Chapter 1

Introduction

Mango cv. Kaew is one of the most common cultivars (Radanachaless *et al.*, 2000) and also be the major economic mango in Thailand (Arthachinta, 2000). Kunasol (1989) reported that the most popular clone, Kaew Hua Juk, was an important commercially because of its large size, thick flesh, high productivity and dual purposes ; appropriate for both fresh fruit and fruit processing (Chaikiattiyos *et al.*, 2000).

In the Upland ecoregion, Radanachaless (2001) searched many species of multipurpose trees which thrived well under rainfed conditions, and concluded that mango-based farming systems would meet with the farmers' requirements because of its advantages, such as well grown, drought tolerance, simple management, high yield and market demand. Thus, Kaew mango was very important for the less privileged farmers because it was one of the high potential local fruit tree which created long term income and increased the labor employment in community (Radanachaless, 1989). Na Songkla (1994) also suggested that the North region should grow the Kaew mango cultivars because of the stable market system.

Naturally, mangos are seasonal pattern, they give a yield only once a year with short harvesting season, within four months (March to June). In early season (end of March), the prices of Kaew mango are about 9-11 Baht/kg, which benefits early production areas, for example the central region, because the harvesting starts early there. In mid season the peak production period April through May, the yield prices is lower (2-5 Baht/kg) because there is abundant mango supply from both Central and North-east regions (Nartvaranant *et al.*, 2000). In the later period (June to July), the price will increase up to three fold to 15 Baht/kg for late season fruit (Siripanich, 2000). Most Kaew mango farmers generally encounter low prices because their yields are harvested at about the same time. Strategies to resolve these low price problems are important of interest to farmers. While farmers cannot directly influence the market price, if they can supply their produce at a later time, when less fruit is available. They will receive a higher price.

The off-season production is a practical method for raising the farmers' income. Though, the method for producing off-season mango is currently available, this technique had many restrictions, such as limitation of area conditions, lack of water, specific technology, practical knowledge of many farmers and high cost. Thus, nowadays, most of off-season production is found in areas where there is a sufficient water, namely Central and East parts (Na Songkla, 1994).

The another supply concept for increasing the value of Kaew mango yield is late season production or long productive duration. In accordance with Siripanich (2000) findings, if the growers could delay the harvesting period until mid July, they would get the higher price. From this concept, led to the search for new technologies for extending the harvest period of Kaew mangos on their trees, but one of the restriction of these strategies is sites of area for producing late season. The natural maturity of Kaew mango fruits starts from the Central through North-east and finally in Upper North where the last flowering and fruiting is. Thus, the potential site for naturally late season production should be the Upper North.

The Upper North of Thailand, especially Chiang Dao district, Mae Ore Nai village, grows Kaew mango as a major fruit tree. Due to the advantages of its locations and climate, these sites are most famous for producing the natural late season, during May to June, there is no yield from the other at this time. From these attribute, there is a potential for delaying the harvesting period of Kaew mango by taking advantage of the climate and developing technologies to increase the price of the yield. Since the later harvesting period, the farmers will get the higher value especially up to July 15 when the market's demand is high and supply is low. Thus, the delayed harvesting period of mango cv. Kaew in the Upper North will be very advantageous to the growers because it will be the alternative to raise the farmers' income. Though these areas have the potential for Kaew mango late production, there are no commercial or experimental techniques available for delaying the natural harvesting period. From these concepts, the main objective of this study is to search for the potential to produce late season Kaew mango. In order to create opportunities for the less privileged farmers in the Upper North, by using their geography and climate advantages combined with the optimal technologies based on plant physiology to raise the Kaew mango value.

Objectives of the experiment

From the above mentioned justification, this research attempts to search for new technology for producing late season Kaew mango by dividing into three stages : (a) delayed flowering ; (b) extension of panicle growth and (c) delaying fruit maturation. The most successful techniques will be trialled in the rainfed upland. The specific objectives of this study are as follows :

1. To identify promising areas for producing late season Kaew mango in the Rainfed Upland of Chiang Mai

2. To search the alternative technology for producing the late season Kaew mango by three approaches : (1) delaying flowering, (2) extending the growth of panicles and (3) delaying the preharvest fruit maturity

3. To assess the farmer opinions and views on the practicality of the new technologies