

Efficient Greenhouse Management Strategies for Ornamental Plants Cultivation

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Abstract

Greenhouse ornamentals are part of a 55 billion USD global ornamentals industry. It's important to provide the right growing conditions for attractive plants in the greenhouse in order for them to flourish. This entails controlling elements including crop rotation and spacing, lighting, temperature, irrigation, fertilisation, controlling pests and diseases, and harvesting and post-harvest care. Understanding the unique needs of many plant species is necessary for effective greenhouse management of ornamental plants. Managers of greenhouses may make sure that their decorative plants are beautiful, healthy, and profitable for their operation by using the right management strategies. The importance of greenhouse care for decorative plants is the requirement for specialised knowledge and experience in this area.

Introduction

Greenhouses provide a controlled environment that allows for the cultivation of various plant species, including ornamental plants. Growing ornamental plants for their aesthetic value makes them a vital part of the horticulture sector. However, specialised knowledge and expertise are necessary for efficient greenhouse care of attractive plants. Providing the wrong environment can result in poor plant growth, poor-quality crops, and diminished profitability. The ideal growing conditions for ornamental plants are different from those for food crops. To give the ideal growing circumstances, greenhouse managers in this situation need to be aware of the unique needs of each type of decorative plant. Key greenhouse management practises for ornamental plants are covered in this article, including lighting, temperature, irrigation, fertilisation, pest and disease control, crop rotation and spacing, harvesting, and post-harvest handling. Sustainable pest management techniques are continually being improved due to public preference for ornamentals free of chemical

residues. For bedding plants, foliage plants, flowering potted plants, cut flowers, and foliage plants, specific production processes are used. Growers may produce high-quality ornamental plants that satisfy consumer demand, make revenues, and support the horticultural sector by putting good greenhouse management practises into practise. To maintain the health and good quality of ornamental plants grown in greenhouses, particular expertise and techniques are needed. The following are some essential elements of decorative plant maintenance in greenhouses:

- 1. Lighting:** Specific lighting requirements must be met for ornamental plants to thrive and flower at their best. To encourage healthy growth, growers must offer the proper light intensity, duration, and spectrum. Farmers must offer the right illumination to ensure healthy and high-quality crops because flowering plants need precise lighting conditions to support optimal growth and development. Growers must choose the ideal light duration and intensity for each species because various flower crops have distinct light needs. Some flowers, for instance, need lengthy days with at least 16 hours of light to encourage blossom production, while others need short days with fewer than 12 hours of light to begin flowering. The duration and intensity of light by using artificial lighting, such as high-pressure sodium (HPS) or light-emitting diode (LED) lights. HPS lights are commonly used in greenhouse lighting, as they provide a broad spectrum of light and are relatively affordable



2. **Temperature control:** The temperature needs of ornamental plants vary based on the type and stage of growth. Most flower crops thrive in a temperature range of 55 to 65 degrees Fahrenheit at night and 60 to 75 degrees Fahrenheit during the day. We can employ a range of heating and cooling technologies to control temperature. During the colder months, heating equipment, such as boilers and heaters, are utilised to keep the temperature within the required range. During the hottest months, cooling systems including fans, evaporative cooling pads, and air conditioning are utilised to reduce the temperature within the greenhouse. In order to maintain the required temperature range and produce high-quality crops, temperature sensors can be connected to a computer or automation system that can change the heating or cooling systems as necessary.
3. **Irrigation:** Depending on the species, substrate, and habitat, ornamental plants have various water needs. Choosing the ideal watering schedule is the first step in irrigation management. The type of plant, stage of growth, size of the container, and growing medium are just a few of the variables that affect how frequently plants need to be watered. Plant growth and development can be adversely affected by either overwatering or under watering. Drip irrigation, ebb and flow irrigation, and overhead irrigation are the irrigation methods most frequently employed in greenhouses. Water is delivered to plant roots directly using drip irrigation systems, reducing water waste and preventing water from resting on leaves, which can cause fungus illnesses. Overhead irrigation systems deliver water through sprinklers or misting nozzles, which can be adjusted to provide the appropriate amount of water for each crop.



4. **Pest and disease management:** Pests and diseases that can harm ornamental plants' health and attractiveness are a possibility. Because of how easily diseases and pests can spread among plants in an enclosed space like a greenhouse. Creating an environment that is unfavourable to illnesses and pests is a part of cultural practises. This can be accomplished by following good sanitation procedures, such as clearing away plant debris, keeping growth areas tidy, and monitoring and controlling environmental conditions. To keep an eye out for pests, growers can employ a combination of visual inspections, sticky traps, and pheromone traps. For the development of greenhouse flower crops, effective pest and disease management is crucial. Growers can prevent and control pest and disease issues by employing an Integrated Pest Management strategy that incorporates cultural practises, biological controls, and chemical controls, resulting in healthy, high-quality crops.
5. **Fertilizers:** Ornamental plants require specific nutrients for healthy growth and flowering. Fertilizer management is an important aspect of greenhouse management, as plants grown in containers depend on growers to provide them with essential nutrients. Fertilizers are necessary to promote plant growth, development, and yield. We can use a variety of fertilizers, including liquid fertilizers, slow-release fertilizers, and organic fertilizers. To ensure proper fertilizer application, growers can use fertilizer injectors. Too much fertilizer burn can lead to leaf scorching, stunted growth, and even plant death. To prevent fertilizer burn, growers should follow recommended fertilizer application rates and avoid applying fertilizer to dry plants or in hot weather.
6. **Harvesting and post-harvest care:** Depending on the species and intended application, ornamental plants require varied harvesting and handling techniques. To maintain quality and shelf life, growers must make sure that plants are picked and handled properly.

Conclusion

The management of greenhouses for decorative plants is a specialised sector that calls for knowledge and proficiency in creating the ideal growing environments for these plants. To achieve high-quality crops, every aspect of greenhouse management must be meticulously controlled, from lighting and temperature to pest control and post-harvest care. A greenhouse

business's profitability and success depend on its ability to supply the market with decorative plants that are both wholesome and aesthetically pleasing. As a result, managers of greenhouses must keep up with the most recent innovations, industry best practises, and scientific discoveries. We can create a regulated atmosphere that encourages healthy plant growth and high-quality harvests by putting into practise efficient greenhouse management practises including integrated pest management (IPM), heating and cooling systems, and light management. In conclusion, effective greenhouse management for ornamental plants is crucial to the horticulture sector and calls for specialised skills and knowledge to produce the best outcomes.

References

- Baille, A. (1997, November). Greenhouse structure and equipment for improving crop production in mild winter climates. In *International Symposium Greenhouse Management for Better Yield & Quality in Mild Winter Climates* 491 (pp. 37-48).
- Pardossi, A., Tognoni, F., & Incrocci, L. (2004). Mediterranean greenhouse technology. *Chronica horticultrae*, 44(2), 28-34.
- Slathia, D., Nisa, M. U., Reshi, M., Dolkar, T., & Hussain, S. (2018). Protected cultivation of ornamentals. *Global Journal of Bio-Science and Biotechnology*, 7(2), 302-311.
- Trivellini, A., Toscano, S., Romano, D., & Ferrante, A. (2023). LED lighting to produce high-quality ornamental plants. *Plants*, 12(8), 1667.
- Vox, G., Teitel, M., Pardossi, A., Minuto, A., Tinivella, F., & Schettini, E. (2010). Sustainable greenhouse systems. *Sustainable agriculture: technology, planning and management*, 14.