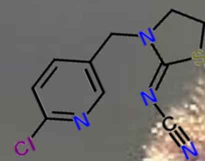
EP INTERGROUP ON CLIMATE CHANGE, BIODIVERSITY AND SUSTAINABLE DEVELOPMENT

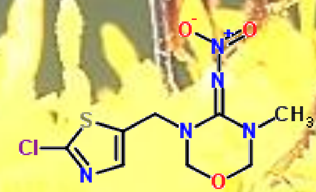
The Task Force on Systemic Pesticides
WWW.TFSP.INFO

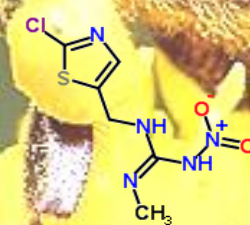
REDEFINING INTEGRATED PEST MANAGEMENT

European Parliament, Brussels, 1 July 2015, Chaired by **Pavel Poc MEP**

Chair of the European Parliament Intergroup on *"Climate Change, Biodiversity and Sustainable Development"*



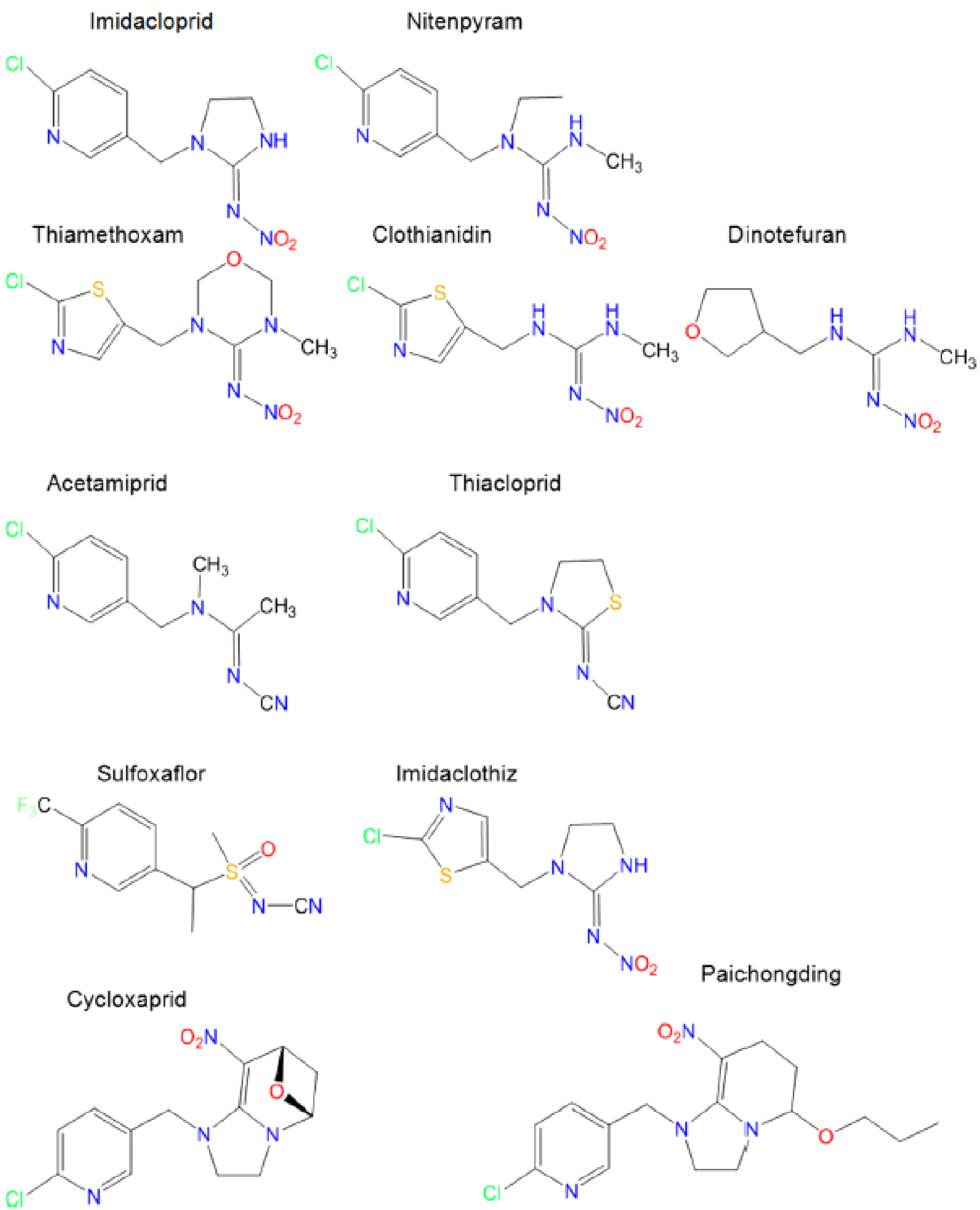


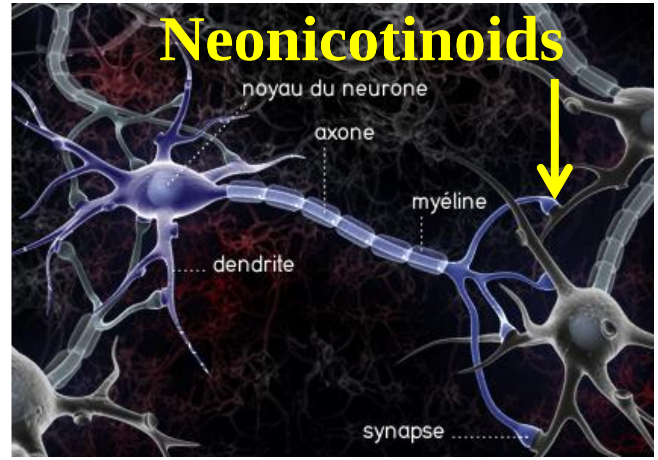


Neonics: an example of unsustainable agriculture that requires an urgent change towards IPM

Dr JM Bonmatin, CNRS France & Vice-chair TFSP

cnrs dépasser les frontières

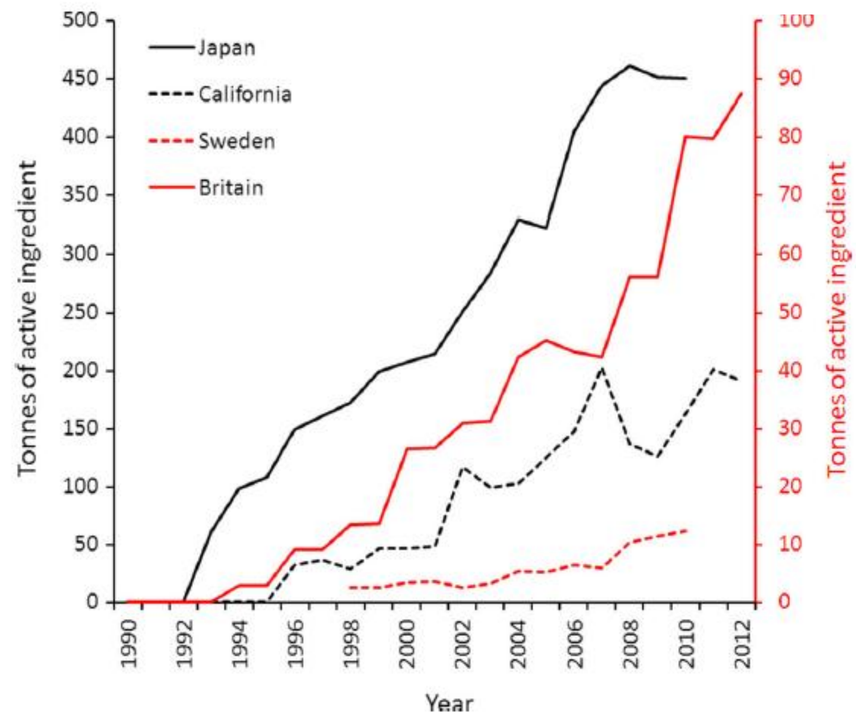




Environ Sci Pollut Res
DOI 10.1007/s11356-014-3470-y

WORLDWIDE INTEGRATED ASSESSMENT OF THE IMPACT OF SYSTEMIC PESTICIDES ON BIODIVERSITY AND ECOSYSTEMS

