Breeding, Production and PVP of Fruit Variety in Malaysia

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Department Of Agriculture
Ministry of Agriculture

MOA

Ministry of Agriculture

MARDI

Malaysian Agriculture Research and Development Institute

Other Research Centres (6)

Horticulture Research Centre

Other programs (3)

Breeding program

Other Agencies (11)

DOA

Department of Agriculture

* PVP Office

Trust Area: Development of new varieties (high yielding, high quality, long storage life and disease resistant/tolerant)

Priority: short term commercial fruit: papaya, pineapple, starfruit, jackfruit, banana, mangosteen
Backcross breeding program (1972-1987)

THE 1st MEETING OF TEST GUIDELINES HARMONISATION ON RAMBUTAN AND STARFRUIT. 4-6 Nov 2014. KLUANG, JOHOR, MALAYSIA

Carica papaya

- Released in 1987
- Malaysia’s flagship papaya for export

Subang X Sunrise Solo

$\text{F}_1$

$\text{F}_2 \times \text{S. Solo (BC}_1\text{)}$

$\text{F}_1\text{BC}_1$

$\text{F}_2\text{BC}_1 \times \text{S. Solo (BC}_2\text{)}$

$\text{F}_1\text{BC}_2$

$\text{F}_5\text{BC}_2$

Line 20 (Eksotika)

Improved EQ Size 1972-87

F1 hybrid (Eksotika II)

A new hybrid with improved fruit cosmetics, storage life and yield
Maspine

• 9 clones – registered (Mac 2013)
• Fruit cylinder in shape,
• Fruit weight: 1.8 kg,
• Thin skin, recovery rate 20% (‘Gandul’16-18%)
• Golden colour flesh, colour still retain after processing
• Sugar content (TSS) 16%

Josapine

• Released 1996
• Sugar contents (TSS) 16 – 17%
• Weight: 1.2 - 1.5 kg
• Pleasant aroma
• Long shelf-life
• Tolerant to black heart disorder

Ananas comosus
**Durian** *(Durio zibethinus)*

- Cross between D24 and D10
- Started early 1960s
- Released in 1990s
- Tasty
- Popular

- 124 clones – registered
- D1 (1934) ....... D 199 (2013)

**New variety**

MDUR79

MDUR78

MDUR88
**Melomas**

- Registered 2002
- Tolerant to Greening diseases
- Weight: 1.0 - 1.2 kg
- Sweet 11.4 – 12.0 °Brix
- Less fibrous
- Juicy and low acid
- No bitter taste

- 3 clones – registered
  - PO54 (1990) ....... PO56 (2002)
Ciku (Manilkara zapota)

Mega (C64)

- Registered 2001
- Tolerant to stem-gall formation
- Weight: 300 – 400g
- Sweetness 20 - 21 °Brix
- Single fruit per panicle

- 21 clones – registered
- C4 (1937) ....... C68 (2012)
- Short-term program
- For ‘cleaning’ and stabilising local varieties selected by farmers
- ‘Subang 6’ is a selection suitable for fresh consumption
- ‘Sitiawan’ and ‘Batu Arang’ for processing
- Sekaki.
Starfruit (Averrhoa carambola)

- 18 varieties registered (DOA)

Popular variety (farmer’s selection)
• 61 clones (DOA)
• R1 (1937)…..R193 (1991)
Mango

(Mangifera indica)

- 76 clones (DOA)
- MA3 (1937).....MA226 (1992)

Chokanan

Harumanis

Popular variety (farmer’s selection)
(Musa spp)
- 14 clones – registered

(Psidium guajava)
- 14 clones – registered
- GU3 (1951) ....... GU16 (2013)

- a. Pisang Mas
- b. Pisang Abu
- c. Pisang Berangan
- d. Pisang Nipah
**Mangosteen** *(Garcinia mangostana)*

