



Conduction of Demonstration and Awareness Programme on Trellis (Machan) System for Cucumber Cultivation among Farmers in Rajnandgaon District

*Sunil Kumar Gupta¹, Kishan Kumar Sharma², Subuhi Nishad³ and Medha Saha⁴

¹Ph.D. Scholar, NSS Volunteer, Department of Post Harvest Management, Pt. K.L.S. College of Horticulture and Research Station, Rajnandgaon, Chhattisgarh, India

²Assistant Professor, Department of Plant Pathology, NSS Programme Officer, Pt. K.L.S. CHRS, Rajnandgaon, Chhattisgarh, India

³NSS Coordinator, Indira Gandhi Krishi Vishwavidyalaya (IGKV), Raipur, Chhattisgarh, India

⁴Assistant Professor, Department of Floriculture and Landscape Aarchitecture, NSS Programme Officer, Pt. K.L.S. CHRS, Rajnandgaon, Chhattisgarh, India

*Corresponding Author's email: sunilguptahorti@gmail.com

The present study was conducted during 2025–2026 to create awareness among farmers regarding scientific cucumber cultivation using the Trellis (Machan) system and to assess their knowledge and perception about the technology. The programme was conducted in selected villages of Rajnandgaon, Dongargaon and Dongargarh blocks of Rajnandgaon district. Practical demonstrations covered field preparation, raised bed preparation, mulching, drip irrigation, construction of the trellis structure, sowing, vine training, pruning, fertigation, pest and disease management, harvesting, grading and post-harvest handling. Farmers were also informed about the economic and production benefits of the system. The programme showed that the Trellis system improves vine growth, sunlight interception and air circulation and helps in producing clean, straight and marketable fruits. It also reduces fruit rot and disease incidence and makes harvesting and other crop management operations easier. Most participating farmers expressed willingness to adopt the technology after observing its practical advantages. Regular awareness programmes, practical training, demonstration plots, technical guidance and use of locally available materials can help in wider adoption of the Trellis (Machan) system for profitable and sustainable cucumber cultivation.

Keywords: Cucumber cultivation, Machan system, Farmer awareness, Demonstration, Rajnandgaon.

Introduction

Vegetables are an essential component of human diet and play an important role in nutritional security, food diversification and improvement of public health. They are rich sources of vitamins, minerals, dietary fibre, antioxidants and other bioactive compounds. In India, vegetable cultivation has an important place in horticulture because of its higher productivity, shorter duration and economic returns compared with many field crops. The horticulture sector also provides employment opportunities to a large number of rural households. Among vegetable crops, cucumber (*Cucumis sativus* L.) is widely cultivated in tropical and subtropical regions. It is used for fresh consumption, salad preparation, pickling and processing. The crop has a short duration, early harvesting and continuous fruiting, which can provide regular income during the harvesting period. Cucumber belongs to the family Cucurbitaceae and has a vining growth habit, tendrils and good response to training and support systems. In Chhattisgarh, particularly in Rajnandgaon district, cucumber cultivation

has expanded because of favourable climatic conditions, irrigation facilities and market demand. However, many farmers still follow the conventional ground-spreading method. In this method, vines spread directly on the soil surface, which may result in poor air circulation, higher disease incidence, fruit rotting, irregular fruit shape, difficulty in harvesting, increased weed growth and lower marketable yield. Soil contact may also cause mechanical damage and contamination of fruits. The Trellis (Machan) system provides vertical support to cucumber vines using materials such as bamboo poles, wooden or iron poles, GI wire, nylon ropes and plastic nets. Vertical training allows better sunlight exposure and air circulation. It helps in maintaining cleaner fruits, reducing soil contact, and making crop management and harvesting easier. The available literature has also reported better marketable yield and fruit quality under trellis cultivation. Therefore, a demonstration and awareness programme was conducted among farmers of Rajnandgaon district to improve their technical knowledge and encourage adoption of scientific cucumber cultivation practices.

Objectives

1. To study the profile characteristics of the farmers.
2. To conduct awareness among farmers about Trellis (Machan) system use in cucumber farming.
3. To demonstrate the staking method.
4. To gain knowledge about the benefits of the Trellis (Machan) system in cucumber cultivation and promote sustainable practices.
5. To study the problems faced by farmers while using the Trellis system in cucumber farming.

Methodology

The investigation entitled “Conduction of Demonstration and Awareness Programme on Trellis (Machan) System for Cucumber Cultivation among Farmers in Rajnandgaon District” was carried out during 2025–2026. Rajnandgaon district was selected purposively because cucumber cultivation is widely practiced and the district provides suitable conditions for extension demonstrations on the Trellis system.



