Brennpunkt

diagnose-funk

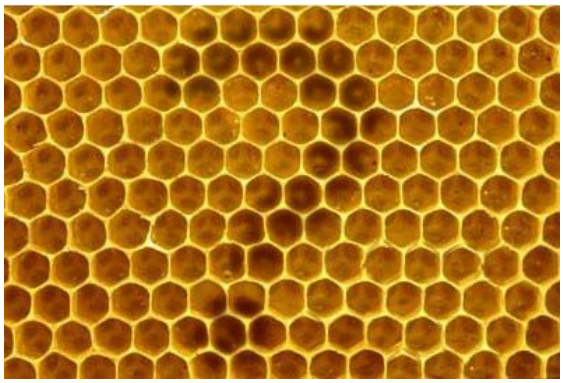
The Big Bee Death

Issue 4 April 2007

The mysterious disappearance of entire bee colonies, which has been observed for several years in many countries, **could soon have grave consequences for agricultural production**.

Last March, various European and US newspapers reported a strange phenomenon: Worker bees did not return to the hive, which resulted in the death of the brood and the queen. Science has even come up with a name for this phenomenon: **„Colony Collapse Disorder“** (CCD), which describes an as yet unexplained disturbance in the behaviour of the bees.

Meanwhile, unusual colony losses are reported from many countries worldwide, including **Switzerland**, half of all **US American States**, **Canada**, **Austria, Germany, South Tyrol, Spain, Poland and New Zealand**. **25 to 50% of US American beekeepers reported losses due to CCD [1]. During the past six months, 50 to 90% of their bees had disappeared,** and the remaining colonies were so weak that they could hardly produce any honey [2].



“Imagine waking one morning to find 80 per cent of the people in your community are just gone," says May Berenbaum of the University of Illinois, regarding the CCD phenomenon [1].

In Switzerland, the situation is similar. As early as 2006, the Swiss Research Institute for Animal Husbandry and Dairy Farming ‚Agroscope’ (Federal Agency for Agriculture) reported that all of Switzerland was affected by the bee deaths, however, different regions were affected to different degrees. Jean Daniel Charrière of Agroscope estimated that the **countrywide losses in the year 2003 numbered around one quarter of the population [3]. From 2004 to 2006 the losses were in a similar above average range [4].**

The television programme “10 vor 10” broadcast on 21 March 2007 by the Swiss Channel SF1 did not mention numbers, but it indicated that the trend seems to be continuing this year. Dr. Peter Gallmann of Agroscope discussed many possible **causes, but dismissed all of them as vague and not very likely.**

The Search for the Cause

When researching this issue, a variety of possible causes can be found, but none of these can explain the occurring phenomena in a satisfactory manner:

- An **exceptionally cold winter** does not seem to have been the crucial factor, according to Agroscope [3].
- **Genetically modified plants**, the pollen of which could potentially damage the bees do not (yet) exist in Switzerland.
- **Monocultures**, such as they cover large areas of the United States, do not exist in Switzerland.
- **Toxic Pesticides** have been in use for several decades. However, the bee deaths are a very recent occurrence.

- **Varroa mites:** Although the resistance of bees has suffered in the last ten years (according to bee researcher Jürgen Tautz from the Biozentrum of the University of Würzburg, Germany), the beekeepers could not find as massive a Varroa infestation as it was the case in the late Eighties. Furthermore, with Colony Collapse Disorder, it often takes several weeks until the dying hive is taken over by moths and other pests [5].

Secretive Research

One possible cause, so far overlooked by the Swiss Authorities, are electromagnetic fields. The **Austrian Federal Ministry for Agriculture and Forestry, Environment and Water Management**, however, wrote as early as April 2006 to the National Counsel Dr. Andreas Khol:

„**Scientific research has found evidence that electromagnetic fields can have negative effects on bees**. " (...)Studies have shown that bees exposed to strong electric fields of over 4 Kilovolt/m, e.g. directly under a 380 kV high voltage line, **produce less honey and show increased mortality**. (The guideline for the protection of humans from the exposure to these fields is set at 5 kV/m)" [6].

