



## HORTIN II Co Innovation Programme

*Towards cost effective, high quality value chains*

**Strengthening fresh and processed rambutan value chains**

HORTIN-II Mission Report nr. 19

Jeroen Knol (Wageningen UR, AFSG)  
Iskandar Zulkarnain (HPSP, INA, Fresh Studio Innovations)  
Marcel Stallen (Fresh Studio Innovations)

Wageningen, The Netherlands, Jakarta, Indonesia, November 2008



The purpose of the HORTIN II programme is to contribute to the development of cost effective high quality value chains for vegetables and fruits. Among others this can be achieved when technology development takes place in close collaboration between public institutions, farmers and private companies.

In Indonesia, the programme is carried out by the Indonesian Vegetable Research Institute (**IVEGRI**) in Lembang and the Indonesian Centre for Agricultural Postharvest Research and Development (**ICAPRD**) in Bogor. In the Netherlands Applied Plant Research (**APR**), WUR-Greenhouse Horticulture (**GH**), the Agricultural Economics Research Institute (**AEI**) and the Agrotechnology and Food Science Group (**AFSG**), all part of Wageningen University and Research Centre, are the principal partners.

Addresses:

**Indonesian Vegetable Research Institute (IVEGRI)**

Address : Jl. Tangkuban Perahu 517 Lembang-Bandung 40391, West Java, Indonesia  
Tel. : +62 22 2786 245  
Fax : +62 22 2786 416  
E-mail : dir\_ivegri@balitsa.org or balitsa@balitsa.org  
Internet : www.balitsa.org

**Indonesian Centre for Agricultural Postharvest Research and Development (ICAPRD)**

Address : Kampus Penelitian Pertanian, Cimanggu, Bogor 16114, West Java, Indonesia  
Tel. : + 62 251 321762  
Fax : + 62 251 350920  
E-mail : bb\_pascapanen@litbang.deptan.go.id or bb\_pascapanen@yahoo.com  
Internet : www.pascapanen.litbang.deptan.go.id

**Agricultural Economics Research Institute (LEI)**

Address : Burgemeester Patijnlaan 19, Den Haag, The Netherlands  
: PO Box 29703, 2502 LS Den Haag, The Netherlands  
Tel. : +31 70 335 83 30  
Fax : +31 70 361 56 24  
E-mail : informatie.lei@wur.nl  
Internet : www.lei.wur.nl

**Agrotechnology and Food Sciences Group (ASFG)**

Address : Building 118, Bornsesteeg 59, Wageningen, The Netherlands  
: PO Box 17, 6700 AA, Wageningen, The Netherlands  
Tel. : +31 317 480 084  
Fax : +31 317 483 011  
E-mail : info.asfg@wur.nl  
Internet : www.asfg.wur.nl

**Applied Plant Research (APR)**

AGV Research Unit

Address : Edelhertweg 1, Lelystad, The Netherlands  
: PO Box 430, 8200 AK Lelystad, The Netherlands  
Tel. : +31 320 29 11 11  
Fax : +31 320 23 04 79  
E-mail : infoagv.ppo@wur.nl  
Internet : www.ppo.wur.nl

**WUR-Greenhouse Horticulture (Wageningen UR Glastuinbouw)**

Address : Violierenweg 1, Bleiswijk, The Netherlands  
: PO Box 20, 2665 ZG Bleiswijk, The Netherlands  
Tel. : +31 317 48 56 06  
Fax : +31 10 52 25 193  
E-mail : glastuinbouw@wur.nl  
Internet : www.glastuinbouw.wur.nl

© 2008 AFSG, Wageningen, The Netherlands; ICAPRD, Bogor, Indonesia.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form of by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of AFSG, Wageningen, The Netherlands; ICAPRD, Bogor, Indonesia.

AFSG, Wageningen, The Netherlands; ICAPRD, Bogor, Indonesia, take no responsibility for any injury or damage sustained by using data from this publication.

## Programme Team

---

|                                | Indonesia  | The Netherlands   |
|--------------------------------|--|---|
| Programme management           | Dr. Nikardi Gunadi, IVEGRI<br>Telephone +62 22 2786 245<br>Fax +62 22 2786 416<br>E-mail: <a href="mailto:NGUNADI@BDG.CENTRIN.NET.ID">NGUNADI@BDG.CENTRIN.NET.ID</a> | Dr. Arij Everaarts, APR, General management<br>Telephone +31 320 291 671<br>Fax +31 320 230 479<br>E-mail: <a href="mailto:ARIJ.EVERAARTS@WUR.NL">ARIJ.EVERAARTS@WUR.NL</a><br><br>Dr. Andre de Jager, AEI, Co-innovation<br>Telephone +31 70 3358 341<br>Fax +31 70 3615 624<br>E-mail: <a href="mailto:ANDRE.DEJAGER@WUR.NL">ANDRE.DEJAGER@WUR.NL</a> |
| Sweet pepper pilot project     | Dr. Nikardi Gunadi, IVEGRI<br>Telephone +62 22 2786 245<br>Fax +62 22 2786 416<br>E-mail: <a href="mailto:NGUNADI@BDG.CENTRIN.NET.ID">NGUNADI@BDG.CENTRIN.NET.ID</a> | Ruud Maaswinkel, WUR-Greenhouse Horticulture<br>Telephone +31 317 485 537<br>Fax +31 105 225 193<br>E-mail: <a href="mailto:RUUD.MAASWINKEL@WUR.NL">RUUD.MAASWINKEL@WUR.NL</a>  |
| Shallot pilot project          | Dr. Rofik Sinung Basuki, IVEGRI<br>Telephone +62 22 2786 245<br>Fax +62 22 2786 416<br>E-mail: <a href="mailto:ROFIK@HOTMAIL.COM">ROFIK@HOTMAIL.COM</a>              | Lubbert van den Brink, APR<br>Telephone +31 320 291 353<br>Fax +31 320 230 479<br>E-mail: <a href="mailto:LUBBERT.VANDENBRINK@WUR.NL">LUBBERT.VANDENBRINK@WUR.NL</a>  |
| Hot pepper pilot project       | Dr. Witono Adiyoga, IVEGRI<br>Telephone +62 22 2786 245<br>Fax +62 22 2786 416<br>E-mail: <a href="mailto:VICIANTI@YAHOO.CO.ID">VICIANTI@YAHOO.CO.ID</a>             | Herman de Putter, APR<br>Telephone +31 320 291 614<br>Fax: +31 320 230 479<br>E-mail: <a href="mailto:HERMAN.DEPUTTER@WUR.NL">HERMAN.DEPUTTER@WUR.NL</a>  |
| Quantitative Economic Analysis | Dr. Witono Adiyoga, IVEGRI<br>Telephone +62 22 2786 245<br>Fax +62 22 2786 416<br>E-mail: <a href="mailto:VICIANTI@YAHOO.CO.ID">VICIANTI@YAHOO.CO.ID</a>             | Marcel van der Voort, APR<br>Telephone +31 320 291 312<br>Fax +31 320 230 479<br>E-mail: <a href="mailto:MARCEL.VANDERVOORT@WUR.NL">MARCEL.VANDERVOORT@WUR.NL</a>   |
| Fruit supply chains            | Dr. Sri Yuliani, ICAPRD<br>Telephone +62 251 321762<br>Fax +62 251 350920<br>E-mail: <a href="mailto:S.YULIANI@GMAIL.COM">S.YULIANI@GMAIL.COM</a>                    | Dr. Jeroen Knol, ASFG<br>Telephone +31 317 480177<br>Fax +31 317 483011<br>E-mail: <a href="mailto:JEROEN.KNOL@WUR.NL">JEROEN.KNOL@WUR.NL</a>   |



