STATUS OF THE PHILIPPINE BEE INDUSTRY
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Professor Emeritus, UP Los Banos
& President
APIMONDIA Regional Commission for Asia
At least 1/3 of the world's agricultural crops depends upon pollination provided by insects and other animals.
Profile

• Number of Beekeepers* ≥500

• Total Colony Holdings**
  – Apis mellifera >6,000†
  – Apis cerana >3000
  – Tetragonula spp >6000

• Total Production (2013)
  – Apis mellifera ≤112 metric tons
  – Apis cerana 3.6 metric tons
  – Trigona spp 1.3 metric tons
  – Apis dorsata 46 metric tons

* actual people handling bees, cooperatives with communal holdings counted as 1
** hived colonies
† reduced number from 2008 figures due to colony deaths
Research and Development Institutions

- Benguet State University
- Cagayan State University
- Cavite State University
- Central Bicol State University of Agriculture
- Don Mariano Marcos Memorial State University
- Nueva Viscaya State University
- Pampanga State Agricultural University
- Saint Louis University
- Southern Luzon State University
- University of the Philippines Los Baños
Other Projects

• Philippine Nuclear Research Institute-DOST
• Department of Trade and Industry
Local Government Unit

- Calamba LGU
- STIARC, Lipa City
- Batac LGU

Has existing program
- Pilar LGU
- Toril LGU
BEEPROGRAM

COMPUTATIONAL BEE ECOLOGY

Bioinformatics  Dynamic Models

Signal Processing  Biomechanics

Biophysics
Indigenous beekeeping practices
Utilization of bees specially among indigenous communities
Socio-economic studies
Beekeeping technologies
Milestone

- Technology for Propagation of Stingless Bees
- Bee Disease Diagnosis and Control
- Bee Product Development
- Genetic Diversity Studies
- Apitherapy – alginate, test on animals
- Standard for Organic Honey
Stingless bees used in large scale mango plantation
Apis cerana apiaries
4 Minimum requirements for Organic Beekeeping

4.1. Choice of Species

The honey bee species preferred for use in organic beekeeping include Asian Honeybees, *Apis dorsata dorsata*, *Apis dorsata breviligula*, *Apis cerana* and Stingless bees, *Tetragonula* spp., *Lepidotrigona* spp. The exotic honeybee species, *Apis mellifera* may also be considered.
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<thead>
<tr>
<th>4.2.</th>
<th><strong>Hive Material/Design</strong></th>
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<tr>
<td></td>
<td>The hives shall consist primarily of natural materials and present no risk of contamination to the environment or the bee products. Use of construction materials with potentially toxic effects is prohibited.</td>
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<td>4.3.</td>
<td>Location of colonies/apiaries</td>
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<td>4.3.1</td>
<td>Wild and hived colonies should be located in organically managed fields and/or wild natural areas within a three (3) kilometer radius away from fields or other areas where chemical pesticides are used.</td>
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If hives have to be migrated to other sites due to insufficient forage, predation or habitat disturbance, the location should be recorded showing also the dates of transfer, location, and number of colonies.
| 4.3.3 | Nests of wild or feral colonies of honeybees *Apis dorsata dorsata*, *Apis dorsata breviligula* and stingless bees, *Tetragonula spp.* and *Leptotrigona spp.* should be identified prior to harvest. |
4.3.4 Only “warm” (yellow colored) light bulbs should be used in the apiary sites and foraging areas
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<thead>
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<th>4.4.</th>
<th>Mutilations in beekeeping</th>
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<td></td>
<td>Mutilations, such as clipping of the wings of queen bees, are prohibited.</td>
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<td>4.5.</td>
<td><strong>Supplemental Feeding</strong></td>
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<td>Supplemental feeding with honey, pollen, or organic sugar should be done during dearth period or when pollen and nectar are not sufficient. The feed should come from organic sources such as reserves of honey and pollen left during harvesting.</td>
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<td>4.6.</td>
<td>Bee Stock Sources</td>
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<td></td>
<td>Importation is not allowed for <em>Apis cerana</em>, stingless bees, and solitary bee species.</td>
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### 4.6. Bee Stock Sources

<p>| | The starter colonies should be sourced from apiaries that are free from pests (mites, hive beetles) and diseases (American Foul Brood, European Foul Brood, Virus diseases, fungal diseases). Importation of <em>Apis mellifera</em> queens may be allowed from countries with no known Africanized Honey Bee (AHB) populations and colony collapse disorder (CCD). |</p>
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<th>4.7.</th>
<th><strong>Pest and Disease Control /Disinfection</strong></th>
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<td>The health and welfare of the hive shall be primarily achieved by hygiene and hive management.</td>
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</table>
4.7.1 For pest and disease control the following are allowed:

