

the balance between vegetative and reproductive growth. Light and moderate pruning are generally beneficial for maintaining a stable balance between shoot renewal and flower bud formation. Although heavy pruning and renewal pruning may reduce yield in the short term, they can rejuvenate the tree, improve canopy ventilation, and restore long-term productivity. The timing of pruning, as well as its coordination with other orchard management practices, has a significant impact on both fruit appearance and internal quality.

From a practical perspective, growers should avoid adopting a single, rigid pruning pattern. Instead, pruning strategies should be flexibly adjusted according to tree age, tree vigor, cultivar, and planting density. For young trees, training pruning should be the main focus, aiming to establish a well-structured and evenly distributed framework, and to form an open and moderately dense canopy that allows sufficient light penetration. During the full bearing period, moderate annual pruning should be applied, mainly removing overly vigorous branches, crowded branches, and crossing branches, in order to maintain good ventilation and light conditions and promote the formation of fruiting shoots on well-exposed branches. At the same time, appropriate flower and fruit thinning should be combined to regulate crop load and improve fruit size and uniformity. In old or declining orchards, heavy pruning or renewal pruning can be implemented in stages, renewing part of the canopy to stimulate new shoot growth while maintaining a basic level of yield. Throughout the whole growth cycle, pruning should also be coordinated with fertilization, irrigation, pest and disease control, and harvest scheduling, so as to reduce plant stress and avoid excessive vegetative growth.

Looking ahead, improving pruning efficiency and orchard productivity in loquat requires integrating physiological understanding, technological innovation, and precision management. Future research should further clarify the quantitative relationships among pruning intensity, canopy light environment, and source–sink relationships, so as to establish more predictive models for yield and quality responses. The application of remote sensing, digital canopy imaging, and three-dimensional modeling is expected to enable objective evaluation of canopy structure and provide a scientific basis for precision pruning. Mechanized or semi-mechanized pruning tools adapted to loquat canopy characteristics can help reduce labor costs and improve operational consistency. In addition, decision support systems that integrate meteorological data, tree vigor indicators, and historical yield records can assist growers in optimizing pruning timing and intensity under changing climate conditions. By combining these technological advances with improved cultivar breeding, high-density planting systems, and sustainable soil and water management, loquat orchards are expected to achieve higher productivity, better fruit quality, and stronger adaptability to environmental and market changes in the future.

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