Tactics Used by Agro-Chemical Industries to Impose and Maintain Harmful Pesticides on the Market

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Bee Life – European Beekeeping Coordination

INTRODUCTION

Agro-chemical industries developed different strategies to keep pesticides on the market, which are known to be highly toxic to bees. Their tactics largely rely on: unfounded statements, misleading information and dubious sources.

In this report the reader will find the results of a verification test run on all the buzz created around bee-toxic pesticides known as neonicotinoids. Pesticide industry orchestrated them to create uncertainty around their harmfulness and keep marketing them, despite of their danger.

Oilseed rape fields in Belgium
Photo: J. Kievits

The restrictions imposed by the European Commission on three neonicotinoid insecticides (imidacloprid, clothianidin and thiamethoxam) [1] were taken on the basis of no new scientific or technical evidence of their toxicity.

It is true that beekeepers have been complaining about the problems generated by neonicotinoid insecticides since the nineties. However, the so-called March 2012 [2-4] studies did provide new, more exploitable data of the effects of these three neonicotinoid insecticides at environmental relevant doses. They also used new techniques to assess their risk to pollinators [5]. These studies, after being reviewed by EFSA, led to the implementation of several suspensions in their use aiming to bee protection.

Bee foraging maize pollen

Italy banned the use of neonicotinoid-coated corn seeds in 2008, before the European restrictions were applied, and yet Italy's farmers experienced no drop in crop yields [6].
In the UK, the oilseed rape crop of 2015 was 7% higher, after the neonicotinoid ban, than it was before [7].

The effects of three different neonicotinoid insecticides should not be considered similarly.

These three neonicotinoids share similar chemical structures, mode of action and levels of toxicity. Thus it is logical to consider them together; to apply research and studies on one substance to the others and restrict their use on a similar rationale.

Neonicotinoids are not harmful to bees.

Some agro-chemical industries base this statement on population monitoring studies; studies not appropriate to correctly estimate if bees were in contact with these pesticides and often not carried out by independent scientists [8].
Moreover the eye-witness evidence of thousands of beekeepers confirms that millions of colonies have died, when the only new factor in the local environment, was neonicotinoids.

If neonicotinoid-coated seeds are forbidden for certain crops, yields will drop significantly and there will be considerable economic losses.

This assertion is speculative and supported by the so-called Humboldt report, commissioned by pesticide companies. This report is widely regarded as unscientific and flawed, tailor-made for the purpose.
Neonicotinoid-coated seeds are highly toxic to bees; on the one hand because of their systemic nature they end up in plant exudates and flowers visited by bees, and on the other hand because of the toxic dust that is emitted, while sowing these seeds.

Detail of dead bees in front of the hive

Concrete examples of acute intoxication with neonicotinoids exist:
In 1994, French beekeepers reported alarming signs in apiaries close to neonicotinoid treated sunflower and corn fields [9].
In 2008, in Germany, many examples of bee poisoning were observed after the sowing of clothianidin coated-seeds [10]. In Italy, in 2009, there were examples of acute intoxication of bee colonies by the substance thiamethoxam [6].

UNFOUNDED

Bee equipped with a RFID monitoring technology

A study in Sweden proved the negative effects of a clothianidin-coated seeds on wild bees [11].
Another study in the UK provided evidence of a link between imidacloprid-coated seeds and honeybee colony losses at landscape level [5,12].
A study by Henry et al. (2012) provided evidence of a risk of colony collapse, as honeybees failed to return to the hive due to thiamethoxam intoxication [3,5].
The Apenet project conducted in 2009 in Italy provides examples of acute intoxication of honeybee colonies with thiamethoxam [6].

EFSA's review [13], which assessed the risk of three neonicotinoids for bees and other pollinators, highlighted the fact that the doses used for the tests were unrealistically high.

EFSA stated that some of the doses in the studies were higher than the "potential estimated exposure" but that others were lower or in the range [14].
The doses in nectar and pollen found later by independent studies showed to be higher than estimated before and thus validate the doses used in the questioned studies [11, 15, 16].

Relatively few forager bees could be exposed and contaminated by neonicotinoids considering their mode of foraging.

When foraging, scout bees identify interesting sources of food or water and then go back to the hive and inform the other bees of their location, so many bees can go to forage there. If a source is contaminated by neonicotinoids, a great number of bees is automatically exposed to these chemicals [17].

The varroa mite is the main causal-factor in bee colony deaths. Neonicotinoids are the least likely cause of honeybee decline.

No ranking can be made between the different factors stressing bees as they depend heavily on the global context.
However, many studies do show a relationship between: exposure to neonicotinoids and bee colony deaths, or pollinator decline. Furthermore, neonicotinoid producers advertised their pesticides by describing that the way their products worked was by disturbing the natural immune system of insects, therefore rendering insects more sensitive to parasites and pathogens.
It is therefore misleading to maintain that the varroa mite is the main factor of bee colony deaths. Furthermore, solitary bees experienced drops in population as well and they do not suffer from the varroa mite.

Bees' exposure to the planting dust of neonicotinoid-coated seeds only led to limited colony death.

Planting dust from neonicotinoid-coated seeds is extremely toxic to honeybees and there are many examples of mass-colony-deaths due to dust from seed planting.