The following studies corroborate the statement of the Austrian Ministry:

- As early as the Seventies, biophysicist Dr. rer. nat Ulrich Warnke of the University of Saarbrücken, Germany, found that bees showed stress reactions under the influence of low frequency fields. When exposed to signals in the frequency range of 10 to 20 KHz, **increased aggression** and a **reduced capability to return to the hive** was observed. [7]
- In 1974, the Russian researchers Eskov and Sapozhnikov found that bees generate electromagnetic signals with a modulation frequency between 180 and 250 Hz when they do their communications dances. (It is important to note that our GSM mobile system is modulated with 217 Hz). Hungry bees react to those frequencies by erecting their antennae [8]. Warnke reported that the **communication impulses of the antennae when touched by a fellow bee** can be measured with an oscillograph [9].
- In 2005, a group of scientists of the University of Koblenz-Landau headed by Prof. Hermann Stever conducted a pilot study to research the 'returning behaviour' of bees as well as the weight and surface development of the comb under the influence of electromagnetic radiation [10]. Four out of eight colonies were exposed **to DECT phone base stations which were put into the hive and constantly emitted radiation.**

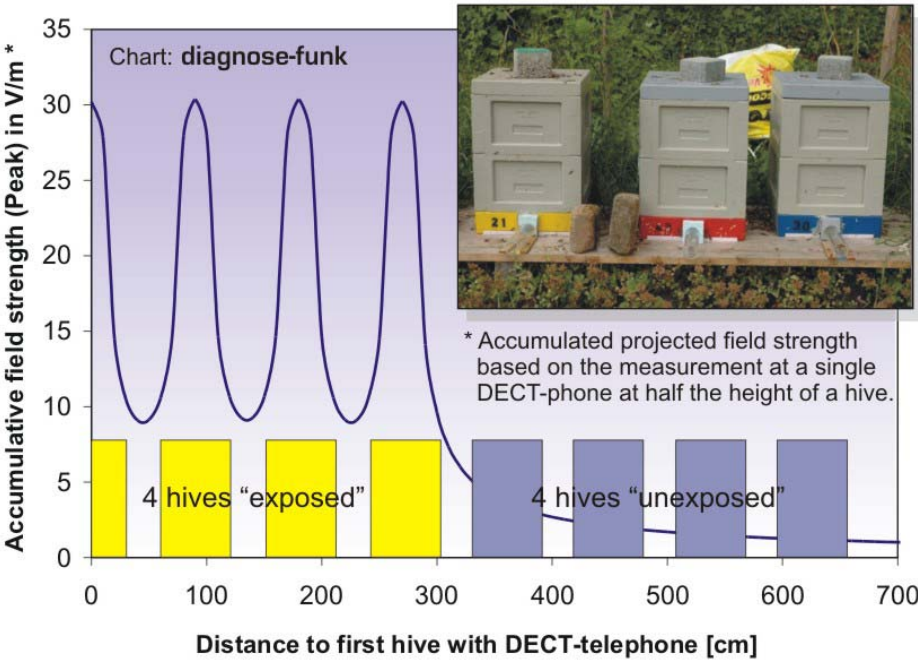
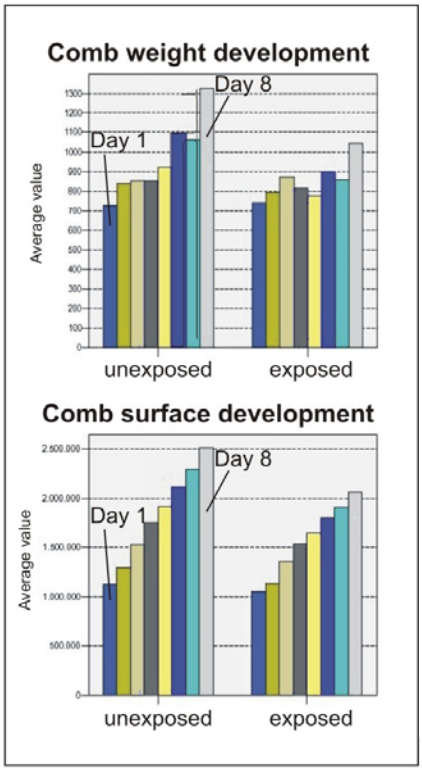


Fig 1: *This graph shows the field strength in the four DECT exposed and the four unexposed hives of the Koblenz-Landau study, as estimated by Diagnose-Funk. In this pilot study, the hives were not shielded against electromagnetic fields, which resulted in some exposure of the unexposed colonies, although this exposure was less strong than the one occurring in the near field of the DECT stations.*

The comb weight and surface development of the colonies exposed to the DECT phone was significantly slower, than that of the "unexposed" colonies (see Fig. 4). In order to examine the "returning behaviour", various bees of each hive were marked with colour dots and released at a distance of 800 meters to the hive after a minimum DECT exposure period of five days [11]. **There were significant differences in the time needed for returning to the hive between the "exposed" and "unexposed" bees.** (see Fig. 3).



