

Print ISSN : 0972-8813  
e-ISSN : 2582-2780

[Vol. 22(3) September-December 2024]

# Pantnagar Journal of Research

(Formerly International Journal of Basic and  
Applied Agricultural Research ISSN : 2349-8765)



G.B. Pant University of Agriculture & Technology, Pantnagar



## ADVISORYBOARD

### Patron

Dr. Manmohan Singh Chauhan, Vice-Chancellor, G.B. Pant University of Agriculture and Technology, Pantnagar, India

### Members

Dr. A.S. Nain, Ph.D., Director Research, G.B. Pant University of Agri. & Tech., Pantnagar, India  
Dr. Jitendra Kwatra, Ph.D., Director, Extension Education, G.B. Pant University of Agri. & Tech., Pantnagar, India  
Dr. S.K. Kashyap, Ph.D., Dean, College of Agriculture, G.B. Pant University of Agri. & Tech., Pantnagar, India  
Dr. A.H. Ahmad, Ph.D., Dean, College of Veterinary & Animal Sciences, G.B. Pant University of Agri. & Tech., Pantnagar, India  
Dr. K.P. Raverkar, Ph.D., Dean, College of Post Graduate Studies, G.B. Pant University of Agri. & Tech., Pantnagar, India  
Dr. Sandeep Arora, Ph.D., Dean, College of Basic Sciences & Humanities, G.B. Pant University of Agri. & Tech., Pantnagar, India  
Dr. Alknanda Ashok, Ph.D., Dean, College of Technology, G.B. Pant University of Agri. & Tech., Pantnagar, India  
Dr. Alka Goel, Ph.D., Dean, College of Home Science, G.B. Pant University of Agri. & Tech., Pantnagar, India  
Dr. Avdhesh Kumar, Ph.D., Dean, College of Fisheries, G.B. Pant University of Agri. & Tech., Pantnagar, India  
Dr. R.S. Jadoun, Ph.D., Dean, College of Agribusiness Management, G.B. Pant University of Agri. & Tech., Pantnagar, India

## EDITORIALBOARD

### Members

Prof. A.K. Misra, Ph.D., Chairman, Agricultural Scientists Recruitment Board, Krishi Anusandhan Bhavan I, New Delhi, India  
Dr. Anand Shukla, Director, Reefberry Foodex Pvt. Ltd., Veraval, Gujarat, India  
Dr. Anil Kumar, Ph.D., Director, Education, Rani Lakshmi Bai Central Agricultural University, Jhansi, India  
Dr. Ashok K. Mishra, Ph.D., Kemper and Ethel Marley Foundation Chair, W P Carey Business School, Arizona State University, U.S.A  
Dr. B.B. Singh, Ph.D., Visiting Professor and Senior Fellow, Dept. of Soil and Crop Sciences and Borlaug Institute for International Agriculture, Texas A&M University, U.S.A.  
Prof. Binod Kumar Kanaujia, Ph.D., Professor, School of Computational and Integrative Sciences, Jawahar Lal Nehru University, New Delhi, India  
Dr. D. Ratna Kumari, Ph.D., Associate Dean, College of Community / Home Science, PJTSAU, Hyderabad, India  
Dr. Deepak Pant, Ph.D., Separation and Conversion Technology, Flemish Institute for Technological Research (VITO), Belgium  
Dr. Desirazu N. Rao, Ph.D., Professor, Department of Biochemistry, Indian Institute of Science, Bangalore, India  
Dr. G.K. Garg, Ph.D., Dean (Retired), College of Basic Sciences & Humanities, G.B. Pant University of Agric. & Tech., Pantnagar, India  
Dr. Humnath Bhandari, Ph.D., IIRRI Representative for Bangladesh, Agricultural Economist, Agrifood Policy Platform, Philippines  
Dr. Indu S Sawant, Ph.D., Director, ICAR - National Research Centre for Grapes, Pune, India  
Dr. Kuldeep Singh, Ph.D., Director, ICAR - National Bureau of Plant Genetic Resources, New Delhi, India  
Dr. M.P. Pandey, Ph.D., Ex. Vice Chancellor, BAU, Ranchi & IGKV, Raipur and Director General, IAT, Allahabad, India  
Dr. Martin Mortimer, Ph.D., Professor, The Centre of Excellence for Sustainable Food Systems, University of Liverpool, United Kingdom  
Dr. Muneshwar Singh, Ph.D., Project Coordinator AICRP- LTFE, ICAR - Indian Institute of Soil Science, Bhopal, India  
Prof. Omkar, Ph.D., Professor, Department of Zoology, University of Lucknow, India  
Dr. P.C. Srivastav, Ph.D., Professor, Department of Soil Science, G.B. Pant University of Agriculture and Technology, Pantnagar, India  
Dr. Prashant Srivastava, Ph.D., Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, University of South Australia, Australia  
Dr. Puneet Srivastava, Ph.D., Director, Water Resources Center, Butler-Cunningham Eminent Scholar, Professor, Biosystems Engineering, Auburn University, U.S.A.  
Dr. R.C. Chaudhary, Ph.D., Chairman, Participatory Rural Development Foundation, Gorakhpur, India  
Dr. R.K. Singh, Ph.D., Director & Vice Chancellor, ICAR-Indian Veterinary Research Institute, Izatnagar, U.P., India  
Prof. Ramesh Kanwar, Ph.D., Charles F. Curtiss Distinguished Professor of Water Resources Engineering, Iowa State University, U.S.A.  
Dr. S.N. Maurya, Ph.D., Professor (Retired), Department of Gynecology & Obstetrics, G.B. Pant University of Agric. & Tech., Pantnagar, India  
Dr. Sham S. Goyal, Ph.D., Professor (Retired), Faculty of Agriculture and Environmental Sciences, University of California, Davis, U.S.A.  
Prof. Umesh Varshney, Ph.D., Professor, Department of Microbiology and Cell Biology, Indian Institute of Science, Bangalore, India  
Prof. V.D. Sharma, Ph.D., Dean Academics, SAI Group of Institutions, Dehradun, India  
Dr. V.K. Singh, Ph.D., Head, Division of Agronomy, ICAR-Indian Agricultural Research Institute, New Delhi, India  
Dr. Vijay P. Singh, Ph.D., Distinguished Professor, Caroline and William N. Lehrer Distinguished Chair in Water Engineering, Department of Biological Agricultural Engineering, Texas A&M University, U.S.A.  
Dr. Vinay Mehrotra, Ph.D., President, Vinlax Canada Inc., Canada

### Editor-in-Chief

Dr. Manoranjan Dutta, Head Crop Improvement Division (Retd.), National Bureau of Plant Genetic Resources, New Delhi, India

### Managing Editor

Dr. S.N. Tiwari, Ph.D., Professor, Department of Entomology, G.B. Pant University of Agriculture and Technology, Pantnagar, India

### Assistant Managing Editor

Dr. Jyotsna Yadav, Ph.D., Research Editor, Directorate of Research, G.B. Pant University of Agriculture and Technology, Pantnagar, India