Fig. 1. Delivering information about Trellis (Machan) system for cucumber (*Cucumis sativus*) cultivation to the farmers

Three blocks, namely Rajnandgaon, Dongargaon and Dongargarh, were selected. The villages selected were Tumbibod and Arjuni from Rajnandgaon block, Barga and Bortalab from Dongargaon block and Chichola from Dongargarh block. The villages were selected because cucumber cultivation was widely practiced, farmers were actively engaged in vegetable cultivation and the villages were convenient for conducting the programme. From each selected village, cucumber-growing farmers were selected for the study. The interview schedule was prepared according to the objectives and included questions on socio-economic profile, existing cultivation practices, awareness of the Trellis system, perceived benefits, constraints and suggestions for wider dissemination. The schedule was prepared in Hindi and was discussed with the advisory committee, subject matter specialists and extension experts before finalization. Primary information was collected through personal interviews using a pre-tested interview schedule before and after the awareness programme. The respondents were informed about the purpose of the study and rapport was developed before collecting information. The awareness programme included lectures, group discussions and practical demonstrations on construction of the trellis structure, vine training, pruning, irrigation, fertigation, nutrient management, integrated pest and disease management and scientific harvesting practices. Printed extension literature and technical guidance were also provided.

Results and Discussion

The study covered farmers from Tumbibod, Arjuni, Barga, Bortalab and Chichola villages. The available respondent profile in the project report shows that the participating sample was male dominated. In the reported table, 25 respondents were male and no female respondent was recorded. Educational status showed that 32% were graduates, 20% had higher secondary education, 20% had high school education, 12% had middle school education, 12% had primary education and 4% were illiterate. In terms of age, 13 respondents belonged to the 36–55 years category, 8 were up to 35 years and 4 were above 55 years. Regarding landholding, 52% were medium farmers with 5.1–10.0 acres, 32% were large farmers with more than 10 acres and 16% were small farmers with 2.6–5.0 acres. The demonstration programme was carried out through a series of field visits and practical activities. Meetings were held with the Sarpanch, Panchayat Secretary, progressive farmers, Rural Agricultural Extension Officer and horticulture officials. Baseline information was collected, followed by demonstrations on field preparation, bed preparation, mulching, drip irrigation and Trellis installation. Further demonstrations covered sowing, vine training, pruning, insect and disease identification, nutrient management, fertigation, irrigation scheduling, harvesting, grading and post-harvest handling. A group discussion and feedback programme was also conducted at the end.

Most farmers were practicing conventional ground trailing and had limited knowledge about vertical cultivation. During interaction, farmers were informed that the Trellis system provides proper support for vertical vine growth, improves sunlight interception and air circulation, and reduces humidity in the crop canopy. Fruits remain suspended above the soil and therefore remain clean, straight and attractive. Soil contact is reduced, which helps in lowering fruit rot, staining and mechanical injury. The system also makes irrigation, fertigation, pruning, plant protection, harvesting and grading easier. The comparison presented in the project report showed that the conventional method has lower initial cost but poorer air circulation, less sunlight interception, lower marketable yield, higher fruit rot and disease incidence, less effective spray coverage, difficult harvesting, soil contact with fruits and lower net return. In comparison, the Trellis system has moderate to high initial cost but better air circulation and sunlight interception, excellent fruit quality, higher marketable yield, lower fruit rot and disease incidence, better spray coverage, easier harvesting, clean fruits and higher net return. Although the initial investment is comparatively higher, the project report notes that better productivity, fruit quality and market price can help recover the additional investment.

The programme improved farmers' understanding of scientific cucumber cultivation. Most participating farmers expressed willingness to adopt the technology in future seasons

after observing its practical advantages. The project therefore indicates that practical demonstrations and regular technical guidance are useful for improving knowledge, confidence and technical skills related to Trellis-based cucumber cultivation.

Conclusion

The demonstration and awareness programme on the Trellis (Machan) system helped farmers understand the importance of scientific cucumber cultivation. Through practical demonstrations, farmers learned about field preparation, mulching, drip irrigation, trellis construction, vine training, pruning, fertigation, pest and disease management, harvesting and grading. The programme showed that the Trellis system can improve fruit quality, increase marketable yield, reduce pest and disease incidence and make crop management easier. Most of the participating farmers showed interest in adopting the technology after observing its practical benefits. Overall, the Trellis (Machan) system is an effective and sustainable cultivation practice that can improve cucumber productivity, enhance farmers' income and promote scientific vegetable cultivation in Rajnandgaon district.

Suggestions

Regular awareness and demonstration programmes should be organized at village level. Farmers should be trained in construction, maintenance and management of trellis structures using locally available materials. Practical training should cover vine training, pruning, fertigation, integrated nutrient management and integrated pest and disease management. Demonstration plots should be established so that farmers can observe the technology under field conditions. Technical literature and advisory services should be made available through the Department of Horticulture, Krishi Vigyan Kendras and agricultural universities. Farmers should also use quality seed, recommended fertilizers, drip irrigation and fertigation, follow timely crop management, monitor pests and diseases, use government schemes and subsidies where applicable, and maintain proper grading, packaging and post-harvest handling.

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Table 1. Comparison between Conventional Ground Cultivation and Trellis (Machan) System in Cucumber.

Particular	Conventional Method	Trellis (Machan) System
Initial cost	Low	Moderate to High
Labour requirement	Moderate	Moderate (during installation)
Air circulation	Poor	Good
Sunlight interception	Less	Better
Fruit quality	Moderate	Excellent
Marketable yield	Lower	Higher
Fruit rot	Higher	Lower
Disease incidence	Higher	Lower
Spray coverage	Less effective	More effective
Harvesting	Difficult	Easy
Fruit cleanliness	Soil contact	Clean fruits
Net return	Lower	Higher

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