Strengthening Organic Industry in Malaysia through Research and Technology

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ORGANIC AGRICULTURE SCENARIO IN MALAYSIA

✓ Mid 1990’s

✓ Certification of SOM (MS 1529) – 2001

✓ Before that based on trust

✓ Organic agriculture gaining consumers attention due health and environment awareness
Current situation organic agriculture in Malaysia

### Land area
- 2002: 121 hectare
- 2014: 1757 hectare
- 2016: 1923 hectare

<table>
<thead>
<tr>
<th>Type of Commodity</th>
<th>myOrganic Certificate (2016)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of farms</td>
</tr>
<tr>
<td>Fruit</td>
<td>33</td>
</tr>
<tr>
<td>Vegetable</td>
<td>44</td>
</tr>
<tr>
<td>Paddy</td>
<td>3</td>
</tr>
<tr>
<td>Others</td>
<td>66</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>146</strong></td>
</tr>
</tbody>
</table>
Total organic production in Malaysia 2014 estimated 65,591 tonne valued at USD 40 million

MS1529:2001

MS1529:2015 (First Review)
Main issues of organic agriculture in Malaysia

- Limited resources
- High cost of input & labor
- Low yield
- Weak marketing

P & D
Adaptation and application ranking of technology used by organic farmers in 3 selected countries

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<table>
<thead>
<tr>
<th>RESEARCH CORE</th>
<th></th>
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</thead>
</table>
| **Balancing Biodiversity** | • biological diversity: genetic diversity, species and ecosystem in one system  
• Harmony interaction between biodiversity sources  
• Biological control  
• Ecology engineering |
| **Increase soil fertility** | • Soil quality  
• Soil biological activity (bacteria, algae, fungi, earthworm etc.) |
| **Efficient input use** | • Environmental friendly  
• Reduce input cost  
• Reduce production cost  
• Use natural product |
| **Recycling agriculture waste** | • Composting  
• Pyrolysis (generate energy, heat and produce by product - biochar, wood vinegar, biogas) |
| **Efficient farming system** | • Automated and mechanization  
• Early warning system - telematic |
| **Efficient marketing** | • Promotion, incentive |
OF HOLLISTIC CONCEPT

- Zero waste management
- Efficient cropping system
- Integrated system

Biodiversity richness

Agricultural waste recycling

- Exploitation of flowering agent (e.g., bees)

Animal production

- Production of quality, safe and healthy organic food
- Maximize the agricultural land used

- Cost effective and efficient
- Environmental friendly and sustainable

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Scope of Transformation

Current situation

Farm size:
- small
- uneconomic

Labor force:
- limited
- ageing

Farm management:
- traditional
- “satisfactory”
- “enough”
- manual

After transformation

Large scale, commercial and economic

Mechanization and automation
Less labor intensive activities

Professional,
Agriculture is business,
Application of ICT,
Commercial management/integrated/economic of scale,
Business Plan
Scope of Transformation

Current situation

Less/ not competitive:
- Low product quality
- non-standard quality
- product dumping

Return on Investment
- Low
- time consuming

After transformation

Standard, certification & export quality

Diversified returns:
- mixed farming, intercropping value-added
<table>
<thead>
<tr>
<th>Enhance domestic food production</th>
<th>Reduce labour depending &amp; promote use of mechanisation</th>
<th>Maximising and resource use</th>
<th>Development of innovations</th>
<th>Establish more domestic and international markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Focus on production of major food products e.g: Fishery, livestock, rice, fruits &amp; vegetables</td>
<td>• Cultivation of new crops that require less labour</td>
<td>• Promoting agroforestry enterprises</td>
<td>• Dedicated fund in agriculture</td>
<td>• Quality food products</td>
</tr>
<tr>
<td>• Zooming for food production areas</td>
<td>• Promotion of controlled environment, automated and mechanized systems</td>
<td>• Integrating livestock with plantation crops</td>
<td>• Streamline national R&amp;D Agendas</td>
<td>• Competitive food price</td>
</tr>
<tr>
<td>• Increase yield through efficient and cost effective technologies</td>
<td>• Intensification of R &amp; D in labour-saving technologies in farm operations and harvesting</td>
<td>• Promoting large-scale, technology-intensive, mixed farming ventures</td>
<td>• Avoid duplications</td>
<td>• Comply to Int. standards</td>
</tr>
<tr>
<td>• Improve infrastructure</td>
<td></td>
<td></td>
<td>• Exploit synergies and complement between RIs and RUs</td>
<td></td>
</tr>
</tbody>
</table>

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The gross expenditure for research in Malaysia in 2000-2012