### Technical Manager

Dr. S.D. Samantray, Ph.D., Professor, Department of Computer Science and Engineering, G.B. Pant University of Agriculture and Technology, Pantnagar, India

## CONTENTS

<b>Exploration of red rice land races from north western Himalayas for a vailability and interactions of anthocyanin and antioxidant nutrients</b> ASHISH NAMGAIN and ASHUTOSH DUBEY	<b>493</b>
<b>Comparative phytochemical analysis in high-yielding <i>Brassica juncea</i> varieties</b> SHIVANSHU GARG, HIMANSHU PUNETHA and USHA PANT	<b>502</b>
<b>Thermal stability and catalytic efficiency of <math>\beta</math>-Glucosidase extracted from biogas slurry: Implications for biomass conversion</b> GAURAV SINGH RANA, A. K. VERMA and ASHUTOSH DUBEY	<b>509</b>
<b>Impact of weather parameters on the population dynamics of major insect pests of sugarcane under the <i>Tarai</i> ecosystem of Pantnagar</b> SABA TANVEER and RAVI PRAKASH MAURYA	<b>517</b>
<b>Geospatial survey of rice sheath blight in Uttarakhand</b> ASHISH SINGH BISHT and BIJENDER KUMAR	<b>526</b>
<b>Exploring the management strategies for wilt of lentil under natural farming system</b> ANSHUL ARYA and K.P.S. KUSHWAHA	<b>532</b>
<b>Heat unit requirement of wheat (<i>Triticum aestivum</i> L.) varieties under different sowing dates and irrigation levels in <i>Tarai</i> region of Uttarakhand</b> SIDDHANT GUPTA and RAJEEV RANJAN	<b>541</b>
<b>Application of principal component analysis and discriminant function analysis in developing prediction models to forecast maize yield using weather indices</b> ANITA YADAV and A.K. SHUKLA	<b>547</b>
<b>Indigenously prepared foods and beverages of <i>Bhotiya</i> tribal community of Munsyari, Pithoragarh, Uttarakhand</b> MEGHA CHAMLEGI and ANJU BISHT	<b>553</b>
<b>Glycemic index of maize flour mixes</b> ANKITA SHARMA and MAYA CHOUDHRY	<b>560</b>
<b>Process optimisation and quality evaluation of mango pulp incorporated plant-based milk substitute</b> SREELAKSHMI A. S. and SEEJA THOMACHAN PANJIKKARAN	<b>564</b>
<b>Standardisation and quality evaluation of banana incorporated ice creams</b> C. R. RAJEESHA and SHARON C. L.	<b>570</b>

<b>Trends and instability in area, production and productivity of paddy across districts in Kerala, India</b> CIBIN J DAS and A. PREMA	<b>577</b>
<b>Comparative analysis of trend and growth projections in area, production and productivity of oilseeds and pulses in India</b> LEKHA KALRA and S.K. SRIVASTAVA	<b>590</b>
<b>Economic analysis of improved green gram variety (MH-421) disseminated through farmers' participatory approach in Hisar district of Haryana</b> ANIL KUMAR MALIK, A.K. GODARA, KARMAL SINGH and DALIP KUMAR BISHNOI	<b>594</b>
<b>Temporal and spatial consumption of meat in the Central Asia region</b> ABDUL WAHID and S. K. SRIVASTAVA	<b>602</b>
<b>An economic analysis of organic farming of Pithoragarh district of Uttarakhand</b> NEELAM BISHT, NIKHIL PRATAP SINGH and CHANDRA DEV	<b>608</b>
<b>Analyzing the role of biomass properties in determining activated biochar yield</b> PHALPHALE KETAN BIBHISHAN and RAJ NARAYAN PATERIYA	<b>621</b>
<b>Experimental study on the enhancement of fabricated 6101 Aluminium alloy through Cryogenic treatment</b> BIRENDRA SINGH KARKI and ANADI MISRA	<b>628</b>
<b>Electrostatic hand sweeper for pest control in cotton crop</b> SANTOSH KUMAR, APOORV PRAKASH and SAURABH RATRA	<b>636</b>
<b>Microbial contamination in panipuri ingredients and utensils</b> SHIVANGI MAURYA and AJAY KUMAR UPADHYAY	<b>647</b>
<b>Enhancing rural livelihoods through small scale duck farming in flood-prone districts of Assam</b> R. ISLAM, A. ALI, M. RAHMAN and A. KR. SAIKIA	<b>651</b>
<b>Exploring the socio-economic and psychological dimensions of agripreneurs in Kumaon, Uttarakhand</b> GAGAN TRIPATHI and ARPITA SHARMA KANDPAL	<b>657</b>

## An economic analysis of organic farming of Pithoragarh district of Uttarakhand

NEELAM BISHT<sup>1</sup>, NIKHIL PRATAP SINGH<sup>2</sup> and CHANDRA DEV<sup>1\*</sup>

<sup>1</sup>Department of Agriculture Economics, College of Agriculture, G. B. Pant University of Agriculture & Technology, Pantnagar – 263145 (U.S. Nagar, Uttarakhand), <sup>2</sup>University of Reading (U. K.)

\*Corresponding author's mail id: cdev\_2006@yahoo.co.in

**ABSTRACT:** Study was conducted to examine the socioeconomic status of the farmers and the comparative economics of organic and inorganic farming and to find out the constraints faced by farmers in adoption of organic farming. A total number of 60 farmers selected. Out of these 30 farmers selected for each category using random sampling technique. Total cost of cultivation in paddy, maize and finger millet in organic was Rs. 47564/ha, Rs. 38932/ha and Rs. 39792/ha in case of inorganic farms Rs. 49999/ha., Rs. 40546/ha and Rs. 41919/ha respectively. The net returns in organic farms were more in all crops paddy, maize and finger millet as compared with inorganic farms. In case of maize higher returns were found Rs. 60094/ha from organic and Rs. 55619/ha from inorganic and in case of finger millet Rs. 36611/ha from organic and Rs. 30061/ha from inorganic and lower in case of paddy Rs. 25348 /ha from organic and Rs. 20899 /ha from inorganic farms respectively. The return over per rupee investment in maize crop was higher 2.54 in organic and 2.37 in inorganic than paddy and finger millet on the study area. It was observed that most of the farmers expressed the problems regarding lack of knowledge of organic production technology, requirement of long period to get positive response from the ecosystem, lack of specialized markets for organic produce, initial yield loss and lack of knowledge about certification process, uncertainty of irrigation water and small land holding or land in patches.

**Key words:** Farming, gross returns, inorganic, maize, millet, net returns, production, organic, productivity, paddy

Agriculture with its allied sectors like animal husbandry, forestry and fisheries, is the largest source of livelihoods in India. It is great task to meet all the needs related to food, fiber, fuel and many other things with continuous increasing of the population and decreasing the cultivable land. In order to sustain the productivity of crop and maintain soil health and environment there is needed to adopt alternative farming may be the organic farming. Various forms of organic manures and bio- fertilizers are used for substituting the chemical fertilizers. In India organic manures have been used at subsistence level since ancient times.