---

## CONTENTS

|   |           |
|---|-----------|
| <b>Executive summary .....</b>  | <b>3</b>  |
| <b>1. Introduction .....</b>  | <b>5</b>  |
| 1.1. Context and purpose of mission .....   | 5         |
| 1.2. Terms of reference mission .....   | 5         |
| 1.3. This report .....  | 6         |
| <b>2. Summaries and action points per meeting .....</b>   | <b>7</b>  |
| 2.1. Meeting with DG Horticulture .....   | 7         |
| 2.2. Meeting with ICHORD, IVEGRI, ITFRI & IRICSF .....  | 7         |
| 2.3. Visit of Kramat Jati wholesale market, Jakarta .....   | 8         |
| 2.4. Direktorat Sarana Produksi .....   | 9         |
| 2.5. Meeting Pt Masindo Mitra Mandiri.....  | 9         |
| 2.6. Meeting Centre for Tropical Fruit Studies, IPB Bogor .....                                       | 10        |
| 2.7. Meeting ICAPRD .....   | 11        |
| 2.8. Meeting Puresso, Promindo Utama cv & SS Fresh Fruit Company .....                                | 12        |
| 2.9. Dinas Pertanian Subang & Selected farmers' fields .....  | 12        |
| 2.10. Royal Dutch Embassy Jakarta .....   | 13        |
| 2.11. Australian Centre for International Agricultural Research (ACIAR) .....                         | 13        |
| <b>3. Project proposals and protocol – 1<sup>st</sup> draft versions.....</b>                         | <b>13</b> |
| 3.1. Processing for new Product Market Combinations rambutan .....                                    | 13        |
| 3.1.1 Introduction .....  | 13        |
| 3.1.2 Planning .....  | 14        |
| 3.2. Modified Atmosphere Packaging for prolonged shelf life and better quality .....                  | 14        |
| 3.2.1 Introduction .....  | 14        |
| 3.2.2 Objective .....   | 14        |
| 3.2.3 Set-up.....   | 14        |
| 3.2.4 Evaluation .....  | 15        |
| 3.2.5 Protocol.....   | 16        |
| 3.2.6 Planning .....  | 17        |
| <b>Annex I. Itinerary and persons met .....</b>   | <b>18</b> |
| <b>Annex II. Project Description: Product diversification &amp; quality improvement Rambutan.....</b> | <b>19</b> |
| <b>Annex III. Presentations Wageningen UR, AFSG and Fresh Studio Innovations .....</b>                | <b>22</b> |



## Executive summary

### Processing for new Product Market Combinations Rambutan

- All potential parties involved in rambutan production and marketing underlined the importance of developing new Product Market Combinations for Rambutan.
- Currently Thailand exports 10 times more processed (mainly canned) rambutan as compared with fresh rambutan. Lessons learnt from the Thai processing industry and the fruit sector as a whole could be valuable for developing the Indonesian fruit sector.
- Canning and making juice / pulp and concentrate seem to be the most feasible processing options for rambutan. Researchers propose to systematically evaluate various processing routes for rambutan.
- Consultants could not visit the company in Bogor that cans some rambutan already; this visit will be organized after completion of the mission.
- It was strongly suggested by stakeholders to conduct market and consumer research before producing any products on a pilot scale.
- Tentatively the major bottleneck for processing rambutan into juice, pulp or concentrate is its low efficiency of less than 20 %. (E.g. for mangosteen the processing efficiency was estimated at 16 % (for making 1 kg of juice 5 kg mangosteen is required)
- The Centre for Tropical Fruit Studies (IPB) Bogor was identified as counterpart institute of WUR AFSG in the field of consumers' research
- For the evaluation of processing opportunities on an experimental scale the Institute for Post Harvest Research in Bogor has the facilities and expertise to cooperate in the proposed HORTIN project on rambutan.
- Following the principles of co innovation private parties will be involved in the development of technology as well as the evaluation of the feasibility of processing opportunities.
- For certain activities, in particular marketing and consumers' research it will be considered to involve students of IPB Bogor and Wageningen UR.

**Table 1 Indonesian & Dutch researchers propose the following activities in 2008/09:**

| Activity   | 2008 |   | 2009 |   |   |   |   |   |   |   |   |   |   |   |
|--|------|---|------|---|---|---|---|---|---|---|---|---|---|---|
|  | N    | D | J    | F | M | A | M | J | J | A | S | O | N | D |
| 1. Literature survey                               |      | ■ |      |   |   |   |   |   |   |   |   |   |   |   |
| 2. Simulation and desk research                    |      |   | ■    |   |   |   |   |   |   |   |   |   |   |   |
| 3. Reporting                                       |      |   |      | X |   |   |   |   |   |   |   |   |   |   |
| 4. Selections of counterpart institute             |      |   |      | X |   |   |   |   |   |   |   |   |   |   |
| 5. Development proposal & protocols                |      |   |      |   | ■ |   |   |   |   |   |   |   |   |   |
| 6. Consumers' preferences (Asia, EU and Indonesia) |      |   |      |   |   | ■ | ■ | ■ | ■ |   |   |   |   |   |
| 7. Market survey (Asia, EU and Indonesia)          |      |   |      |   |   | ■ | ■ | ■ | ■ |   |   |   |   |   |
| 8. Processing under experimental conditions (1)    |      |   |      |   |   |   |   |   |   |   |   |   | ■ |   |
| 9. Processing under experimental conditions (2)    |      |   |      |   |   |   |   |   |   |   |   |   |   | ■ |
| 10. Evaluation (go / no go)                        |      |   |      |   |   |   |   |   |   |   |   |   |   | X |
| 11. Finalize arrangements with processing company  |      |   |      |   |   |   |   |   |   |   |   |   |   |   |
| 12. Pilot processing unit (1)                      |      |   |      |   |   |   |   |   |   |   |   |   |   |   |
| 13. Pilot processing unit (2)                      |      |   |      |   |   |   |   |   |   |   |   |   |   |   |
| 14. Evaluation and reporting                       |      |   |      |   |   |   |   |   |   |   |   |   |   |   |

### Modified Atmosphere Packaging for prolonged shelf life and better quality

- The relevance of this topic was underlined by staff of the Directorate General Horticultural Production in Indonesia and the Indonesian IAARD research institutes on post harvest research as well as staff of the Centre for Tropical Fruit Studies in Bogor. Private companies also recognize potential benefits for rambutan when using MAP technology.
- The domestic and export market that can be serviced with high qualitative fresh rambutan is relatively small but can be extended by means of modified atmosphere packaging and transport.

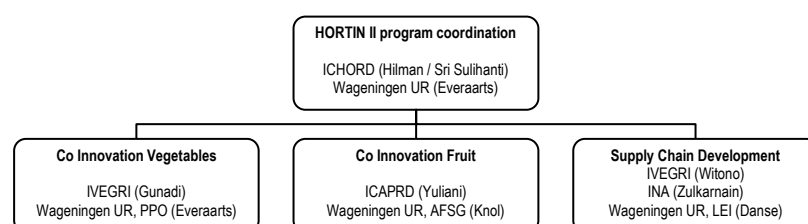
- MAP is a proven technology that has extended the transportability and storage and marketing opportunities for many fruits already.
- As a matter of fact the absence of a cold chain approach for rambutan is a bottle neck and reduces the full potential of MAP packaging concepts. However exporters and transporters have good reasons to work with ambient temperatures rather than deploying pre cooling equipment,
- The exact description and analysis of the export and packaging operation of PT Masindo is yet to be done by one of the Indonesian researchers and / or Iskandar Zulkarnain and / or AFSG visiting staff. The current Masindo operational procedures are leading.
- Researchers in Bogor and Wageningen have agreed upon kick starting the project because of the upcoming rambutan season and in order not to loose a season.
- An initial screening of pre selected MAP PE films in combination with Rambutan is planned in December. A pre condition is indeed that the exploratory experiments under controlled and experimental conditions in the laboratory have produced tangible results for rambutan.
- A comprehensive test of the MAP concept under real life supply chain conditions is planned in January / February 2009 in cooperation with an Indonesian exporter and a Dutch importer. The remaining shelf life and qualitative of these rambutans will be measured in Indonesia and in the Netherlands.
- The Institute of Post Harvest Research in Bogor was identified as a suitable potential counterpart institute to cooperate with WUR AFSG in the HORTIN project on rambutan.

