Cost comparison of honey production in frame and Warré ecological hives for 5 hives over 10 years*

Translated by David Heaf (with permission) from the 430-page manual on Warré beekeeping entitled 'L’ apiculture écologique de A à Z', by Jean-Marie Frères and Jean-Claude Guillaume

Updated to euros from the 804-page second edition of the same book, January 2012 (but see endnote)

<table>
<thead>
<tr>
<th>1 Frame hive</th>
<th>Cost</th>
<th>Time</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>euros €</td>
<td>min.</td>
<td>kg</td>
</tr>
<tr>
<td>(2011)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1 Materials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a Starting materials for 5 hives</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Clothing &amp; veil</td>
<td>20.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gloves</td>
<td>8.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoker</td>
<td>24.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame lifter</td>
<td>3.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brush</td>
<td>4.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hive (all types, 5 at 109 €)</td>
<td>545</td>
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</tr>
<tr>
<td>Feeder</td>
<td>5.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ripener 60 kg</td>
<td>81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knife</td>
<td>6.81</td>
<td></td>
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<tr>
<td>Nuc box</td>
<td>57</td>
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<tr>
<td>Foundation (15 sheets at 0.75 €)</td>
<td>11.25</td>
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<tr>
<td>Castors</td>
<td>2.97</td>
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<tr>
<td>Spur embedder</td>
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<td>Bradawl</td>
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<td>Tinned wire (250 g)</td>
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<td>Frame lifting pliers</td>
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<td>Queen excluder</td>
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<tr>
<td>Extractor (minimum price)</td>
<td>280</td>
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<td>Sulfur sticks (10 pieces at 0.27 €)</td>
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<tr>
<td>Propolis production grille</td>
<td>5.57</td>
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<tr>
<td>Skep</td>
<td>29.75</td>
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<tr>
<td>12-frame transport boxes (6)</td>
<td>148.77</td>
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<tr>
<td>Bee brush</td>
<td>1.44</td>
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<tr>
<td>Honey pots (40 x 5 x 0.25 €)</td>
<td>50</td>
<td></td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1311.54</strong></td>
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<table>
<thead>
<tr>
<th>2 Warré ecological hive</th>
<th>Cost</th>
<th>Time</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>euros €</td>
<td>min.</td>
<td>kg</td>
</tr>
<tr>
<td>(2011)</td>
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<td></td>
<td></td>
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<tr>
<td>2.1 Materials</td>
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<tr>
<td>a Starting materials for 5 hives</td>
<td></td>
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<tr>
<td>Clothing and veil</td>
<td>20.7</td>
<td></td>
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</tr>
<tr>
<td>Gloves</td>
<td>8.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoker</td>
<td>24.8</td>
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<td>Frame lifter</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Brush</td>
<td>4.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hive (all types, 5 at 100 €)</td>
<td>500</td>
<td></td>
<td></td>
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<tr>
<td>Feeder</td>
<td>5.83</td>
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<td></td>
</tr>
<tr>
<td>Ripener 60 kg</td>
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<td>6.81</td>
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</tr>
<tr>
<td>Sulphur sticks (10 pieces at 0.27 €)</td>
<td>2.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>687.13</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| b Consumables (calculated for 10 years) | | |
| Gloves (1 pair minimum) | 8.68 | | |

| c Consumables (calculated over 10 years) | | |
| Gloves (1 pair minimum) | 8.67 | | |
1.2 Detail of time allocated for this type of hive

List of tasks for one hive

a **Spring visit**
- Putting on bee suit and gloves: 10 minutes
- Lighting smoker: 5 minutes
- Removing roof: 2 minutes
- Removing crown board: 2 minutes
- Inspecting hive (4 frames): 20 minutes
- Replacing crown board: 2 minutes

