Baishao' exhibits strong heat-humidity tolerance and low chilling requirements, making it suitable for warm-winter regions. In addition, the integration of open-field and protected cultivation systems can effectively improve production efficiency by extending harvest periods and regulating flowering time, although precise environmental control remains necessary to maintain quality.

Continuous production management is critical for maintaining stable yield and medicinal quality in perennial *P. lactiflora* cultivation. Advances in embryo culture and tissue culture have significantly improved propagation efficiency, providing technical support for standardized seedling production. However, sustainable production still requires effective control of replanting obstacles, as long-term cultivation can disrupt soil microbial communities, reduce nutrient availability, and increase harmful microorganisms. Therefore, integrated management involving standardized propagation, soil health maintenance, optimized cultivation duration, and appropriate post-harvest processing is necessary. Regional studies suggest that four-year-old roots and late September harvesting can provide favorable yield-quality performance, while ecological cultivation approaches may further enhance paeoniflorin accumulation and medicinal quality.

Future development of the *P. lactiflora* industry should focus on green, standardized, and intelligent production systems integrating breeding, propagation, environmental regulation, and digital management. Standardized regeneration technologies, including optimized embryo culture and tissue culture systems, provide a foundation for rapid propagation and germplasm improvement. Meanwhile, the application of AI, IoT, remote sensing, and data-driven decision systems can enable real-time monitoring of environmental conditions, plant growth, irrigation, nutrition, and disease risks. Establishing standardized field datasets and intelligent management platforms will facilitate precision cultivation, improve resource utilization efficiency, and promote the sustainable development of the *P. lactiflora* industry.

Conflict of Interest Disclosure

The author affirms that this research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

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