**Table 2 Indonesian & Dutch researchers propose the following activities in 2008/09:**

| Activity   | 2008 |   | 2009 |   |   |   |   |   |   |   |   |   |   |   |
|--|------|---|------|---|---|---|---|---|---|---|---|---|---|---|
|  | N    | D | J    | F | M | A | M | J | J | A | S | O | N | D |
| 1. Literature survey                                 |      |   |      |   |   |   |   |   |   |   |   |   |   |   |
| 2. Reporting   |      | X |      |   |   |   |   |   |   |   |   |   |   |   |
| 3. Selections of counterpart institute               | X    |   |      |   |   |   |   |   |   |   |   |   |   |   |
| 4. Development proposal & protocols                  | X    |   |      |   |   |   |   |   |   |   |   |   |   |   |
| 5. Experimental screening of PE films for rambutan 1 |      |   |      |   |   |   |   |   |   |   |   |   |   |   |
| 6. Experimental screening of PE films for rambutan 2 |      |   |      |   |   |   |   |   |   |   |   |   |   |   |
| 7. Evaluation and selection of material for export   |      |   |      | X |   |   |   |   |   |   |   |   |   |   |
| 8. Finalize arrangements with exporter & importer    |      |   |      | X |   |   |   |   |   |   |   |   |   |   |
| 9. Supply chain test 1                               |      |   |      |   |   |   |   |   |   |   |   |   |   |   |
| 10. Supply chain test 2                              |      |   |      |   |   |   |   |   |   |   |   |   |   |   |
| 11. Evaluation and reporting                         |      |   |      |   |   |   |   |   |   |   |   |   |   | X |

## General

- The Wageningen UR HORTIN coordinator needs to discuss the availability of manpower within IPB and the IAARD Research Institutes with the ICHORD director. The ICHORD director in cooperation with the IAARD institutes will decide whether it is possible to avail manpower for the proposed experiments on rambutan in 2008 and 2009.
- All research parties involved have indicated to do the utmost to get MAP packaging experiments started on a short notice and to make research capacity available. However under these special conditions HORTIN II should pay for necessary facilities such as transport, materials, plastic films, data loggers (if required) according to the final project proposals. Before any decision can be taken on cooperation and joint experiments detailed project proposals and protocols are needed.
- The following organisational structure is proposed for effective coordination of the various HORTIN activities (fruits, vegetables and supply chain development)



**Figure 1 Organisational structure HORTIN II**



---

## 1. Introduction

### 1.1. Context and purpose of mission

A quick scan of selected domestic and export oriented supply chains Rambutan and avocado was conducted by a team consisting of staff of Wageningen UR, Fresh Studio Innovations, HPSP-INA and Directorate General Horticulture in July 2008. A summary of the recommendations and conclusions of this mission is attached (see also HORTIN II report no 16). During this survey Indonesian research Institutes were not involved yet and the team interviewed mainly growers, traders, staff of the Ministry of Agriculture, owners of packaging centres and they visited market places including retail outlets.

Although innovative results of Research and Development (R&D) programs will play an important role for strengthening supply chains the mission started with the market and commercial and public parties first. Based on this survey cum stakeholders' consultation bottle necks and opportunities for supply chain development were systematically identified.

The purpose of the current mission is – among others - to identify partners for reaping these opportunities and / or solving the bottle necks for supply chain development rambutan. For this purpose a one week program was put together as attached (Annex 1). During this mission researchers were consulted and their contribution was discussed at length. By the end of 2008 it is envisaged that co innovation activities on rambutan will be geared up in collaboration with Indonesian and Netherlands' researchers and private parties such as producers, packers and exporters as well a processing companies.

A summary of the Terms of Reference of this mission is presented below and these excerpts were also used as official introduction of the mission team with Indonesian partners.

Three tracks for strengthening rambutan supply chains were jointly identified and are to be discussed and its feasibility evaluated with Indonesian counterparts during this mission;

1. Processing routes for preservation of rambutan for the development of alternative product market combinations and to create new and off season markets for processed rambutan.
2. Development of Modified Atmosphere packaging methods for improved quality of rambutan and prolonged shelf life at export and high end domestic markets.
3. Screening of opportunities to influence the flowering and harvest period of rambutan

### 1.2. Terms of reference mission

The objectives of the mission are the following:

- To discuss research institutes' activities on rambutan in general and supply chain innovations fruit in particular in 2008 and 2009;
- Explanation and exploratory discussion on the HORTIN II program fruit; proposed activities 2008 and 2009 on rambutan and the mode of cooperation Wageningen UR is looking for;
- Screen & discuss opportunities for rambutan supply chain development & product market innovations and to explore opportunities for cooperation with Indonesian Research institutes and ICHORD involvement.
- Make arrangements for follow up experimental and applied research activities

The mission team consist of Dr. Jeroen Knol (Wageningen UR, AFSG), Iskandar Zulkarnain (Horticultural Partner Ship Program (HPSP) and Indonesian Netherlands Association (INA)) and Marcel Stallen (Fresh Studio Innovations). The mission was conducted in week 47, 2008 (17 – 21 November 2008).

---

### **1.3. This report**

Only major conclusions and key observations are reported in this mission report. Action points are summarized, especially who should take which action and when. Most important the tentative proposals for supply chain R&D projects rambutan are presented.

Consultants would like to thank staff of the Agricultural Department (Dinas Pertanian) Subang, Staff of the Directorate General Horticultural Production (fruits), Staff of ICHORD and Research Institutes as well as farmers and traders for their cooperation and willingness to discuss opportunities for research cooperation.

Huissen, Wageningen, Jakarta,

November 2008

## 2. Summaries and action points per meeting

### 2.1. Meeting with DG Horticulture

|  |   |
|--|---|
| <b>Organization &amp; Persons met</b>    | DG Horticulture – ir. Winny Dian Wibawa (director) and ir. Samsuardi (staff)  |
| <b>Date</b>                              | Monday afternoon, November 17, 2008, Jakarta  |
| <b>Discussion &amp; Key observations</b> | <ul style="list-style-type: none"> <li>• DG Horticulture agrees with the priorities set for rambutan and they are willing to support the project through cooperation at local Kabupaten level.</li> <li>• We discussed the contents of the ACIAR program on rambutan in which DG Horticulture cooperates and the irrelevance of rambutan strengthening and variety testing at Nusantara islands. The major centres for rambutan production are West Java and Sumatra.</li> <li>• It was stressed that the variety effect on MAP results and shelf life could be considerable. There is a difference in market appreciation and quality between 'Lebak' and 'Binjai'.</li> <li>• The seasonality of rambutan is rather extreme and prices vary from 8000 IRP in the low season till 1000 IRP in the peak season of rambutan supply</li> <li>• DG Horticulture supports a systematic screening of PMC's for rambutan</li> </ul> |
| <b>Action points</b>                     | 1. DG Horticulture will inform staff of Dinas Pertanian Kabupaten Subang to assist us when we wish to visit market places and farmers' fields.  |

