

natural adjustment alone. In practice, hand thinning is usually done during early fruit development or after fruit set, and traditional operations retain only a limited number of fruit per panicle to reduce sink competition and improve fruit growth. This method is valued because it allows precise selection of fruit number and position within each cluster, which is difficult to achieve with less selective approaches. The main constraint is labor demand, since hand thinning is slow, costly, and dependent on trained workers, which limits its efficiency at larger production scales (Figure 2).

Loquat experiments consistently show that manual thinning improves external fruit quality, but the optimal intensity depends on the balance between fruit size and retained yield. In ‘Precoco de Itaquera’, maintaining four flower buds per cluster produced the best overall fruit-quality response, whereas retaining more buds increased cluster weight and yield. Across multiple loquat cultivars, thinning to four fruit per panicle also resulted in superior fruit length, width, and weight, confirming that stronger hand thinning generally favors fruit enlargement. Even so, the practical target is not the most severe thinning possible, because loquat performance also varies with cultivar, climate, and timing of intervention. Evidence from other fruit crops points to the same compromise, with moderate hand thinning at an early stage often giving high fruit quality without the disproportionate yield loss caused by very severe crop reduction.



Figure 2 Manual fruit thinning process and crop-load adjustment in loquat production

6.2 Research progress in chemical and mechanical-assisted thinning

Chemical thinning in loquat has been studied mainly as an alternative to expensive hand thinning, with naphthaleneacetic acid-related compounds giving the most consistent results. NAAm applied at the end of bloom increased fruit diameter by about 11% to 18%, improved grading, and advanced harvest, while total yield declined only slightly. A separate study found that naphthaleneacetic acid at 20 mg L⁻¹ applied 10-15 days after anthesis was the most effective treatment for thinning and increasing average fruit size (Agustí et al., 2000). Chemical thinning therefore appears useful when growers need earlier crop-load adjustment than hand thinning can provide, especially because late manual thinning has been described as both expensive and of limited usefulness in loquat.

Its main limitation is that chemical thinning is highly sensitive to dose, timing, and environmental conditions. In ‘Golden Nugget’, higher NAA doses caused stronger thinning and larger fruit, but they also produced the lowest