Systemic insecticides (neonicotinoids and fipronil): trends, uses, mode of action and metabolites



Acute toxicity on honeybees

pesticide	®	Use	Dose g/ha	LD50 ng/ab	Tox/DDT
DDT	Dinocide	insecticide	200-600	27 000.0	1
thiaclopride	Proteus	insecticide	62,5	12 600.0	2.1
amitraze	Apivar	acaricide	-	12 000.0	2.3
acetamiprid	Supreme	insecticide	30-150	7 100.0	3.8
coumaphos	Perizin	acaricide	-	3 000.0	9
methiocarb	Mesurol	insecticide	150-2200	230.0	117
tau-fluvalinate	Apistan	acaricide	-	200.0	135
carbofuran	Curater	insecticide	600	160.0	169
λ-cyhalothrine	Karate	insecticide	150	38.0	711
thiaméthoxam	Cruiser	insecticide	69	5.0	5 400
fipronil	Regent	insecticide	50	4.2	6 475
imidaclopride	Gaucho	insecticide	75	3.7	7 297
clothianidine	Poncho	insecticide	50	2.5	10 800
deltamethrine	Décis	insecticide	7,5	2.5	10 800

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WORLDWIDE INTEGRATED ASSESSMENT OF THE IMPACT OF SYSTEMIC PESTICIDES ON BIODIVERSITY AND ECOSYSTEMS

