

Feature Review

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Effects of Pruning Systems on Fruit Yield and Quality in Loquat

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Abstract This study focuses on loquat (*Eriobotrya japonica* Lindl.) and systematically analyzes how different pruning systems affect yield and fruit quality. By examining the growth habits of loquat, its flowering and fruiting characteristics, and the relationship between canopy structure and yield, the effects of various pruning methods—including light, moderate, heavy, and seasonal pruning—were compared under practical production conditions. Pruning regulates canopy structure, improves ventilation and light penetration, and optimizes the source–sink relationship, thereby significantly influencing flower bud differentiation, fruit set, and fruit development. Moderate pruning can maintain relatively high yield while improving fruit size, soluble solids content, and appearance quality. In contrast, overly light pruning tends to produce smaller fruits, whereas excessive pruning reduces yield. Intensive pruning methods such as double heading help promote the formation of high-quality fruiting branches, improving individual fruit weight and the proportion of premium fruits. Pruning should be coordinated with practices such as flower and fruit thinning, fertilization, irrigation, and planting density management to achieve a balance between yield and quality. A well-designed pruning system is a key technical approach for improving orchard productivity and economic returns, and it plays an important role in the refined management of modern orchards.

Keywords Loquat (*Eriobotrya japonica* Lindl.); Pruning methods; Yield regulation; Fruit quality; Comparative analysis

1 Introduction

Loquat (*Eriobotrya japonica* Lindl.) is an evergreen subtropical fruit tree belonging to the Rosaceae family and has become an increasingly important component of diversified fruit production systems worldwide. Major producing countries include China, Brazil, Spain, Italy, as well as some regions in the Middle East and South Asia. Loquat fruits mature from late spring to early summer, usually during a market window when other fresh fruits are not yet widely available. This allows loquat to “fill the market gap” and obtain relatively high market prices due to its early maturity and unique sensory qualities (Hueso et al., 2021). Loquat fruit is favored for its juicy texture and pleasant flavor, and it is rich in sugars, organic acids, carotenoids, phenolic compounds, vitamins, and mineral nutrients, showing high nutritional value and pharmacological potential (Cai et al., 2019; Tinebra et al., 2022). High-quality loquat for fresh consumption generally has large fruit size, attractive peel color, high soluble solids content, a good balance between sweetness and acidity, and a low incidence of physiological disorders (Deng et al., 2023). In addition to fresh consumption, loquat can be processed into juice, jam, dried slices, fruit wine, and canned products. Its leaves and seeds can also be used as raw materials for health products and functional foods, further increasing its economic value (Dhiman et al., 2022). However, despite its strong development potential, the commercial expansion of the loquat industry in many regions is still limited by relatively low and unstable yields and the difficulty of consistently achieving high fruit quality compared with other pome fruits such as apple and pear (Jing et al., 2023).

Loquat trees are vigorous and tend to form large and dense canopies. Without effective canopy management, trees often become too tall, with poor ventilation and light penetration, outward movement of fruiting positions, and increased susceptibility of flowers and fruits to adverse conditions such as low-temperature injury and sunburn. Proper pruning practices (usually combined with training systems) can help control tree height, improve canopy structure, reduce the occurrence of pests and diseases, and promote the formation of high-quality fruiting branches. Traditional pruning and training methods are mostly based on growers’ experience. Because tree structural