### 2.2. Meeting with ICHORD, IVEGRI, ITFRI & IRICSF

|  |   |
|--|---|
| <b>Organization &amp; Persons met</b>    | ICHORD – dr. Yusdar Hilman (director), Ibu Sri Sulihanti and Bpk Sutrisno (staff), IVEGRI – Bpk Ahsol Hasyim (director), dr. Nikardi Gunadi (HORTIN II coordinator), ITFRI (Indonesian Tropical Fruit Research Institute) – ir. Nurhadi (director), IRICSF (Indonesian Research Institute for Citrus and Subtropical Fruits) – Director.  |
| <b>Date</b>                              | Monday afternoon, November 17, 2008, Jakarta  |
| <b>Discussion &amp; Key observations</b> | <ul style="list-style-type: none"> <li>• We were informed by Bpk Yusdar Hilman that IAARD has a new director, Mr. Gatot and that he should be informed about the progress in the HORTIN II projects and the program as a whole. IAARD is responsible for HORTIN II.</li> <li>• Marcel Stallen explained about the mission on fruits that was executed in July 2008 on the request of the Agricultural Counsellor of the Dutch Embassy, Mr Hans van der Zijden, Bpk Dimiyati and Arij Everaarts (Dutch HORTIN II coordinator).</li> <li>• The purpose of this visit (today and the rest of the week) is to discuss ideas about research and development on rambutan – based on the quick scan of fruit supply chains last July. But also to identify a suitable counterpart research institute for fruit and a coordinator for the fruit program.</li> <li>• Although Rambutan and Avocado (but also strawberry) are not IAARD research priorities this should not be a major problem. ICHORD and the institutes itself could still facilitate Wageningen UR on fruit research and make some funds and staff available for an early start in 2008 / 2009. However Wageningen UR (AFSG) should, together with their Indonesian counterpart (institute and researcher) first prepare sound project proposals including activities, equipment, (travel) budget and staff</li> </ul> |

|                      |   |
|----------------------|---|
|                      | <p>requirements.</p> <ul style="list-style-type: none"> <li>• We discussed about Rambutan research and development activities and concluded that both processing and modified atmosphere packaging could be interesting options to develop new markets, but those variety aspects should be taken into account. Balitbu has experience in Rambutan research and has a nice variety collection. It was suggested to cooperate with Balitbu on modified atmosphere packaging and with the Institute for Post Harvest Research in Bogor on processing. Jeroen will explore these opportunities in the coming week and will also discuss Indonesian counterpart staff and facilities required.</li> <li>• We agreed that from a logistical and efficiency point of view (but also to create impact in the market) it is good to focus on Subang as a major production centre and the IAARD institute on post harvest research in Bogor for the experimental work. However we will try to involve Balitbu staff in the R&amp;D work whenever possible. Both institutes are part of IAARD.</li> <li>• It was emphasised that we should develop our proposal soon in order to discuss it during the bilateral meeting on agricultural cooperation between the Netherlands and Indonesia in Bandung next week.</li> <li>• Ibu Sri Sulihanti also asked us about the end of the HORTIN program in 2009, whether it will be extended and whether she should prepare for a new MoU.</li> <li>• ICHORD continually wants to be informed about all aspects and projects of HORTIN II (fruit and vegetables). It is well understood that direct lines of communication are required with Nikardi Gunadi as the HORTIN II coordinator for vegetables R&amp;D and with a yet to be appointed fruit coordinator. Nevertheless all reports and crucial information should also be copied to Bpk Yusdar and Ibu Sulihanti (ICHORD).</li> </ul> |
| <b>Action points</b> | <ol style="list-style-type: none"> <li>1. HORTIN II program leader (the Netherlands, Arij Everaarts) will contact director ICHORD on above mentioned issues and on how to include the R&amp;D work on rambutan in the on going ICHORD program 2008 / 2009</li> <li>2. Jeroen Knol (HORTIN II fruit researcher) will discuss the expertise and equipment needed for the envisaged experiments with Bpk Nurhadi (director Balitbu), director Post Harvest Research Institute Bogor and the Centre for tropical Fruit Studies institute, IPB Bogor.</li> <li>3. Researchers should submit their joint research proposals with ICHORD as soon as possible (via the HORTIN II coordinator)</li> <li>4. A coordinator for the co innovation program fruit (at research institute level) is desirable</li> <li>5. Marcel Stallen or Arij Everaarts will disseminate copies of the HORTIN II mission report on rambutan and avocado via Ibu Sri Sulihanti (Mission report 16)</li> <li>6. Marcel Stallen and Jeroen Knol will brief the Agricultural Counsellor of the Royal Dutch Embassy about progress in the HORTIN II fruit program, for inclusion in the bilateral meeting in week 48.</li> <li>7. The HORTIN II program leader will officially request ICHORD to avail research capacity at the institutes that are identified for cooperation by the mission.</li> </ol>  |

### 2.3. Visit of Kramat Jati wholesale market, Jakarta

|                                       |  |
|---------------------------------------|--|
| <b>Organization &amp; Persons met</b> | Kramat Jati wholesale market, Jakarta<br>Various traders and staff and management of wholesale market                                |
| <b>Date</b>                           | Tuesday morning, November 18, 2008, Jakarta  |
| <b>Discussion</b>                     | <ul style="list-style-type: none"> <li>• There is a strict division in between retail and wholesale fruits and vegetables</li> </ul> |

|                               |  |
|-------------------------------|--|
| <b>&amp; Key observations</b> | <p>(separate buildings)</p> <ul style="list-style-type: none"> <li>• There is a complete absence of quality and safety guidelines and the management is not responsible for developing standards and enforcing them.</li> <li>• There is no central registration of rambutan prices and quantities traded through Kramat Jati (rambutan is considered as a minor crop)</li> <li>• The variety 'Çiplat' is appreciated by the Jakarta population</li> </ul> |
| <b>Action points</b>          |  |

## 2.4. Direktorat Sarana Produksi

|  |   |
|--|---|
| <b>Organization &amp; Persons met</b>    | Direktorat Jenderal Tanaman Pangan, Direktorat Sarana Produksi - Bpk Budi Satriyo. (previously Bpk Budi worked with the department of processing and he was deployed as a researcher on post harvest issues before)   |
| <b>Date</b>                              | Tuesday morning, November 18, 2008, Jakarta   |
| <b>Discussion &amp; Key observations</b> | <ul style="list-style-type: none"> <li>• We discussed opportunities for vacuum frying of fruits in general. This method is successfully used for pineapple and jackfruit. To date no experiments with rambutan have been conducted.</li> <li>• The high water content of rambutan might cause problems in case of vacuum frying</li> <li>• Equipment for vacuum frying was not used for over a year but in general the appliances appear to be OK</li> <li>• The equipment is rather cumbersome to operate but at a pilot scale (limited capacity in one run only) the method produced good results for jackfruit and pine apple according to Bpk Budi Satriyo</li> <li>• The method of vacuum frying is characterised by a relatively low efficiency.</li> <li>• We discussed opportunities to extract the relatively high contents of (healthy) anti oxidants from the skin of rambutan.</li> <li>• A systematic comparison of processing opportunities will be conducted by researchers. Investments costs for equipment should indeed be taken into account to assess the feasibility and cost price of a particular method.</li> </ul> |
| <b>Action points</b>                     |   |

## 2.5. Meeting Pt Masindo Mitra Mandiri

|  |  |
|--|--|
| <b>Organization &amp; Persons met</b>    | PT Masindo Mitra Mandiri - Bpk Salim Ali (marketing manager)   |
| <b>Date</b>                              | Tuesday afternoon, November 18, 2008, Jakarta  |
| <b>Discussion &amp; key observations</b> | <ul style="list-style-type: none"> <li>• Mr Salim Ali explained their fresh export operations and packaging in detail.</li> <li>• Mostly within two days after an order has been received and placed with the Subang collector the product will arrive at the end destinations with the client</li> <li>• Recently – for the first time ever – a MRL violation with rambutan was observed in the EU. Masindo farmers have been warned not to apply pesticide and to respect the Pre Harvest Intervals. In general it is not understood how this MRL violation could happen.</li> <li>• Masindo prefers not to pre cool its produce because it is often impossible to maintain</li> </ul> |

