



Is the future of bees in the hands of the pesticide lobby?

European Commission allows corporations to shape the pesticide rules.

Corporate Europe Observatory and the European Beekeeping Coordination
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Introduction

Bees and other pollinating insect numbers are falling dramatically, putting their future survival in jeopardy with catastrophic consequences for ecosystems and agriculture. In some European countries, bees are disappearing from the environment at a shocking rate of up to 20-32% a year¹. A number of factors are thought to be contributing to this decline, including the emergence of new viruses and the changing climate, but there are clear indications that modern agricultural practices, particularly the dominance of monoculture farming with its reliance on pesticides could be key.

Scientific evidence suggests that changes in farming practice could be leaving bee populations vulnerable to disease and parasites, increasing mortality rates – and that changes in the use of pesticides may even be responsible for the collapse of whole bee colonies. Improved testing and scrutiny of pesticide use is urgently needed – but in the European Union, this process appears to have been taken over by industry. The advisory groups responsible for drafting the guidelines on pesticide use are made up of corporate ‘experts’ from the pesticide industry.

The bee crisis

Bee numbers have been declining over the last few decades as a result of various factors. In the past four years however, there have been inexplicably high death rates among honeybee populations, termed ‘colony collapse disorder’. Apparently healthy colonies suddenly collapse, sometimes leaving only the queen in the hive and abandoning the brood and their food reserves. Scientists are very concerned because of the vital role bees play in our food supply, with many food crops dependent on insects for pollination². Many beekeepers are losing business but do not know what they can do to save their hives.



Frame of honeybee hive showing signs of Colony Collapse Disorder

The specific cause(s) of colony collapse has not yet been identified. Some argue it is a virus, others say it is climate change. But there is growing support among scientists and members of the bee-keeping community for the hypothesis that neurotoxic pesticides play a role. Indeed, the available data appears to show a high correlation between the countries experiencing the greatest bee losses and those that have highest pesticide use³. A previous example of high death rates among bees in France was shown to be caused by the pesticide coating used on sunflower seeds (until the suspension of this practice with certain pesticides). The peak of new bee colony collapses happened in spring 2008 in France, Germany, Italy and Slovenia where a high load of neurotoxic pesticides was present in the air.

¹ EFSA (2009) SCIENTIFIC REPORT Bee Mortality and Bee Surveillance in Europe. CFP/EFSA/AMU/2008/02. Accepted for Publication on 03 December 2009

² ‘Bad winter deepens disappearing bees crisis’, CBS news, 24 March 2010

³ OECD (2008) Environmental Data compendium 2008 Agriculture Environmental Performance and information division OECD. Working group on environmental information and outlooks.

The European Beekeeping Coordination (EBC) is a task force of professional beekeeping associations from across the EU⁴ that has studied the impacts of pesticides on bees and the way in which pesticides are regulated. An investigation into current EU pesticide legislation revealed major flaws, allowing the marketing and growing use of pesticides which have a damaging impact on bee populations⁵. The EBC is calling for an urgent revision of the way pesticides and their active substances are authorised in the EU.

The call is particularly timely as the annexes of the 2009 pesticide regulation⁶ are currently being revised along with the requirements that chemical companies must comply with before their pesticide products are authorised. This could provide an opportunity to improve the way pesticides are assessed in the EU, and to prevent highly toxic substances from being spread in the environment, killing bees and other beneficial insects.

However, this process appears to have been hijacked by the pesticides industry. The European institutions and the Commission in particular, rely on over a thousand expert groups and advisory bodies in order to design new legislation. This system has acted as an open invitation for corporations to influence policies that affect them. Corporate lobbyists have found their way in many of the bodies relied on by the Commission, where they can influence and help shape legislation from the early drafting stages.