Year | GRIs | IHLs | BEs
---|---|---|---
2000 | 25.00 | 17.10 | 57.90
2002 | 20.28 | 14.40 | 65.31
2004 | 10.44 | 18.05 | 71.51
2006 | 5.20 | 9.89 | 84.91
2008 | 9.93 | 19.57 | 70.49
2009 | 6.38 | 23.77 | 69.86
2010 | 6.05 | 28.96 | 64.99
2011 | 14.41 | 28.93 | 56.67
2012 | 6.88 | 28.67 | 64.45

Percentage (%)
Percentage of fund contribution for R&D activities

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Universities
- UPM
- UKM
- UM
- USM
- UTM
- UMT
- UMK
- UniMAP
- UiTM
- Etc.

Governments RI
- MARDI
- MCB
- MPOB
- FOREST RI
- VET RI
- MPIP

Private Sector
- Applied Agricultural Research
- FELDA Tun Razak Agricultural Services
- United Plantation Research
- Applied Agricultural Research
- DUPONT Malaysia Research
- Sime Darby

Streamline R&D
- Avoid duplication
- Exploit synergies
- Maximising R&D fund

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**Fruits and Vegetables**

**High Value products**
- Vacuum fried tropical fruits: jackfruit, papaya, pineapple dan mango
- VitAtop sweet potato flour
- Functional drink for health – JUST GREAT

**Urban Farming**
- Self watering system
- Fertikit
- Roof top
- Vertical farming
- Tube plot
- Urban kit

**Post Harvest Handling**
- Shelf life extension for fruits through controlled atmosphere
- Minimally processed jackfruit, pineapple and durian
- Golden starfruit for international market
- Quarantine Treatment Protocol for Harumanis using Vapour Heat Treatment

**Planting System**
- Rainshelter and fertigation system
- Organic agriculture
- High density planting system

**Technologies**

**Fruits and Vegetables**

R&D Invest: RM18.24 mil
Import: RM1.8 billion (fruits)
Export: RM615 mil (fruits)

**Varieties Released**
- Durian MDUR78, MDUR79, MDUR88
- Salak Terangganu ST1, ST2, ST3 (2009)
- HibriMAS sweet corn (2010)

**Pest and Disease Management**
- PROMAR fruitfly protein bait
- Reflective plastic mulch for managing virus diseases on chilli
- Integrated Management of Plutella
- Management of nematode of pineapple
- NPV for controlling insect pests
- Bacteriaphage for controlling bacterial diseases on pineapple & tomato

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Rich in Biodiversity

Cook’s Choice Garden
Creative cooks will have fun with these flavorful herbs and garden-fresh veggies. Friends and family will appreciate dining on colorful salads, savory sauces and healthful greens.

View the Garden Plan

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High intensity will produce more plant
Ecology Engineering

- Increased population beneficial insect naturally
- Conserved environment
- Pest control
- Increased soil biological activity
Increased biodiversity with organic agriculture ecosystem
Mass rearing of *Phytoseiulus persimilis* for the control of *Tetranychus urticae* on roses and strawberries in Cameron Highlands
Assessment of different types organic fertilizer efficiency

Using different types of organic fertilizer

1. Enriched Rice Husk Biocharcoal
2. Compost
3. Vermicompost
4. Indigenous Microbe/Nature Farming
5. Animal waste- Chicken dung
6. Organic industry waste
Testing on different crop and systems (open area and under shaded)
POTENTIAL HIGH VALUE ADDED PRODUCTS READY FOR COMMERCIALISATION

TECHNOLOGY: HIGH VALUE ADDED PRODUCTS

1. Production of fungsional compounds from sources of agrobiodiversity

2. Use of microbes in white agriculture

3. Biopesticides for controlling insect pests

4. Integrated nutrient management in rice production using Plant Growth Promoting Rhizobacteria

5. High value added products from VitAto – Collaboration with PPK and Nestle
VIRUS BASED; BIOPESTICIDES

Environmental Friendly Virus based Biopesticide for controlling Armyworm, Spodoptera litura

- Novelty: Stable NPV
- Advantages:
  - Room’ Temp. storage
  - Longer shelf life
  - Added with UV protectant
  - LATEST DEVELOPMENT
    Multi NPV for broad application

Crude/Semipurified NPV S. litura
Formulated NPV S. litura

Untreated (control)  Treated with crude NPV  Treated with formulated NPV
Field efficacy of formulated nucleopolyhedrosis virus (NPV) against *Spodoptera litura*

- Monitoring of pest
  - *Crocidolamia* spp.
  - *Helulla* spp.
  - *Spodoptera litura*
Efficient Use of Agricultural Inputs