|                      |  |
|----------------------|--|
|                      | <p>rambutan cool all the way to the EU or the Middle East, Condensation problem in case of temperature fluctuations could become an even bigger problem than sub optimal storage at ambient temperature. Therefore Masindo prefers to ship at ambient temperature rather than to try to maintain a cold chain.</p> <ul style="list-style-type: none"> <li>• Masindo staff clean the rambutan in Jakarta under controlled conditions (not yet HACCP) and the make the product free of ants ('smut') by means of compressed air.</li> <li>• We screened a number of potential importers in the Netherlands.</li> <li>• The packaging process of Masindo and the type of materials and boxes used were explained by Mr Salim. Two PVC wrapped and fully closed trays are put in one box for export.</li> <li>• About 20 to 25 fruits are packed on one tray (total about 1 – 1, 5 kg per tray depending on the variety).</li> <li>• A pre condition for cooperation on any type of experiment is that we should not upset or alter the packaging process.</li> <li>• We discussed the varieties in relationship to particular markets and concluded that:</li> <li>• 'Lebak' variety is superior for export purposes because of its appearance and thick red coloured hairs (robustness)</li> <li>• 'Binjai' is a more fragile variety with thin hairs and the skin resembles a sponge. Thicker skin but the flesh is sweet.</li> <li>• Details of the Masindo fresh export supply chain are depicted below:</li> </ul> |
| <b>Action Points</b> | <ol style="list-style-type: none"> <li>1. Mr Salim will discuss our request for cooperation on MAP packaging experiment with the general manager of Masindo.</li> <li>2. Pre conditions are; no interference with the current packaging operations (these are leading), same type of boxes should be used and the speed of packaging should be the same</li> <li>3. We will be allowed to inspect his packaging and export process in detail ion beforehand. An appointment will be made for this purpose</li> <li>4. We send Masindo the names and websites of the importers that could be involved in these MAP experiment. The quality and remaining shelf life in the Netherlands will be evaluated by AFSG (Jeroen Knol and staff). In Jakarta Masindo will be assisted by staff of the institute for post harvest research in Bogor.</li> </ol>  |

| Day 1                     |                            | Day 2                                |                                      |                    |
|---------------------------|----------------------------|--------------------------------------|--------------------------------------|--------------------|
| 8 hrs                     | 17 – 23 hrs                | 0 – 6 hrs                            | 8 hrs                                | 17 hrs onwards     |
| Order to Subang collector | Arrival of rambutan in JKK | Cleaning, grading and packing in JKK | 1st shipment by SQ or other airlines | Arrival at clients |

## 2.6. Meeting Centre for Tropical Fruit Studies, IPB Bogor

|  |  |
|--|--|
| <b>Organization &amp; Persons met</b>    | Centre for Tropical Fruit Studies, IPB Bogor – dr. Sobir (director), dr. Rahmad Suhartanto and dr. Darda Efendi (both staff of IPB)  |
| <b>Date</b>                              | Wednesday morning, November 19, 2008   |
| <b>Discussion &amp; Key observations</b> | <ul style="list-style-type: none"> <li>• The Centre for Tropical Fruit Studies is an independent entity within IPB Bogor. The Centre is not linked to the IAARD structure and is rather flexible. For research purposes the Centre can directly cooperate with farmers, processors and other parties and they are not bound to do this via the MoA network.</li> <li>• For post harvest research and development work the Centre often cooperate with and use facilities of BB Pascapanen in Bogor.</li> </ul> |

|                      |  |
|----------------------|--|
|                      | <ul style="list-style-type: none"> <li>• The Centre for Tropical Fruit Studies has its own experimental garden in Tangerang with a number of good rambutan varieties.</li> <li>• We exchanged presentations of their and our experimental work on fruits.</li> <li>• The Centre strongly recommended including consumers' research and consumers expectations of tropical fruits in our set up. IPB is interested to cooperate in the field of consumers' research.</li> <li>• IPB also work on MA / CA storage methods for fruits and they underline our research priorities for rambutan</li> <li>• We discussed the opportunities for processing of rambutan but also the severe restrictions.</li> </ul> |
| <b>Action points</b> | <ol style="list-style-type: none"> <li>1. Dr. Darda Efendi is our contact person and he is willing to cooperate and first of all to comment on and contribute to our research proposal and protocols.</li> <li>2. Arrangements for operational budgets need to be made to kick start activities on rambutan in 2008 and 2009. The availability of research capacity is yet to be discussed internally and depends also on the type of activities.</li> <li>3. For consumers' research we should contact Ibu Yaya</li> </ol>  |

## 2.7. Meeting ICAPRD

|  |  |
|--|--|
| <b>Organization &amp; Persons met</b>    | ICAPRD (Indonesian Centre for Agricultural Postharvest Research and Development) – dr. Wisnu Broto (director), dr. Sri Yuliani (international cooperation and relations), dr. Setyadjit and staff  |
| <b>Date</b>                              | Wednesday afternoon, November 19, 2008, Jakarta  |
| <b>Discussion &amp; Key observations</b> | <ul style="list-style-type: none"> <li>• ICAPRD is a recently established new IAARD institute. The institute seems well equipped to cooperate with Wageningen UR AFSG in the HORTIN II program.</li> <li>• Rambutan is not included in their list of priority crops and topics (yet)</li> <li>• The production of fruit juices and puree is a major topic within the R&amp;D program and a pilot demonstration unit is operational in Losari near Cirebon.</li> <li>• Currently the institute has some cooperation with ACIAR and FAO and cooperation with Wageningen UR-AFSG is welcome.</li> <li>• It was mentioned that a project was submitted by ICAPRD on post harvest research within the partite country program (Netherlands, Indonesia and Malaysia) on market access some time ago. Unfortunately this project was not granted.</li> <li>• The project request for MAP rambutan is considered as an emergency project and manpower can be arranged on special request of the director IAARD and ICHORD. However funds for materials, travel, facilities and chemicals need to be made available by third parties.</li> <li>• Before jumping into a decision on possible cooperation and budgets all parties wish to know what is exactly required and therefore we better first discuss the contents of the activities and the project itself.</li> </ul> |
| <b>Action Points</b>                     | <ol style="list-style-type: none"> <li>1. Dr Sri Yuliani is nominated as the counterpart of Jeroen Knol</li> <li>2. Jeroen will submit his preliminary ideas on MAP rambutan research and Sri Yuliani will add her ideas as soon as possible to be able to present this as a joint experiment.</li> <li>3. In case of actual cooperation a formal request of IAARD and ICHORD is required to facilitate the HORTIN program with research capacity (manpower)</li> </ol>  |

## 2.8. Meeting Puresso, Promindo Utama cv & SS Fresh Fruit Company

|  |  |
|--|--|
| <b>Organization &amp; persons met</b>    | Processing factory Puresso, Promindo Utama cv<br>H. Sholeh RH Kurdi<br>SS Fresh Fruit Company, Sahril Sidik  |
| <b>Date</b>                              | Thursday morning, November 20, 2008, Jakarta   |
| <b>Discussion &amp; key observations</b> | <ul style="list-style-type: none"> <li>• We discussed processing opportunities Rambutan</li> <li>• Obviously the efficiency could be a major bottle neck. We learned that in case of mangosteen the process efficiency is as low as 16 %</li> <li>• Bpk Sholeh has made pulp and juice out of mango, soursop, guava, strawberry and carrot</li> <li>• Another problem when processing rambutan is the seed and the hull of the seed which sometimes is difficult to separate from the flesh.</li> <li>• In 2007 the company exported 500 kg puree to Japan.</li> <li>• The capacity of the machine in case of mango is 400 kg per hr and one labourer can clean only 140 kg mango per day.</li> <li>• His puree has no additives and should be stored at -2oC to -4oC. AT ambient temperature the keep ability of the puree is very limited</li> <li>• Bpk Sholeh will produce whenever there is a request from the market in whatsoever quantity, including rambutan which he has never tried so far.</li> <li>• The company works closely with researchers of the Institute for post habits research in Bogor</li> <li>• Waste material of the processing factory is used a compost</li> </ul> |
| <b>Action Points</b>                     | <ol style="list-style-type: none"> <li>1. When there is a request from a market party to produce juice or puree we can request for his cooperation.</li> <li>2. Processing at a pilot scale can be organized at his location.</li> </ol>   |