Effects of neonicotinoids and fipronil on non-target invertebrates

Environmental Science & Technology

Article

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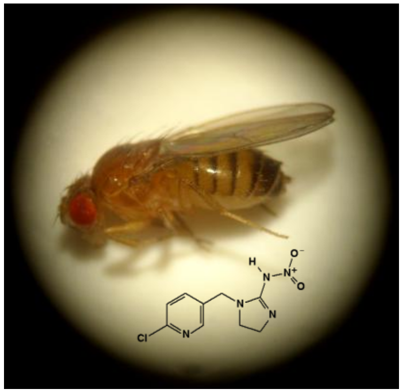
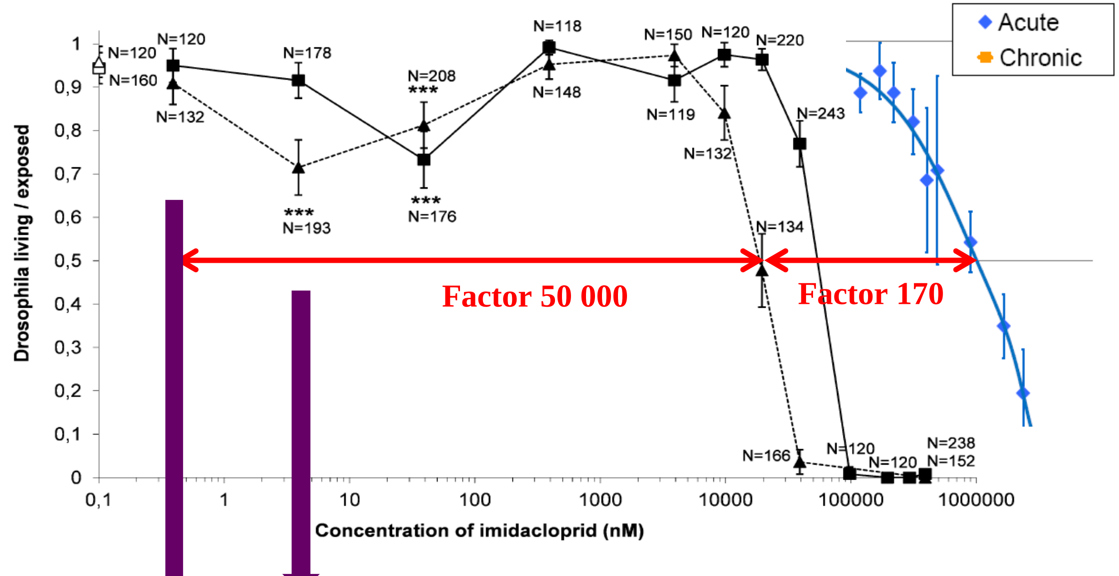
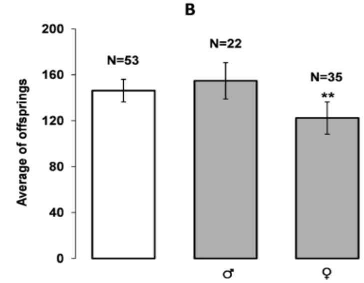
Lethal and Sublethal Effects of Imidacloprid, After Chronic Exposure, On the Insect Model *Drosophila melanogaster*

Gaël Charpentier,[†] Fanny Louat,[†] Jean-Marc Bonmatin,[*,†] Patrice A. Marchand,[†] Fanny Vanier,[†] Daniel Locker,[†,‡] and Martine Decoville[†,‡]



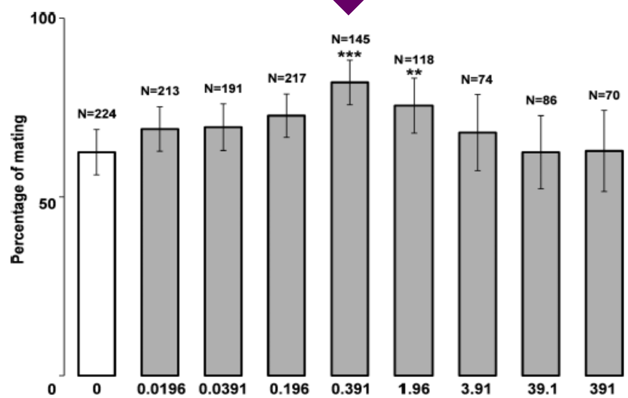


Concentration of imidacloprid (nM)



Fecondity –16%

Chronic LOEC (0,1 ng/g)



Mating +30 %

♂ acute LC50 / 3 300 000

♀ acute LC50 / 8 600 000

Bee declines driven by combined stress from parasites, pesticides, and lack of flowers

Dave Goulson,* Elizabeth Nicholls, Cristina Botías, Ellen L. Rotheray

School of Life Sciences, University of Sussex, Falmer, Brighton BN1 9QG, UK.