In present scenario, people are much concerned about their health and also aware about organic farming regarding healthy and safe food, soil fertility, environment friendly practices. Initially it is costlier and labour intensive but in long run it is more cost effective. Organic farming is beneficial for human health, animal, soil, water and environment. This study was conducted to analyze the problems faced by the farmers during practicing organic farming, their socio-economic status and comparison of cost

involved, yield in organic and inorganic farming. Thus, the outcome of the study will be helpful in formulation of policies and developmental measures for organic farmers.

Kumar *et al.* (2011) conducted study in Uttarakhand to know the socioeconomic condition of wheat growers which was based on sample collection of 60 farmers for agricultural year 2011-2012. Simple descriptive statistics tools like and averages and percentages used for various socio-economic variables. Results showed that large farms incurred highest total cost (Rs.59628/ha) and marginal and small the lowest (Rs.55783.41/ha). Study suggested that efforts made for timely supply of quality inputs at reasonable price and in adequate quantity to farmers gave better results. Roy *et al.* (2013) conducted study in Dhauladevi block in Almora district of Uttarakhand. Sixty farmers were randomly selected. Ten variables were selected to asses socio-economic status which were age, category, education, occupation and landholding social participation, herd size, farming experience, annual income and material possession. Well-structured

schedule was prepared for data collection. The results of study showed that 58 percent of the respondents belonged to SC category and others were unreserved. The major occupation was agriculture while others are involved in subsidiary profession. Medium level of social participation (78.34%) was adopted by majority of respondents. The average size of landholding was 0.40 ha and most respondents were having a medium herd size (66.67%). The respondents were having an average farming experience of 19 years. Kadam (2016) conducted study on attitude of the farmers towards integrated pest management technology programme in district Parbhani. It was concluded from the study that majority of farmers, around 64 per cent belonged to medium annual income group which has a range between Rs.55001 to Rs. 92500. It was followed by farmers belonged to high annual income level (22%) and low annual income level groups (14%) who possessed above than Rs. 92500 and below Rs. 55000 annual incomes respectively. Prajapati *et al.* (2018) have found from the study that majority of the farmers were of middle age group, they were educated up to primary to secondary level and having medium family size and medium experience in organic farming. Major number of the farmers was having medium annual income. More number of the farmers was having medium level of perception towards organic farming and understood that future scope of sustainable agriculture will depend on organic farming. Jat (2020) conducted study on organic farming utilization status of vegetable growers in Jaipur district of state Rajasthan. This study was performed in 8 villages with 15 respondents from each village and total sample size formed was 120 respondents. It was found from the study that majority of respondents have medium socio-economic status. 60 per cent respondents belonged to middle age group. Approximate 59 per cent respondents lived in nuclear family. Maximum number of respondents belonged to backward class, educated up to middle level and agriculture as their main profession. Rubinos *et al.* (2007) compared the production economics between conventional and organic lowland rice farming in terms of production function and cost and return in Magsaysay. For both production systems with the help of SHAZAM

Version 9.0 an OLS translog production function was estimated. It was evidently suggested by the production functions to increase seeding rate for further increase in the production of organic rice farmers whereas to increase labor input and pesticide application for output increment for conventional rice farmers. Conventional rice farms yielded 23% higher than organic rice farms but net returns were low due to high input costs and lower farm gate price. Although the difference is not significant, returns above total costs of organic farming is higher than conventional rice farming. Charyulu and Biswas (2010) purposively selected and investigated four states namely Gujarat, Maharashtra, Punjab and U.P for issues like economics and efficiency of organic farming vis-à-vis conventional farming in India. Similarly for comparison, four major crops i.e., cotton, sugarcane, paddy and wheat were chosen. They analyzed the efficiency of the farming systems with the help of a model based nonparametric Data Envelopment Analysis (DEA). The crop economics results a mixed response. Sudheer (2013) studied and compared the economics of organic versus chemical farming and for three crops, paddy, red gram and groundnuts, in Andhra Pradesh. A gross income of 5 percent in paddy, 10 percent in red gram and 7 percent in groundnut earnings was found higher in organic farmers as compared to the chemical farmers and the profits with lower input costs earned by the organic farmers were higher by 37%, 33% and 59% for the selected crops respectively. Verma *et al.* (2011) conducted study on the constraints in adoption of recommended organic farming practices in Chhattisgarh State. Constraints in adoption of organic farming practices were identified. Hundred per cent respondents were encountered lack of media and propaganda and advertisement to promote organic farming practices and products, lack of information and lack of supply of organic farming products. Second major constraint in that study voted by 98.33 percent respondents was lack of training facility to understand the organic farming practices. Study suggested that there should be more training facility in respect of organic farming practices. Haneef *et al.* (2019) conducted study in state of Uttarakhand. Two districts, one from Garhwal region

(Rudraprayag) and one from Kumaon region(Nainital) district were selected purposively. On the basis of mean score, it was reported that economic were initial low price for the organic produce (2.89), initial yield loss with mean score (2.76), inadequate availability of credit in order of *sevariety* (2.33) ranked third, higher cost involved in the certification charges (1.97) and inadequate subsidies for organic cultivation of crops (1.88), infrastructural constraints including lack of training institutions (1.93), lack of indigenous certification agencies (1.81) and lack of specialized institutes for doing research on organic farming. (2020) has conducted study in Himachal Pradesh and observed severe constraints which were being faced by the farmers-practicing organic farming in the study area were small land holding, decline in crop productivity, higher incidence of pests and diseases, non-availability of marketplace, lack of minimum support prices for organic products, wild animals menace, less erratic monsoon, fluctuation in temperature and humidity. These factors show the weak links, which need to be strengthened for promoting organic farming widely.

## MATERIALS AND METHODS

The study has been categorized under three sections. First section deals with the sampling design, second section presents data collection and third section elaborates the analytical tools and techniques used for the study. The present study was conducted in Pithoragarh district of Uttarakhand. A multistage sampling was adopted for the study. Pithoragarh district has eight community development blocks. Among the 8 blocks, one block Kanalichhina was selected purposively from the district being highest in net sown area 5, 950 ha. (Sankhyiki Patrika of Pithoragarh 2020).

As per the list of organic and non-organic farmers, from each village 10 organic farmers and 10 non-organic farmers were selected randomly. In this study those farmers which are certified by PKVY (Paramparagat Krishi Vikas Yojna), NPOP (National Programme for Organic Production) and NOP (National Organic Programme) under UOCB

(Uttarakhand Organic Commodity Board), USOCA (Uttarakhand State Organic Certification Agency) were considered as organic farmers. Thus, the total sample size of 60 farmers selected for study, out of which 30 farmers were organic farmers and 30 were non-organic farmers.

The data was collected from both the primary and the secondary sources. The primary data required for the study conducted in the year 2020-2021 was collected using personal interview techniques from farmers doing organic farming and conventional farming with the help of well-structured survey schedule. Secondary data was collected from agriculture department, various Government publications.

To obtain the socioeconomic status of the farmers, information on different socioeconomic variables like age of the head of the family, family size, educational status, operational land holding possessed by the farmer, cropping pattern, occupation and assets owned by farmer like livestock were analysed using simple descriptive statistical tools like averages, percentage, etc.