- 2 clones – registered

**Jackfruit** *(Artocarpus heterophyllus)*

- 14 clones – registered

**Popular variety (farmer’s selection)**

- J29 (1973)
- J31 (1973)
CURRENT STATUS ON PVP IMPLEMENTATION IN MALAYSIA

Applications

Granted PBRs

Substantive Examinations

THE 1st MEETING OF TEST GUIDELINES HARMONISATION ON RAMBUTAN AND STARFRUIT. 4-6 Nov 2014. KLUANG, JOHOR, MALAYSIA
Number of Applications Received; 2008 – August 2014 (by Crop Type)

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Total Applications</th>
<th>Rejected</th>
<th>Withdrawn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ornamentals</td>
<td>94</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Rice</td>
<td>20</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Forest Plantation Sp.</td>
<td>19</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Fruit</strong></td>
<td><strong>18</strong></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Industrial Crop</td>
<td>11</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Vegetables</td>
<td>11</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Herbs</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mushroom</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>180</strong></td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Fruit Crop</td>
<td>Variety</td>
<td>Granted</td>
</tr>
<tr>
<td>---</td>
<td>------------</td>
<td>---------</td>
<td>---------------</td>
</tr>
<tr>
<td>1</td>
<td>Papaya</td>
<td>Frangi</td>
<td>2012</td>
</tr>
<tr>
<td>2</td>
<td>Papaya</td>
<td>MARDI Purple</td>
<td>Under testing</td>
</tr>
<tr>
<td>3</td>
<td>Papaya</td>
<td>Glimmer</td>
<td>2012 Under testing</td>
</tr>
<tr>
<td>4</td>
<td>Pineapple</td>
<td>Dole-14</td>
<td>Under testing</td>
</tr>
<tr>
<td>5</td>
<td>Pineapple</td>
<td>View of Sunset</td>
<td>2015</td>
</tr>
<tr>
<td>6</td>
<td>Dragon Fruit</td>
<td>Pink Dragon Sunlike</td>
<td>2014</td>
</tr>
<tr>
<td>7</td>
<td>Dragon Fruit</td>
<td>Iguana</td>
<td>2015</td>
</tr>
<tr>
<td>8,9,10</td>
<td>Kiwifruit</td>
<td>Zesy 002, Zesy 003, Zesh 004</td>
<td>2015</td>
</tr>
<tr>
<td>11</td>
<td>Lime</td>
<td>Merdeka</td>
<td>2014</td>
</tr>
<tr>
<td>12</td>
<td>Durian</td>
<td>Kim Luang</td>
<td>2014</td>
</tr>
<tr>
<td>13</td>
<td>Watermelon</td>
<td>SuperHort Red</td>
<td>Under testing</td>
</tr>
<tr>
<td>14,15,16,17</td>
<td>Guava</td>
<td>Guvano, Guvito, Gennova, G-MAS</td>
<td>Under testing</td>
</tr>
<tr>
<td>18</td>
<td>Melon</td>
<td>Permai 5</td>
<td>Under testing</td>
</tr>
</tbody>
</table>
Number of PVP Applications by Nationality (2008 – August 2014)

<table>
<thead>
<tr>
<th>Year</th>
<th>LOCAL</th>
<th>FOREIGN</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2009</td>
<td>36</td>
<td>6</td>
</tr>
<tr>
<td>2010</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>2011</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>2012</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>2013</td>
<td>16</td>
<td>35</td>
</tr>
<tr>
<td>2014</td>
<td>9</td>
<td>19</td>
</tr>
</tbody>
</table>
PVP APPLICATIONS by APPLICANT CATEGORIES (2008- August 2014)

