Research co-operation with Indonesia

1994-2012

02-06-2012
Research cooperation with Indonesia

- BIOBREES I and II
- BIORIN
- BIORIN
- BIOTRAIN
- Public-Private Projects
- INDOSOL
- HORTIN 1 and 2
BIOBREES
An expanding research collaboration of Indonesian and Netherlands institutions

- **BIOBREES** stands for: **BIO**technology in **BREE**ding and **Seed** technology
  - Joint Research Co-operative Programme between Indonesia and the Netherlands on Biotechnology, Plant Breeding and Seed Technology Research for Horticulture.
- Many small projects
Public Private Projects

- Projects granted by Dutch Ministry of Economic Affairs
- Dutch companies who have a collaboration with companies in Indonesia
  - BIOPEP - Pepper
  - BIOTIC - Chrysanthemum
  - INDOROSA - Roses
  - EARLYTOM - Tomato
  - INDOSEED - Seed Quality
  - INDOMWHITEFLY - Tomato
BIOTRAIN
Train the Trainers

- Sponsored by Ministry of Economic affairs (Asia Facility)

- Aim: Five teaching modules suitable for private companies
  - 8 researchers 1 month a course in the Netherlands
  - 3 of them additional six months research
  - All: development of five modules and two try outs
Molecular breeding for drought tolerance and blast resistance in rice

Tomato molecular breeding for resistance to early blight

Indonesian cocoa with Bt toxin-mediated resistance to cocoa pod borer

Modification of cassava starch composition by genetic engineering

Use of haploid technology for genetic improvement of hot pepper
BIORIN
Biotechnology Research Netherlands-Indonesia
Financed by Royal Dutch Academy of Science

- Construction and equipping of a biotechnology laboratory
- Four summer schools

- Partners: IBC, IPB, BRUEC, LIPI, RIFCB, Leiden University, Wageningen University, Plant Research International
SHORT COURSE:
USING MOLECULAR MARKER FOR PLANT BREEDING
COLLABORATION BETWEEN INDONESIAN BIOTECHNOLOGY CONSORTIUM
AND
WAGENINGEN UNIVERSITEIT & RESEARCHCENTRUM, THE NETHERLANDS
PUSAT PENELITIAN BIOTEKNOLOGI IPB, BOGOR 1-6 MARCH 2004
Research cooperation with Indonesia

INDOSOL
2007-2012
KNAW financed
2006 – Visit Indonesia

- Decision for five PhD projects
  - Solanaceae and environment
    - understand and exploit mechanisms for resistance of fruit bearing Solanaceae
  - Solanaceae and health
    - understand and exploit the biochemical pathways in fruit bearing Solanaceae of carotenoids, flavonoids and terpenoids
- Also four summer schools / annual meetings
- Further use of laboratory
2007 in Indonesia

- Masterclass with 18 students
  - science and English
- Five were asked to do PhD study
  - 4 years, 9 months in Netherlands, 3 months in Indonesia
- Three in Wageningen and two in Nijmegen
5 PhD projects

- Quality attributes to pepper metabolites: a systems approach
- Components of whitefly resistance in tomato
- Candidate genes for thrips resistance in pepper (Capsicum spp.)
- Nutritional value and resistance in wild Indonesian Solanum species
  - Diversity study of Indonesian Solanum Subgenus Leptostemonum
  - Resistance to Ralstonia solanacearum in Indonesian eggplant (S. melongena) and wild relatives
Quality attributes to pepper metabolites

- Explore biochemical diversity present within wild and cultivated pepper genotypes.

Yuni Wahyuni/Enny Sudarmonowati/Arnaud Bovy
Conclusions

- The biochemical variation in pepper reveals a large potential for genetic improvement of metabolic traits.
Whitefly resistance in tomato and hot pepper

Syarifin Firdaus, Ence Darmo Jaya Supena, Sjaak van Heusden
And the winner was ..........

S. lycopersicum MM X S. cheesmanii
Mechanism

- Phenotyping F2 (Indonesia and Netherlands)
Indowhitefly

- Additional funding:
  - Ministry of Economic affairs Netherlands
  - Dutch company - ENZA zaden
  - Indonesian company – Ewindo, Purwakarta
  - Wageningen UR Plant Breeding
Candidate genes for thrips resistance in pepper (Capsicum spp.)

Awang Maharijaya/Agus Purwito/ Roeland Voorrips
Resistance screening of pepper accessions
Results screening
Diversity study of Indonesian *Solanum* Subgenus *Leptostemonum*

- Collection and ethno-botanical study of Indonesian eggplants and their wild relatives

Hakim Kurniawan, Hartati, Asadi, Titti Mariani, Gerard van der Weerden
Eggplant is considered one of the important vegetables in Indonesia.