**Cost components:** CACP cost concepts were used to fulfil the objectives. The following components were considered for cost estimation.

**Fixed Cost:** This includes land rent, land revenue, depreciation of farm implements and interest on fixed capital.

**Variable cost (Direct):** It includes cost of seed/ planting materials and operational inputs.

Cost of hired human labour, cost of hired bullock labour, cost of owned bullock labour, cost of hired machine power, cost of farm produced/ purchased seed, cost of plant protection chemicals, cost of farm produced/ purchased manure, cost of fertilizer, depreciation on farm machinery, equipment and buildings, cost of irrigation, land revenue, land development tax and other taxes, interest on working capital, miscellaneous expenses  
 $Cost A_1 = \text{All actual expenses in cash and kind incurred in production by the producer}$   
 $Cost A_2 = Cost A_1 + \text{rent paid for leased}$

in land: Cost  $B_1 = \text{Cost}A_1 + \text{interest on value of owned fixed capital assets (excluding land)}$ : Cost  $B_2 = \text{Cost } B_1 + \text{imputed rental value of owned land (Net land revenue) and rent paid for leased in land}$ : Cost  $C_1 = \text{Cost } B_1 + \text{imputed value of family labour}$ : Cost  $C_2 = \text{Cost } B_2 + \text{imputed value of family labour}$ : Cost  $C_2^* = \text{Cost } C_2$  worked out at actual wage rate or statutory minimum wage rate, whichever is higher: Cost  $C_3 = \text{Cost } C_2^* + 10 \text{ per cent of Cost } C_2^*$  (for managerial functions performed by farmer).

**Costs:** Costs were analysed in terms of operational costs, material costs and other costs.

- a) **Operational Costs:** Human labour, bullock labour and machine power
- b) **Material Costs:** Seeds, FYM, bio fertilizers, vermicompost, fertilizers and plant protection chemicals and Irrigation charges
- c) **Other costs:** Interest on working capital, depreciation charges, land revenue, landrent and Interest on fixed capital  
Annual depreciation= (Purchase value - Junk Value) / Economic life span of the assets

### Revenue

**Gross return** = Main Product \* Price of Main Product

**Net Return** = Gross return – Cost of production

**Garrett's Ranking Technique was used.** It was helpful to know the problems faced by the farmers. By this technique the scores (ranks) of each individual were taken in response to importance and ranks are quantified.

Percent Position =  $100 (R_{ij} - 0.50) / N_{ij}$

Where,

$R_{ij}$  is the rank given to  $i^{\text{th}}$  item by the  $j^{\text{th}}$  individual.

$N_{ij}$  is the no. of items ranked by  $j^{\text{th}}$  individual.

The percent position of each rank was converted to scores by referring a table given by Garrett and Woodworth (1969). Then for each factor, the scores of individual respondents were summed up and were divided by the total number of respondents from whom scores were gathered. The mean scores for the factors were arranged in descending order and thus ranks were assigned to constraints.

## RESULTS AND DISCUSSION

It includes distribution of sample farmers according to age, education, composition of family, operational land holding, cropping pattern, occupational status, income status and status of livestock which was worked out and presented in this section.

The maximum numbers of farmers are in the range of 40-60 years of age both in organic and inorganic farms. In organic out of the total farmers about 83 percent are in the range of 40-60 age groups. More than 60 years of age are only 4 farmers which contributed 13.33% and below 40 years old only 1 farmer and contributed 3.34% of total number of total organic farmers (Table 1).

In inorganic, in the range of 40-60 years old there are contributed 80% of total number of inorganic farmers. Below 40 years old they are contribute only 3.34% and more than 60 years old contributed 16.66% to the total number of inorganic farmers. This reflected that most population of farmers is of middle age group followed by old age group both in organic and inorganic (Table 1). Similar observations have been reported by Sihare *et al.* (2017).

Distribution of sample organic and inorganic farmers according to their educational level indicated that farmers are educated about 90 percent and 10% of total belonged to illiterate farmers in organic situation. up-to primary level. Farmers which are educated at primary level and high school level contributed about 73 percent and those who are studied till intermediate and above are only 17 percent (Table 2).

In inorganic the maximum number of farmers

**Table 1: Age-wise distribution of sample farmers (Numbers)**

S. No.	Age group (years)	Organic	Inorganic
1.	< 40	1 (3.34)	1 (3.34)
2.	40-60	25 (83.33)	24 (80.00)
3.	>60	4 (13.33)	5 (16.66)
	Overall	30 (100.00)	30 (100.00)
	Average Age	48.57	49.53

Note: Figures in the parentheses indicate percentage to the respective total

belonged to high school level of education and contributed about 37 percent of total number of sample farmers. It is followed by farmers who are educated up-to intermediate or above and contributed 27 percent and primarily educated 20percent. Out of the total sample farms about 17 percent are illiterate. It is reflected from the table-2 that literacy per cent of organic farmers is more than inorganic farmers. So this is indicating that education level more effective in organic sample farms.

It was observed from the table 3 that overall family size more than 8 persons per family of sample farmers out of which in organic 8.09 persons and in inorganic 8.49 persons. Average numbers of male and female members are same about 30 percent in organic farmers. The children are higher in number and contributed 39.06% of total average family size of organic farmers. In case of inorganic farms children are more and contributed about 46 percent to the average family size. Average number of females was slightly higher about 4 percent of males on inorganic sample farmers.

The table 4 shows that operational land holding of sample farmers indicated that maximum farmers are small farmers in both organic and inorganic. In organic farming small farmers contributed 87 percent

**Table 2: Educational status of sample farmers (Numbers)**

S. No.	Education level	Organic	Inorganic
1.	Illiterate	3 (10.00)	5 (16.67)
2.	Primary	12 (40.00)	6 (20.00)
3.	High school	10 (33.33)	11 (36.66)
4.	Intermediate and above	5 (16.67)	8 (26.67)
	Total	30 (100.00)	30 (100.00)

Note: Figures in the parentheses indicate percentage to the respective total

**Table 3: Family composition of sample farmers (Numbers)**

S. No.	Category	Male	Female	Children	Overall
1.	Organic	2.43 (30.04)	2.50 (30.90)	3.16 (39.06)	8.09 (100)
2.	Inorganic	2.13 (25.09)	2.46 (28.97)	3.90 (45.94)	8.49 (100)
	Overall	2.28 (27.50)	2.48 (29.92)	3.53 (42.58)	8.29 (100)

Note: Figures in the parentheses indicate percentage to the respective total

followed by 10 per cent and 3 per cent in medium and marginal group respectively. The average size of land holding was maximum in medium land, 1.40 ha but numbers of farmers were very less, only 10 per cent of the study area. The average land holding is 0.84 ha in inorganic farming. Maximum number of farmers came under category of small farmers; these are 20 in number out of 30. Small farmers having total land holding of 13.51 ha. It is followed by marginal farmers. These are 9 in number and having 3.05 ha landholding.

