

of pesticides on honeybees: relative roles of science and politics



Laura Maxim

**National Center for Scientific
Research (CNRS), France**

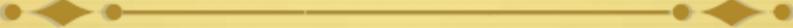
Jeroen van der Sluijs

**Copernicus Institute of
Sustainable Development,
Utrecht University, The
Netherlands**



Guidelines: science-based policy instruments

Objectives:

- 
- ✦ protecting human health and the environment,
 - ✦ creating a common reference and thus facilitating communication between industry and regulatory authorities,
 - ✦ avoiding “green barriers” to the international commerce, i.e., avoiding distortion of global markets.

In chemical risk assessment, frames of reference for deciding about the “level of evidence”.

Recent change in the relative proportion of “science” and “policy”, under the pressure of controversies (BPA, neonicotinoids)

Risk assessment of pesticides for honeybees: the EPPO scheme

- ✦ **EPPO** (European and Mediterranean Plant Protection Organization)
- 1992, 1998, 2003: EPPO 3/10, Environmental risk assessment scheme for plant protection products, Chapter 10: Honeybees
- 1991, 1998, 2000: EPPO 1/170, Side-effects on honeybees
- ✦ Main characteristics:
 - Hazard Quotient = the field application rate / oral or contact LD50; if $HQ > 50$, (semi-)field trials may be done
 - (Semi-)Field tests decisive when laboratory tests indicate toxicity

Insights from the French case on the risk assessment of neonicotinoids (2)

Controversy on the effects of Gaucho (neonicotinoid) on honeybees in France

Precautionary principle (Minister of Agriculture)

⇒ ban of Gaucho® in sunflower seed-dressing in 1999

⇒ maize seed-dressing in 2004



Insights from the French case on the risk assessment of neonicotinoids

Review by academic scientists of the risk assessment (industry) for the authorization given to Gaucho® for sunflower seed-dressing (1993):

- Wrong estimation of exposure
- Wrong estimation of effect (acute toxicity only, instead of chronic and sublethal)
- Wrong risk assessment method (HQ)

New risk assessment scheme **based on PEC/PNEC** by the Scientific and Technical Committee in France => Gaucho® has a risk for honeybees in sunflower and maize



“Revision” of the risk assessment scheme: EPPO (1)

- ✦ **The controversy on neonicotinoids became European (Italy, Germany, Slovenia, also in Spain, Belgium, Netherlands, Portugal, UK) + boosted by CCD in the US**
- ✦ **European Commission => EPPO (European and Mediterranean Plant Protection Organization):**
 - intergovernmental organization responsible for international cooperation in plant protection in the European and Mediterranean region.
 - According to the FAO International Plant Protection Convention, it is the regional plant protection organization for Europe.
 - Founded in 1951, it now has 50 member governments
 - Any competence on honeybees => ICPBR

“Revision” by EPPO (2): ICPBR

- => A group of **ICPBR** (The International Commission for Plant-Pollinator Relationships) => « new » scheme
- ✦ ICPBR is a **quasi-informal** structure, created in 1950 and based at University of Guelph (Canada)
 - ✦ Example: conference in Bucharest (2008) where new tests were proposed and “discussed”
 - Sponsored by BASF, Bayer, Dow, Syngenta, DuPont
 - Among the participants in this symposium, 43% were representing private companies, 24% governmental agencies (like AFSSA), 21% were representing research structures and only 9% were beekeepers

“Revision” by EPPO (3)

Alix et al. (2009) (ICPBR) => EPPO (2010)

WG = 9 members: **academic scientists under-represented, beekeepers absent**

- ✦ 3 from pesticide companies (Bayer, Dow Chemicals and Syngenta),
- ✦ 3 from the previous AFSSA (French Food Safety Agency); (some worked for the pesticide producing companies before working for AFSSA),
- ✦ 1 is member of a governmental structure in UK and has already published together with persons from Bayer,
- ✦ 1 is member of a private consultancy company providing services for companies,
- ✦ only 1 is a university researcher.

