BEEKEEPING & DEVELOPMENT

HARMONY O

Apis mellifera colonies in a coconut plantation, although longan honey is in fact the main honey source in the area.

Apis mellifera

THE BEEKEEPING SITUATION

Apis cerana is a species of honeybee native to Vietnam. According to Mulder (1) there are four main methods of beekeeping with Apis cerana in Vietnam:

1. Traditional family beekeeping using log hives; sedentary (the hives are not moved around to different locations).
2. Family beekeeping using frame hives; less than 15 colonies and sedentary.
3. Family beekeeping with frame hives; more than 15 colonies and migratory beekeeping is practised, but over short distances and with limited transport.
4. Group beekeeping; over 50 colonies and intensive, migratory beekeeping.

Most Apis cerana beekeepers in southern Vietnam fit into categories 2 and 3. To practise beekeeping according to category 4 requires extensive investment and transportation which does not fit Vietnam’s present economy. In 1992 our survey of 23 households in four provinces revealed the beekeeping pattern:

| Category | %  
|----------|----|
| Category 1 | 0%  
| Category 2 | 17%  
| Category 3 | 74%  
| Category 4 | 9%  

Apis mellifera (the European honeybee) and its related beekeeping techniques were introduced successfully into Vietnam in the 1960s. Binh and Tan (2) reported that there were 500-600 professional Apis mellifera beekeepers in the provinces of Dong nai, Lam dong, the Central Highlands and the fruit orchards in the Mekong Delta. In 1992, 1200 tonnes of honey were exported. Apis mellifera is only kept according to category 4, that is intensive, migratory beekeeping with more than 50 colonies.

FLOWER SUPPLIES

The central coastal plains and the Mekong Delta are abundant in coconut and areca nut plantations, providing pollen and nectar for Apis cerana nearly all year round. The provinces bordering eastern Ho Chi Minh City and the Central Highlands have plenty of flowers.

Students of the University visit an Apis mellifera apiary.

BEE COMBS

In Vietnam (like elsewhere in Asia) beekeepers often buy and sell honeybee colonies. The sizes of the colonies can be very different: an Apis mellifera colony usually consists of between one and 10 combs, and an Apis cerana colony usually has between one and six combs. The unit for sale therefore is the ‘bee comb’, rather than the colony. The more combs there are in a colony, the higher the price. Vietnamese beekeepers therefore do not pay attention to the number of colonies, but the number of ‘bee combs’. This is especially true for Apis mellifera.
BEEKEEPING & DEVELOPMENT

CONFLICT?

by Nguyen Quang Tan and Pham Thanh Binh
of coffee and rubber plantations. Lam dong province has tea plantations. The provinces of Dong nai, Song be, and the Mekong Delta are well-known for their fruit orchards of durian, longan, rambutan and water plum. These crops are ideal for Apis cerana and also for industrial-scale beekeeping with Apis mellifera.

ECONOMIC EFFICIENCIES OF THE TWO BEEKEEPING SYSTEMS

Research on Apis cerana beekeeping was carried out on 23 households in 1991-1992: one household could on average manage 50 colonies of Apis cerana. Research on the characteristics and economic efficiency of Apis mellifera beekeeping in Southern Vietnam was carried out using data from 22 apiaries in the season 1989-1990. One beekeeper could on average manage 870 combs of Apis mellifera (see ‘bee combs’).

The results are shown in Table 1.

DISCUSSION

The results show why many people prefer Apis cerana to Apis mellifera beekeeping.

1. Apis cerana beekeeping is shown to be more economic than Apis mellifera beekeeping. From Figure 1 (overleaf) we calculate that 100 Apis cerana colonies (capital investment US$4101) would provide the same income as keeping 1,742 Apis mellifera bee combs (capital investment US$2,763). Therefore beekeeping with 100 Apis cerana colonies is better economically than beekeeping with 1,742 Apis mellifera combs (about 175 colonies).

2. An Apis cerana beekeeper can begin with only a few colonies. Even under low input conditions this can be developed to 100 colonies. With Apis mellifera, it is not feasible to have a low input and a small number of colonies because there will not be sufficient income to cover overheads.