Cropping pattern of farmers in both cases, organic and inorganic revealed that farmers are growing a number of crops on their farms. Some crops are Paddy, Maize, Finger millet, Wheat, Barley, Mustard, some vegetables and pulses.

Table 5 depicts that major crop grown in kharif season was paddy 0.26 ha. It is followed by maize grown in 0.23 ha, finger millet grown in 0.17 ha and other crops grown only in 0.13 ha of land. Out of the total area kharif season was about 49 and about 51 percent of gross cropped area under rabi season. Major crop grown under rabi season was wheat (0.35ha) followed by barley (0.24ha) and mustard (0.14ha). Net cropped area under organic farming was 0.82ha. The cropping intensity of organic farming was 195.12%

For inorganic farmers area under kharif season was 0.58ha which was 50.43% of gross cropped area. Major crop grown was same as organic farmers, Paddy on an average area of 0.21 ha by sample farmers. It was 18.26% of gross cropped area. It is followed by Maize grown an average area of 0.17 ha, Finger millet 0.12 ha and rest crops grown in 0.08 ha of land. Area under rabi crops were 0.57 ha which was 49.57% of gross cropped area. Wheat was the major crop of rabi season it was contributed 24.35% to the total gross cropped area (Table 5). The cropping intensity of inorganic farm was lower than organic sample farms.

The occupation-wise distribution of sample farmers shown in Table 6 the study reveals that agriculture and allied activities (livestock) were organic farmers

76.67% of farmers and in inorganic farming 66.67% of farmers were in this occupation. Other occupation was service sector 10% of organic farmers and 13.33% of inorganic farmers. Rest of the farmers of organic and inorganic farming was involved in other sectors like business, shops, labor etc.

Table 7 shows that maximum number of sample farmers was having less than one lakh annual income in both organic and inorganic farming. But in inorganic farming farmers were more in number (80% of total) than organic farmers (66.67%). Between 1 to 1.5 lakh annual incomes there were 7 (23.33% of total) farmers in organic and 4 (13.33% of total) farmers in inorganic. In organic 3 (10% of total) farmers were having more than 1.5 lakh income level. While in inorganic 2 (6.67% of total) farmers were having more than 1.5 lakh of income level. It is observed that in organic situation about 33% farmers get above 1 lakh annual income and in

inorganic situation only about 20% farmers get above 1 lakh annual income. That organic production is more profitable as compared to inorganic production. It was observed that a finding in the present study confirms the observation of Kadam (2016).

It is basically the comparison between the organic and inorganic farming by calculating their costs and returns. Study was taken into consideration to determine the profitability of crop enterprise by calculating the costs and returns.

It was revealed that paddy is the main crop in kharif season among both the groups, organic and inorganic. It occupied 32.93 per cent of total organic operational land holding and 36.67 per cent of total inorganic operational land holding. The second major crop of Kharif season was maize. It was occupied 28.05 per cent of total organic operational land holding and 30 per cent of total inorganic

**Table 4: Operational land holding of sample farmers**

Operational land holding (ha)	Organic			Inorganic		
	Selected farmers (no.)	Total land holding (ha)	Average size of landholding (ha)	Selected farmers (no.)	Total land holding (ha)	Average size of landholding (ha)
Marginal (<0.5)	1(3.33)	0.4(1.63)	0.40	9(30)	3.05(16.89)	0.34
Small (0.5-1)	26(86.67)	19.95(81.26)	0.77	20(66.67)	13.51(74.81)	0.68
Medium (>1)	3(10)	4.2(17.11)	1.40	1(3.33)	1.5(8.30)	1.50
Overall	30(100.00)	24.55(100.00)	0.86	30(100)	18.06(100.00)	0.84

Note: Figures in the parentheses indicate percentage to the respective total

**Table 5: Cropping pattern of sample farmers**

S. No.	Crops/ Season	Organic		Inorganic	
		Area (ha)	%	Area (ha)	%
I	Kharif				
1.	Paddy	0.26	16.26	0.21	18.26
2.	Maize	0.23	14.39	0.17	14.78
3.	Finger millet	0.17	10.63	0.12	10.43
4.	Others	0.13	8.13	0.08	6.96
	Total	0.79	49.41	0.58	50.43
II	Rabi				
1.	Wheat	0.35	21.89	0.28	24.35
2.	Barley	0.24	15.00	0.16	13.91
3.	Mustard	0.14	8.76	0.09	7.83
4.	Others	0.08	4.94	0.04	3.48
	Total	0.81	50.59	0.57	49.57
	Net cropped area	0.82	-	0.61	-
	Gross cropped area	1.60	100.00	1.15	100.00
	Cropping intensity (%)	195.12	-	188.52	-

**Table 6: Principal occupational status of sample farmers (Numbers)**

Occupation	Organic		Inorganic	
	Number of farmers	%	Number of farmers	%
Agriculture and allied activities (livestock)	23	76.67	20	66.67
Service sector	3	10.00	4	13.33
Other sectors	4	13.33	6	20.00
Overall	30	100.00	30	100.00

**Table 7: Distribution of sample farmers as per their annual income**

Annual Income (Rs. / Farm)	Organic		Inorganic	
	Number of farmers	%	Number of farmers	%
<1 lakh	20	66.67	24	80.00
1lakh -1.5 lakh	7	23.33	4	13.33
>1.5 lakh	3	10.00	2	6.67
Total	30	100	30	100

operational land holding and third major crop grown in study area was finger millet. It was occupied 21.95 per cent of total organic operational land holding

**Table 8: Input used in organic and inorganic cultivation of paddy crop (Per ha)**

S. No.	Particulars	Organic	Inorganic
1.	Operational inputs		
a.	Human labour (man days)	51.63	56.13
	Family labour	51.63	56.13
b.	Bullock Power (days)	4.69	4.26
	Hired	3.13	2.20
	Owned	1.56	2.06
c.	Machine use (hours)	6.8	7.2
	Hired	5.3	6.2
	Owned	1.5	1.0
2.	Materials		
a.	Seeds (kg)	30	34.20
b.	FYM (tones)	1.5	1
c.	Bio-fertilizers/ organic manure		
1.	PROM (kg)	35.7	-
2.	Vermicompost (tones)	1	-
d.	Bio-pesticides		
1.	Neem extract (kg)	25	-
2.	Neem oil (liters)	3.2	
e.	Chemical Fertilizers (kg)		
1.	DAP	-	40
2.	Urea	-	22
3.	Zinc Sulphate	-	25
f.	Plant protection chemicals		
1.	Chloropyriphos (liters)	-	2
2.	Copper oxy chloride (kg)	-	1.25

and 21.67 per cent of total inorganic operational land holding.

The different quantities of input used in cultivation of different crops. Input used in kharif season crops like Paddy, Maize and Finger millet, for organic and inorganic farmers were given below.

