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

[Vol. 22(1) January-April 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. S.P. Singh, 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. Alaknanda Ashok, Ph.D., Dean, College of Technology, G.B. Pant University of Agri. & Tech., Pantnagar, India
Dr. Alka Goel, Ph.D., Dean, College of Community 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., IRRI 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

PANTNAGAR JOURNAL OF RESEARCH

Vol. 22(1) January-April 2024

CONTENTS

Productivity, nutrient uptake and economics of sweet corn (*Zea mays* L. var. *saccharata*) under different planting geometry and NPK levels **1-7**
AMIT BHATNAGAR, SAILESH DEB KARJEE, GURVINDER SINGH and DINESH KUMAR SINGH

Integrated effect of natural farming concoctions and organic farming practices with various NPK doses on quality of bread wheat **8-13**
PRERNA NEGI, MOINUDDIN CHISTI and HIMANSHU VERMA

Characterization and fertility capability classification of some soils in the rain forest zone of Edo state, Nigeria **14-25**
OKUNSEBOR, F.E., OGBEMUDIA, I. and OKOLIE, S. I.

Characterization and classification of guava growing soils of North-East Haryana according to frame work of land evaluation (FAO, 1993) **26-35**
DHARAM PAL, MANOJ SHARMA, R.S. GARHWAL and DINESH

Interactive impact of heavy metals and mycorrhizal fungi on growth and yield of pepper (*Capsicum annuum* Linn.) **36-47**
SHARMILA CHAUHAN, MOHINDER SINGH, SNEHA DOBHAL, DEEKSHA SEMWAL and PRAVEEN

Response of chilli (*Capsicum annuum* var. *annuum* L.) to different nutrient management practices **48-58**
SHEETAL, K.C. SHARMA, SHIVAM SHARMA, NEHA SHARMA, D.R. CHAUDHARY, SANDEEP MANUJA and AKHILESH SHARMA

Trend detection in weather parameters using Mann-Kendall test for *Tarai* region of Uttarakhand **59-67**
SHUBHIKA GOEL and R.K. SINGH

Comparative study of antioxidant potential of fresh peel from different citrus species **68-74**
TARU NEGI, ANIL KUMAR, ARCHANA GANGWAR, SATISH KUMAR SHARMA, ANURADHA DUTTA, NAVIN CHAND SHAHI, OM PRAKASH and ASHUTOSH DUBEY

Suitability of Quinoa Grains (*Chenopodium Quinoa Willd.*) for development of Low Glycemic Index Biscuits **75-84**
RUSHDA ANAM MALIK, SARITA SRIVASTAVA and MEENAL

A study on dietary intake among school-going adolescent girls of Udaipur, Rajasthan during COVID-19 **85-92**
JYOTI SINGH and NIKITA WADHAWAN

Nutritional and sensory evaluation of gluten free chapatti developed using underutilised food sources **93-98**
AYUSHI JOSHI, ARCHANA KUSHWAHA, ANURADHA DUTTA, ANIL KUMAR and NAVIN CHANDRA SHAHI

Nutrient-enriched wheat *chapatti* with fresh pea shells (*Pisum sativum l.):* A comprehensive quality assessment **99-109**
AMITA BENIWAL, SAVITA, VEENU SANGWAN and DARSHAN PUNIA

Pearl Millet-Based Pasta and Noodles Incorporated with *Jamun* Seed Powder: Quality Analysis **110-121**
SAVITA, AMITA BENIWAL, VEENU SANGWAN and ASHA KAWATRA

Unlocking the biofortification potential of *Serratia marcescens* for enhanced zinc and iron content in wheat grains **122-131**
BHARTI KUKRETI and AJAY VEER SINGH

Antioxidant and anti-inflammatory properties of sun-dried leaves and fruits of wild *Pyracantha crenulata* (D. Don) M. Roem. **132-141**
SUGANDHA PANT, PREETI CHATURVEDI, AAKANSHA VERMA, MANDEEP RAWAT, VAISHNAVI RAJWAR and KAVITA NEGI

Studies on productive herd life, longevity, and selective value and their components in crossbred cattle **142-150**
SHASHIKANT, C.V. SINGH and R.S. BARWAL

Studies on replacement rate and its components in crossbred cattle **151-157**
SHASHIKANT, C.V. SINGH, R.S. BARWAL and MANITA DANGI