### Table 1

<table>
<thead>
<tr>
<th>INDICATORS</th>
<th>Apis mellifera beekeeping system (for 870 combs)</th>
<th>Apis cerana beekeeping system (50 colonies)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMOUNT US$</td>
<td>AMOUNT US$</td>
<td></td>
</tr>
<tr>
<td>1. Production costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>equipment</td>
<td>168 (12%)</td>
<td>45 (22%)</td>
</tr>
<tr>
<td>bee feeds</td>
<td>498 (37%)</td>
<td>23 (11%)</td>
</tr>
<tr>
<td>transportation</td>
<td>100 (7%)</td>
<td>18 (9%)</td>
</tr>
<tr>
<td>labour</td>
<td>378 (27%)</td>
<td>120 (58%)</td>
</tr>
<tr>
<td>capital interest</td>
<td>236 (17%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Total</td>
<td>1,380 (100%)</td>
<td>206 (100%)</td>
</tr>
<tr>
<td>2. Gross production values:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>honey</td>
<td>1,368 (89%)</td>
<td>566 (93%)</td>
</tr>
<tr>
<td>pollen</td>
<td>60 (4%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>royal jelly</td>
<td>28 (2%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>wax</td>
<td>31 (2%)</td>
<td>14 (2%)</td>
</tr>
<tr>
<td>bee combs</td>
<td>48 (3%)</td>
<td>32 (5%)</td>
</tr>
<tr>
<td>Total</td>
<td>1,535 (100%)</td>
<td>612 (100%)</td>
</tr>
<tr>
<td>3. Profita</td>
<td>155</td>
<td>406</td>
</tr>
<tr>
<td>4. Incomeb</td>
<td>533</td>
<td>526</td>
</tr>
<tr>
<td>5. Production cost per unitc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- per kilogram of honey</td>
<td>0.37</td>
<td>0.20</td>
</tr>
<tr>
<td>- per bee comb</td>
<td>1.44</td>
<td>0.27</td>
</tr>
<tr>
<td>6. Total production value</td>
<td>1.11</td>
<td>2.97</td>
</tr>
<tr>
<td>Total production cost</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Profit</td>
<td>0.11</td>
<td>1.97</td>
</tr>
<tr>
<td>8. Income</td>
<td>0.38</td>
<td>2.56</td>
</tr>
<tr>
<td>9. Annual honey yield</td>
<td>38 kg per colony of,10 combs</td>
<td>18.2 kg per colony of 5 combs</td>
</tr>
<tr>
<td>10. Management capacity per labourer</td>
<td></td>
<td>870 combs</td>
</tr>
<tr>
<td>Average</td>
<td>12-100 colonies</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>50 colonies</td>
<td></td>
</tr>
</tbody>
</table>
| Where X = total amount of honey harvested. Where Y = value of other products equivalent to 1kg honey using the exchange ratio at the time of survey.

* Profit = total production value - total production cost
* Income = profit + labour cost
* Production cost per unit was calculated according to the formula, production cost per kg honey = Total production cost / X + Y where X = total amount of honey harvested where Y = value of other products equivalent to 1kg honey using the exchange ratio at the time of survey.
3. Beekeeping with *Apis cerana* has fewer risks than with *Apis mellifera*. Under bad conditions such as disease outbreak, bad weather or poor forage, *Apis cerana* beekeepers lose nothing or much smaller investment capital than *Apis mellifera* beekeepers. *Apis cerana* can be kept at all levels: from small-scale to large-scale, from extensive to intensive.

However, beekeeping with *Apis mellifera* is still popular for other reasons:

1. The number of colonies (or combs) which can be managed by one labourer is higher for *Apis mellifera* than for *Apis cerana* beekeeping. For *Apis cerana*, a worker could manage at most 100 colonies. The maximum capital investment would be US$410 yielding a maximum income of US$1,051 per year. By comparison one beekeeper using standardised, quick methods could manage about 300 colonies of *Apis mellifera*. With investment capital of US$4,761 these could provide an income of US$1,809 per year.