The above Table 8 shows that human labour required in inorganic paddy cultivation was more than organic paddy cultivation. Because in inorganic paddy cultivation there is practices like chemical fertilizer application, unorganized practices in preparation and application of FYM and other practices required more days, so as more human labour. The use of bullock labour was higher (4.69 days/ha) in organic paddy cultivation than inorganic (4.26 days/ha). The machine power required was more in inorganic (7.2 hours) paddy cultivation than organic paddy cultivation (6.8hours) due to improved technology adopted by organic producer. Seed rate was quite similar among organic and inorganic paddy cultivation. It was 30 kg/ha in organic and 34.20 kg/ha in inorganic paddy cultivation. It is due to

**Table 9: Input used in organic and inorganic cultivation of maize crop (Per ha)**

S. No.	Particulars	Organic	Inorganic
1.	Operational inputs		
a.	Human labour (man days)	18.24	20.60
	Family labour	18.24	20.60
b.	Bullock Power (days)	4.60	4.20
	Hired	2.5	2.3
	Owned	2.1	1.9
c.	Machine use (hours)	5.0	6.2
	Hired	3.2	5.4
	Owned	1.8	0.8
2.	Materials		
a.	Seeds (kg)	18.6	17.4
b.	FYM (tones)	1.5	0.9
c.	Bio-fertilizers/ organic manure		
1.	PROM (kg)	50	-
2.	Vermicompost (kg)	100	-
d.	Bio-pesticides		
1.	Neem extract (kg)	35	-
e.	Chemical Fertilizers (kg)		
1.	DAP	-	50
2.	Urea	-	50
3.	Zinc Sulphate	-	30
f.	Plant protection chemicals		
	Chloropyriphos (liters)	-	2.5

different fertility status of land and seed for both. Farm yard manure was commonly required in both organic and inorganic paddy cultivation but applied in different amount. In organic cultivation of paddy there was use of bio-fertilizers to improve the production.

The quantity of input requirement in organic maize cultivation and inorganic maize cultivation is presented in Table 9. Human labour requirement was more in inorganic maize cultivation (20.60 Man days) than organic maize cultivation (18.24 Man days). Bullock power required more in organic maize cultivation (4.60 days/ha) than inorganic maize cultivation (4.20 days/ha). In case of inorganic maize cultivation machine power was higher than organic maize cultivation. Seed requirement was quite more in organic maize cultivation (18.6 kg/ha) than inorganic maize cultivation (17.4 kg/ha). Farm Yard Manure was applied in both type of maize cultivation but in slightly high amount in organic cultivation than inorganic maize cultivation.

Table 10 further shows input requirement for finger millet cultivation in both organic and inorganic. Human labour requirement was more in inorganic

**Table 10: Input used in organic and inorganic cultivation of Finger millet crop (Per ha)**

S. No.	Particulars	Organic	Inorganic
1.	Operational inputs		
a.	Human labour (man days)	21.63	26.13
	Family labour	21.63	26.13
b.	Bullock Power (pair days)	5.5	4.20
	Hired	3.7	2.5
	Owned	1.8	1.7
c.	Machine use (hours)	4.6	4.8
	Hired	3.5	3.1
	Owned	1.1	1.7
2.	Materials		
a.	Seeds (kg)	16.5	18.6
b.	FYM (tones)	1.5	1
c.	Bio-fertilizers/ organic manure		
1.	PROM (kg)	35.7	-
2.	Vermicompost (tones)	1	-
d.	Chemical Fertilizers (kg)		
1.	N	-	60
2.	P	-	40
3.	K	-	40
	Zinc Sulphate	-	25

finger millet cultivation (26.13 Man days) than organic cultivation (21.63 Man days). Seed requirement in organic cultivation was 16.5 kg/ha while in inorganic cultivation 18.6 kg/ha. FYM 1.5 tones/ha applied in organic finger millet cultivation while in inorganic cultivation 1 tones/ha of FYM was applied. In organic cultivation bio-fertilizers like PROM (35.7 kg/ha) and vermin-compost (1 tone/ha) was applied. While in inorganic farming chemical fertilizers like NPK (60: 40: 40) kg/ha and Zinc Sulphate (25kg/ha) was applied.

In the paddy crop different costs were incurred in organic and inorganic cultivation. These costs were operational cost, material cost and other cost shown in Table 11. The total cost incurred in the cultivation of organic paddy was Rs. 43257/ha. Out of the total material cost maximum share contributed by family labour in both organic and inorganic farms about 24%. At the aggregate level cost A1 and A2 were similar and worked out to be Rs. 13890/ha for organic paddy cultivation and Rs. 15138/ha in inorganic paddy cultivation. Cost C2 and cost C2\* were similar and accounts maximum share 90.90 per cent to the cost of cultivation in both cases. Cost B2 was higher than Cost B1 because of addition of rental value of land and occupies 69.20% in organic cultivation of paddy and 68.56% in inorganic paddy cultivation. Cost C1 accounts 53.10% in organic and 55.05% in inorganic. The total cost of cultivation or cost C3 came out to be Rs. 47564/ha in organic paddy cultivation and Rs. 49999/ha in inorganic paddy cultivation.

Cost incurred in organic and inorganic maize cultivation among various components has been shown in Table 12. Total cost incurred in the cultivation of organic maize was Rs. 35409/ha and inorganic maize cultivation Rs. 36877/ha. In inorganic cultivation of maize cost of cultivation was higher than organic cultivation, due to suitable package of practices applied in organic cultivation in study area. Out of the total cost maximum share contributed by other costs in both cases 57.34% in organic and 55.50% in inorganic, followed by operational cost 23.77% and 24.59% and material cost 18.89% and 19.91% in organic and inorganic

maize cultivation. At the aggregate level cost A1 and A2 were similar. Cost C2 and cost C2\* were similar and accounts maximum share 90.90 per cent to the cost of cultivation in both cases. Cost B2 was higher than Cost B1 because of addition of rental value of land and occupies 81.54% in organic cultivation of maize and 80.40% in inorganic maize cultivation. Cost C1 accounts 44.72% in organic and 46.56% in inorganic. Cost C3 was much higher in case of inorganic maize cultivation as compared to organic cultivation.

cultivation of organic finger millet was Rs. 36191/ha. Out of the total cost operational cost Rs. 11196/ha (30.94%) and material cost Rs. 4833 (13.35%). Family labour constituted maximum proportion to the operational cost Rs. 5408/ha (14.94%). It was followed by machine hours Rs. 3038/ha (8.39%) and bullock power Rs.2750/ha (7.60%).At the aggregate level cost A1 and A2 were similar. Cost B2 was higher than cost B1 and occupies 77.32% in organic cultivation of finger millet and 75.32% in inorganic finger millet cultivation. Cost C1 accounts 45.72% in organic and 48.00% in inorganic. The total cost