- Replacing roof: 2 minutes
- Levelling hive: 5 minutes

**TOTAL**: 48 minutes

b **Supering**
- Putting on bee suit and gloves: 10 minutes
- Lighting smoker: 5 minutes
- Removing roof: 2 minutes
- Removing crown board: 2 minutes
- Putting on queen excluder: 1 minute
- Putting super on: 2 minutes
- Replacing crown board: 1 minute
- Replacing roof: 2 minutes

**TOTAL**: 25 minutes

c **Visit mid nectar flow**
- Putting on bee suit and gloves: 10 minutes
- Lighting smoker: 5 minutes
- Removing roof: 2 minutes

2.2 Detail of time allocated for this type of hive

List of tasks for one hive

a **Honey harvest**
- Putting on bee suit and gloves: 10 minutes
- Lighting smoker: 5 minutes
- Removing roof: 2 minutes
- Freeing hive body box: 2 minutes
- Lifting off hive body box with honey: 5 minutes
- Replacing roof: 2 minutes
- Bringing back box to extract honey, time varies according to distance, min. time: 5 minutes

**TOTAL**: 21 minutes

b **Extraction**
- Removing comb and honey from box: 5 minutes
- Draining honey (monitoring): 30 minutes

**TOTAL**: 35 minutes

c **Cleaning**
- Cleaning equipment (overall time): 30 minutes
- Cleaning honey jars (24 jars of 0.5 kg x 2 min.): 48 minutes

**TOTAL**: 78 minutes

d **Bottling**
This is based on an annual production of 12 kg which corresponds to the average for this type of hive, given that a weight of approximately 12 kg honey is left for the bees for wintering.
- Bottling (24 jars at 2 min.): 48 minutes

e **Rendering wax**
<table>
<thead>
<tr>
<th>Activity Description</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removing crown board</td>
<td>2</td>
</tr>
<tr>
<td>Inspecting frames (5 frames 5 min)</td>
<td>25</td>
</tr>
<tr>
<td>Replacing crown board</td>
<td>2</td>
</tr>
<tr>
<td>Replacing roof</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48</strong></td>
</tr>
</tbody>
</table>

**d Swarm control**

<table>
<thead>
<tr>
<th>Activity Description</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Putting on bee suit and gloves</td>
<td>10</td>
</tr>
<tr>
<td>Lighting smoker</td>
<td>5</td>
</tr>
<tr>
<td>Removing roof</td>
<td>2</td>
</tr>
<tr>
<td>Removing crown board</td>
<td>2</td>
</tr>
<tr>
<td>Removing super</td>
<td>5</td>
</tr>
<tr>
<td>Removing 3 frames</td>
<td>15</td>
</tr>
<tr>
<td>Inserting 3 empty frames</td>
<td>2</td>
</tr>
<tr>
<td>Replacing excluder &amp; super</td>
<td>3</td>
</tr>
<tr>
<td>Replacing crown board</td>
<td>1</td>
</tr>
<tr>
<td>Replacing roof</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total time</strong></td>
<td><strong>47</strong></td>
</tr>
</tbody>
</table>

**e Winter preparation of hive**

Feeding to be multiplied 4 times
Dissolving 4 kg sugar in water | 10 |
(cost 4 x 1 € = 4 €) |
Removing roof | 2 |
Adding feed | 1 |
Replacing roof | 2 |
| **Total time 15 x 4** | **60** |

Total cost of wintering 4 € x 4 | **16 €** |

**f In case of natural swarming**

Checking 'x' days, minimum time | 15 |
Putting on bee suit and gloves | 10 |
Taking swarm in skep | 10 |
Checking queen is in swarm | 5 |
Preparation of nuc + 6 frames of foundation | 30 |
Transferring swarm to nuc | 30 |
Feeding: dissolving 1 kg sugar in water | 10 |
Feeding swarm | 1 |
| **Total** | **57** |

**g Natural swarming**

Putting on bee suit and gloves | 10 |
Recovering swarm in an inverted hive-body box with starter strips | 30 |
Setting up hive with supplementary boxes | 5 |
Feeding (1 kg sugar + water, 2 lemons / kg sugar) | 10 |
Installing roof | 2 |
| **TOTAL** | **57** |

