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Factors affecting integrated pest management in pigeonpea in Parbhani district of Maharashtra state

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Abstract
The present study was undertaken in Sayala and Wadgaon Tarfe Takli village of Parbhnai district of Maharashtra state. A sample of 60 pigoenpea cultivators were selected with the help of subject matter specialist of KVK parbhani. The primary data were collected from the selected pigeonpea growers with the help of an interview schedule by personal interview method. Factors affecting adoption of IPM technology by pigeonpea cultivation was the main objective of the present study. With the help of regression analysis, the analysis at overall level of technology adoption reveals that there was 40 percent variation between the independent variables and the adoption of IPM technologies among the sample farmers. Present investigation revealed that the independent variable total farm size is highly positively related to the IPM technology adoption among the sample farmers as compare to the other factors.

Keywords: Factors, management, Parbhani, IPM, pigoenpea

Introduction
In 1967 the term Integrated Pest Management (IPM) was introduced by R.F. Smith and R. Van Den Bosch. The term IPM was formalized by the US National Academy of Sciences in 1969. IPM was adopted as policy by various world governments during the 1970's and 1980's, including the USA (1972). Food and Agriculture Organization (FAO, 1967) defined IPM as a system that, in the context of associated environment and population dynamics of the pest species, utilizes all suitable techniques and methods in as compatible a manner as possible and maintains pest populations at levels below those causing economic injury." IPM as "Intelligent selection and use of pest control tactics that will ensure favorable economical, ecological and sociological consequences." The integrated pest management practices comprise the use of new generation pesticides and has significant potential to increase crop yield with less pesticides and reduce cost of production.

The pigeon pea (*Cajanus cajan*) is a perennial legume from the family Fabaceae. It is widely cultivated in tropical and semitropical regions around the world, being commonly consumed in South Asia, Southeast Asia, Africa, Latin America and the Caribbean. The pigeonpea is an important legume crop cultivated in India, Malaysia, Indonesia, Philippines, East & West Africa. Among the pulses, pigeon pea is the second most important legume after chickpea in India and grown predominantly under rainfed conditions. Pigeon pea is one of the protein (20-22%) rich legumes of the semi-arid tropics grown throughout the world. Pigeonpea ranked sixth globally after peas, broad beans, lentils, chickpeas and common beans. Globally, pigeonpea is cultivated on 5.4 million hectare land area with an annual production of 4.49 million tons. It is grown in about eighty-two (82) countries of the world. India accounts for about 72 percent of the area grown to pigeonpea. (FAO Statistics Pigeon Producing Countries. Production and Area Harvested Food and Agriculture Organization of the United Nations, Rome 2017). The pigeon pea production of India was 4.34 million tonnes (leading producer) from an acreage of 5.05 million ha. with a productivity of 859 Kg/ha.

The factors that influence the adoption decision of farmers with respect to IPM in pigeon pea *viz* age, education, farm size, family size, farming experience and IPM farming experience were studied. Panda and Sharma (2023) [5] conducted an experiment on cotton during the year 2016-2017 to identify the factors influencing the adoption of IPM technology in Rajasthan. Simple of 90 farmers were selected for the study. Result found that higher education, for application of current practices, higher number of workshops attended, higher number of training attended for the current practices are three major groups of elements influencing the adoption of IPM practices.

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Along with years of experience in current practice followed, years of experience in agriculture, and years of education are the sub components effects in adoption of IPM.

Methodology
Methodology comprises salient features of study area, sampling design and analytical tools to be used for drawing the inferences. A list of farmers who cultivated pigeonpea with IPM technology was obtained from Krishi Vindhyan Kendra (KVK) Parbhani and 60 farmers were finalized for the present study.

A schedule of developed and recommended IPM technology in pigeonpea cultivation was collected from subject matter specialists of KVK parbhani and accordingly an interview schedule was developed. The primary data were collected from the selected pigeonpea growers with the help of an interview schedule by personal interview method. The data were collected for the *kharif* season of the agricultural year 2022-23.

Result and Discussion
The factors which affect the adoption of IPM technology by farmers *viz.* age, family size, education, total farm size, farming experience along with IPM farming experience was analyzed by a regression analysis model and result of the same are presented in Table 1 Coefficient of determination R^2 = 0.4009Standard error = 15.2638
F-test value = 5.9099
F-Significance value = 0.000089
***Significant at 1 percent

The analysis at overall level of technology adoption reveals that there was 40 percent variation between the independent variables and the adoption of IPM technologies among the sample farmers. From the table, it is clear that farm size was the only significant variable found at overall level of technology adoption.

The other factors were non-significant, such as age, family, education, farming experience and IPM experience in case of overall technology adoption group.

Table 1: Estimated coefficients of independent variables at overall level of technology adoption

Coefficients		Standard Error	t Stat
Intercept	24.7757	21.9147	1.1306
Age	-0.1275	0.2444	-0.5216
Family size	-0.5968	2.2129	-0.2697
Education	1.0083	0.9256	1.0893
Total farm size	4.8023***	1.0405	4.6155
Farming experience	0.1938	0.2158	0.8983
IPM experience	2.4800	2.2845	1.0856

Conclusion
The analysis at overall level reveals that there was 40 percent relation between the independent variables and the adoption of IPM technologies among the sample farmers, which can be clear from R^2 value of 0.40, and can also be concluded that the model is statistically significant with the obtained f value as 5.909. From Table 1 it is clear that the independent variable total farm size is highly positively related to the IPM technology adoption among the sample farmers as compare to the other factors.

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