Table 13 depict that total cost incurred in the

**Table 11: Cost of cultivation of organic and inorganic paddy crop (Rs./ha)**

S.No.	Particulars	Organic		Inorganic	
		Cost	Share (%)	Cost	Share (%)
<b>A.</b>	Operational Cost				
1.	Human labour	10326	23.87	11226	24.66
a.	Family labour	10326	23.87	11226	24.66
2.	Bullock power	2345	5.42	2257	4.96
a.	Hired	1563	3.61	1227	2.70
b.	Owned	782	1.81	1030	2.26
3.	Machine	3169	7.33	3714	8.16
a.	Hired	2505	5.79	2930	6.44
b.	Owned	664	1.54	784	1.72
	Sub-total (1+2+3)	15840	36.62	17197	37.78
<b>B.</b>	Material Cost				
1.	Seeds	1075	2.49	800	1.76
2.	FYM	3832	8.86	3055	6.71
3.	Bio-fertilizers	932	2.15	-	
4.	Chemical fertilizers	-		1949	4.28
5.	Plant protection chemicals	-		1473	3.24
6.	Bio-pesticides	877	2.03	-	
	Sub-total (1+2+3+4+5+6)	6716	15.53	7277	15.98
<b>C.</b>	Other cost				
1.	Interest on working capital@7.5%	459	1.06	497	1.09
2.	Rental value of owned land	18000	41.61	18000	39.54
3.	Land revenue	17.50	0.04	17.50	0.04
4.	Depreciation	1183	2.73	1375	3.02
5.	Interest on value of fixed assets @9%	1041	2.41	1160	2.55
	Sub-total (1+2+3+4)	20701	47.85	21050	46.24
	Grand Total (A+B+C)	43257	100.00	45524	100.00
<b>D.</b>	Cost Concepts				
1.	Cost A1	13890	29.20	15138	30.28
2.	Cost A2	13890	29.20	15138	30.28
3.	Cost B1	14931	31.39	16298	32.59
4.	Cost B2	32914	69.20	34281	68.56
5.	Cost C1	25257	53.10	27524	55.05
6.	Cost C2	43240	90.90	45507	91.01
7.	Cost C2*	43240	90.90	45507	91.01
8.	Cost C3	47564	100.00	49999	100.00

of cultivation or cost C3 came out to be Rs. 39792/ha in organic finger millet cultivation and Rs. 41919/ha in inorganic finger millet cultivation. It was observed that a finding in the present study confirms the observation of Shrestha *et al.* (2014)

The average yield of the paddy crop in case of organic cultivation was 27.00 qt/ha which was comparatively lower than inorganic cultivation 39.39 qt/ha. The average market price was Rs. 2700/qt in case of organic paddy and Rs. 1800/qt in case of inorganic paddy shown in Table 14. Yield of the paddy was very low in organic cultivation due to

lack of plant protection measures and fertilizers. However, in case of market price, of organic produce was higher than inorganic produce.

The average yield of maize was 45 qt/ha in case of organic cultivation which was comparatively lower than inorganic cultivation 60 qt/ha but in case of gross return which provided Rs. 99026/ha much higher than Rs. 96165/ha in inorganic sample farms. The net returns over cost A1, A2, B1, B2, C1, C2, C2\* and C3 in organic were higher than inorganic situation (Table 15). The output-input ratio was 2.54 in organic and 2.37 in inorganic on the study area is

**Table 12: Cost of cultivation of organic and inorganic maize crop (Rs. /ha)**

S.NO.	Particulars	Organic		Inorganic	
		Cost	Share (%)	Cost	Share (%)
A.	Operational Cost				
1.	Human labour	3648	10.30	4260	11.55
a.	Family labour	3648	10.30	4260	11.55
2.	Bullock power	2300	6.50	2189	5.94
a.	Hired	1270	3.59	1225	3.32
b.	Owned	1030	2.90	964	2.61
3.	Machine	2469	6.97	2620	7.10
a.	Hired	1551	4.38	2218	6.01
b.	Owned	918	2.59	402	1.09
	Sub-total (1+2+3)	8417	23.77	9069	24.59
B.	Material Cost				
1.	Seeds	1024	2.89	2090	5.67
2.	FYM	2795	7.89	1826	4.95
3.	Bio-fertilizers	1875	5.30	-	-
4.	Bio-pesticides	996	2.81	-	-
5.	Chemical fertilizers	-	-	2301	6.24
6.	Plant protection chemicals	-	-	1125	3.05
	Sub-total (1+2+3+4+5+6)	6690	18.89	7342	19.91
C.	Other cost				
1.	Interest on working capital@7.5%	430	1.21	456	1.24
2.	Rental value of owned land	18000	50.83	18000	48.81
3.	Land revenue	17.50	0.05	17.50	0.05
4.	Depreciation	967	2.73	1043	2.83
5.	Interest on value of fixed assets @9%	887	2.51	949	2.57
	Sub-total (1+2+3+4+5)	20302	57.34	20466	55.50
	Grand Total (A+B+C)	35409	100.00	36877	100.00
D.	Cost Concepts				
1.	Cost A1	12874	33.07	13668	33.71
2.	Cost A2	12874	33.07	13668	33.71
3.	Cost B1	13761	35.35	14617	36.05
4.	Cost B2	31744	81.54	32600	80.40
5.	Cost C1	17402	44.72	18877	46.56
6.	Cost C2	35392	90.90	36860	90.90
7.	Cost C2*	35392	90.90	36860	90.90
8.	Cost C3	38932	100.00	40546	100.00

quite good in organic situation.

The Table 16 further reveals that average yield of finger millet was about 41 percent lower in case of organic cultivation than inorganic cultivation. The average market price was Rs. 4575/qt and Rs. 3050/ha in organic and inorganic respectively.

To find out the constraints in study area Garrett Ranking was used and shown in Table 17. It was observed that lack of knowledge of organic production technology holds first rank with mean score of 71.75. Similar observations have been reported by Magarvadiya, D. K. and Patel, V. T. (2014). It was followed by lack of specialized market for organic produce having mean score 62.77. Third

constraint was required long period to get positive response from the ecosystem with 60.40 mean score. The fourth rank was occupied by 52.96, the constraint initial yield loss. The fifth rank was hold by the constraint lack of knowledge about certification process with mean score 42.63. Uncertainty of irrigation water was also a constraint which hold sixth position with mean score 36.10. The last, seventh rank was hold by the constraint small land holding in study area with mean score of 25.90. Similar observations have been reported by Devi (2020).

Organic agriculture sustains and enhances the health of soil, plant, animal, human and earth. Input used in organic farming was mostly prepared under on-

**Table 13: Cost of cultivation of organic and inorganic finger milletcrop (Rs./ha)**

S. No.	Particulars	Organic		Inorganic	
		Cost	Share (%)	Cost	Share (%)
<b>A.</b>	<b>Operational Cost</b>				
1.	Human labour	5408	14.94	6533	17.14
a.	Family labour	5408	14.94	6533	17.14
2.	Bullock power	2750	7.60	2600	6.82
a.	Hired	1833	5.06	1733	4.55
b.	Owned	917	2.53	867	2.27
3.	Machine	3038	8.39	3127	8.20
a.	Hired	1982	5.48	2085	5.47
b.	Owned	1056	2.92	1042	2.73
	Sub-total (1+2+3)	11196	30.94	12260	32.16
<b>B.</b>	<b>Material Cost</b>				
1.	Seeds	698	1.93	558	1.46
2.	FYM	3085	8.52	2726	7.15
3.	Bio-fertilizers	1050	2.90	-	-
4.	Chemical fertilizers	-	-	2180	5.72
	Sub-total (1+2+3+4)	4833	13.35	5464	14.34
<b>C.</b>	<b>Other cost</b>				
1.	Interest on working capital@7.5%	399	1.10	420	1.10
2.	Rental value of owned land	18000	49.74	18000	47.22
3.	Land revenue	17.50	0.05	17.50	0.05
4.	Depreciation	1050	2.90	1268	3.33
5.	Interest on value of fixed assets @9%	695	1.92	686	1.80
	Sub-total (1+2+3+4+5)	20162	55.71	20392	53.50
	Grand Total (A+B+C)	36191	100.00	38116	100.00
<b>D.</b>	<b>Cost Concepts</b>				
1.	Cost A1	12088	30.38	12897	30.77
2.	CostA2	12088	30.38	12897	30.77
3.	Cost B1	12783	32.12	13592	32.38
4.	Cost B2	30766	77.32	31575	75.32
5.	Cost C1	18191	45.72	20125	48.00
6.	Cost C2	36174	90.90	38108	90.90
7.	Cost C2*	36174	90.90	38108	90.90
8.	Cost C3	39792	100.00	41919	100.00