Therefore until methods are found for one worker to manage more *Apis cerana* colonies, some people will still prefer *Apis mellifera*.

2. Royal jelly can be produced with *Apis mellifera* beekeeping, but not with *Apis cerana*. In 1989/1990 only a little royal jelly was produced so the economic efficiency of the *Apis mellifera* system was low. According to research (3) the production cost of one kilogram of royal jelly was US$16-20. Therefore in other years additional income could be generated from royal jelly production and this is being practised increasingly in *Apis mellifera* apiaries.

3. The interest charged by banks or beekeeping companies in Vietnam was very high (3-4% per month). Annual interest costs could be as much as 17.1% of the total production cost for the *Apis mellifera* system (see Table I).

**CONCLUSIONS**

*Apis cerana* colonies can survive anywhere in southern Vietnam because they are native to the area. *Apis mellifera* colonies need to be kept in suitable forage areas and require considerable management and investment.

*Apis cerana* colonies are commonly kept in the coconut and areca nut areas of the Mekong Delta and the central coastal provinces. *Apis mellifera* colonies are to be found in Dong nai and Lam dong provinces and the Central Highlands which are considered better for *Apis mellifera* than the coconut area.

Only during the honey flow can both bee species be moved to rubber plantations or longan and rambutan orchards at the same time. This is why there is now no fierce competition between the two species for flower supplies.

2. An *Apis mellifera* beekeeper is usually a full-time professional whereas for an *Apis cerana* beekeeper, the activities can remain optional. One beekeeper working full time can become rich with *Apis mellifera*, while another can obtain a useful sideline income with *Apis cerana*.

**FIGURE 1**

**THE LINEAR RELATIONSHIPS BETWEEN THE INCOME AND THE INVESTMENT CAPITAL OF THE TWO BEEKEEPING SYSTEMS**

<table>
<thead>
<tr>
<th>Income (USD)</th>
<th>Invest. capital (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>410</td>
</tr>
<tr>
<td>1051</td>
<td>2763</td>
</tr>
<tr>
<td>1809</td>
<td>4762</td>
</tr>
</tbody>
</table>

Notes: (1) *A. cerana* (2) *A. mellifera* as many as 3000 combs

At most (100 colonies) 1742 combs

(1) *A. cerana* (2) *A. mellifera*
Family level, frame-hive

Beekeeping with *Apis cerana*

Most families have less than 15 colonies, which usually remain at one site throughout the year.

Large-scale, professional beekeeping with *Apis mellifera*. There are at least 50 colonies at each site and they are moved from one location to another during the year.

**RECOMMENDATIONS**

1. We must consider what will happen when poor people try *Apis mellifera* beekeeping. When there is little forage available (the dearth season) the two bee species will fight if beekeepers do not have sugar to feed the bees. As a rule, *Apis mellifera* will win and kill or chase away the *Apis cerana* from the area. After that, *Apis mellifera* will be unable to survive in a strange environment of scattered forage.

2. Beekeeping with *Apis cerana* should be encouraged for rural households with low investment capacity. *Apis mellifera* should be introduced to beekeeping organisations or individuals who can invest larger sums per labourer.

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**FIGURE 2**

**PRODUCTION COSTS FOR APIS MELLIFERA SYSTEMS**

- **Labour**: 27%
- **Transport**: 7%
- **Capital Interest**: 17%
- **Equipment**: 12%
- **Bee Feeds**: 37%

**FIGURE 3**

**PRODUCTION COSTS FOR APIS CERANA SYSTEMS**

- **Labour**: 58%
- **Equipment**: 22%
- **Bee Feeds**: 11%
- **Transport**: 9%

**FIGURE 4**

**PRODUCTION VALUES FOR APIS MELLIFERA SYSTEMS**

- **Honey**: 89%
- **Pollen**: 4%
- **Royal Jelly**: 2%
- **Wax**: 2%
- **Bee Combs**: 3%

**FIGURE 5**

**PRODUCTION VALUES FOR APIS CERANA SYSTEMS**

- **Honey**: 93%
- **Bee Combs**: 5%
- **Wax**: 2%