Principal component analysis in production and reproduction traits of Frieswal cattle under field progeny testing **158-163**
OLYMPICA SARMA, R. S. BARWAL, C. V. SINGH, D. KUMAR, C. B. SINGH, A. K. GHOSH, B. N. SHAHI and S. K. SINGH

Degenerative renal pathology in swine: A comprehensive histopathological investigation in Rajasthan, India **164-169**
SHOBHA BURDAK, INDU VYAS, HEMANT DADHICH, MANISHA MATHUR, SHESH ASOPA, RENU

Evaluation of histopathological changes on acute exposure of profenofos in Swiss albino mice **170-177**
SONU DEVI, VINOD KUMAR, PREETI BAGRI and DEEPIKA LATHER

Temporal and spatial performance of rapeseed and mustard oilseed in India: A study in the context of Technology Mission on Oilseeds[1] **178-190**
LEKHA KALRA and S. K. SRIVASTAVA

Comparative economics of maize cultivation in major and minor maize producing districts of Karnataka – a study across farm size groups **191-203**
GEETHA, R. S. and S. K. SRIVASTAVA

A study on Usefulness of Participatory Newsletter for Potato growers in Udham Singh Nagar district of Uttarakhand **204--209**
RAMESH NAUTIYAL and ARPITA SHARMA KANDPAL

Training Needs of Hortipreneurs in Value Addition and fruit crop production in Kumaon Hills of Uttarakhand **210-215**
KRITIKA PANT and ARPITA SHARMA KANDPAL

Post-training Knowledge Assessment of the rural women about Mushroom Cultivation under TSP project, funded by ICAR **216-220**
ARPITA SHARMA KANDPAL, S. K. MISHRA and OMVEER SINGH

UAV Technology: Applications, economical reliance and feasibility in Indian Agriculture **221-229**
A. AJAY and S. SAI MOHAN

https://doi.org/10.67063/pjr.vol.22.issue.01.25

Post-training Knowledge Assessment of the rural women about Mushroom Cultivation under TSP project, funded by ICAR

ARPITA SHARMA KANDPAL[1*], S. K. MISHRA[2]and OMVEER SINGH[3]

[1]Department of Agricultural Communication,[2] Department of Plant Pathology, [3]Department of Horticulture, College of Agriculture, G. B. Pant University of Agriculture and Technology, Pantnagar- 263145 (U.S. Nagar, Uttarakhand)
[*]Corresponding author's email id: sharmaarpita35@gmail.com

ABSTRACT: Mushroom cultivation is acknowledged as a technically viable and lucrative agricultural practice, acknowledged by both researchers and farmers as a means to generate substantial income, employment opportunities, and foster rural development. Initiatives aimed at employment generation and poverty alleviation play a pivotal role in fortifying the socio-economic status of marginalized populations, particularly rural women. Numerous agricultural universities, KrishiVigyan Kendras, and research centres have organized extensive training programs and workshops over time to equip women with the necessary skills for mushroom cultivation. Consequently, training initiatives have gained widespread acceptance as a strategy with significant returns on investment. The current research investigation was conducted at GBPUA&T, Pantnagar. Five training sessions on "Techniques of Mushroom production and value Addition" were organized under the Tribal Sub Plan project, funded by ICAR at MRTC, Pantnagar, with a total of 200 SC/ST farm women selected for data collection. Data was gathered through interviews and discussions. The findings from this study revealed that majority of respondents belonged to medium age (53 per cent), primary education (55 per cent), small family size (52.50per cent), Cosmopoliteness (14.50 per cent), medium level of extension contact (76%). Gain in knowledge was increased after implementation of training programme.

Key words: Knowledge, mushroom growers, training

India is predominantly an agriculture-based country, owing to its diverse soil and climatic conditions, which facilitate the production of a variety of crops across different regions. This diversity also presents vast potential for mushroom cultivation, thanks to the ample availability of raw materials and favorable climatic conditions. The FAO has endorsed mushrooms as a valuable food item contributing to the protein nutrition of developing nations. In a country like India, where vegetarianism is prevalent, efforts should be directed towards popularizing vegetable protein sources like mushrooms, as documented by Nagaraj *et al.* (2017).

Mushroom cultivation has garnered recognition as a technically feasible and profitable venture, widely embraced by researchers as a means for higher income generation, employment, and rural development. Moreover, mushroom cultivation can significantly contribute to the efficient utilization of agricultural and industrial waste, thereby aiding in poverty alleviation and providing employment opportunities for educated unemployed youth. (Kandpal *et al.*, 2023).

