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Protected Cultivation of Cut Roses for Year-Round Production

Ashutosh Kumar[1*], Ramanand Patel[2] Rajnish Kumar[3], Subhash Verma[4]

[1]SMS, Horticulture Vegetables KVK Narkatiyaganj, RPCAU Pusa
[2]Scientist (Agrometeorology), Regional Research Station Zone-|| Agwanpur -852202 Saharsa, Bihar, BAU Sabour
[3]Assistant Professor, School of Agriculture, Gyanveer University, Sagar, Madhya Pradesh
[4]Assistant Professor, School of Agriculture, Eklavya University, Damoh, Madhya Pradesh

*Corresponding Author
Ashutosh Kumar*

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INTRODUCTION

Cut roses which belong to the *Rosa* spp. species rank as the top commercial flowering plants grown worldwide because of their beauty their fragrance and their strong market demand which continues to increase in India through both domestic and international markets. However open-field cultivation results in variable quality and time-dependent outputs because environmental conditions change. Therefore, growers use protected cultivation through greenhouse and polyhouse systems to produce high-quality cut roses all year round.

Concept of Protected Cultivation

Protected cultivation enables farmers to grow crops inside controlled environments through greenhouse and polyhouse and shade net house systems which create conditions that farmers can control for temperature and humidity and light intensity and carbon dioxide levels to establish suitable conditions which support plants to grow and bloom and produce better quality products throughout the entire year.

ISSN (E): 2582 – 7022

Types of Protected Structures

Rose growers choose different protected structures according to their local weather patterns and their financial resources because Indian farmers prefer naturally ventilated polyhouses as an affordable solution which operates efficiently in moderate climatic conditions and greenhouse operators choose climate-controlled greenhouses which contain advanced environmental systems that include cooling pads and fans and heating units and automation technologies to achieve precise climate control and shade net houses protect plants from excess sunlight in areas which experience intense solar radiation to cut down light levels and stop plants from overheating.

Climate Requirements

Roses display maximum growth potential when their climatic environment maintains temperature and humidity and light conditions at their designated optimal values which require daytime temperatures between 18°C and 28°C and nighttime temperatures to stay between 15°C and 18°C and relative humidity levels to maintain their growth and disease control should stay between 60 and 75 percent while plants need proper light levels to carry out photosynthesis and create flowers and plants grow better when their carbon dioxide levels remain between 800 and 1000 ppm which results in continuous flower production and better flower quality.

Soil and Growing Media

Roses need well-drained fertile soil which contains organic matter to achieve their best growth results while they prefer soil pH values between 5.5 and 6.5 and protected cultivation systems use soilless growing media like cocopeat and perlite and vermiculite to boost their ability to aerate and retain water and deliver nutrients which results in better root growth and plant development.

Varieties for Cut Rose Production

Selection of suitable varieties is crucial for successful cut rose production under protected conditions, and popular hybrid tea and floribunda varieties include ‘First Red,’ ‘Taj Mahal,’ ‘Grand Gala,’ ‘Top Secret,’ and ‘Avalanche,’ which are preferred for their long stems, attractive buds, uniformity, and extended vase life, making them highly suitable for both domestic markets and export purposes.

Planting and Spacing

The correct methods of planting and spacing roses lead to maximum flower production while maintaining healthy plant development because growers establish rose plants at six to

eight specimens per square meter while maintaining 30 × 45 cm distances which vary according to plant variety and farming method, and growers construct raised beds to achieve better soil drainage and air circulation which promotes deeper root growth that results in stronger plant development and increased crop yields.

Irrigation and Fertigation

Drip irrigation systems with fertigation enable efficient water and nutrient management because the systems provide exact water and nutrient quantities which are delivered to plant roots while the system decreases resource waste and enhances fertilizer effectiveness through balanced delivery of essential elements such as nitrogen and phosphorus and potassium and micronutrients which support continuous flower production and lead to improved stem development and higher agricultural output.

Training and Pruning

The two essential practices of training and pruning function as vital maintenance methods for rose plants grown in protected environments because pinching creates more branches that develop into flowering shoots while disbudding removes extra buds to create bigger blossoms and pruning establishes controlled flowering patterns which create better plant structure with consistent stem development that produces high-quality flowers for increased overall production.

Pest and Disease Management

Protected rose cultivation needs pest and disease management because rose gardens face common insect problems from aphids and thrips and mites and whiteflies and they have major disease threats from powdery mildew and downy mildew and black spot and integrated pest management solutions can help solve these issues through biological control agents and proper sanitation and adequate ventilation and safe pesticide application which protects plant health and growth.

Harvesting and Post-Harvest Handling

Cut roses should be harvested according to market requirements because distant markets need flowers at the tight bud stage to ensure longer vase life and local markets require harvesting at the half-open stage and post-harvest handling involves immediate hydration of stems in clean water and grading based on stem length and bud size and storage at low temperatures of 2 to 5℃ and packaging in corrugated fiberboard boxes to maintain quality and extend vase life during transportation.

Advantages of Protected Cultivation

Protected cultivation of roses provides multiple benefits because it allows rose production throughout the year regardless of seasonal changes and it produces flowers of high quality that have consistent color and size and the system produces higher crop yields and better resource efficiency and the system reduces pest and disease problems through its controlled growing conditions and the system enables growers to achieve better prices and export markets through their continuous delivery of top quality flowers.

Challenge

Challenges rose protection throughout cut rose cultivation because the process relies on special facilities which need expensive building costs and requires workers with technical skills and expert knowledge and another factor is that costs for power and system upkeep will rise because pests and diseases can spread rapidly throughout enclosed spaces and businesses need organizations to function properly in order to achieve their financial targets.

Economic Potential

Protected rose cultivation offers farmers in urban market areas and export hub locations a profitable business model because they can grow their flowers for sale throughout the year at premium prices which results in higher earnings than conventional open-field farming methods.

Advanced Technologies in Rose Cultivation

Protected rose cultivation will develop into a successful industry because advanced technologies create automated climate control systems and precision fertigation and artificial

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intelligence-based crop monitoring and hydroponic systems because these technologies improve product output and product quality and product sustainability and government agencies support protected cultivation through their financial schemes and educational programs and their development of essential facilities.

CONCLUSION

The protected cultivation method for cut rose production establishes an effective system which produces high-quality flowers throughout the year because it creates controlled environments that improve plant development and flower development while facing two main obstacles which include expensive startup costs and complex technical requirements but recent technological progress and institutional backing have made this system more profitable and easier to use.

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