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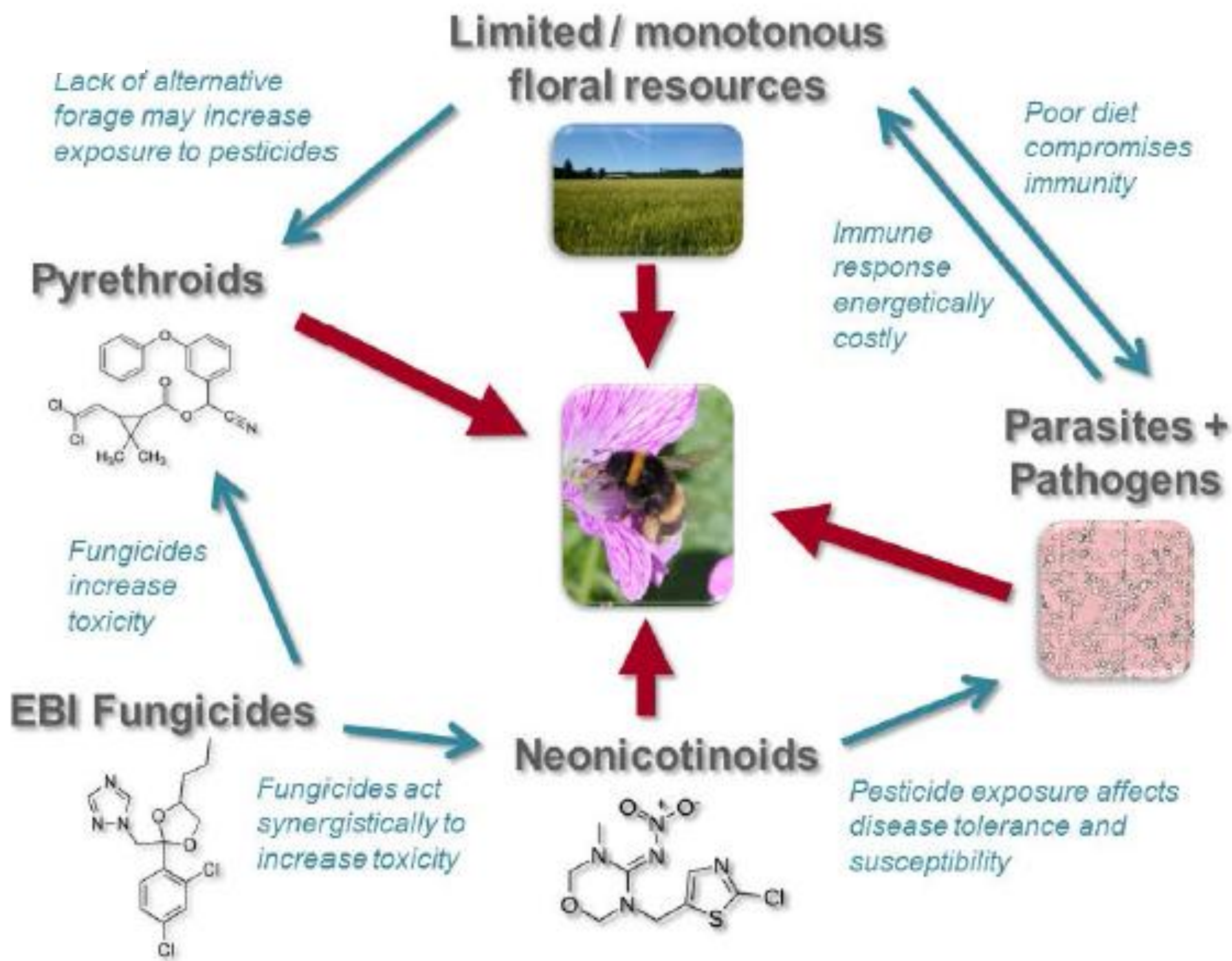


The European Red List of Bees provides, for the first time, factual information on the status of all bees in Europe, nearly 2,000 species. This new assessment shows us that 9% of bees are threatened with extinction in Europe mainly due to habitat loss as a result of agriculture intensification (e.g., changes in agricultural practices including the use of pesticides and fertilisers), urban development, increased frequency of fires and climate change.