<table>
<thead>
<tr>
<th>Year</th>
<th>Pepper (Ton)</th>
<th>Cabbage (Ton)</th>
<th>Potato (Ton)</th>
<th>Eggplant (Ton)</th>
<th>Carrot (Ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>727,747</td>
<td>1,336,410</td>
<td>977,349</td>
<td>270,748</td>
<td>326,693</td>
</tr>
<tr>
<td>2001</td>
<td>580,464</td>
<td>1,238,079</td>
<td>831,140</td>
<td>244,371</td>
<td>300,648</td>
</tr>
<tr>
<td>2002</td>
<td>635,089</td>
<td>1,232,643</td>
<td>893,824</td>
<td>272,700</td>
<td>292,240</td>
</tr>
<tr>
<td>2003</td>
<td>1,069,722</td>
<td>1,348,433</td>
<td>1,009,979</td>
<td>301,030</td>
<td>355,802</td>
</tr>
<tr>
<td>2004</td>
<td>1,100,514</td>
<td>1,432,814</td>
<td>1,027,040</td>
<td>312,354</td>
<td>423,722</td>
</tr>
<tr>
<td>2005</td>
<td>1,058,023</td>
<td>1,292,984</td>
<td>1,009,619</td>
<td>333,328</td>
<td>440,002</td>
</tr>
<tr>
<td>2006</td>
<td>1,185,057</td>
<td>1,267,745</td>
<td>1,011,911</td>
<td>358,095</td>
<td>391,371</td>
</tr>
<tr>
<td>2007</td>
<td>1,128,792</td>
<td>1,288,738</td>
<td>1,003,732</td>
<td>390,847</td>
<td>350,170</td>
</tr>
<tr>
<td>2008</td>
<td>1,153,060</td>
<td>1,323,702</td>
<td>1,071,543</td>
<td>427,166</td>
<td>367,111</td>
</tr>
<tr>
<td>2009</td>
<td>1,378,727</td>
<td>1,358,113</td>
<td>1,176,304</td>
<td>451,564</td>
<td>358,014</td>
</tr>
</tbody>
</table>

(Statistics Indonesia, 2010)
Collection

- To make an inventory of the eggplant and wild relatives distribution.
- Carried out in 12 provinces of Indonesia during June – December 2008.
- Collected material: seeds, passport data, preliminary characterization data, and photos.
Ethno-botanical study

- To describe the popular uses in various regions: what people know about the plant, specific local names, how people use it, which part of plant is used, etc.
**S. melongena**

**Local name:**

**Status:** cultivated

**Edible:** yes

**Taste:** vary.

**Uses:** food (as vegetable)

**Range of use:** widely use.

**Used method:** boiled, fried with chili & tomato, as ‘taoco’, baked, raw.
Major uses is for food.

Some popular recipes based on eggplant.

- Lodeh
  Java (Javanese)

- Spicy-balado
  West Sumatera (Padangnese)

- Fried-spicy 'sambal'
  North Sulawesi

- Raw-eaten 'lalap'
  West Java (Sundanese)
Data documentation in Access database
Resistance to *Ralstonia solanacearum* in Indonesian eggplant (*S. melongena*) and wild relatives

- Collection wild Solanum species
- Screening for resistance to *Ralstonia solanacearum*

Hartati, Prof. Dr. Titti Mariani, Dr. Asadi
But also a few others:
Prof. dr. Richard Visser, Dr. Sony Suharsono, Dr. Ence Supena, Prof. Dr. Titti Mariani, Dr. Enny Sudarmonowati, Dr. Asadi, Dr. Roeland Voorrips, Dr. Agus Purwito, Dr. Arnaud Bovy, Dr. Ben Vosman, Dr. Ronald van den Berg, G. van der Weerden, Dr. Sjaak van Heusden, East West Seeds Indonesia
Koninklijke Nederlandse Akademie van Wetenschappen

PT EAST WEST SEED INDONESIA

SenterNovem

Terima Kasih

WAGENINGEN UR
For quality of life
Future
Netherlands Initiative for Capacity development in Higher Education (NICHE)
TRAINING COURSE ON MOLECULAR MARKER
AND COMPUTER APPLICATION FOR GENETIC STUDIES
Pusat Penelitian Biotechnology IPB, 1-8 November 2001
Kerjasama Konsorsium Biotechnology Indonesia dengan
Plant Research International, Belanda