## 2.9. Dinas Pertanian Subang & Selected farmers' fields

|  |   |
|--|---|
| <b>Organization &amp; persons met</b>    | Dinas Pertanian Subang and selected farmers' fields and market places rambutan Kabupaten Subang   |
| <b>Date</b>                              | Thursday afternoon, November 20, 2008, Jakarta  |
| <b>Discussion &amp; key observations</b> | <ul style="list-style-type: none"> <li>• The program and activities of the Dinas Pertanian and their involvement with fruit production was explained to us.</li> <li>• We discussed varieties, diseases, harvest system, flower induction buy irrigation and the influence of the season on flowering and harvest time.</li> <li>• Biannual bearing can be a problem with rambutan</li> <li>• The trading system and prices was discussed with various traders, farmers and staff of Dinas Pertanian.</li> <li>• After picking bunches of fruit there is still some selection of fruits to be done to get uniform ripe bunches of fruit. About 30 % is removed because the fruits are immature.</li> <li>• Smut (ants) are a major problem in rambutan</li> <li>• We discussed the in transparency of the marketing system</li> <li>• Bunches of fruits are about 1,5 kg and consist of 20 – 30 fruits</li> </ul> |



|                      |   |
|----------------------|---|
|                      | <ul style="list-style-type: none"> <li>The average harvest is about 200 – 300 kg rambutan per tree</li> </ul> |
| <b>Action Points</b> | We can request for cooperation of Dinas, farmers and traders at any time                                      |

## 2.10. Royal Dutch Embassy Jakarta

|  |   |
|--|---|
| <b>Organization &amp; persons met</b>    | Office of the Agricultural Counsellor, Royal Dutch Embassy Jakarta, Mr. Hans vd Zijden  |
| <b>Date</b>                              | Friday Morning, November 21, 2008, Jakarta  |
| <b>Discussion &amp; key observations</b> | <ul style="list-style-type: none"> <li>Briefing on progress and the follow up on rambutan (and avocado) in the coming period</li> </ul> |
| <b>Action Points</b>                     |   |

## 2.11. Australian Centre for International Agricultural Research (ACIAR)

|  |   |
|--|---|
| <b>Organization &amp; persons met</b>    | Australian Centre for International Agricultural Research (ACIAR) Mr. Julien de Meyer |
| <b>Date</b>                              | Friday November 21 (cancelled)  |
| <b>Discussion &amp; key observations</b> | Cooperation on rambutan (later)   |
| <b>Action Points</b>                     |   |

## 3. Project proposals and protocol – 1<sup>st</sup> draft versions

### 3.1. Processing for new Product Market Combinations rambutan

#### 3.1.1 Introduction

In this activity, processing technologies will be investigated to extend shelf life, and their suitability for application on rambutans. Literature information, expert knowledge and the discussions with stakeholders in Indonesia should result in a first selection of technologies. The following technologies will be evaluated: curing, drying, canning, addition of chemical additives, low temperatures, irradiation, fermentation, pasteurization, preservation with sugar, jellying, wax formulation and edible coatings, high pressure processing, hot water treatment, processing using ultrasound and vacuum frying. Focus was on peeled and stoned rambutan. Options for juice processing and preservation can be studied in next year.

### 3.1.2 Planning

| Activity   | 2008 |   | 2009 |   |   |   |   |   |   |   |   |   |   |   |   |
|--|------|---|------|---|---|---|---|---|---|---|---|---|---|---|---|
|  | N    | D | J    | F | M | A | M | J | J | A | S | O | N | D |   |
| 1. Literature survey                               |      | ■ |      |   |   |   |   |   |   |   |   |   |   |   |   |
| 2. Simulation and desk research                    |      | ■ | ■    |   |   |   |   |   |   |   |   |   |   |   |   |
| 3. Reporting                                       |      |   | X    |   |   |   |   |   |   |   |   |   |   |   |   |
| 4. Selections of counterpart institute             |      |   | X    |   |   |   |   |   |   |   |   |   |   |   |   |
| 5. Development proposal & protocols                |      |   |      | ■ |   |   |   |   |   |   |   |   |   |   |   |
| 6. Consumers' preferences (Asia, EU and Indonesia) |      |   |      |   | ■ | ■ | ■ | ■ | ■ | ■ |   |   |   |   |   |
| 7. Market survey (Asia, EU and Indonesia)          |      |   |      |   | ■ | ■ | ■ | ■ | ■ | ■ |   |   |   |   |   |
| 8. Processing under experimental conditions (1)    |      |   |      |   |   |   |   |   |   |   |   |   | ■ |   |   |
| 9. Processing under experimental conditions (2)    |      |   |      |   |   |   |   |   |   |   |   |   | ■ | ■ |   |
| 10. Evaluation (go / no go)                        |      |   |      |   |   |   |   |   |   |   |   |   |   |   | X |
| 11. Finalize arrangements with processing company  |      |   |      |   |   |   |   |   |   |   |   |   |   |   |   |
| 12. Pilot processing unit (1)                      |      |   |      |   |   |   |   |   |   |   |   |   |   |   |   |
| 13. Pilot processing unit (2)                      |      |   |      |   |   |   |   |   |   |   |   |   |   |   |   |
| 14. Evaluation and reporting                       |      |   |      |   |   |   |   |   |   |   |   |   |   |   |   |

## 3.2. Modified Atmosphere Packaging for prolonged shelf life and better quality

### 3.2.1 Introduction

In order to contribute to the development of tropical fruit sector in Indonesia, new packaging concepts should be investigated to increase shelf life of these fruit. The extension of the shelf life will assure easier and longer distribution radius. The economical fall-out can have significant effects on the Indonesian fruit chain.

The present study is processed to determine the potential opportunities of using modified atmosphere packaging for Rambutan fruits. The literature reports that modified atmosphere packaging has a positive effect on the quality of the rambutan fruit and an extension of the shelf life was observed. In order to determine if this packaging method is practical at small scale farmer in Indonesia, the present set-up was established.

Cooperation's with the farmer/cooperative and local research institutes are indispensable in order to determine the limits and further expectations of this technique on the export market and local market.

### 3.2.2 Objective

Several bags with micro-perforations were prepared in the Netherlands. Fresh rambutans are packed in these bags and stored in refrigerated room 12°C. A shelf life of 21 days is aimed for cold storage treatment.

### 3.2.3 Set-up

Bags are made with Polyethylene material of 40µm thickness with Antifog layer with different micro-perforations hand made with a needle of 100µm of diameter. Ones the rambutan placed inside the bag, this one should be closed hermetically thanks to a hot seal (use seal bar: temperature sealing: 130°C, Time sealing 1 second, temperature cooling: 110°C). If no sealing bar is available at the packaging platform, bags should be manually closed in the most hermetic way is possible (the opening should be tightly folded on itself 5 times and fixed with tape). For both closing procedure, it is important to close at the level of the mark present of the bag. The dimensions of the active bag are 25 by 25 cm (10 cm extra at the opening will permit to close hermetically the bag by folding). Each bag is pre-labelled with appropriate code. Follow these codes to dispatch the bags according to the appropriate treatments. Evaluate the bag following the protocol set-up requirement.

- 15 rambutan fruits are packed per bag. The average bag's weigh is 550 gram.
- Before packing, fruit are pre-cooled at 15C for 2 hours.

---

### Treatments

- Reference: rambutan stored in standard packaging: punnet of tray of 550g stored directly at air atmosphere [**Ref**]
- PE bag without perforation [**No perf**]
- PE bag with 5 micro-perforation [**5 perf**]
- PE bag with 10 micro-perforations [**10 perf**]
- PE bag with 30 micro-perforations [**30 perf**]

2 storage temperatures will be tested during all the experiment

- Room temperature (around 25-30°C) to mimic the local market conditions [**R temp**]
- Cold storage temperature (12°C) to optimize the MAP [**C temp**]

The total amount of bags/punnet needed for this test is 5x2x2x3 (treatments x duplicate x temperature x evaluation) = 60 bags. A total of 900 rambutan fruits (or 31.5 kg) are needed to process this experiment.