**Table 14: Gross and net returns on different costs of organic and inorganic paddy crop (Rs./ha)**

S. No.	Particulars	Organic	Inorganic
1.	Yield (qt/ha)	27.00	39.39
2.	Price (Rs./quintal)	2700	1800
3.	Gross Returns	72912	70898
4.	Net Returns Over		
	Cost A1	59022	55760
	Cost A2	59022	55760
	Cost B1	57981	54600
	Cost B2	39998	36617
	Cost C1	47655	43374
	Cost C2	29672	25391
	Cost C2*	29672	25391
	Cost C3	25348	20899
5.	Net Returns (Rs./ha)	25348	20899
6.	Returns per rupee of expenditure	1.53	1.42

**Table 15: Gross and net returns on different costs of organic and inorganic Maize crop (Rs./ha)**

S. No.	Particulars	Organic	Inorganic
1.	Yield (qt/ha)	45.01	60.10
2.	Price (Rs./quintal)	2200	1600
3.	Gross Returns	99026	96165
4.	Net Returns Over		
	Cost A1	86152	82497
	Cost A2	86152	82497
	Cost B1	85265	81548
	Cost B2	67282	63565
	Cost C1	81617	77288
	Cost C2	63634	59305
	Cost C2*	63634	59305
	Cost C3	60094	55619
5.	Net Returns (Rs./ha)	60094	55619
6.	Returns per rupee of expenditure	2.54	2.37

**Table 16: Gross and net returns on different costs of organic and inorganic Finger millet crop (Rs. /ha)**

S. No.	Particulars	Organic	Inorganic
1.	Yield (qt/ha)	16.70	23.60
2.	Price (Rs./quintal)	4575	3050
3.	Gross Returns	76403	71980
4.	Net Returns Over		
	Cost A1	64315	59083
	Cost A2	64315	59083
	Cost B1	63620	58388
	Cost B2	45637	40405
	Cost C1	58212	51855
	Cost C2	40229	33872
	Cost C2*	40229	33872
	Cost C3	36611	30061
5.	Net Returns (Rs./ha)	36611	30061
6.	Returns per rupee of expenditure	1.92	1.72

**Table 17: Constraints faced by farmers in adoption of organic farming**

S.No.	Constraints	Mean score	Rank order
1.	Lack of knowledge of organic production technology	71.75	I
2.	Lack of specialized markets for organic produce	62.77	II
3.	Requirement of long period to get positive response from the ecosystem	60.40	III
4.	Initial yield loss	52.96	IV
5.	Lack of knowledge about certification process	42.63	V
6.	Uncertainty of irrigation water	36.10	VI
7.	Small land holding/ land in patches	25.90	VII

farm conditions. Therefore, training programs and skill development programs should be organized for farmers by concerned agencies to promote organic farming. Currently market demand for organic products is increasing. There should be development of markets at local, regional and national level to promote organic farming. Besides this, a minimum support price should be decided for organic products at market like other inorganic produce to encourage the farmers towards organic farming.

## REFERENCES

- Charyulu, D. K. and Biswas, S. (2010). Economics and efficiency of organic farming vis-à-vis conventional farming in India. Indian Institute of Management. Ahemdabad, 26p.
- Devi, N. (2020). Constraints perceived by the farmers of Himachal Pradesh in organic farming. *Econ. Aff.*, 65(2): 213-218.
- Haneef, R., Sharma, G. and Ahmad, T. (2019). Constraints Faced by Farmers Practicing Organic Farming in Hill Region of Uttarakhand, India. *Int. J. Curr. Microbiol.App. Sci.*, 8(5): 1149-1157.
- Jat, A. (2020). Organic Farming Utilization Status of Vegetable Growers in Jaipur District of Rajasthan. Thesis, Masters of Science in Agriculture, Sri Karan Narendra Agriculture University, Jobner, Rajasthan, India. 197p.
- Kadam, P. (2016). Attitude of the farmers towards integrated pest management technology

- programme in Parbhani district. Thesis, MAU Parbhani, Maharashtra, India. 175p
- Kumar, D., Churpal, D. and Yadav, N. (2011). Socio-economic condition of wheat growers in Udham Singh Nagar district of Uttarakhand. *J. Pharmacogn. Phytochem.* 8(2): 226-229.
- Magarvadiya, D. K. and Patel, V. T. (2014). Knowledge and Attitude of Farmers Regarding Biofertilizers. *Guj. J. Extn. Edu.* 25(2): 149-151.
- Prajapati, R. C., Mistry, J. J. and Patel, D. B. (2018). Perception of farmers about organic farming. *Gujarat J. Ext. Edu.*, 29(1): 36-39.
- Roy, M. L., Chandra, N., Kharbikar, H. L., Joshi, P. and Jethi, R. (2013). Socio-economic status of hill farmers: An exploration from Almora district in Uttarakhand. *Int. J. Agric. Fd. Sci. Technol.*, 4(4): 353-358.
- Rubinos, R., Jalipa, A. T. and Bayacag, P. (2007). Comparative economic study of organic and conventional rice farming in Magsaysay, Davao Del Sur. *J. Conv. Stats.*, 17p.
- Shrestha, K., Shrestha, G. and Pandey, P. R. (2014). Economic analysis of commercial organic and conventional vegetable farming in Kathmandu valley. *J. Agric. Environ.*, 15: 58-71.
- Sihare, A., Bisht, K., Singh, S. P. and Raghuvanshi, S. (2017). Farmers' knowledge related to organic farming: A study in Tikamgarh district of Madhya Pradesh. *J. of Progressive Agric.*, 8(1): 123-129.
- Sudheer, P. (2013). Economics of organic versus chemical farming for three crops in Andhra Pradesh, India. *J. Org. Syst.*, 8(2): 36-49.
- Verma, S. K., Sengar, R. S., Yadav, K. N. and Suryawanshi, R. K. (2011). Constraints in adoption of recommended organic farming practices in Chhattisgarh state. *Res. J. Agric. Anim. Sci.*, 26(4): 103-107.

Received: November 25, 2024

Accepted: December 21, 2024