Observation of the hive in the early morning: dead bees in front of the hive entrance

In this case, the apparent lack of expertise on bees in the EU institutions has led to the development of guidelines being outsourced to other organisations. This in turn has allowed 'experts' from the pesticide industry to advise on how the impact of pesticides on bees should be measured. These 'experts' include employees from BASF, Bayer Crop Science, Dow Chemicals, Syngenta, and others involved in the working groups on bees. Experts at the European Beekeeping Coordination say that the resulting advice will have disastrous consequences for bees.

Market authorisation of pesticides: legal framework

The toxicity and other characteristics of pesticides and their active substances must be evaluated in order to get authorisation for marketing in the EU. In accordance with European Directive 91/414/EEC, the pesticide active substances are approved at European level, while pesticide products containing these substances are approved at national level.

So whenever a company wants to market a pesticide or its active substances in the EU, it must compile a dossier with studies demonstrating its impact on human health, animal health and the environment. In order to test the environmental impact, research must be done by the company regarding the impacts on several plant, animals or insects species including bees. Bees are important because they represent a large number of pollinators.

⁴ www.bee-life.eu

⁵ Tennekes, H.A (2010) The significance of the Druckrey-Küpfmüller equation for risk assessment – The toxicity of neonicotinoid insecticides to arthropods is reinforced by exposure time. Toxicology. In press.

⁶ Annex II and III of Council Directive 91/414 of 15 July 1991 concerning the placing of plant protection products on the market.

The Commission makes a decision on the authorisation, based on the advice by one or more member states and the European Food and Safety Agency (EFSA), which both review the company's information, which is largely confidential. But no independent research is undertaken by EFSA or member states to confirm the company's research reports.

The role of EFSA – set up in 2002 after a number of major food crises – is supposed to be an “independent source of scientific advice and communication on risks associated with the food chain” for the EU institutions. However, several members of EFSA panels, and the new EFSA chairwoman Diana Banati, face accusations of conflicts of interest because of their ties with the food or biotech industry.

Chronic exposure ignored

Traditionally, pesticides have been sprayed directly onto the plants. But pesticides are now also applied in a systemic way by coating the seeds with a toxic mixture of insecticides and fungicides, injecting pesticides into the soil, irrigating crops with water containing pesticides or by injecting the pesticides directly into the plant. As a result, the plant either soaks up the pesticides during its development or the pesticides are spread directly throughout the whole plant, including the flowers.

Insects feeding on the pollen, the nectar or the plant, or drinking pesticide-treated water, are thereby exposed little by little to the pesticides, that remain in the plant over long periods. Even if the concentrations do not kill them instantly, the repeated exposure to small amounts of pesticides can have serious impacts on the bees' health. In addition, systemic pesticides build up in the hive's food reserves (made up of nectar, water⁷ and pollen)⁸, meaning that members of the colony that stay inside the hive are also exposed to the pesticides, not just the bees collecting the food.

So far, the impact of this chronic exposure to contaminated food and water sources on bees and their colonies has been completely ignored in safety assessments. Only acute toxicity, considered as the adverse effects of a pesticide resulting either from a single direct exposure (or from multiple exposures in a short space of time, usually less than 24 hours), and in certain cases the toxicity for larvae has been evaluated. In addition, the methodologies used to assess the impact on adult bees and the colony as a whole do not take account of the long-lasting presence of pesticides in the environment.

Many beekeepers believe that a new class of systemic insecticides based on nicotine, called neonicotinoids, may be an important factor in the recent mass bee deaths. While nicotine is an stimulant in humans, this substance and its derivatives, neonicotinoids, are potent insecticides that among other actions interfere with activities such as learning, recognising or reacting to stimuli. These products started to be widely used at the end of the last century, applied either to the soil or to seed coatings, mainly for corn.⁹ Some of these pesticides are highly toxic. For example, the active substance Imidacloprid, a Bayer product, is over 7,000 times more toxic for bees than the DDT it has replaced¹⁰. These pesticides also persist in the environment for longer.

⁷ Girolami, V. M. (2009). Translocation of Neonicotinoid Insecticides From Coated Seeds to Seedling Guttation Drops: A Novel Way of Intoxication for Bees . *Journal of Economic entomology* , 102 (5), 1808-1815 .

