influences flowering dynamics at the whole-tree level: removing the main inflorescence can induce re-flowering, but the secondary inflorescences have fewer flower buds and branch axes, resulting in lower fruiting potential per inflorescence, while effectively extending the flowering and fruiting period by 2~4 months (Peng et al., 2022).

5.2 Fruit set and fruit retention performance

Experiments on manual thinning of loquat flower buds during the full bloom stage showed that retaining 4 flower buds per inflorescence, compared with retaining 12 buds, increased the fruit set rate per cluster by about 15%. This may be due to reduced competition for assimilates within the cluster and improved early source-sink relationships (Nordi et al., 2025). Studies combining flower and fruit thinning with bagging treatments indicate that reducing flower number can increase fruit set rate by up to 49%. Pruning strategies that create a moderate inflorescence load-either by reducing the number of fruiting shoots (such as double-heading) or by fine-scale thinning within inflorescences—can improve fruit set efficiency and reduce early fruit drop. In contrast, excessive flower density may suppress effective fruit set when the initial flower number is too high.

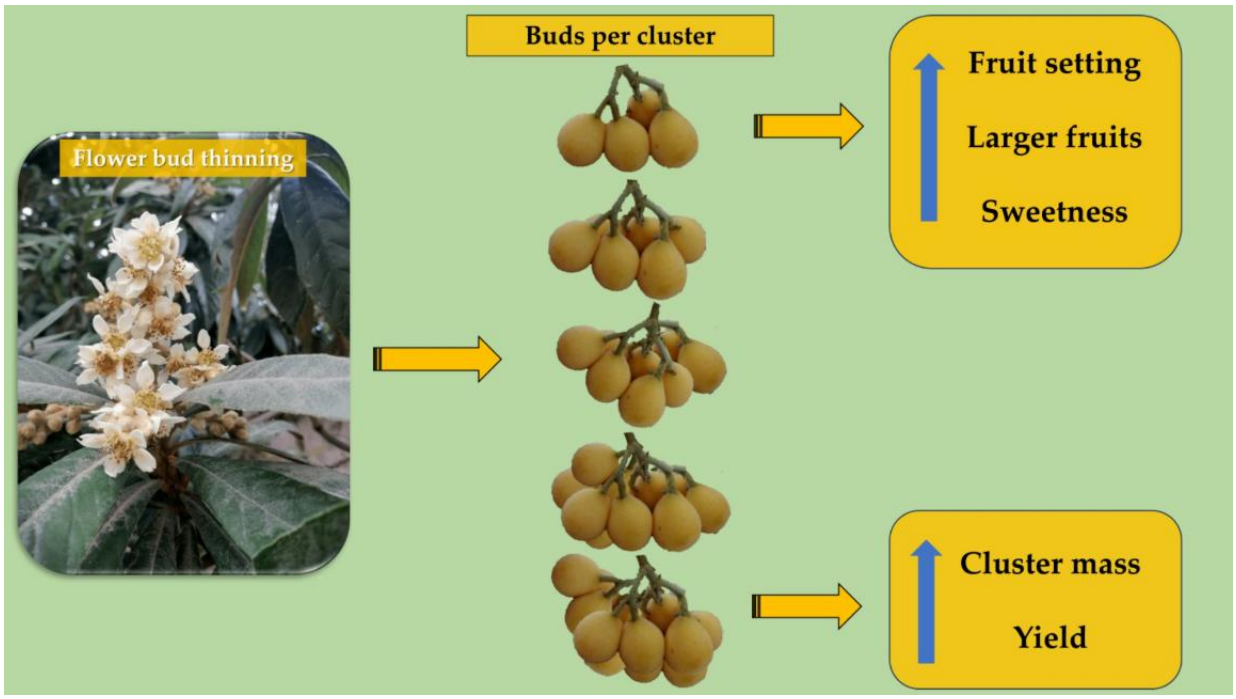

Figure 2 Effect of flower bud thinning on fruit set, fruit size, sweetness, and yield in clustered fruits (Adapted from Nordi et al., 2025)

5.3 Changes in fruit number and size

Loquat fruits show a single S-shaped growth curve under both heavy thinning and no-thinning conditions, but the growth curve under thinning is steeper, resulting in larger final fruit size, indicating stronger sink strength of individual fruits. Seed number and seed size are the main factors determining final fruit size, while leaf area per shoot shows only a weak correlation with fruit size. This highlights the importance of regulating fruit load based on the inherent sink capacity of fruits (Cuevas et al., 2003). At the shoot level, double-heading shows a similar pattern: this strong pruning method reduces the number of flowering shoots but produces larger flowers and significantly larger fruits. This is associated with enhanced cell division during early fruit development and downregulation of fruit weight-related genes (EjFWL1/2) (Su et al., 2024).

5.4 Overall yield performance under different pruning systems

At the cluster level, retaining more flowers can maximize yield per cluster, but this is often accompanied by smaller fruits and lower market value. At the whole-tree level, pruning methods that moderately reduce fruit number while significantly increasing average fruit weight and quality can improve the proportion of premium fruits and economic returns, even if total fruit number decreases. Double-heading can increase single fruit weight by about 35%, cluster weight by 32%, and the proportion of premium fruits (>65 g) to over 75%, resulting in