This hive is ready for production.
Feeding in 10-frame hive after 1 year 30

Cost of feeding swarm: 1 € x 1 operation (not included in analysis) 1 €

Preparing nuc for winter
Feeding to be multiplied 4 times
Dissolving 2 kg sugar in water 10
(cost 4 x 40 = 160 F)
Removing roof 2
Adding feed 1
Replacing roof 2

Total time 15 x 4 60

Cost of wintering nuc (2kg x 1 €) x 4 operations 8 €

Harvesting honey
Putting on bee suit and gloves 10
Lighting smoker 5
Removing roof 2
Removing crown board 2
Removing frames to transport box 10
Replacing crown board 2
Replacing roof 2

Extracting honey
Preparing equipment (frame holder, extractor, ripener, uncapping knife, box) 30
Uncapping on frame holder (10 x 4) 40
Extraction by 4 frames at a time (8 min), 3 extractions (3 x 8) 24
Draining and filtering honey into ripener 30

Total extraction time 157

Cleaning equipment
Before extraction
Overall cleaning time 30
After extraction

**Giving the supers frames back to the bees to lick clean**
- Putting on bee suit and gloves: 10
- Removing roof: 2
- Replacing super: 2
- Replacing frames: 2
- Replacing roof: 2
  **Total:** 18

**Recovering supers frames**
- Putting on bee suit and gloves: 10
- Removing roof: 2
- Removing super and frames: 2
- Replacing roof: 2
  **Total:** 16

**Setting up the sulphuring of the supers frames**
- Overall time: 15
- Cost of this operation: supplying two candles at 0.27 € each

**Cleaning equipment**
- Overall time: 60
  **Total cleaning time:** 139

**Bottling**
- This is based on an annual production of 20 kg which corresponds to the average for this type of hive
- Cleaning jars (2 min. x 40): 80
- Mixing honey: 30
- Bottling (2 min. x 40): 80
  **Total:** 190

**Total time allocated**
- Spring visit: 48
- Supering: 25
- Visit mid nectar flow: 48
- Swarm control: 47
- Winter preparation of hive: 60

**Total time allocated**
- Honey harvest: 31
- Extraction: 35
- Cleaning: 78
- Bottling: 48
- Rendering wax: 60
Extracting honey 157
Cleaning equipment 139
Bottling honey 190

TOTAL TIME 714

Which is 11 h 54 min.
Time rounded to 12 h per hive.
This is 12 x 5 = 60 for 5 hives.

Supplement for natural swarming (not included in the calculation)
Recovering swarm 141
Preparing nuc for winter 60

TOTAL 201

Time rounded to 3 h 30 min per hive
For 5 hives: 3 h 30 min. x 5 = 17 h 30 min.

1.3 Calculation of production cost of 1 kg honey
Based on 5 hives over a period of 10 years assuming one stops at 5 hives

a Capital outlay
Starting materials 1311.54
Consumables 87.58

TOTAL 1399.12

ROUNDED TOTAL 1400

b Supplementary feeding with sugar and sulphuring stored frames
4 kg at 1 € per kg = 4 € a feed
4 € x 4 feeds = 16 € F per hive per year
For 10 years: €16 x 5 hives x 10 years 800
Sulphuring stored frames 0.27 € x 2 x 10 years 5.4

TOTAL 805.4

In case of natural swarming, feeding bees in nucs with sugar
1 kg at 1 € x 5 hives = 5 € per year
For 10 years: 1 € x 5 hives x 10 years = 50 € of supplementary feeds.