⁸ Bonmatin, J. M., Marchant, P.A., Charvet, R., Moineau, I., Bengsch, E.R., Colin, M.E. (2005). Quantification of imidacloprid uptake in maize crops. *Journal of Agricultural and Food Chemistry* , 53, 5336-5341.

⁹ Behind mass die-offs, pesticides lurk as culprit, *Yale Environment* 360, 07 January 2010

¹⁰ <http://pmep.cce.cornell.edu>

Understanding bee colonies

To understand the relationship between individual bees and their colony, think of the colony as like an animal in which all the cells are independent and can move, but could not survive on their own. A colony is a living being composed of different members, each performing different tasks: the queen lays eggs, the drones fertilise the queen and the female workers fly off to search for food, take care of the brood or maintain the temperature inside the hive. Each individual has a duty and the survival of the colony depends on each of these tasks being performed well. Communication among individual bees is crucial. Bees are very sensitive to different smells and other stimuli.

The presence of neurotoxic pesticides in food and water sources affects all the individual bees in the hive. As well as their direct toxicity for bees and the brood, sub-lethal concentrations of pesticides affect bees' nervous systems, altering their memory and learning abilities, disabling their sensitivity to stimuli, hindering communication and damaging their sense of orientation. The effect on the bee is similar to the effect of alcohol on humans. It affects the way in which the colony can defend itself against other damaging factors.



Bee foraging nectar and pollen from lavender

Whose expertise?

The European Beekeeping Coordination strongly believes a proper assessment of the impacts of these pesticides on bees is of paramount importance. But when the organisation, together with representatives from the scientific community, raised the need to change the approval procedure for these pesticides, they discovered that the pesticide industry had managed to get its own people in 'expert' working groups advising on how pesticides should be evaluated.

It soon became clear that neither the European Commission, nor EFSA, has a single bee expert. The Commission normally relies primarily on the European and Mediterranean Plant Protection Organization (EPPO) for the evaluation of the impacts of pesticides on living species. This inter-governmental organisation brings together representatives from European, Northern African and West Asian countries and drafts guidelines for testing pesticides on different species. The guidelines are continuously adapted following new scientific findings¹¹.

However, in the specific cases of bees and bee colonies, EPPO does not have any internal expertise either, so it has delegated the task of designing the guidelines and updates to an international, informal group of experts called the International Committee of Plant-Bee Relationship (ICPBR). This Committee does not have a formal status, but was created in 1950 as a platform to share research and information on bees and plants. The ICPBR started out as a scientific platform, but has attracted an increasing level of involvement from the pesticide industry which appears to exercise considerable influence on its work.

¹¹ EPPO Guidelines PP3/10(3) Environmental risk assessment scheme for plant protection products, Chapter 10: Honeybees and PP 1/170(4) Efficacy evaluation of plant protection products. Side-effects on honeybees

The ICPBR is organised into working groups, one of which discusses the latest knowledge about bees and ecotoxicology. It is made up of scientists, government officials, representatives from the pesticide industry and consultants who carry out tests and draft dossiers for companies. Needless to say, pesticide companies have a great interest in influencing the decisions, messages and recommendations made by these groups since these will affect whether their pesticides are approved for commercialisation.

ICPBR formed three working groups to look at the issue of pesticides and their impacts on bees. Out of the 17 working group members, six were from industry with some of them participating in two working groups. The industry members were: Roland Becker (BASF), Mike Coulson (Syngenta), Natalie Ruddle (Syngenta), Ed Pilling (Syngenta), Christian Maus (Bayer Crop Science), Mark Miles (Dow Chemicals).

These companies produce the systemic pesticides thought to be responsible for the problem, yet they have been invited to shape the guidelines that will be used to assess their own products. This is a typical case of the fox guarding the henhouse.

The result: industry-friendly recommendations

The ECB says the results have been disastrous. The ICPBR working groups have put forward proposals that are totally incompatible with the survival of bee colonies and beekeeping.

