption of IPM in rice cultivation. In contrast, age, landholding size, family size and economic motivation are not significantly associated with the adoption of IPM in cauliflower production. In Chomu tehsil, only the total annual income of respondents is significantly positive and the level of adoption of IPM practices in cattle farming. In contrast, the rest of the variables were found to have significant associations with adoption rates. However, none of the independent variables were found to be significantly associated with the rate of adoption of IPM practices in cauliflower cultivation in Bassi tehsil.

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