Extension trainings have been recognized as a means for exchanging ideas within communities, making them a widely accepted strategy with significant returns on investment. (Singh *et al.,* 2010). There is an urgent need to impart technical knowledge to farm women and youth to encourage the adoption of mushroom production as an income-generating activity, thereby enhancing their economic status. Mushroom production is characterized by its simplicity, low cost, suitability for rural areas, and labor-intensive nature, making it capable of providing employment opportunities in both rural and semi-urban areas. (Joshi *et al.,* 2022).

The production of mushrooms can improve the socio-economic conditions of farmers and their families, playing a significant role in poverty alleviation and employment generation for educated unemployed youth in rural and semi-urban areas. (Rahman *et al.,* 2017). Therefore, the present study aims to assess knowledge and skill development for

mushroom production as an enterprise or self-employment opportunity. The training provided by Mushroom Research and Training Centre, G B Pant University of Agriculture and Technology, Pantnagar, aims to empower women and increase their income and become self-reliant entrepreneurs in the future. Hence, this study endeavors to evaluate the knowledge levels of SC/ST farm women regarding different aspects of mushroom cultivation.

MATERIALS AND METHODS

The training program on mushroom production targeted SC/ST farm women interested in self-employment. The study took place at Mushroom Research and Training Centre, G B Pant University of Agriculture and Technology, Pantnagar during 2023-2024. Five training sessions on "Techniques of Mushroom production and value Addition" were organized under the Tribal Sub Plan project, funded by ICAR at MRTC, Pantnagar, with a total of 200 SC/ST farm women selected for data collection. Total 200 trainees received training on mushroom cultivation in five batches. A questionnaire was developed to gather general information and background details of the participants, including their landholding. The questionnaire was divided into two parts: General Information and Knowledge Test. Prior to the training program, a pre-evaluation test was conducted to assess the participants' existing knowledge levels regarding cultivation techniques, spawn preparation, substrate preparation, marketing, preservation, value addition, and other related aspects. The training program provided comprehensive instruction on various aspects of mushroom production. Following the completion of the training course, a post-evaluation was conducted to evaluate the knowledge acquired by the trainees and the effectiveness of the training. The deviation or gain in knowledge was calculated by comparing the scores obtained in the pre- and post-training knowledge tests.

RESULTS AND DISCUSSION

In this section, the findings on the farmers' selected characteristics have been discussed and a summary profile of these characteristics is presented in Table 1.

Table 1: Distribution of respondents according to socio-economic status (N=200)

S. No.	Category	Number	Percentage	
1.	Age	Young (Up to 35)	87	43.50
		Medium (35-45)	106	53.0
		Old (Above 45)	7	3.5
2.	Education	Can sign only	17	8.50
		Primary education	110	55
		Secondary education	63	31.50
		Above secondary	10	5
3.	Family size	Small family (up to 4 members)	105	52.50
		Medium family (5 to 7 members)	67	33.50
		Large family (above 7 members)	28	14
4.	Annual family income	Low income (up to 60,000)	61	30.50
		Medium income (61,000 to 120000)	131	65.50
		High income (above 120000)	8	4
5.	Extension media contact	Low contact	25	12.50
		Medium contact	153	76.50
		High contact	22	11
6.	Organizational participation	Low participation	21	10.50
		Medium participation	159	79.50
		High participation	20	10
7.	Innovativeness	Low innovative	38	19
		Medium innovative	154	77
		High innovative	8	4

Socio-economics characteristics of respondents: Table 1 indicates that an overwhelming majority (53%) of the respondents belonged to middle age followed by young aged category (43.50%) where considerable proportion of the respondents had primary education (55%) and small sized households (52.50%). The highest proportion (65.50%) of the trained farm women had medium annual income whereas only 33.50 % of them had low annual income. An overwhelming majority of the respondents had low to medium extension contact (76.50%) and low organizational participation (79.50%). More than two-thirds (77%) of the respondents had medium innovativeness while only 19% of them had low innovativeness.

On the basis of above findings this can be concluded that the predominance of middle-aged and young respondents suggests that these age groups are actively engaged in agricultural activities, highlighting the need to tailor interventions that cater to their specific needs and preferences. The high proportion of respondents with primary education highlights the importance of designing extension programs and training materials that are accessible and comprehensible to individuals with varying levels of educational attainment. This could facilitate the dissemination of agricultural innovations and best practices more effectively among this demographic. The prevalence of small-sized households among respondents indicates potential challenges related to resource allocation and labor availability within farming households. Policy initiatives aimed at supporting smallholder farmers with access to credit, technology, and markets could contribute to improving productivity and livelihoods in these contexts. The distribution of income among trained farm women reflects existing disparities in economic well-being, with a significant proportion reporting medium incomes. Efforts to enhance income-generating opportunities through skill development, market linkages, and value addition could contribute to reducing income inequality and improving overall economic outcomes for women in agriculture. The levels of extension contact and organizational participation highlight the importance of strengthening agricultural extension services and fostering collaboration among farming communities.

