

Chapter VI

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions6.1.1 Preservation of Fresh Lime Fruit by Controlled-Atmosphere Storage

The study of preservation of fresh lime fruit by controlled-atmosphere (C.A.) storage can be concluded as follows:

6.1.1.1 Of all the experiments conducted in this study, the optimum composition of controlled-atmosphere for storage of limes kept at 10°C was 10% O_2 and 5% CO_2 with a relative humidity of 89%. Fresh lime fruits could be stored for 5 months and their overall quality i.e. general appearance, color, and flavor, was still favourably accepted although the color of limes was changed from green to completely yellow color.

6.1.1.2 There was small variation in the important components and chemical properties of the normal lime, namely, pH, Acidity, Ascorbic Acid content, Total Soluble Solid, % Volume of Juice and % Weight of Juice during experimental storage period of up to 5 months.

6.1.1.3 Concentration of Benlate solution up to 2000ppm did not prevent development of spoilage due to fungi and a

considerable amount of lime fruit samples were lost as the result.

6.1.1.4 The percentage of CO_2 used in the controlled atmosphere storage was very important. The experiments undertaken, when % CO_2 was more than 15% CO_2 injuring would occur.

6.1.2 Lime Juice Concentrate Processing

Concentration of lime juice by vacuum evaporation at low temperature has an important effect on chemical and physical properties of the concentrated lime juice. The concentrated juice had a slightly brown color in comparison with a yellowish-green color as in the fresh lime juice. The intensity of aroma and taste of the concentrated lime juice was slightly reduced due to evaporation of some volatile substances responsible for flavor of lime juice. But adjusted flavor of concentrated juice can be enhanced to normal level by addition of fresh lime juice.

The storage life of concentrated lime juice could be prolonged fairly satisfactorily for a long storage period if stored at low temperature and with addition of potassium metabisulfite.

6.2 Recommendation for Future Study

6.2.1 Preservation of Fresh Lime Fruit by Controlled Atmosphere Storage

6.2.1.1 It was found in the experiments that decay of lime fruits kept under controlled-atmosphere due to fungal origin

was still fairly high possibly caused by molds in the pores of the skin. The application of Benlate fungicide by dipping was not sufficient for their complete destruction. Consequently, further study of pre-harvest treatment of lime fruits is necessary to ensure that damage due to fungi will be controlled to a very small extent.

6.2.1.2 Further study of controlled-atmosphere storage at pilot scale should be conducted.

6.2.1.3 Additional study on different levels of CO_2 and O_2 should be encouraged so that more precise information as to the most optimum condition for storage of limes can be obtained.

6.1.2.4 Further research work on controlling the atmosphere to a desired level using ordinary air in conjunction with CO_2 or O_2 is necessary so that cost of operation can be drastically reduced.

6.2.2 Lime Juice Concentrate Processing

From the experiment conducted, it is reasonable to conclude that keeping the concentrated lime juice at low temperature and with addition of 300 ppm of potassium metabisulfite yielded fairly good results. Nevertheless, further study of concentrated lime juice using higher concentration of potassium metabisulfite may be undertaken. The addition of preservative in the lime juice before concentration should also be investigated.