- International Companies: 48%
- Domestic Private Companies: 19%
- Government Research Agencies: 18%
- Universities: 10%
- Individuals: 5%
<table>
<thead>
<tr>
<th>No.</th>
<th>Crop</th>
<th>Number of Applications</th>
<th>Applicant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Chrysanthemum</td>
<td>20</td>
<td>Dekker Breeding B.V.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Deliflor Royalties B.V.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Malaysia Nuclear Agency</td>
</tr>
<tr>
<td>2.</td>
<td>Orchid</td>
<td>2</td>
<td>Malaysia Nuclear Agency</td>
</tr>
<tr>
<td>3.</td>
<td>Tunera</td>
<td>1</td>
<td>Department of Landscape</td>
</tr>
<tr>
<td>4.</td>
<td>Canna</td>
<td>1</td>
<td>Department of Landscape</td>
</tr>
<tr>
<td>5.</td>
<td>Lettuce</td>
<td>4</td>
<td>Rijk Zwaan Zaadteelt en Zaadhandle B.V.</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>28</td>
<td></td>
</tr>
</tbody>
</table>
# Protected Varieties

<table>
<thead>
<tr>
<th>YEAR of GRANTING</th>
<th>Term</th>
<th>NUMBER OF TITLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>April</td>
<td>25 (Acacia, Chrysanthemum, Papaya, Orchid Dendrobium)</td>
</tr>
<tr>
<td>2014</td>
<td>May</td>
<td>14 (Rice, Chrysanthemum, Roselle, Durian, Capsicum)</td>
</tr>
<tr>
<td>2014</td>
<td>Oct.</td>
<td>26 (Rice, Chrysanthemum, Dragon Fruit, Lemon Myrtle)</td>
</tr>
<tr>
<td>2014</td>
<td>Nov.</td>
<td>6 (Chrysanthemum, Pandanus, Lime)</td>
</tr>
<tr>
<td>2015</td>
<td>Feb.</td>
<td>17 (Kiwi fruit, Lettuce, Chrysanthemum)</td>
</tr>
</tbody>
</table>
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EXPECLING OCT 2014

or more ...

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Substantive Examinations

Method of Substantive Examination

<table>
<thead>
<tr>
<th>Examination Method</th>
<th>Num.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method 1: Document Examination</td>
<td>58</td>
</tr>
<tr>
<td>Method 2: On-Site Inspection</td>
<td>82</td>
</tr>
<tr>
<td>Method 3: Growing Test</td>
<td>3</td>
</tr>
<tr>
<td>Preliminary Checking (under decision)</td>
<td>34</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>180</strong></td>
</tr>
</tbody>
</table>

Varieties under Testing Procedures

<table>
<thead>
<tr>
<th>Method</th>
<th>NUMBER OF TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROWING TEST</td>
<td>6 [Rice, Lemon Grass, Canna, Turnera]</td>
</tr>
<tr>
<td>ON-SITE INSPECTION</td>
<td>17 [Rice, Cacao (4), Pineapple, Capsicum (4), Orchids (5), Oil Palm (2), Papaya, Mushroom, Water Melon, Stevia]</td>
</tr>
<tr>
<td>DOCUMENT EXAMINATION</td>
<td>24 [Chrysanthemum, Kiwi Fruits, Lettuce]</td>
</tr>
</tbody>
</table>
On-site inspection

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Growing Test

THE 1st MEETING OF TEST GUIDELINES HARMONISATION ON RAMBURUTAN AND STARFRUIT. 4-6 Nov 2014. KLUANG, JOHOR, MALAYSIA
NEW PLANT VARIETY TESTING CENTER

TITI SERONG, PERAK
Rice

SERDANG, SELANGOR
Short term Ornamental

PADANG IPOH, TERENGGANU
Vegetable

CAMERON HIGHLANDS, PAHANG
Tamperate

THE 1st MEETING OF TEST GUIDELINES HARMONISATION ON RAMBUTAN AND STARFRUIT. 4-6 Nov 2014. KLUANG, JOHOR, MALAYSIA
What we can contribute?

Developing and harmonizing of TG for rambutan and starfruit in terms of technical aspect of the crops.
Thank You