- **Nutrients**
  - Mg
  - Ca
  - P
  - N
  - K

- **Biopesticides**
  - BIO PEST

- **Growth promoters**
  - Microbe that functions efficiently

- **Control release organic fertilizer**

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BioriCHAR: Biochar Based Bio-Organic Fertilizer
Adding product value (biofortification)

Increase food nutrition

Developed by the method of repairer genes or through agricultural inputs such as fertilizer
Farm mechanization

- User friendly
  * Simple and easy used
- Environmental friendly
  * No negative impact
- Time
  * Agriculture efficient
- Save energy
  * Reduce cost
Automation and Mechanization

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Adaptation of ICT systems in farming

- Early warning systems (telematric)
- Anticipate and control pest infestation
- Stimulating new growth sources within the ICT sector
- To attract youth to be involved in the field of agriculture

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Automation and Mechanization

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Post harvest management

- Product treatment
- Storage
- Transfer and transportation
- Packaging (quality and attractive)
- Shelf life
Pre treatment

Storage

Post harvest management

Packaging

Nice and quality packaging

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PHL Processes and Aspiration

**Aspiration**: Reduce post harvest losses (PHL) currently at 28.5%*. Focus on harvesting (2014) to reduce by 2%.

**Transformation Focus**

- **Man**
- **Machine Ownership**
- **Machine Mechanism**
- **Crops Maturity**

- **Harvesting (9.0% Loss)**
- **Transportation (6.0% Loss)**
- **Drying (3.5% Loss)**
- **Milling (6% Loss)**
- **Storage (4% Loss)**


28.5% Paddy PHL (730k tonnes)  RM918m PHL value Per annum
Formulation of substrate for mushroom from agricultural waste

- 23% rice husk
- 32% rice straw
- 45% wood dusk of rubber tree
Testing the efficacy of the substrate formulation on grey oyster mushroom
Consumer Awareness

- About 60% of Malaysian consumers can recognize the labels of organic products in the market.

- Unfortunately, only about 34% are aware of the Malaysian Certification of Organic Products or SOM (Sijil Organik Malaysia) label.

- Consumer awareness of organic products is high. An opportunity/potential market for organic products in Malaysia.
**Strategy for organic agriculture**

- **Efficient and full package technology**
  - Manual technology of planting
  - Automated and mechanization technology

- **Seed development**
  - Varietal development
  - Seed quality

- **Marketing**
  - Wider market
  - Effective value chain

- **Expanding the areas**
  - Gazetted areas (dedicated farm e.g.: paddy or vegetable organic valley)
  - Promoting from conventional to organic

- **Farmers involvement**
  - Young agroprenuer with high technology infrastructure

- **Incentive for organic producer**
  - Premium price
  - Green tax
Marketing strategy for boosting the organic production

• **Product**
  – Recognize organic products as a product for health to attract more people to buy

• **Price**
  – Price of organic products at least 30% higher than conventional products so that the company viable
  – Government can propose “Organic Product Fair Price” so that it is a win-win situation between producers and buyers

• **Promotion**
  – By the government through special events such as “Organic Day”
  – Incentives from the Government for marketers to promote organic products such as tax exemption

• **Premise**
  – Premises augment sales of organic products, for example through cooperatives to encourage consumers to buy
  – Organic supermarkets (as in Europe) to allow producers to market directly to the premises
PASARAN ORGANIK UNTUK PRODUK PROSES DI MALAYSIA
CONCLUSION

1. Exploration new areas for organic farming concept – urban farming / valley

2. Incentive from government to promote organic farming

3. Industry/agency to develop new field such organic seed for germplasm

4. RI and Universities to develop technology that can be used and simple

5. Marketing channel need to be strengthen
Terima Kasih
Price comparison between organic and conventional in 2014

<table>
<thead>
<tr>
<th>Produk</th>
<th>Organik (RM/kg)</th>
<th>Konvensional (RM/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomato</td>
<td>12.60</td>
<td>4.90</td>
</tr>
<tr>
<td>Kacang panjang</td>
<td>12.00</td>
<td>2.60</td>
</tr>
<tr>
<td>Terung</td>
<td>13.00</td>
<td>3.90</td>
</tr>
<tr>
<td>Salad</td>
<td>8.50</td>
<td>2.90</td>
</tr>
<tr>
<td>Kubis</td>
<td>12.00</td>
<td>4.90</td>
</tr>
<tr>
<td>Timun Jepun</td>
<td>12.60</td>
<td>5.90</td>
</tr>
<tr>
<td>Timun</td>
<td>8.50</td>
<td>2.90</td>
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