CHAPTER 1

Introduction

1.1 Introduction

Orange fruit (*Citrus sinensis* Osbeck) is a non-climacteric subtropical fruit, and it is one of the most valuable fruit in Vietnam for domestic and export markets because it has a delicious taste and excellent nutritional properties. In Vietnam, the production area of oranges and tangerines was around 58,300 ha, and the yield was over 736,100 tons (Vietnam General Statistics, 2014). There are several varieties of orange which are available in domestic markets such as 'Sanh', 'Vinh' and 'Canh'. Sweet orange cv. Canh fruit is one of the best quality fruit and has high economic value commercially due to the fruits making the commodity in great demand in countries and as a potential candidate for export (MADR, 2014). In recent years, there were several reports on postharvest treatments to store orange fruit in Vietnam such as carbendazim soaking (Hoan *et al*., 2002), chitosan coating (Thuy and Tuyen, 2011; Binh and Dien, 1995), glycerol soaking (Ha *et al*., 2009), temperature storage (Thuy and Tuyen, 2011) and wax coating (Lam, 2013; Thang *et al*., 2013). However, there were no any published works on storage of 'Canh' sweet orange fruit. In Vietnam, the main production areas are in the northern provinces of Ha Giang, Yen Bai, Lang Son, PhuTho, HaNoi, ThanhHoa, NinhBinh, Nghe An and Ha Tinh. Oranges are also grown in the South, mainly in Can Tho, TienGiang, VinhLong, Ben Tre, Dong Thap, TraVinh, DongNai provinces. Sweet orange trees are strong and fruit has an attractive shade on skin and a deep red to purplish pigmented pulp with a special delightful aroma that makes the commodity a great demand domestically and as a potential candidate for export.

All researches to store orange fruit in Vietnam have focused on cultivars such as 'Sanh', 'Vinh'. For orange sweet cv. Canh, there was not any research or any report. The storage of orange cv. Canh fruit after harvesting is a very important step for

controlling price, in both in season and off season. It is not only useful for growers but also to fulfill the demands of consumers. Therefore, there is a need to research and develop an effective method to extend the shelf-life of orange cv. Canh fruit in Vietnam. Replacing carbendazim, thiabendazol, imazalil, ect are very necessary because they are types of fungicide, and damaging the health of people and to the environment. One of methods is that the use of bio-fungus and mixed wax coating in combination with temperatures storage at ambient temperature or low temperature to extend the storage life and maintain qualities of fruit.

1.2 Purposes of the Study

1.2.1 To study the shrinkage pattern of Vietnamese sweet orange fruit cv. Canh during storage.

1.2.2 To study the effects of phenyllactic acid and mixed wax coating (bees wax and carnauba wax) on the postharvest quality and storage life of Vietnamese sweet orange cv. Canh.

1.2.3 To study the effects of temperature and mixed wax coating (bees wax and carnauba wax) on the post-harvest quality and storage life of Vietnamese sweet orange cv. Canh.

1.3 Education/application advantages

Using mixed waxes (bees wax, carnauba wax - MW) in combination with antifungal agent (phenyllatic acid - PLA) and temperature to reduce weight loss, prolong storage life and inhibit post-harvest disease of Vietnamese sweet orange cv. Canh. Orange fruit harvest at the right time and does not affect the next crop. Furthermore, results from this research will help Vietnamese people not only to handle new technology on preservation of cv. Canh orange fruit but also to increase the price at the peak of the harvesting period.

1.4. Location

- Postharvest Technology Research Institute, Chiang Mai University, Thailand.

- Vietnam Institute of Agricultural Engineering and Post-harvest Technology, Hanoi, Vietnam.
- 69Institute, Ministry of Defence, Vietnam