Pia Bucella
Director
Directorate B: Natural Capital
European Commission

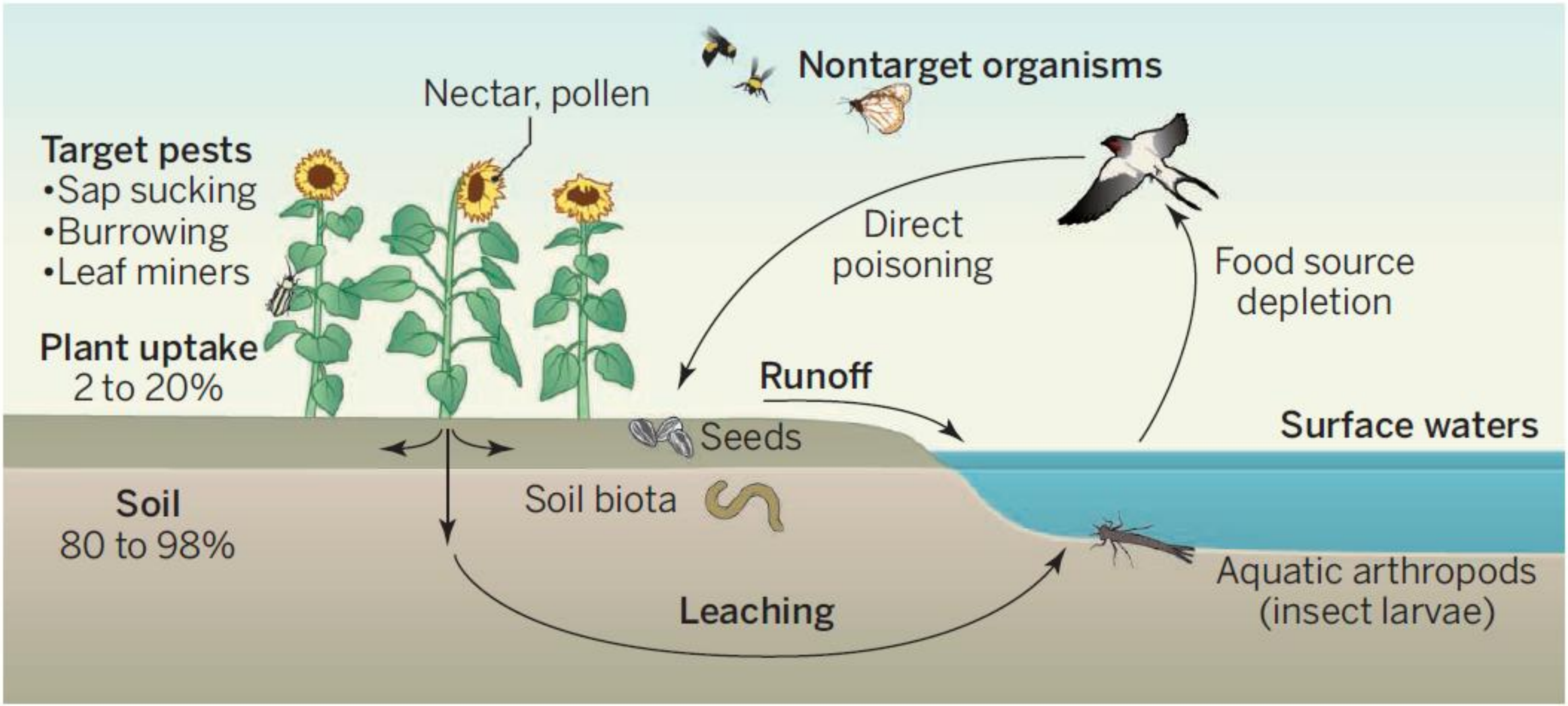
Recommendations

- Improve the advice to farmers, landowners, managers of public and amenity spaces and gardeners on best practices for using insecticides. This should draw upon research evidence to provide guidance which takes into account the diverse life histories of European bees and other pollinators.
- Commit to a sustainable long-term reduction in the use of pesticides, with quantitative targets for the reductions in the total application of all pesticide active ingredients, and encourage the uptake of alternative pest management methods including the use of natural enemies and Integrated Pest Management (IPM).

The trouble with neonicotinoids

Chronic exposure to widely used insecticides kills bees and many other invertebrates

806 14 NOVEMBER 2014 • VOL 346 ISSUE 6211 *By* **Francisco Sánchez-Bayo** sciencemag.org SCIENCE



Fate of neonicotinoids and pathways of environmental contamination.

Environ Sci Pollut Res
DOI 10.1007/s11356-014-3220-1

EDITORIAL

The Task Force on Systemic Pesticides
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Worldwide integrated assessment on systemic pesticides