Table: 2: Gain in knowledge after training with respect to different components (N=200)

S. No.	Parameters	Pre training (%)	Post training (%)	Change in knowledge (%)
1.	Preparation of compost.	25 (12.50)	186 (93)	161(80.5)
2.	Method of spawn preparation.	48 (24)	195(97.5)	147(73.5)
3.	Suitable temp for spawn production.	3 (1.5)	189 (94.5)	186(93)
4.	Importance of casing.	38 (19)	190 (95)	152(76)
5.	Nutrition and health benefits.	56 (28)	191(95.5)	135(67.50)
6.	Preparation of spawn.	47(23.5)	198(99)	151(75.5)
7.	Harvesting methods.	56(28)	184(92)	128(64)
8.	Different mushroom recipes.	3(1.5)	200(100)	197(98.5)
9.	Preservation techniques.	19 (9.5)	188(94)	169(84.5)
10.	Government schemes for mushroom growers.	17(8.5)	197(98.50)	180(90)
11.	Use of social media in Mushroom Cultivation.	8(4)	192(96)	184(92)
12.	Economic profits.	67(33.5)	189(94.50)	122(61)
13.	Women friendly avenues.	36 (18)	193(96.50)	157(78.50)
14.	Requires less land to grow.	67(33.5)	190(95)	123(61.50)
15.	Needs less amount of money.	89(44.5)	190(95)	101(50.50)
16.	Gives quick return in time.	13(6.5)	198(99)	185(92.50)
17.	Effect of Climatic condition.	6(3)	187(93.50)	181(90.50)
18.	Species of mushrooms.	90(45)	199(99.5)	109(54.50)
19.	Eco-friendly crop.	89(44.5)	197(98.5)	108(54)
20.	Contain equal protein to other non-veg food.	16(8)	198(99)	182(91)
21.	Disease and its effects on mushroom cultivation.	17 (8.50)	185(92.5)	168 (84)
22.	Clean knife and gloves should be used for mushroom production.	5 (2.5)	179(89.5)	174(87)
23.	Processing of mushroom before the sale.	9(4.5)	184 (92)	175(87.5)

Initiatives that promote farmer-to-farmer learning and networking could enhance knowledge-sharing and innovation diffusion within these communities. The observed levels of innovativeness among respondents suggest a moderate readiness to adopt new technologies and practices. Strategies such as demonstration plots, farmer field schools, and incentive-based approaches could be effective in encouraging the adoption of innovative agricultural practices and technologies among this population.

Increase in Knowledge Level

Pre-training and post-training scores were computed for all sub-components of mushroom production (Table 2). Initially, it was evident that participants had insufficient knowledge across all aspects of the training program. However, following the training sessions, there was a notable improvement in knowledge across all domains. Significant enhancements were observed in various sub-components, including understanding of the nutritive value, optimal growing conditions, mushroom types, suitable substrates, importance of casing, quality spawn production, harvesting techniques, marketing strategies, preservation methods, and mushroom recipes. The most remarkable increase in knowledge was seen in the "Different mushroom recipes" category, with a gain of 98.5%, followed by "Effect of Climatic condition" (90.5%) and "Government schemes for mushroom growers" (90%). Substantial knowledge gains were also noted in areas such as "Use of social media in Mushroom Cultivation" (92%), "Quick return in tim≥ (90.5%), and "Suitable temperature for spawn production" (93%). Furthermore, it was observed that after the training, 80.5% of respondents demonstrated improved knowledge regarding "Preparation of compost," while 76% exhibited enhanced understanding of the "Importance of casing." Additionally, 87% of respondents showed increased awareness of the importance of using clean knives and gloves for mushroom production. Thus, Knowledge level was enhanced after implementation of training programme.