2.3 Calculation of the production cost of 1 kg honey
Based on 5 hives over a period of 10 years assuming one stops at 5 hives

a Starting materials 687.13
Consumables 40.27

TOTAL 727.4

TOTAL ROUNDED 730

b Feeding the bees in spring with honey
0.5 kg at 6.2 € per kilo per hive per year
3.1 € x 5 hives x 10 years 155

TOTAL 155

In case of natural swarming, feeding bees in nucs with sugar
1 kg at 40 F x 5 hives = 200 F per year
For 10 years: 40 F x 5 hives x 10 years = 2000 F of supplementary feeds.
This last sum is not taken into account in the production cost which follows.

c **Total cost**
- Capital outlay (rounded): 1400
- Supplementary feeding and sulphuring frames in store: 805.4

**TOTAL**: 2205.4

**TOTAL ROUNDED**: 2200

d **Honey production**
Based on an average yield of 20 kg per hive.
- For 1 year: 20 kg x 5 hives = 100 kg
- For 10 years: 20 kg x 5 hives x 10 years = 1000 kg

**TOTAL**: 2200

d **Honey production**
Based on an average yield of 12 kg per hive.
- For 1 year: 20 kg x 5 hives = 100 kg
- For 10 years: 20 kg x 5 hives x 10 years = 600 kg

**TOTAL**: 885

e **Sales receipts**
Based on an average price of 250 F per kilo of honey and 20 kg per hive per year.
- For 1 year: 20 kg x 6.2 € x 5 hives
- For 10 years: 20 kg x 6.2 € x 5 hives x 10 years

**TOTAL**: 6200

e **Sales receipts**
Based on the current average price of 250 F per kilo of honey and 12 kg per hive per year.
- For 1 year: 12 kg x 6.2 € x 5 hives
- For 10 years: 12 kg x 6.2 € x 5 hives x 10 years

**TOTAL**: 3720

f **Net profit**
For 10 years with 5 hives
- Sales receipts: 6200
- Total cost: 2200

**NET PROFIT**: 4000

f **Net profit**
For 10 years with 5 hives
- Sales receipts: 3720
- Total cost: 885

**NET PROFIT**: 2835

g **Production cost of 1 kg honey (euros)**
- **Frame hive**: 2.2
- **Warré hive**: 1.48

**Summary table of comparison**

<table>
<thead>
<tr>
<th></th>
<th>Frame hive</th>
<th>Warré hive</th>
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</thead>
<tbody>
<tr>
<td>Total annual production</td>
<td>20 kg</td>
<td>12 kg</td>
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<tr>
<td>Capital outlay</td>
<td>1400</td>
<td>730 euros</td>
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<tr>
<td>Supplementary feed (and sulphur for frame hive)</td>
<td>805</td>
<td>155 euros</td>
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<tr>
<td>Total outlay</td>
<td>2200</td>
<td>885 euros</td>
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<tr>
<td>Honey production</td>
<td>1000</td>
<td>600 kg</td>
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<tr>
<td>Sales receipts</td>
<td>6200</td>
<td>3720 euros</td>
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<tr>
<td>Net profit</td>
<td>4000</td>
<td>2800 euros</td>
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<tr>
<td>Production cost per kg. honey</td>
<td>2.2</td>
<td>1.48 euros</td>
</tr>
<tr>
<td>Time allocation for 1 hive for one year</td>
<td>12 hours</td>
<td>5 hours</td>
</tr>
</tbody>
</table>

Note by J-C Guillaume, p. 43, 2nd edition, *L' apiculture écologique de A à Z*

Even if this detailed study is a little dated since it was made in 1992 for the first edition of this work, and even if the price of materials and honey have increased somewhat, the differences remain almost the same.

Regarding the benefits, it is important to note that nowadays several treatments are required to maintain colonies in modern hives, which even further complicates their management. If we were to look closer, we would certainly notice that these new tasks lengthen, in all likelihood in a significant way, the time needed for running these hives. This means that a similar cost-benefit analysis that would be done these days, would show an increase in benefits which would in all probability be very much higher than the one we have estimated here, but with additional expenses which would also without any doubt be rising.