Farmers and Beekeepers - Cooperations and Differences
A case study in Switzerland

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A Common Pesticide Decreases Foraging Success and Survival in Honey Bees

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Non-lethal exposure of honey bees to thiamethoxam (neonicotinoid systemic pesticide) causes high mortality due to homing failure at levels that could put a colony at risk of collapse. Simulated exposure events on free-ranging foragers labeled with an RFID tag suggest that homing is impaired by thiamethoxam intoxication. These experiments offer new insights into the consequences of common neonicotinoid pesticides used worldwide.

Thiamethoxam
Honeybee Colony Disorder in Crop Areas: The Role of Pesticides and Viruses

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Abstract

As in many other locations in the world, honeybee colony losses and disorders have increased in Belgium. Some of the symptoms observed rest unspecific and their causes remain unknown. The present study aims to determine the role of both pesticide exposure and virus load on the appraisal of unexplained honeybee colony disorders in field conditions. From July 2011 to May 2012, 330 colonies were monitored. Honeybees, wax, beeswax and honey samples were collected. Morbidity and mortality information provided by beekeepers, colony clinical visits and availability of analytical matrix were used to form 2 groups: healthy colonies and colonies with disorders (n = 29, n = 25, respectively). Disorders included: (1) dead colonies or colonies in which part of the colony appeared dead, or had disappeared; (2) weak colonies; (3) queen loss; (4) problems linked to brood and not related to any known disease. Five common viruses and 99 pesticides (41 fungicides, 39 insecticides and synergist, 14 herbicides, 5 acaricides and metabolites) were quantified in the samples. The main symptoms observed in the group with disorders are linked to brood and queen. The viruses most frequently found are Black Queen Cell Virus, Sac Brood Virus, Deformed Wing Virus. No significant difference in virus load was observed between the two groups. Three acaricides, 5 insecticides and 13 fungicides were detected in the analysed samples. A significant correlation was found between the presence of fungicide residues and honeybee colony disorders. A significant positive link could also be established between the observation of disorder and the abundance of crop surface around the bee hive. According to our results, the role of fungicides as a potential stressor for honeybee colonies should be further studied, either by their direct and/or indirect impacts on bees and bee colonies.


Editor: Fabio S. Nascimento, Universidade de São Paulo, Faculdade de Filosofia Ciências e Letras de Ribeirão Preto, Brazil

Received February 26, 2014; Accepted June 27, 2014; Published July 21, 2014

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Funding: The Walloon Region was the only funder of this study. The funders had no role in study design, data collection and analysis, or preparation of the manuscript.

Competing Interests: The authors have declared that no competing interests exist.

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Background

- A lot of research is published concerning bee health (Impact of pesticides, fungicides, pests and diseases) or the value of pollination.
- Only little knowledge is available about beekeepers and their relation to farmers.
Organic Beekeeping in Switzerland

- In 2011, 160,000 bee colonies and 16,000 beekeepers
- 5% of all beekeepers in Switzerland are farmers
- 10% of all beekeepers are professional beekeeper
- Organic?
Organic Beekeeping in Switzerland

- In 2010, 258 beekeepers and 3373 bee colonies certified (Bio Suisse, Demeter, organic)
- 1.6% of all beekeepers and 2.1% of all bee colonies are managed according to organic regulation
- Survey conducted 2011
- 57 beekeepers replied
Almost 50% Organic Beekeepers are farmers
70% are connected to farming, 4% are professionals
In average 51 years old
Organic beekeepers in Switzerland

- 40%: 0-10 beehives
- 31%: 11-20 beehives
- 13%: 21-30 beehives
- 7%: 31-40 beehives
- 7%: 41-50 beehives
- 2%: more than 50 beehives
Organic beekeepers in Switzerland

- Direkt marketing: 56%
- Lokal retailer: 37%
- Internet: 5%
- Supermarkets: 2%
# Organic beekeepers in Switzerland

<table>
<thead>
<tr>
<th>Main Challenges for organic beekeepers in Switzerland</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Varroa</td>
<td>70%</td>
</tr>
<tr>
<td>European foulbrood</td>
<td>12%</td>
</tr>
<tr>
<td>Scarce food sources</td>
<td>12%</td>
</tr>
<tr>
<td>Fire blight treatments</td>
<td>8%</td>
</tr>
<tr>
<td>Coordination among beekeepers</td>
<td>2%</td>
</tr>
<tr>
<td>Agriculture</td>
<td>2%</td>
</tr>
<tr>
<td>No support from governments</td>
<td>0%</td>
</tr>
</tbody>
</table>
Could beekeepers and farmers cooperate?

Farmers
6 certified organic
2 conventional farmers

Beekeepers
5 organic/natural beekeeping
7 conventional,

FiBL  www.fibl.org
Collaboration between beekeepers and farmers

Main differences not between
- beekeepers and farmers
- organic and conventional farmers
- conventional and organic beekeepers

Differences between beekeepers
- Quantity and quality of honey
- Perceived importance of bees for pollination
- “Natural bee keeping”
- Traditional beekeeping and old bee varieties
- Professional and non-professional beekeepers
Results

- Swiss Farmers need more knowledge about bees
- Beekeepers are a heterogeneous group
  - different opinions, values and goals
  - production vs. pollination
  - different beekeeping strategies
  - Cooperation is potentially challenging
- Low valuation of pollination services among farmers and beekeepers
- Beekeepers in Switzerland have a positive attitude toward agriculture, but not to each farmer!
Thank you for your attention.
### Assessment of challenges by «professional» and «non-professional» beekeepers

<table>
<thead>
<tr>
<th>«Professional» more than 20 beehives</th>
<th>«Non-Professional» less than 20 beehives</th>
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<tbody>
<tr>
<td>To intensive beekeeping</td>
<td>Varroa</td>
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<tr>
<td>Suppressed swarming</td>
<td>Foulbrood</td>
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<tr>
<td>Insufficient quality of trainings</td>
<td>Mowing</td>
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<tr>
<td>Outdated knowledge and structures</td>
<td>Insecticides</td>
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<tr>
<td>Loss of genetic diversity</td>
<td>Scarce food source</td>
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<tr>
<td>International bee trade</td>
<td></td>
</tr>
<tr>
<td>Scarce food source</td>
<td></td>
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</tbody>
</table>
Organic beekeepers in Switzerland

In average, since 10 years organic