The findings from the analysis of pre-training and post-training scores highlight the effectiveness of the training program in improving participants' knowledge across various aspects of mushroom production. Initially, participants demonstrated insufficient knowledge in all training domains, reflecting the need for capacity-building interventions in mushroom cultivation. Following the training sessions, a notable and statistically significant improvement in knowledge was observed across all sub-components of mushroom production. This improvement suggests that the training program successfully addressed key gaps in understanding among participants. The most remarkable increase in knowledge was observed in areas related to practical application and diversification of mushroom utilization, such as "Different mushroom recipes," "Effect of Climatic condition," and "Government schemes for mushroom growers." This substantial gain highlights the importance of not only imparting technical knowledge but also emphasizing the broader socio-economic and market-oriented aspects of mushroom farming. Significant improvements were also noted in specific technical areas, including "Use of social media in Mushroom Cultivation," "Quick return in time," and "Suitable temperature for spawn production." These findings suggest that participants gained valuable insights into contemporary practices and technological advancements in mushroom cultivation. Moreover, the observed improvements in understanding concepts such as "Preparation of compost" and the "Importance of casing" highlight the practical relevance of the training program in enhancing participants' proficiency in essential techniques and processes of mushroom production. The increased awareness regarding hygiene practices, demonstrated by the majority of respondents recognizing the importance of using clean knives and gloves for mushroom production, reflects a positive shift towards adopting best practices that can contribute to product quality and safety. Overall, the findings indicate that the training program effectively enhanced participants' knowledge and skills in mushroom production, thereby potentially improving their capacity to engage in sustainable and profitable mushroom farming practices. Future evaluations could focus on assessing the longer-term impacts of such training interventions on

participants' livelihoods, adoption of new technologies, and contribution to local agricultural development. Additionally, continuous capacity-building efforts and knowledge dissemination initiatives could further strengthen the resilience and competitiveness of mushroom growers within the broader agricultural sector.

CONCLUSION

In conclusion, the study highlights the significant knowledge gain achieved by participants following their exposure to training in mushroom production. The analysis of pre-training and post-training scores reveals significant enhancements in participants' knowledge across various aspects of mushroom production following the implementation of the training program. Initially identified knowledge gaps were effectively addressed, leading to a substantial improvement in understanding among participants. The most notable improvements were observed in practical application areas such as different mushroom recipes, climatic conditions' effects on cultivation, and awareness of government schemes supporting mushroom growers. These gains highlight the training program's success in imparting not only technical knowledge but also market-relevant skills and socio-economic insights. Specific technical aspects related to modern practices, including the use of social media in cultivation, optimization of production timelines, and spawn production techniques, also demonstrated marked increases in understanding among participants.
Furthermore, improvements in fundamental techniques such as compost preparation, casing importance, and adherence to hygiene practices underscore the program's effectiveness in equipping participants with essential skills for successful mushroom cultivation.

In conclusion, the observed enhancements in participants' knowledge levels following the training program suggest its positive impact on building capacity and promoting sustainable practices within the mushroom farming sector. These outcomes highlight the importance of targeted training interventions in fostering agricultural development and empowering farmers to capitalize on emerging opportunities in mushroom production. Continued support through similar capacity-building initiatives is crucial for sustaining and expanding the positive impacts witnessed in this study, ultimately contributing to improved livelihoods and agricultural resilience among mushroom growers.

REFERENCES

Joshi, A., Kandpal, A. S. and Mishra, S. K. (2022). Training need assessment of Mushroom growers and Constraints: A study in Nainital district of Uttarakhand. *Mushroom Research,* 31(2): 187-193

Kandpal, A. S., Kashyap, S. K. and Mishra, S. K. (2023). Mushroom Cultivation through White Button Mushroom (*Agaricus bisporus*) for economic empowerment under ICAR-Farmer First Project in Uttarakhand. *Agrica*., 12 (1) :86-90.

Nagaraj R., Arun K. P., Hanumanthaswamy B.C., Jyoti M. R. (2017). Mushroom Production for Self Employment-An Impact Study. *Int. J. Curr. Microbiol. App. Sci*., 6(9):2991-2997.

Rahman, M. S., Hossain, K. Z., Ali, M. S. and Afroz, F. (2017). Effectiveness of Training Programme on Mushroom Cultivation. *International Journal of Science and Business*, 1(3): 88-102.

Singh, K., Peshin, R., Saini, S. K. (2010). Evaluation of Agricultural Vocational training programmes conducted by the Krishi Vigyan Kendras (Farm Science Centre's) in Indian Punjab. *Journal of Agriculture and Rural Development in the Tropics and Subtropics*, 111(2):65-77.

Received: April 01, 2024
Accepted: April 22, 2024