Firstly, the ICPBR Bee Brood working group has proposed that a 30% loss of the bee brood (one of the components of the hive: the group of larvae in the colony) in general, or a 50% loss of eggs or other larval stages, is 'normal', as they argue that such a reduction can be seen in a year with bad conditions (bad climate, poor food sources, etc).¹²

However, to suggest that a 30% loss of bee brood from a pesticide, in addition to all other factors that can cause brood loss, is 'normal', is clearly instigated by commercial interests, and will legalise great damage to bees. In addition, a beekeeper cannot survive if he or she systematically loses 30%-50% of the future colony every time that the honey is produced from crops that have received systemic pesticide treatment.

This working group included representatives of BASF, Bayer Crop Science, and Eurofins GAB; as well as representatives from the British and French food safety agencies FERA¹³ and ANSES¹⁴, and the Julius Kühn Institute from Germany.



Suspected case of Colony Collapse Disorder: bees have abandoned the hive.

Secondly, the ICPBR's proposal failed to include an evaluation the chronic toxicity of pesticides.¹⁵ Instead, it proposed measuring the toxic effect only *if* the pesticide shows problems in the short-term (acute toxicity).

¹² Becker R, Vergnet C, Maus C, Pistorius J, Tornier I, Wilkins, S. (2009) Presentation of the proposal of the ICPBR Bee Brood Working Group for testing and assessing potential side effects from the use of plant protection products on honey bee brood. 10th International Symposium, Bucharest, October 08 – 10, 2008.

¹³ FERA: British Food and Environment Research Agency

¹⁴ ANSES: French Agency for Food, Environmental and Occupational Health Safety

Such a refusal is catastrophic. It is impossible to extrapolate the consequences of exposure to small amounts of pesticides during long periods from one-off contact with large concentrations. This would mean that active substances that are highly damaging to bees when they are exposed for long periods, but which do not necessarily cause damage in the short-term, would be considered a low risk for pollinators.

Thirdly, the ICPBR proposals fail to take into account the impact of exposure on the bee colony, which can be disrupted to the point of making it unviable. As previously mentioned, many of these pesticides are neurotoxic. This can impact the bees' ability to recognise signals which is crucial for their orientation and communication.

The European Beekeeping Coordination sent repeated letters and notes to the EPPO and the ICPBR in order to emphasise these points. Apart from one EPPO member who responded sharing these concerns, their claims appear to have been ignored

The situation could not be worse for bees and beekeeping. Since the EPPO lacks expertise on bees, they are also incapable of judging the industry-biased recommendations made by ICPBR working groups. Similarly at the Commission level, there is no expertise to assess these recommendations – and where a final decision on the requirements will be made.



Bee foraging on a flower

These are just some examples of the consequences of the conflict of interest experienced by this group resulting in a total invalidation and lack of logic in the evaluation. As a result, not only is the credibility of this group undermined, but it also raises strong concerns about decision-making in the European Union.