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<tr>
<td>a)</td>
<td>lactic acid, formic acid;</td>
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<tr>
<td>b)</td>
<td>oxalic acid, acetic acid;</td>
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<tr>
<td>c)</td>
<td>sulfur;</td>
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<tr>
<td>d)</td>
<td>natural essential oils (e.g. menthol, eucalyptol, camphor);</td>
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<td>e)</td>
<td><em>Bacillus thuringiensis</em>;</td>
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<td>f)</td>
<td>steam, direct flame and caustic soda for hive disinfection.</td>
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<td>4.7.2.</td>
<td>Colonies infected with American Foul Brood should be destroyed through burning. The use of antibiotics is prohibited. For disease and pest control the following products may be used: formic acid, lactic acid, sucroside and botanical compounds.</td>
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<tr>
<td>4.7.2.</td>
<td>Cleaning and disinfection should be done using heat such as blowtorch / flame torch or hot water, or other mechanical means.</td>
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<td>4.8.</td>
<td>Harvesting</td>
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<td>The use of chemical synthetic repellents is prohibited during extraction of beekeeping products.</td>
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<td>4.9</td>
<td>Moisture content of extracted honey</td>
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<td></td>
<td>The Moisture Content of ripe honey should not be more than 23%</td>
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<td>4.10.</td>
<td><strong>Apiary Conservation and Sustainability</strong></td>
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<td>20% of the honey comb or stores should be reserved and not cut. This serves as a food reserve of the bees during the dearth period.</td>
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<td>4.11.</td>
<td>Processing/Packaging specific to bee products</td>
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<tr>
<td>4.11.1</td>
<td>Processing equipment is thoroughly cleaned with hot water prior to processing</td>
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<td>4.11.2</td>
<td>Surfaces in direct contact with the honey are constructed from sterilized materials</td>
</tr>
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<td>Honey should be packed in sterilized glass jars.</td>
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### 1.4. Conversion requirements for Organic Beekeeping

#### 1.4.1. Conversion period

The transition period is 12 months for hived *Apis mellifera* and *Apis cerana*.

#### 1.4.2. Provision of wax for beehives

The wax used for creating honeycombs should be made from organic beeswax.

However, in cases where organic beeswax is not available, non-organic beeswax may be used if:

- **a.** Organic beeswax is not available in the market
- **b.** The beeswax is free from harmful substances
MAJOR, MAJOR PROBLEM

• Incursion of small hive beetle, *Aethina tumida* Murray
• Reported – June, 2014
• Identification based on the specimens collected by Bhoi Loyola
• Initial assessment Nov. 26-29, 2014 present in Lupon and Gen San absent in one apiary in Bukidnon
Distribution Pattern of SHB in Visayas and Mindanao
Nov. 26-29, 2014
Apiary inspection
Hive beetle sample
Collection of samples, getting relative density, abundance
Treatment with miticide
Use of shb trap
Collecting samples
Explaining the behavior of beetle to beekeeper
A commercial bee farm - free of shb
Happy beekeeper - no shb, so far
Life Cycle of the shb

Eggs are white in color (c). They are deposited in masses inside sealed brood by making a small hole on the cell capping or through the cell wall (d). Generally, a comb is not required for egg-laying. Females can also lay eggs in crevices, e.g. underneath queen cell cups (e) used in queen production. The egg incubation period takes about 2 to 3 days.
Damage to the combs
Larval stage

- Creamy in color
- With 2 rows of spines at posterior end
- Most damaging stage
- 4 instars (first 3 most damaging)
- Last instar “wandering phase, leave hive, barrow soil (5-10 days)
- pupate just below the surface of the soil
Pupal Stage

The white beetle pupae (g) take 5 to 11 days to develop and become young adults. These young adults are very fragile; thus, they remain inside the cells for another 5 to 9 days to mature. About 75% of the beetles’ developmental time is spent in the soil as larvae (h), pupae (i) and then as young adults (j).
When mature adults emerge from the soil (23 or 39 days), they are maroon in color but will turn darker as they age. They are about 1/3 the size of a worker bee (k). An easy way to identify SHB adults is their clubbed antennae (l) and sinuated margin of the thorax (m) and shortened elytra (n), which are the hard wing coverings of adult beetles.
Primer on Small Hive Beetle (Aethina tumida Murray) Management

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Epifanio C. Loyola, Jr.
Elmer A. Polintan
Aimee Lynn B. Dupo

University of the Philippines Los Banos
Department of Agriculture, Bureau of Agricultural Research
Beekeepers’ Network Philippines Foundation, Inc.
Maintain strong colony
Maintain strong colonies - all frames should be covered with bees. Weak colonies are prone to SHB infestation. Empty or unattended frames can serve as hiding places for SHB.
Colony management
Control mites
Scrape propolis and burr combs
Clean the bottom board
Dispose the debris (burn)
Use beetle trap
Develop bee pasture
Issues

• Research Gaps
  a. economic valuation
  b. Inventory of pollinator species
  c. genetic diversity studies

• Policy on quarantine regulation

• On shb- no inter-island movement of bees
  nationwide monitoring
Acknowledgement

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*Dale K. Pollet*
Department of Entomology, LSU AgCenter

*William B. Richardson*, Chancellor
Louisiana State University Agricultural Center

*David J. Boethel*, Vice Chancellor and Director
Louisiana Agricultural Experiment Station

Ken Olley- Organic Honey Producer, Australia

UPLB, DA-BAR and BEENET Philippines