“Revision” by EPPO (4)

- ✦ Example (1) of the ICPBR Bee Brood WG (2008)
- ✦ Composition: 2 representatives of the industry, 3 of governmental agencies and 1 of a consulting company; **academic scientists and beekeepers absent**
- ✦ Proposal of thresholds for considering a pesticide as being of low risk for the bee brood:
 - 30% loss of bee brood
 - 50% of eggs or other larval stages
- ✦ For beekeepers: unacceptable (these values = hives weakened on the long term)

“Revision” by EPPPO (5)

- ✦ Validation by experts named by Ministries of Agriculture in Member States (names confidential)
- Sweden: validation by the Ministry of Agriculture while criticism by KEMI (Swedish Chemicals agency)
- France: Syngenta (ex-Novartis) => AFSSA => author of the original proposal of « revision » = member of the ICPBR group = expert of the Ministry of Agriculture => Dow Agrosciences
- ✦ Criticism by beekeepers (flawed ICPBR process: any of their comments taken into account + composition of the groups)

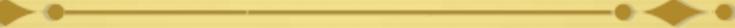
The “discovery” of ICPBR’s functioning

Before the controversy, nobody (except some tireless scientists speaking in the desert) was asking **HOW ARE THE STANDARD TESTS FOR HONEYBEES CREATED?**

- ✦ How are the ICPBR Bee Protection group and its working subgroups created?
- ✦ Who decides who are the members?
- ✦ Who decides, after comments from the different ICPBR delegates, which are the comments to include in the new standard, and which are the comments to leave out?
- ✦ Why have contributions from public scientists and beekeepers been given such a low consideration while their contributions were and are highly relevant and to the point?
- ✦ What is the legitimacy of ICPBR to propose standardized tests, given their non-governmental status?

EPPO's “science-based policy”

✦ EPPO processes



- Biased political process:

policy by (through?) scientists mostly employed by industry or governments

low representativeness \Leftrightarrow low transparency

- Biased scientific process:

low inclusion of academic scientists

lack of peer-review

EFSA's WG

- ✦ European Commission => EFSA (European Food Safety Authority)
- ✦ Group composition:
 - Academic scientists (50% of the WG, one of them started to work with Syngenta while in the WG)
 - Some conflicts of interests addressed during the work of the group => members out
- ✦ Higher transparency (public consultation)

EFSA's opinion and guidance document (1)

✦ Critique of the EPPO guidelines:

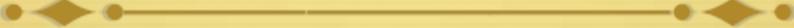
- *“need for improvement of existing laboratory, semi-field and field testing areas... several exposure routes of pesticides are not evaluated in laboratory conditions, such as the intermittent and prolonged exposure of adult bees, exposure through inhalation and the exposure of larvae. Likewise, the effects of sub-lethal doses of pesticides are not fully covered in the conventional standard tests”*
- *“sub-lethal effects should be taken into account and observed in laboratory studies”*

EFSA's opinion and guidance document (2)

- “semi-field testing appears to be a useful option of higher tier testing. Nevertheless, weaknesses have been identified for each of the guidelines e.g. the limited size of crop area, the impossibility to evaluate all the exposure routes of the systemic compounds used as seed- and soil-treatments (SSST), the limited potential to extrapolate the findings on larger colony sizes used in field studies or the relatively short timescale (one brood cycle).”*
- “the guideline for field testing (EPPO 170) (4) has several major weaknesses (e.g., the small size of the colonies, the very small distance between the hives and the treated field, the very low surface of the test field), leading to uncertainties concerning the real exposure of the honeybees.”*

Controversy boosting academic science

- ✦ Attention from beekeepers and learning process: speak the “scientific language of regulation” + defended inclusion of independent scientists in WGs
 - ✦ Beekeepers => put academic science on the political scene
 - ✦ Mobilisation from the scientific community:
 - Increased policy-relevant scientific production
 - Increased participation in expert groups and public debates
 - Accept invitations from the media
- => increased relevancy and role of academic science in regulatory guidelines**



Thank you!