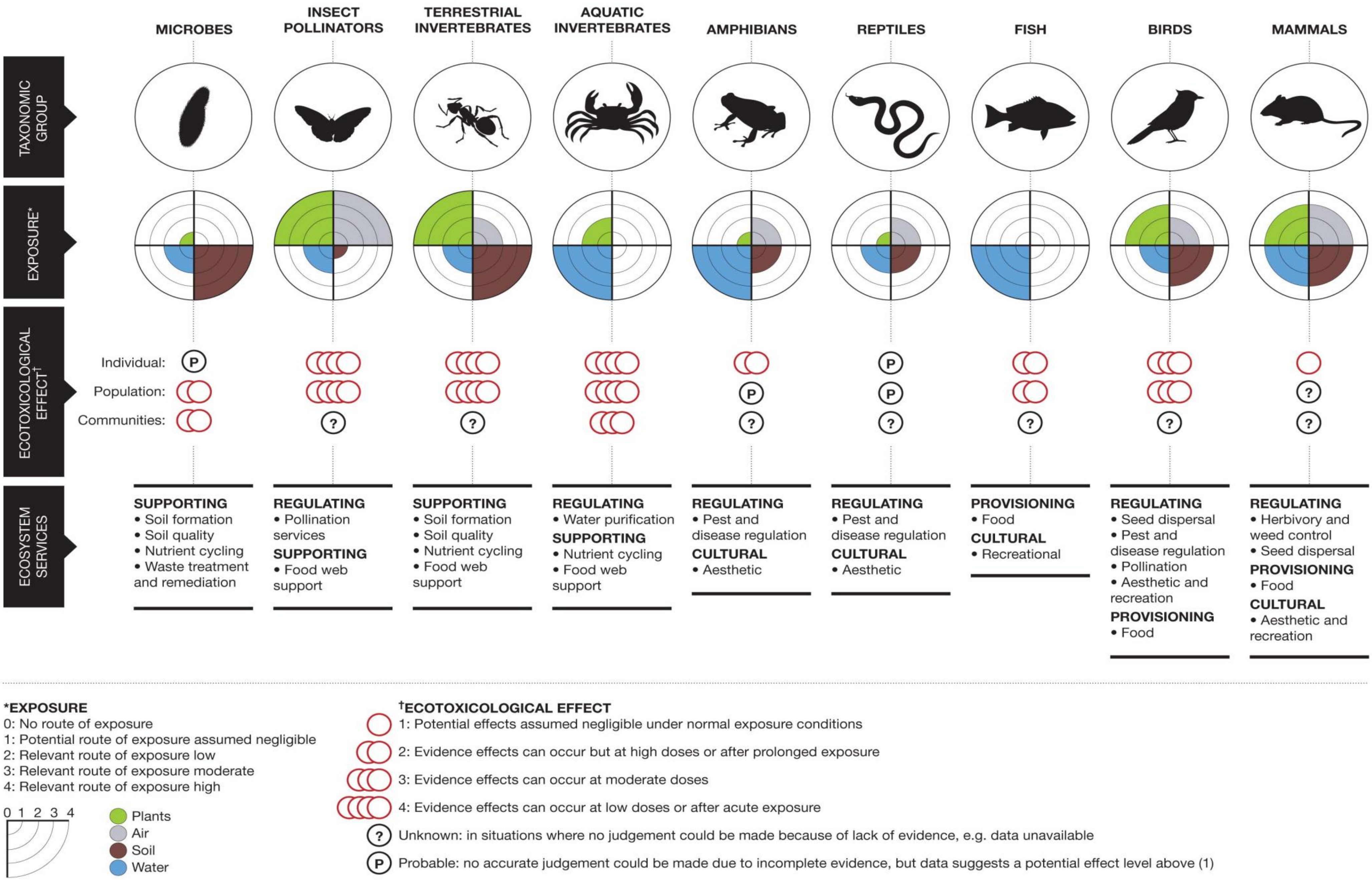
Global collapse of the entomofauna: exploring the role of systemic insecticides

Maarten Bijleveld van Lexmond • Jean-Marc Bonmatin •
Dave Goulson • Dominique A. Noome

8 scientific articles

- **First meta-analysis on neonicotinoids and fipronil**
- **Comprehensive approach, including 1121 publications and data from companies**
- **29 scientific authors (no conflict of interest)**
- **Published in *Environmental Science and Pollution Research*, 2015**

http://www.tfsp.info/resources/



Nature. 2014 Jul 17;511(7509):341-3. doi: 10.1038/nature13531

Declines in insectivorous birds are associated with high neonicotinoid concentrations

Caspar A. Hallmann[1,2], Ruud P. B. Foppen[2,3], Chris A. M. van Turnhout[2], Hans de Kroon[1] & Eelke Jongejans[1]

Recent studies have shown that neonicotinoid insecticides have adverse effects on non-target invertebrate species[1–6]. Invertebrates constitute a substantial part of the diet of many bird species during the breeding season and are indispensable for raising offspring[7]. We investigated the hypothesis that the most widely used neonicotinoid insecticide, imidacloprid, has a negative impact on insectivorous bird populations. Here we show that, in the Netherlands, local population trends were significantly more negative in areas with higher surface-water concentrations of imidacloprid. At imidacloprid concentrations of more than 20 nanograms per litre, bird populations tended to decline by 3.5 per cent on average annually. Additional analyses revealed that this spatial pattern of decline appeared only after the introduction of imidacloprid to the Netherlands, in the mid-1990s. We further show that the recent negative relationship remains after correcting for spatial differences in land-use changes that are known to affect bird populations in farmland. Our results suggest that the impact of neonicotinoids on the natural environment is even more substantial than has recently been reported and is reminiscent of the effects of persistent insecticides in the past. Future legislation should take into account the potential cascading effects of neonicotinoids on ecosystems.

The present study takes advantage of two standardized, long-term, country-wide monitoring schemes in the Netherlands (see Methods)—the Dutch Common Breeding Bird Monitoring Scheme[17] and surface-water quality measurements[4]—to investigate the extent to which average concentrations of imidacloprid residues in the period 2003–2009 spatially correlate with bird population trends in the period 2003–2010. We selected 15 passerine species that are common in farmlands and depend on invertebrates during the breeding season (Extended Data Table 1 and Supplementary Methods). We interpolated concentrations of imidacloprid in surface water to bird monitoring plots (Extended Data Figs 1–3, Supplementary Data and Supplementary Methods) and examined how local bird trends correlate with these concentrations (Fig. 1).