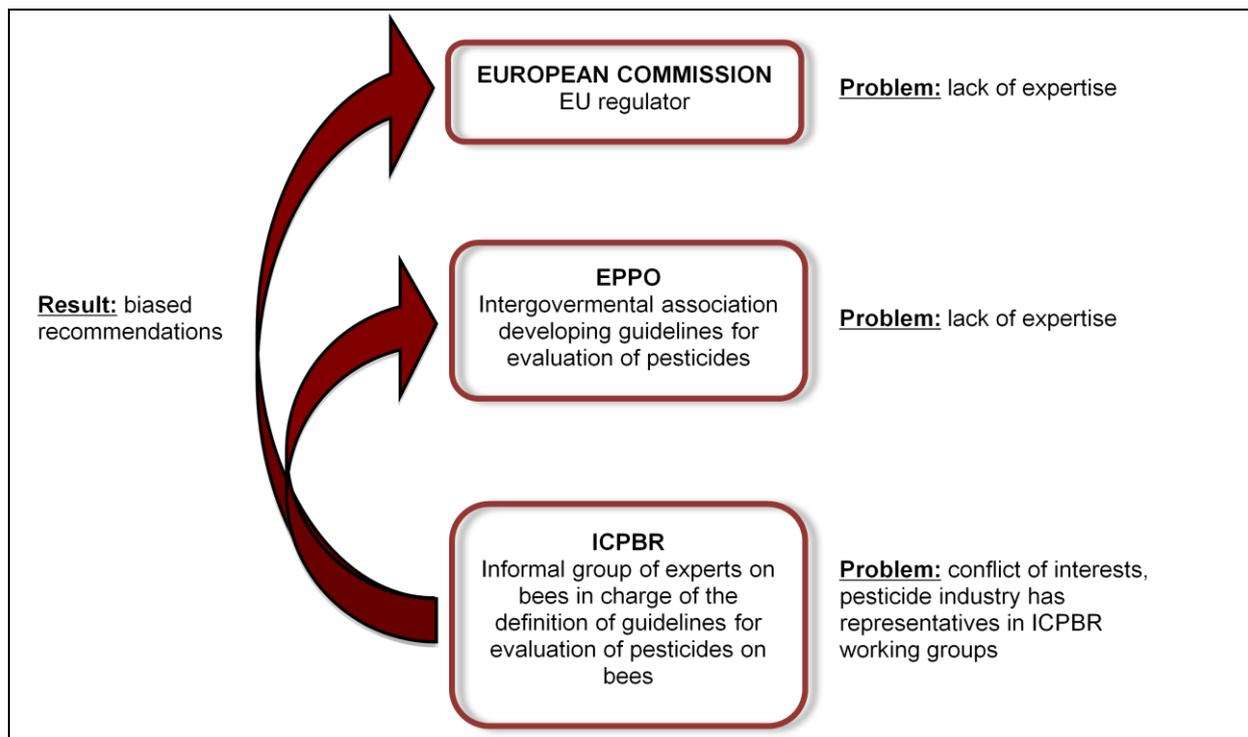
Independent research imperative

The European Commission and the EPPO have outsourced their expertise to industry, and not surprisingly, the industry 'experts' have come up with proposals that suit their interests but not the crucial efforts needed to stop the sudden decline in bee numbers.

Allowing industry to self-regulate carries a clear risk of profit coming before precaution. And in the case of bees, it seems that this is the case. The dominance of industry has created a conflict of interest in their source of expertise.

The ICPBR should guarantee the independence of its work by restructuring its decision-making procedure. It should not be possible for companies to develop the rules made to regulate their own harmful products.

¹⁵ Alix, A. and Lewis, G. (2010) Guidance for the assessment of risks to bees from the use of plant protection products under the framework of Council Directive 91/414 and Regulation 1107/2009. Bulletin OEPP/EPPO Bulletin 40, 196-203



EU member states and EU Commission risk managers will now contribute to the review of the pesticides directive and can use the opportunity to ensure that the studies have been carried out to ensure that there is no risk for bees or for bee colonies.

It is essential for our environment, our flora and our fauna that the Commission and member states ensure that the expertise on which they base their decisions is not biased by companies' profit motive. It is not only our bees and beekeeping sector what is at stake, but is our environment's health (our water, our air, our soil, our nature).

Independent experts and stakeholders from outside the pesticide industry should be involved.

Specifically, the EBC strongly urges these questions to be thoroughly considered:

- Does the evaluation of pesticides resemble the reality of bee colonies: long-term exposure to environmental contamination with a mixture of pesticides?
- Is the expertise on which decisions are based on sufficiently independent? Are industries dossiers independently validated?
- Who is guarding for our environmental health in the EU?

Everything is still to play for – the review will not be finalised until June 2011 and will not become law until 2013/14.

The European Beekeeping Coordination urges the Commission to ensure a framework in which bees and other beneficial insects, together with the beekeeping activity, can cohabit with agriculture.