Fig. 2: *Bee Hive with DECT base station (Photo from [13]).*



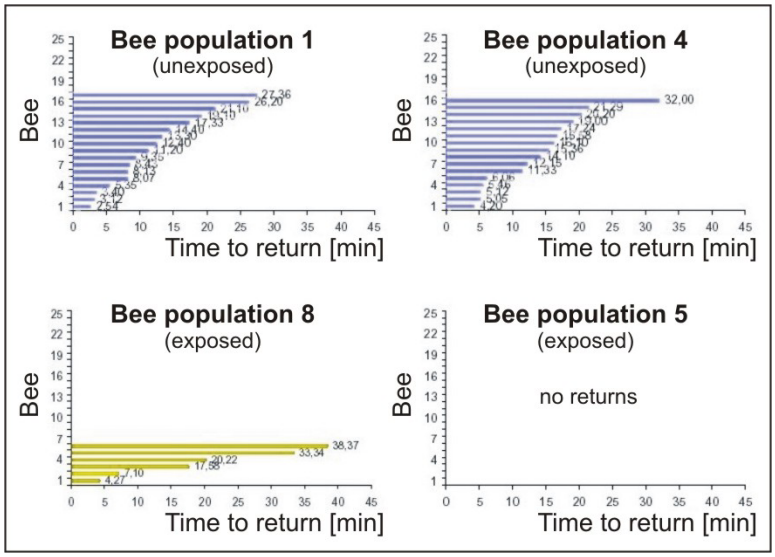


Fig. 3: *Return times of sample colonies with and without DECT phone in the hive. A total 40% of bees from "unexposed" hives returned to their hive, whilst only 7% of "exposed" bees returned [15]. Chart taken from [10]).*

Fig. 4: *Weight and surface development of the comb (from [10]).*

After extensive follow-up studies to the pilot study of 2005, Prof. Stever and his team examined the returning behaviour of bees exposed to DECT phones again in 2006 [13]. This time, the bee hives were screened from each other by using a small meshed metal lattice and they were positioned in a random order in order to balance out any unwanted external influences. The **flight distance** was reduced to **500 meters** [14]. It could be assumed that the exposed colonies would have found it easier to find back to the hive because of the shorter distance. However, the **returning behaviour of the exposed bees was statistically significantly different** from the returning behaviour of the unexposed bees (see Fig.5). With regard to the phenomenon of „Colony Collapse Disorder", it needs to be asked whether the area-wide, all pervasive, but weaker radiation from mobile telecommunications is able to disturb the sense of orientation of the bees in a similar way to a five day exposure to the near field of a DECT phone in the hive..

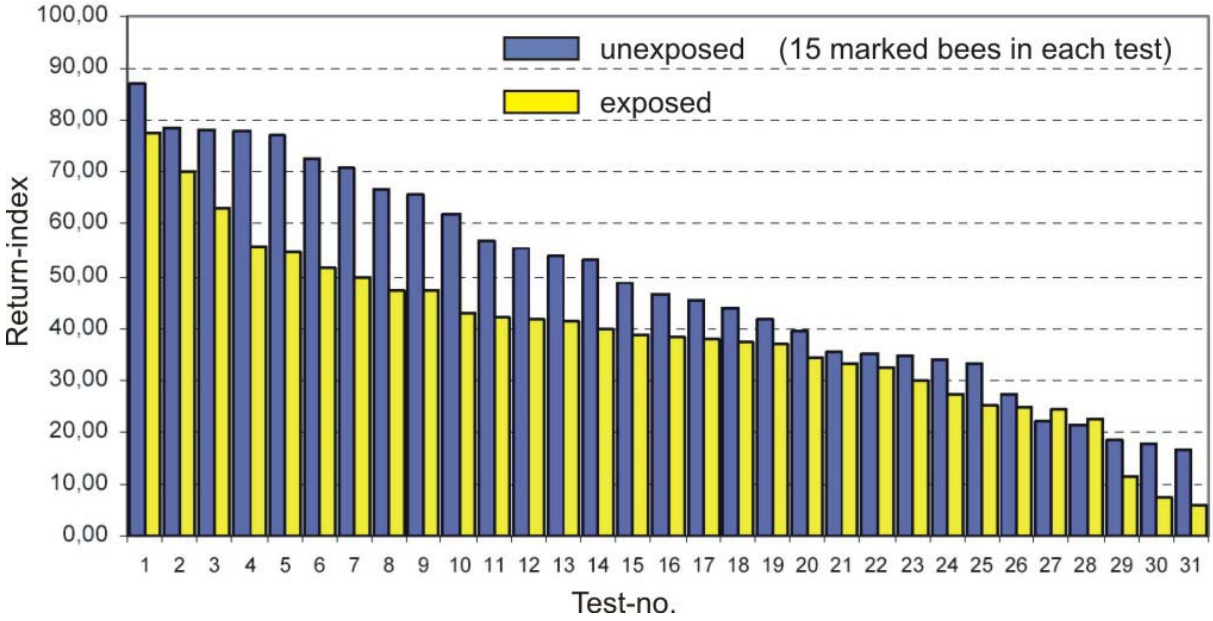


Fig. 5: *Significant difference between the returning behaviour of exposed and unexposed bees. The higher the index, the larger the number of returning bees and/or the shorter the return time. (Chart taken from [13]).*