The average intrinsic rate of increase in local farmland bird populations was negatively affected by the concentration of imidacloprid (Fig. 1b, linear mixed effects regression (LMER): d.f. = 1,443, $t = -5.64$, $P < 0.0001$). At the separately tested individual species level, 14 out of 15 of the tested species had a negative response to interpolated imidacloprid concentrations, and 6 out of 15 had a significant negative response at the 95% confidence level after Bonferroni correction (Table 1 and Extended Data Fig. 4). Thus, higher concentrations of imidacloprid in surface water in

Ecosystem services, agriculture and neonicotinoids

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Critical to assessing the effects of neonicotinoids on ecosystem services is their impact on non-target organisms: both invertebrates and vertebrates, and whether located in the field or margins, or in soils or the aquatic environment. Here, the Expert Group finds the following.

1. There is an increasing body of evidence that the widespread prophylactic use of neonicotinoids has severe negative effects on non-target organisms that provide ecosystem services including pollination and natural pest control.

2. There is clear scientific evidence for sublethal effects of very low levels of neonicotinoids over extended periods on non-target beneficial organisms. These should be addressed in EU approval procedures.

3. Current practice of prophylactic usage of neonicotinoids is inconsistent with the basic principles of integrated pest management as expressed in the EU's Sustainable Pesticides Directive.

4. Widespread use of neonicotinoids (as well as other pesticides) constrains the potential for restoring biodiversity in farmland under the EU's Agri-environment Regulation.

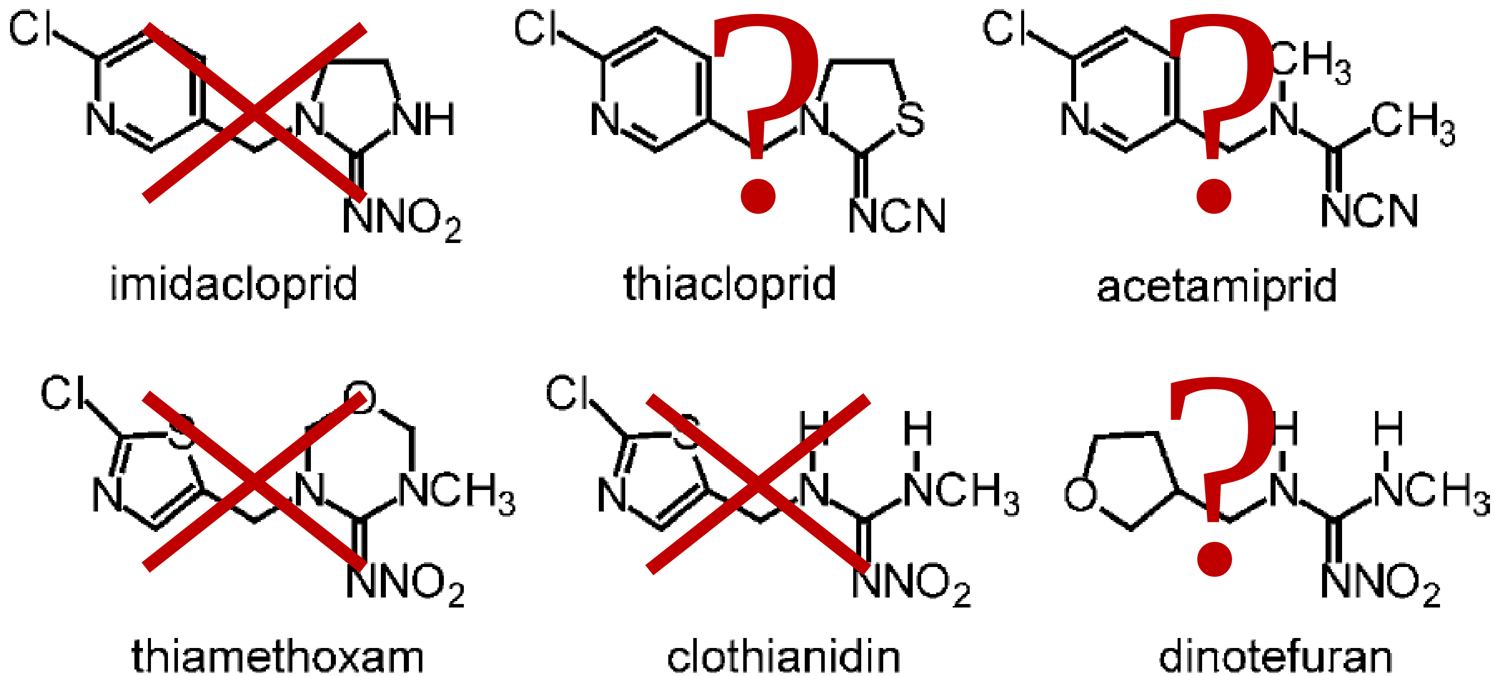
L 139/12 EN Official Journal of the European Union 25.5.2013