### 3.2.4 Evaluation

Sensorial evaluations are processed on day 8, 14 and 21 ([**Day8**], [**Day14**] and [**Day21**]). At each evaluation, 2 bags per treatment are evaluated. (Bags are numbered from 1 to 6)

1. All the bags are weighed after packing and before each evaluation moment (for the bag evaluated) to determine the water loss.
2. Before each evaluation, the gas concentration (oxygen and carbon dioxide) inside the bags is determined (if equipment available).
3. Digital photo of bags before opening and after opening are taken. These photos will be used to visualize the quality "decays" of the rambutans during their shelf life.
4. Additionally to the photos, a sensorial evaluation is required. Colour of the rambutan spintern extremities, colour of the rambutan in general, rot development, texture and taste of the rambutan are evaluated. The score sheet and evaluation protocol is used. Following the criteria and marks used for the sensorial evaluation:

*Colour of rambutan spintern:*

- 0= 75 -40% of spintern is green (fresh light green)
- 1= 10-39 % of spintern is green (darker green)
- 2= <9% of spintern is green, red is the main colour
- 3= spintern has dark red colour (auburn)
- 4= spintern is completely brown

*Colour of rambutan in general: fruit surface browning:*

- 0= none browning, rambutan colour red
- 1= 1-20% of total surface is brown
- 2= 21-50%
- 3= 51-80%
- 4= 81-100%

*Rot evaluation:*

Number of fruit with rot development /total of fruit per package (15)

*Texture evaluation (open the fruit before evaluating the texture):*

- 1 =soft and water
- 2= soft
- 3= crisp
- 4= very crisp

---

*Off-flavour evaluation (of the eatable part of rambutan fruit):*

1= no off-flavour

2= mild off-flavour

3= moderately off-flavour

4= strong off-flavour

5= extremely strong off-flavour

### **3.2.5 Protocol**

Day 0:

- Harvest the rambutan at maturity stage
- Process the rambutan according to standard procedure: cleaning, chemical treatment, sorting...
- Pre-cool the rambutan at 15C for 2 hours
- Pack the rambutan carefully in the Polyethylene bags:
  - 15 rambutans per bag
  - Close the bag hermetically or by hot seal or by folding technique
- Weigh each bag individually. Record the weigh. The initial weigh will permit to determine the water loss of rambutan.
- Place all the bags marked with **[C temp]** in the cooling room with a temperature of 12C. The bags marked with **[R temp]** are placed at room temperature (25C). The storage rooms (at 12C and room temperature) are dark.

Day 8:

- Take 2 bags of each treatment (marked with **[Day 8]**)
- Measure the gas concentration
- Weigh the bag and record the weigh
- Open the bag and take photo (of each bag)
- Evaluate the rambutan according the score sheet parameters:
  - Start with number of rambutan rot
  - Colour of spintern (one mark per bag)
  - Colour of rambutan
  - Texture of rambutan
  - Off-flavour

Day 14:

- Take 2 bags of each treatment (marked with **[Day 14]**)
- Measure the gas concentration
- Weigh the bag and record the weigh
- Open the bag and take photo (of each bag)
- Evaluate the rambutan according the score sheet parameters:
  - Start with number of rambutan rot
  - Colour of spintern (one mark per bag)
  - Colour of rambutan
  - Texture of rambutan
  - Off-flavour

Day 21:

- Take 2 bags of each treatment (marked with **[Day 21]**)
- Measure the gas concentration
- Weigh the bag and record the weigh
- Open the bag and take photo (of each bag)
- Evaluate the rambutan according the score sheet parameters:
  - Start with number of rambutan rot
  - Colour of spintern (one mark per bag)

- Colour of rambutan
- Texture of rambutan
- Off-flavour

Day 22 or later

- send all the results (score sheet and digital photo) to A&F in the Netherlands for analyze of the results and conclusions

### 3.2.6 Planning

**Table 4 Indonesian & Dutch researchers propose the following activities in 2008/09:**

| Activity   | 2008 |   | 2009 |   |   |   |   |   |   |   |   |   |   |   |   |
|--|------|---|------|---|---|---|---|---|---|---|---|---|---|---|---|
|  | N    | D | J    | F | M | A | M | J | J | A | S | O | N | D |   |
| 1. Literature survey                                 |      |   |      |   |   |   |   |   |   |   |   |   |   |   |   |
| 2. Reporting   |      | X |      |   |   |   |   |   |   |   |   |   |   |   |   |
| 3. Selections of counterpart institute               | X    |   |      |   |   |   |   |   |   |   |   |   |   |   |   |
| 4. Development proposal & protocols                  | X    |   |      |   |   |   |   |   |   |   |   |   |   |   |   |
| 5. Experimental screening of PE films for rambutan 1 |      |   |      |   |   |   |   |   |   |   |   |   |   |   |   |
| 6. Experimental screening of PE films for rambutan 2 |      |   |      |   |   |   |   |   |   |   |   |   |   |   |   |
| 7. Evaluation and selection of material for export   |      |   |      | X |   |   |   |   |   |   |   |   |   |   |   |
| 8. Finalize arrangements with exporter & importer    |      |   |      | X |   |   |   |   |   |   |   |   |   |   |   |
| 9. Supply chain test 1                               |      |   |      |   |   |   |   |   |   |   |   |   |   |   |   |
| 10. Supply chain test 2                              |      |   |      |   |   |   |   |   |   |   |   |   |   |   |   |
| 11. Evaluation and reporting                         |      |   |      |   |   |   |   |   |   |   |   |   |   |   | X |

**Annex I. Itinerary and persons met**

| <b>Travel and visit itinerary HORTIN FRUIT mission</b> |   |
|--|---|
| <b>Date and time</b>                                   | <b>Meeting / visit</b>  |
| <b>Monday November 18</b>                              |   |
| 9.00   | Arrival Jeroen Jakarta  |
| 13.00  | Meeting with Directorate Fruit Crops. Ir Winny Dian Wibawa  |
| 16.00  | Meeting ICHORD (dr .Yusdar Hilman) and staff  |
| <b>Tuesday November 19</b>                             |   |
| 08.00  | Visit to wholesale market Kramat Jati & local trader Rambutan                                     |
| 11.00  | Mr Budi Satriyo, Department of Agriculture, Pasar Minggu on processing of Rambutan                |
| 13.00  | PT Masindo Mitra Mandiri (exporter) Bpk Salim   |
| <b>Wednesday November 19</b>                           |   |
| 09.00  | Visit and discussion with Centre for Tropical Fruit Studies, Bogor (Dr Sobir and staff, director) |
| 14.00  | Visit and discussion with staff BB Post Harvest Research, Bogor                                   |
| 22.00  | overnight Cirebon   |
| <b>Thursday November 20</b>                            |   |
| 09.00  | Mango processing factory, Losari  |
| 13.00  | Production Area Subang with DG Fruit staff  |
| 16.00  | Return to Jakarta   |
| <b>Friday November 21</b>                              |   |
| 9.00   | Briefing at Embassy (Agric Counsellor, Hans vd Zijden)  |
| 11.00  | (Cancelled) Meeting with AUSAID / ACIAR program on fruits, Jakarta.                               |
| 16.00  | Jeroen Return to Amsterdam  |

---

## **Annex II. Project Description: Product diversification & quality improvement Rambutan**

### **Horticultural Research Co-operation between Indonesia and The Netherlands - HORTIN-II**

- 1. Project title** : Product diversification and quality improvement Rambutan
- 2. Project leaders** : Jeroen Knol, AFSG, Wageningen UR (Netherlands)  
Sri Yuliani, Indonesian Centre for Agricultural Post Harvest Research and Development, Bogor  
Centre for Tropical Fruit Studies, Bogor
- 3. Executing agencies** : AFSG, ICAPRD
- 4. Abstract** :

**5. Participating organisations and companies <sup>1</sup>:**

- PT Masindo Mitra Mandiri
- PT Agrosari Sentraprima, Medan
- Directorate General (DG) Horticultural Fruit Crops, Jakarta
- HPSP (Horticultural Partnership Support Program)
- AUSAID / ACIAR program on fruits, Jakarta.
- Fresh Studio Innovations Asia

**6. Objectives:**

*Long-term objectives:*

To contribute to the development of the fruit sector in Indonesia and generate employment and income for fruit producers by optimising the supply chain for fruit products.

