

## Chapter VII

### Conclusion

The study on farmers' practices in mango production and propagation in Luang Prabang province brought to determining study issues. Two field experiments were designed and conducted in the nursery at the Multiple Cropping Center, Faculty of Agriculture, Chiang Mai University to evaluate the survival and growth of Kaew scions after grafting on old- and young-aged Tlap-Nak seedling rootstocks using side veneer grafting and stone grafting respectively. Thereafter, the feasibility of the grafting techniques was assessed. The study leads to reasonably conclusive results as the followings:

1. The number of parcels of land holding for the farmer families in the study area varied from one to four, and most of farmers occupied 23 parcels with an average area of 1.2 ha. Mango areas in the study site ranged from 0.2 to 1.5 hectare with a number of 20 to 230 mango trees. Majority of mango orchards (60% growing mango, the farmers still faced pest and disease problems, but chemical fertilizers and pesticides were not used widely among the farmers to maintain and protect their mango trees from pest damage.

2. In the province, farmers have practiced two methods of propagation i.e. seedage and graftage. 87% of farmers have been propagated by seedage method for a long time. Graftage was introduced to them in the past 610 years, but until now there is only a small number of the farmers have practiced this method. It is concluded that mango is widely adapted in rainfed upland conditions of Luang Prabang province. It is an important component of farming systems, because of its multiple functions. Farmers in general managed mango well with locally available resources. But, technique of effective propagation was still lacking, majority depended on seed propagation technique. The common propagation technique by seed has caused the mango to be less productive and difficult to manage, which led to low quality and productivity of mango production in the past as well as at the present time.

3. In side veneer grafting of Kaew scions on old-aged Tlap-Nak seedling rootstocks such 1, 2 and 3 years, the data from the study revealed that the effects of three ages of seedling rootstocks were not significant in survival at 60 DAG and growth rate of rootstock diameter, but there were significantly different in growth rate of grafted union diameter, scion diameter, scion length and number of leaves on scion. Rootstock diameter and grafted union diameter highly correlated with scion diameter and length.

4. Fruit weight and seed weight of Tlap-Nak mango was positively correlated with their size parameter. On the other hand, there was no correlation between fruit and seed weight, survival and growth parameters of the young-aged grafted seedlings.

5. The use of seven young ages of Tlap-Nak seedling rootstocks for stone grafting resulted in significantly different effect on survival of Kaew scions at 60 DAG and rootstock diameter growth rate throughout the period of the study. By then, the 5, 35, 10, 15, 30, 25 and 20 day-old grafted seedlings showed 47.6, 30.0, 26.7, 23.3, 23.3, 6.7 and 3.3 % of survival rate respectively. The 5 and 10 day-old grafted seedlings increased significantly in rootstock diameter growth rate.

6. The effects of using seven young ages of Tlap-Nak seedling rootstocks were not significantly different in grafted union diameter and scion growth parameters (scion diameter, scion length and number of leaves). However, all these growth parameters showed the increasing trend towards time.

7. In respect to economic assessment, in side veneer grafting, the use of the 3 year-old seedling rootstocks obtained the highest gross margin (\$US 34.8/100 grafts), even it had the high invested costs. In stone grafting, the use of 5-day-old seedling rootstocks occupied the highest value of gross margin at \$US 24.3/100 grafts.

8. Concerning the feasibility assessment of grafting techniques, for side veneer grafting, the use of 3 year-old seedling rootstocks occupied high percentage of survival rate, and the shortest time for completing whole process was observed in the

1 year-old seedling rootstocks. In stone grafting, both high survival rate and the shortest time consuming were occupied by the 5 day-old seedling rootstocks. However, farmers preferred these two grafting techniques, because they are easy to perform, appropriate to farmers' condition and effective in the real practice.

9. Both grafting techniques are the more effective than other methods of grafting in most mango producing area in the world. However, in Luang Prabang province they are new, especially stone grafting one. These techniques need to be introduced to the farmers to replace the traditional method of propagation (seedage), which will be alternative in improving mango production systems in the province.