COMMISSION IMPLEMENTING REGULATION (EU) No 485/2013

of 24 May 2013

amending Implementing Regulation (EU) No 540/2011, as regards the conditions of approval of the active substances clothianidin, thiamethoxam and imidacloprid, and prohibiting the use and sale of seeds treated with plant protection products containing those active substances

Neonicotinoids



2013-2015: No reduction of yields for crop production in UE

Liberté • Égalité • Fraternité
République Française

Ministère de l'Écologie, du Développement durable et de l'Énergie

Ségolène ROYAL
Ministre de l'Écologie, du Développement durable et de l'Énergie

Abeilles et pollinisateurs sauvages
Actions du projet de loi pour la reconquête de la biodiversité, de la nature et des paysages

Les actions d'accompagnement du projet de loi :

- **La France engage la démarche d'extension du moratoire européen sur l'ensemble des pesticides néonicotinoides.**

Le rapport du Conseil européen des académies des sciences d'avril 2015 conclut aux sévères effets négatifs des pesticides néonicotinoides sur la faune, l'eau et les sols. Certaines publications montrent une neurotoxicité pour l'homme.

Communication en Conseil des Ministres
Mercredi 20 mai 2015

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

Article

pubs.acs.org/JAFC

Open Access on 06/16/2015

Quantitative Analysis of Neonicotinoid Insecticide Residues in Foods: Implication for Dietary Exposures

Mei Chen,[†] Lin Tao,[†] John McLean,[§] and Chensheng Lu*[,†]

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[§]Consultant Entomologist, Gisborne 4010, New Zealand

ABSTRACT: This study quantitatively measured neonicotinoids in various foods that are common to human consumption. All fruit and vegetable samples (except nectarine and tomato) and 90% of honey samples were detected positive for at least one neonicotinoid; 72% of fruits, 45% of vegetables, and 50% of honey samples contained at least two different neonicotinoids in one sample, with imidacloprid having the highest detection rate among all samples. All pollen samples from New Zealand contained multiple neonicotinoids, and five of seven pollens from Massachusetts detected positive for imidacloprid. These results show the prevalence of low-level neonicotinoid residues in fruits, vegetables, and honey that are readily available in the market for human consumption and in the environment where honeybees forage. In light of new reports of toxicological effects in mammals, the results strengthen the importance of assessing dietary neonicotinoid intakes and the potential human health effects.

KEYWORDS: *neonicotinoid insecticides, dietary exposure, pollen, honey*

NEONICOTINOIDS AND PUBLIC HEALTH

- Neonics supposed to be less toxic to humans (less nicotinic receptors for our CNS)
- Only few studies (despite that neonics represent 1/3 of the global insecticide market):

(non-target species > 1000 publications ; humans < 50 publications)

BUT

- EPA 2002 then UE then ANSES (2013): Thiacloprid carcinogen,
-ARLA 2001, 2004, 2007: 3 neonics are potential endocrine disruptors,
- 2012: Genotoxicity and cytotoxicity of neonics,
- 2012: Neonics have similar effects than nicotine,
- EFSA 2013: Neuro-developmental risk for humans,
- 2014: Effects on hepatic enzymes (==> toxic accumulation of delta-ALA),
- 2014: Cytotoxic effects of formulations >> active ingredients, on human cells ,
- 2014: Effects on thyroid and testicles (endocrine disruptor),
- 2014: Synergies with other pesticides (pyrethroid and carbamate),
- Japan 2014: description of sub-acute effects on poisoned people (hospital),
- Japan 2014 & 2015: human urine contains neonics (90% of tested people),
- 2015: Another new toxic pathway of neonics on the CNS (glutamate receptors)…

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EDITORIAL

Conclusions of the Worldwide Integrated Assessment on the risks of neonicotinoids and fipronil to biodiversity and ecosystem functioning

J. P. van der Sluijs · V. Amaral-Rogers · L. P. Belzunces · M. F. I. J. Bijleveld van Lexmond · J-M. Bonmatin · M. Chagnon · C. A. Downs · L. Furlan · D. W. Gibbons · C. Giorio · V. Girolami · D. Goulson · D. P. Kreutzweiser · C. Krupke · M. Liess · E. Long · M. McField · P. Mineau · E. A. D. Mitchell · C. A. Morrissey · D. A. Noome · L. Pisa · J. Settele · N. Simon-Delso · J. D. Stark · A. Tapparo · H. Van Dyck · J. van Praagh · P. R. Whitehorn · M. Wiemers

- **Preventive and massive uses**
- **Extreme toxicity to invertebrates**
- **High toxicity to vertebrates**
- **Very high persistence in soils**
- **High contamination of water (surface & groundwater)**

→

- ✓ **Collapse of pollinators & biodiversity**
- ✓ **Effects on ecosystem services**
- ✓ **Threats on food production & food security**
- ✓ **Threats on human health**

↓

The present use of systemic insecticides is not sustainable
=> Reduce or suspend => integrated pest management (IPM)

Thanks to my colleagues, to all my collaborators,

… and thank you for your attention.