Emission of dust during the sowing of neonicotinoid-coated seeds

There were thousands of colony deaths linked to neonicotinoid contaminated planting dust in Italy [6] and in Germany [18] (where Bayer compensated beekeepers) as well as in Slovenia [19].

MISLEADING

Mitigation measures, such as deflectors, would reduce risks for bees due to pesticide-laden dust emissions, during the planting of coated seeds.

Mitigation measures do reduce the number of large neonicotinoid-containing particles, but finer particles remain and spread even wider into the environment [6]. Moreover, coated seeds, sown with or without deflectors, are still of a systemic nature: the chemical spreads to the entire treated organism, to pollen, nectar and guttation fluids, contaminating pollinators.

Doses applied for seed treatment are lower than when neonicotinoids are applied as a foliar spray.

This may be true depending on the crop, the density of seeds planted per hectare, the formulation, etc. However, preventive uses of pesticides like seed treatments involve that pesticides are applied in the fields even if there is no need, while foliar spray can be done only if pests are observed at a damaging level. Furthermore, Neonicotinoids are contact and systemic chemicals, therefore, whatever the dose or the method of application, the substance will penetrate into the plant's nectar and pollen, and bees will be poisoned.

In its risk assessment of some neonicotinoid substances, EFSA does not always conclude on effective high risks for bees.

EFSA sometimes cannot conclude on effective high risks because data-gaps in the assessment do not allow experts to assess the risk. However, this does not mean that there is no risk; simply that it cannot be assessed.

The risk of exposure from neonicotinoids in guttation fluids on maize for bees is hypothetical because maize is not a crop attractive to bees.

The notion of crop attractiveness for bees rely on their interest to collect pollen and nectar from the crop.

Guttation fluids are water sources for bees, not food sources, so it is irrelevant to try to determine the potential risk of bees from a water source based on the pollen/nectar attractiveness of a plant.

Moreover, neonicotinoids are mobile in the environment and wild flowers growing in treated fields are readily contaminated with their residues [16].

Bee drinking water from guttation fluids of maize crop

The concentration of neonicotinoids in guttation fluids is higher than in nectar or pollen [20].

Furthermore, in areas where maize is a dominant crop, bees gather vast amounts of maize pollen [21, 22].

MISLEADING

Monitoring studies are not correctly and sufficiently taken into account when assessing the risk of neonicotinoid insecticides for bees.

Monitoring studies cannot always be relied on because they show, at best, a statistical correlation between factors and do not permit to identify scientifically a single cause for a phenomenon. Most of them are also either flawed because partly carried out by pesticides companies or irrelevant because measuring colony losses and not the impact of neonicotinoids on bees (e.g. weakening of colony, immunity loss…).

Supporting arguments via use of unreliable documents (Gernesch monitoring study [24], Humboldt report [25]…).

These studies and reports cannot be considered as reliable, they contain flaws: are not peer-reviewed, are unscientific, non-transparent, partly/totally financed by agro-chemical companies or even conducted by scientists who have conflicts of interest.
See PAN-Europe's opinion on the Humboldt report [26] and the appraisal by PP. Hoppe and A. Safer of the Gernesch monitoring study [27].

Higher tier studies (field studies) and monitoring data should be considered as decisive when contradicting results in laboratory tests.

EFSA examined methodologies of field studies and found several limits to them. Monitoring studies also present many weaknesses. Moreover, in a risk assessment, it is better to take into account all types of studies in a complementary way. For some tests (such as chronic toxicity tests) laboratory tests are more accurate, this is why all methods should be considered equally, bearing in mind their strengths and weaknesses and trying the results in a complementary way.

The EPPO guidelines for risk assessment of pesticides were not applied during the assessment of three neonicotinoids, which were subject to restrictions.

The restrictions occurred after the publication and the evaluation by the EFSA of new scientific data, providing evidence of the toxicity of neonicotinoids to bees, other pollinators and the environment [2-5, 13]. Because these restrictions were based on the publication of new scientific data, the concerned neonicotinoid substances did not need to go through the procedure of risk assessment done for pesticide authorisation.
Moreover, the EPPO guidelines are not adequate to evaluate pesticides with systemic or persistent qualities, as identified by EFSA [23]. The EPPO guidelines were also written under the influence of pesticide companies and are therefore not independent or trustworthy.

Some internationally agreed field study protocols were not taken into account by EFSA and the Commission for the risk assessment.

These protocols were not developed by independent scientists but partly by members of the agro-chemical industry. The EFSA identified many shortcomings in these protocols and so they cannot be relied on or trusted [23].

Hives participating to field trials

DUBIOUS SOURCE

Picture of an apiary during field testing. A tunnel for the development of tunnel tests is just behind

At the same time, and for three years now, new guidelines for the risk assessment of pesticides relating to bees have been criticised and delayed by many stakeholders whose interest was not in their implementation. These new EFSA Guidelines were developed shortly after it became obvious that former ones were not adequate for the assessment of persistent or systemic pesticides such as neonicotinoids.
Here again, a wide range of excuses, the vast majority of which false, was found to hinder their application. The new methodology would actually improve the understanding of the risks of pesticides on insect pollinators, but they are seen as an obstacle to the marketing of pesticide active substances.

Bee Life answers to these arguments opposing the application of these new guidelines in another document untitled: Struggle for the Implementation of New Pesticide Assessment Methods with Regards to Bees – The Truth behind the Excuses.

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