*Short-term objectives:*

- To evaluate possible processing routes for preservation of rambutan for the development of alternative product market combinations and to create new and off season markets for processed rambutan
- To develop Modified Atmosphere packaging methods for improved quality of rambutan at export markets

**7. Project description:**

In this project, the following activities will be conducted:

2008

- Literature survey on possibilities for extension of harvesting season of Rambutan by special measures during the growing period and possibly by measures during the harvest period.
- Joint project planning with stakeholders; creating commitment with local private parties and public partners (Fresh Studio Innovations Asia, A&F) by visiting them in Indonesia early November.
- Literature survey and lessons learnt from the Thai rambutan sector with regard to processing and post harvest / quality improvements (A&F, Fresh Studio Innovations Asia)
- Selection of potential interesting processing routes based on literature survey above and background knowledge A&F (A&F)
- Inventory of traditional processing of rambutan in Indonesia both on industrial scale and in households (Indonesian partners).

---

<sup>1</sup> This is a gross list of partners and contact persons per potential partner have been identified. Depending on the opportunities for and the mode of cooperation a selection of partners will be made.

- First feasibility study to evaluate potential processing options and modified atmosphere treatment (A&F, with input of Indonesian partners...): for some interesting processing routes, including modified atmosphere packaging, small scale evaluation studies will be done for a first feasibility study of which processing options are interesting.
- Reporting of project results (A&F): for each processing option, including modified atmosphere treatment a short information sheet will be made, explaining the method, the potential impact for rambutan processing, the results of the first feasibility study, the main advantages and disadvantages of the processing option, related to potential application in Indonesia.
- Feed back on short information sheets: local bottlenecks and potential problems by introduction and implementation in Indonesia (Indonesian partners).

2009

- Selection of most interesting improvements in processing and optimisation of supply chain
- Experiments in Indonesia and the Netherlands for practical implementation on processing and MA packaging (Initially under controlled, experimental conditions and under practical conditions in collaboration with project partners (pilot) at a later stage)
- Joint workshop for implementation of results.

#### 7. Project methodology:

- Joint project planning with stakeholders; creating commitment with local private parties and public partners
- Literature survey and lessons learnt from the Thai rambutan sector with regard to processing and post harvest / quality improvements and elongation harvesting season
- Applied experimental research and co innovation activities under supply chain conditions
- Demonstrations and pilot with companies including economic analysis
- Strengthening of producers / farmers associations

#### 8. Expected outputs and impacts:

|      | Output  | Impact   |
|------|---|--|
| 2008 | <ul style="list-style-type: none"> <li>• Results (report) of workshop and discussions with potential project partners</li> <li>• Literature survey about processing and Modified Atmosphere opportunities rambutan</li> <li>• Literature survey about possibilities of extension of harvesting season of rambutan</li> <li>• Results of exploratory experiments under controlled conditions on processing Rambutan in Netherlands and Indonesia.</li> <li>• Report describing processing options, including main advantages and disadvantages and potential applications</li> </ul> | <ul style="list-style-type: none"> <li>• Overview of potential processing opportunities</li> <li>• Insight in potential processing</li> <li>• Project reporting</li> </ul> |
| 2009 | <ul style="list-style-type: none"> <li>▪ To be defined based on outcome of 2008 experiments</li> <li>▪ Experiments in collaboration with research &amp; private partners in Indonesia and The Netherlands aiming at practical implementation of processing and MA packaging</li> <li>▪ Joint workshop</li> </ul>  | <ul style="list-style-type: none"> <li>▪ First step towards implementation of optimising supply chain</li> <li>▪ Knowledge transfer</li> </ul>                             |



### 9. Training and technology transfer/knowledge exchange:

| Year | Subject   | Participant Organisation                                  | Location  | Organisation involved  |
|------|---|---|---|--|
| 2008 | Rambutan processing and packaging:<br>Leaflets for knowledge transfer | <ul style="list-style-type: none"> <li>A&amp;F</li> </ul> | <ul style="list-style-type: none"> <li>The Netherlands</li> </ul> | <ul style="list-style-type: none"> <li>A&amp;F</li> </ul>                              |
| 2009 | Rambutan processing and packaging:<br>workshop                        | <ul style="list-style-type: none"> <li>A&amp;F</li> </ul> | <ul style="list-style-type: none"> <li>Indonesia</li> </ul>       | <ul style="list-style-type: none"> <li>A&amp;F</li> <li>Indonesian partners</li> </ul> |

### 10. Work plan 2008 and 2009:

| Time | Activity   | Deliverables  |
|------|--|---|
| 2008 | <ul style="list-style-type: none"> <li>Joint problem identification and project planning with stakeholders; (Fresh Studio Innovations Asia, A&amp;F)</li> <li>Literature survey and lessons learnt from the Thai rambutan sector with regard to processing and post harvest / quality improvements (Fresh Studio Innovations Asia, A&amp;F)</li> <li>Inventory of traditional processing of rambutan in Indonesia both on industrial scale and in households (Indonesian partners).</li> <li>Selection of potential interesting processing routes based on literature survey above and background knowledge A&amp;F (All)</li> <li>First feasibility study to evaluate potential processing options and modified atmosphere treatment (A&amp;F, with input of</li> <li>Reporting of project results (A&amp;F)</li> <li>Feed back on short information sheets: local bottlenecks and potential problems by introduction and implementation in Indonesia (Indonesian partners).</li> </ul> | <ul style="list-style-type: none"> <li>Short literature review</li> <li>Short overview</li> <li>Leaflets</li> </ul> |
| 2009 | <ul style="list-style-type: none"> <li>To be defined based on results 2008</li> <li>Selection of most interesting improvements in processing and optimisation of supply chain</li> <li>Experiments in Indonesia and The Netherlands for practical implementation on processing and MA packaging.</li> <li>Joint workshop for implementation of results</li> </ul>  | <ul style="list-style-type: none"> <li>Report</li> <li>Report</li> <li>Workshop</li> </ul>                          |
| 2010 | <ul style="list-style-type: none"> <li></li> </ul>   | <ul style="list-style-type: none"> <li></li> </ul>  |

---

**Annex III. Presentations Wageningen UR, AFSG and Fresh Studio Innovations**

|  |  |
|--|--|
| Error! Objects cannot be created from editing field codes. | Error! Objects cannot be created from editing field codes. |
| Error! Objects cannot be created from editing field codes. | Error! Objects cannot be created from editing field codes. |
| Error! Objects cannot be created from editing field codes. | Error! Objects cannot be created from editing field codes. |
| Error! Objects cannot be created from editing field codes. | Error! Objects cannot be created from editing field codes. |
| Error! Objects cannot be created from editing field codes. | Error! Objects cannot be created from editing field codes. |
| Error! Objects cannot be created from editing field codes. | Error! Objects cannot be created from editing field codes. |
| Error! Objects cannot be created from editing field codes. | Error! Objects cannot be created from editing field codes. |
| Error! Objects cannot be created from editing field codes. | Error! Objects cannot be created from editing field codes. |
| Error! Objects cannot be created from editing field codes. | Error! Objects cannot be created from editing field codes. |
| Error! Objects cannot be created from editing field codes. | Error! Objects cannot be created from editing field codes. |
| Error! Objects cannot be created from editing field codes. | Error! Objects cannot be created from editing field codes. |
| Error! Objects cannot be created from editing field codes. | Error! Objects cannot be created from editing field codes. |
| Error! Objects cannot be created from editing field codes. | Error! Objects cannot be created from editing field codes. |
| Error! Objects cannot be created from editing field codes. | Error! Objects cannot be created from editing field codes. |
| Error! Objects cannot be created from editing field codes. | Error! Objects cannot be created from editing field codes. |