Experiences of Beekeepers

Prof. em. Dr. Ferdinand Ruzicka, who is a beekeeper himself and has contributed to a variety of beekeeping journals, has assembled a wealth of experiences from his own observations and questionnaires to other beekeepers. He says: "**The problems only appeared since several transmitters have been installed in the immediate proximity to my hives."** After this event, he published a questionnaire in the Beekeeping Journal „Der Bienenvater" 2003/9 [15]:

- The question whether a mobile phone transmitter was **within a 300m radius** of the hives was **answered affirmatively in all 20 replies**.
- The question whether the bees displayed **more aggressive behaviour** after the installation than before was answered affirmatively by 38% of the respondents.
- The question whether the bees showed a **greater inclination to swarm** after the installation was answered affirmatively by 25% of the respondents.
- The last question regarding **unexplained colony collapse was answered affirmatively by 63%** of the respondents.

According to Ruzicka's observations, the bee colonies are so weakened by the mobile telecommunications radiation that they become **more prone to various diseases**, a fact that can also contribute to colony collapse. This is because bees are considered to be very fragile creatures, just like **butterflies** whose numbers have also dramatically fallen during the last few years. However, according to Dr Ruzicka, **15 years ago, bee colonies were able to deal with a much higher degree of Varroa mite infestation than they are able to cope with today**.

Neue Zürcher Zeitung (NZZ): „Bees live longer"...

Directly or indirectly, bees are responsible for around one third of all human food production, since without pollination, agricultural produce (such as fruit and vegetables, but also grains for feeding livestock) cannot thrive. We already know that the extinction of bees can lead to considerable complications. However, warning reports in the Swiss daily newspaper Tagesanzeiger and in the TV programme "10 vor 10" were immediately countered by the Neue Zürcher Zeitung with denials and an all-clear. [16]. The headline: **„Bees live longer"** [4]**.**

The attentive reader cannot help but notice that this is always the case where a **news**

story affects the interests of an industry and potentially threaten a lucrative business (for example tobacco, sugar, microwave ovens etc.). When Diagnose-Funk contacted the Federal Agency for Agriculture, with a query regarding the bee deaths, the Agency replied by referring to the trivialising article in the Sunday NZZ. **Yet, why is it that American farmers are already trying to pollinate their orchards with the help of giant ventilators?** [5]. A farmer from Pennsylvania tried to take bee colonies for 15'000 Dollars to California in order to help pollinate the almond trees, but when he arrived there, not a single colony was alive. [5].

Evi Gaigg, diagnose-funk,

translated by Andrea Klein

References

[1] „Where have all the bees gone?", New Scientist, 22 March 2007. http://www.newscientist.com/channel/life/mg19325964.500-where-have-all-the-bees-gone.html

[2] „The mysterious death of the honey bees", CNN Money, 29 March 2007. http://money.cnn.com/2007/03/29/news/honeybees/index.htm.

[3] „Rätselhaftes Massensterben", Zürichseezeitung, 5 May 2006.

[4] „Schweizer Bienen leben länger", NZZ am Sonntag, 25 March 2007.

[5] „Sag mir, wo die Bienen sind?", Tagesanzeiger, 14 March 2007, http://tages-anzeiger.ch/dyn/wissen/umwelt/729927.html)

[6] Federal MinisterJosef Pröll in his reply dated 27.4.2006 to the President of the National Council Dr. Andreas Khol, Parliament, 1017 Vienna

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[11] Co-Autor Dr. Jochen Kuhn im Interview mit dem IZGMF, http://www.izgmf.de/Aktionen/Meldungen/Archiv_05/bienen/bienen.html.

[12] E-Mail des Co-Autors Wolfgang Harst vom 31. März 2007 an Diagnose-Funk

[13] Stever, H., Kimmel, S., Harst,W., Kuhn, J., Otten, C., Wunder, B.: Verhaltensänderung der Honigbiene apis mellilfera unter elekromagnetischer Exposition. Landau: Arbeitgruppe Bildungsinformatik. http: //agbi.uni-landau.de. http://www.izgmf.de/Aktionen/Meldungen/Archiv_05/bienen/bienen.html

[14] E-mail of the co-author Wolfgang Harst dated 29. März 2007 to Diagnose-Funk. During the pilot study with 1000m distance, no bees arrived back to the hive. This is why the releasing distance was shortened to 500m in the following study, a fact that had not been corrected in the documentation of the study.

[15] http://www.mikrowellensmog.info/bienen.html and correspndence with Diagnose-funk.

[16] „Wird die NZZ zum Sprachrohr der Mobilfunkindustrie?" http://www.diagnose-funk.ch/politik/00000098130868502/033ea298c80012205.html.