









### Research Internship at Chiang Mai University, Thailand

(3-16 August 2013)

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# Science of Bioproduction The United Graduate School of Agricultural Sciences, IWATE UNIVERSITY









### **Internship activities**

- 1. Research presentation in the International Symposium on Quality Management of Fruit and Vegetables for Human Health (FVHH2013).
- 2. Experiment and discussion on "Changes in peroxidase activity of 'Nam Dok Mai' mango skin as influenced by chilling injury during storage" at Science and Technology Research Institute, Chiang Mai University, Thailand



Research presentation in the International Symposium on **Quality Management of Fruit** and Vegetables for Human Health (FVHH2013)

















20 faculty and 1 college



MAP OF CHIANG MAI UNIVERSITY

- 2. Government Saving Bank 8. Sala Dham Hall
  - Information Technology Service Center Faculty of Humanitie
     Faculty of Masscorr
    - Faculty of Social Science Faculty of Polltical Science and Public Administration
      - 12. Faculty of Economics 13. Women's Studies Center
      - 15. Pin Mala Art Hall
- 17. University Library 18. Registration Office
- 19. Faculty of Science
- 20. Silicate Science and Technology Research Center
- Regional Mineral Resoures Office Region 3 (Chiang Mai)
- 22. Student Union
- 23. CMU Guest House 24. CMU. Employee Club
- 25. Faculty of Architecture
- 26. Faculty of Engineering 27. CMU Demonstration School
- 28. Faculty of Education
- 29. Faculty of Business Ad
- 30. Faculty of Fine Arts 31. Graduate School

- - Social Research Institute · Research Institue for Health Science
  - 33. Faculty of Agriculture
  - 34. Multiple Cropping Center
  - 35. Small Animal Hospital
    36. Center for Promotion of Arts and Culture
  - 37. CMU. Art Museum
  - 38. CMU. Alumni Association

  - 39. Fitness Park 40. CMU. Convention Center
  - 41. CMU Academic Services Institute
  - 42. Faculty of Pharmacy 43. Faculty of Dentistry
  - 44. Siam Commercial Bank
  - 45. Faculty of Medicine

    Maharaj Nakorn Chiang Mai Hospital
  - 46. Special Medical Service Center
  - 47. Chulabhorn Research Institute Research Center at Chiang Mai University
  - 48. Faculty of Associated Medical Sciences

  - 50. Language Institute



- A Men's Dormitories
- C Clock Tower
- D Rujirawong Swimming Pool
- F Gymna
- G Mini Bus Station
- H Doi Suthep Nature Study CMU.

## Chilling injury and peroxidase activity change on peel of 'Nam Dok Mai' mango during storage





- ❖ During exportation mango fruit was stored at low temperature to maintain the quality but mango fruit is highly sensitivity to chilling injury (CI) when storage temperature below 13°C (Nair and Singh, 2003).
- ❖ Young mango is always use for export but it is more susceptible to CI than ripening fruit (Zhao et al., 2008).
- ❖ The most common symptom of CI appears on the peel as surface pitting and skin browning.
- CI symptoms is maybe response to chilling temperature caused by oxidative stress, many free radicals are induced (Hariyadi and Parkin, 1991).
- ❖ Peroxidase is catalyses the oxidation of substance and is a plant resistance enzyme which is often increase when plant tissue stress such as low temperature storage.
- ❖ Therefore, in this study the visual CI symptoms and peroxidase activity of mango peel was investigated during storage.



#### Method

Mango fruit (*Manaifera Indica* Linn cv 'Nam Dok Mai See Thong') were harvest at young mature stage (yellow skin)

- 1. Control which is immediately measured after harvest.
- 2. Storage at low temperature (5°C) for 30 days and then measured
- 3. Storage at low temperature (5°C) for 30 days and then transferred to 25°C for 7 days. Seven fruits per each treatment were measured CI index and peroxidase activity after storage.

CI index on mangoes skin and peroxidase activity of mango peel















### **Results**





Control Storage at 5°C for 30 days

Storage at 5°C for 30 days + 25°C for 7 days

**Fig. 1** Characteristic of chilling injury on the skin of matured mango fruit, after harvested, kept for 30 days at 5°C, stored for 30 days at 5°C and then kept for 7 days at 25°C.

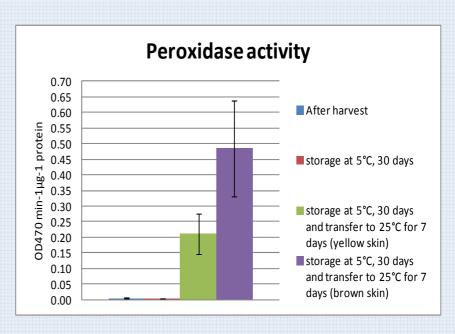


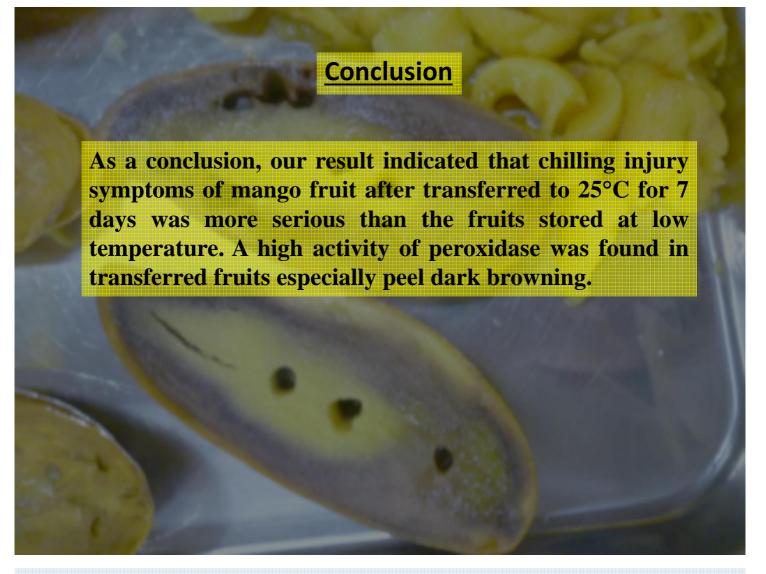
Yellow skin

**Table 1** Chilling injury index (CI index) of mango fruit in control, kept for 30 days at 5°C, stored for 30 days at 5°C and then kept for 7 days at 25°C.

| Treatment   | CI index |
|---|----------|
| Trt1 Control                                      | 0.00     |
| Trt2 Storage at 5°C for 30 days                   | 0.63     |
| Trt3 Storage at 5°C for 30 days + 25°C for 7 days | 1.47     |

**Fig. 2** Peroxidase activity of matured mango fruit peel after harvested, kept for 30 days at 5°C, stored for 30 days at 5°C and then kept for 7 days at 25°C.







### **ACKNOWLEDGEMENT**





