

# **Stéphane Foucart and neonicotinoids**

*Le Monde* and disinformation 1

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**a. Acronymes (institutions)**

AFSSA : Agence française de sécurité sanitaire des aliments  
ANSES : Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail  
CEO : Corporate Europe Observatory  
CFS : Center for Food Safety  
CNRS : Centre national de la recherche scientifique  
CST : Comité scientifique et technique de l'étude multifactorielle des troubles des abeilles  
EASAC : « European Academies Science Advisory Council »  
ECHA : European Chemicals Agency  
ECPA : European Crop Protection Association  
EFSA : European Food Safety Authority  
EPPO : Organisation européenne et méditerranéenne pour la protection des plantes  
FERA : Food and Environment Research Agency  
FFAP : Fédération Française des Apiculteurs Professionnels  
FNH : Fondation Nicolas Hulot  
ICPBR : International Commission on Plant-Bee Relationships  
INRA : Institut national de la recherche agronomique (Maintenant INRAE)  
IPBES : Plate-forme intergouvernementale scientifique et politique sur la biodiversité et les services écosystémiques  
ITAB : Institut Technique de l'agriculture biologique  
ITB : Institut Technique de la Betterave  
HFFA : Humboldt Forum for Food and Agriculture  
LPO : Ligue de protection des oiseaux  
MNHN : Muséum national d'histoire naturelle  
OCDE : Organisation de coopération et de développement économiques  
ONCFS : Office national de la chasse et de la faune sauvage  
ONG : Organisation Non Gouvernementale  
PAN : Pesticide Action Network  
SCOPAFF : Standing Committee on Plants, Animals, Food and Feed  
SNPN : Société Nationale de Protection de la Nature  
UICN : Union internationale pour la conservation de la nature  
UNAF : Union Nationale de l'Apiculture Française  
WWF : World Wildlife Fund (maintenant « World Wide Fund for Nature »)

**b.    *Acronymes (autres)***

ACS : Agriculture de Conservation des sols

AMM : Autorisation de Mise sur le Marché

OGM : Organisme génétiquement modifié

NNI : Néonicotinoïdes

STOC : Suivi temporel des oiseaux communs

WIA : World Integrated Assessment on systemic pesticides

## Introduction

Neonicotinoids are a polemic topic in France, especially since the aphid infestation that ravaged crops in early 2020. It was also at this time that, being interested in agriculture, I discovered agribashing and the extent of disinformation about agriculture. Among the many researchers, journalists and politicians who participate in this contemptable practice, one name struck me as having a fairly central role : a journalist from *Le Monde*, Stéphane Foucart.

Reading his articles often left me with a feeling of unease: beyond the disinformation around agriculture, very common in the press, I felt a larger, systematic pattern. So I started to analyze his literary production. One of his main subjects was neonicotinoids.

Neonicotinoids (NNIs) are insecticides used primarily as a "coating". The "coated" seed will end up inside a kind of bead containing the substance, which will permeate the plant as it grows. The idea is to only target the insects that are trying to devour the plant. Released from the early 1990s, they have become one of the main insecticides used in the world.

They are nevertheless increasingly contested, in particular because of their toxicity for pollinators. The first shock was the poisoning of many beehives by the dust released when sowing coated corn. Some of the coating was pulverized in the air, wiping out neighboring bee colonies. Regulations have been issued to address this risk. Second, it was exposure through nectar that was found to be dangerous for pollinators. EFSA issued a severe opinion in 2013 against 3 NNIs, which resulted in a ban on most of their uses in the EU for 2 years, which was followed by a definitive ban in 2018. In France, a law passed in 2016 banned all the neonicotinoids (NNI) and their uses starting in 2018.

This book aims to analyze the articles written by Stéphane Foucart on NNI. He published 71 articles on the subject between July 8, 2011 and March 26, 2021. I summarize each of them in the appendix.

Overall, the journalist develops two main arguments: on the one hand, the idea that NNIs are largely responsible for the decline of many species, first and foremost pollinators; on the other hand, the idea that it is because of the influence of industry on institutions that these insecticides would not already have been banned since long ago (or even have been authorized in the first place). (Chapter 1) By digging into the subject, we realize that large parts of these arguments are in fact false or heavily misleading. (chapter 2) Nevertheless, the author manages to make his speech credible

for many readers by using a whole toolbox of information manipulation tactics (chapter 3), the complexity and power of which we show by dissecting several articles (Chapter 4).

## **Chapter 1. The journalist's story**

First, we will summarize the argument put forward by S. Foucart through all 71 articles in the corpus. Indeed, if it seems very disparate at first glance, the whole is in fact quite coherent and draws a complex reasoning. I therefore extracted the thesis presented by the journalist. I have done my best to translate the thought of the author as he would claim it himself and give it as much consistency as possible.

The rationale he develops is divided into two branches:

1. First, the role of NNIs in a decline in biodiversity, particularly affecting insects in general and pollinators in particular, as well as birds. (I)
2. Then, the issue of assessing health risks and the influence that the agro-industry allegedly has on it. (II)

To simplify the reading, I will not always use the conditional to relate the words of S. Foucart. If I write in this part "biodiversity is collapsing", it will mean "according to S. Foucart, biodiversity would collapse".

## **I. Biodiversity and NNI**

The first branch of the argument is divided into four axes:

1. The number and diversity of pollinating insects is collapsing, putting agriculture at risk. The biodiversity of fish and birds would also decline.
2. The use of neonicotinoid pesticides (NNIs) creates lasting pollution that may extend even beyond the boundaries of fields and contaminate large areas.
3. Numerous studies show the responsibility of NNIs in the decline of biodiversity.
4. The agricultural model that would organize their use would be counterproductive and would only benefit the agrochemical industries.

### **1. The decline of biodiversity**

The first alerts, in 1994, concerned the excess mortality of honey bees. However, wild pollinators are also affected and, more generally, we observed a disappearance of insects. This could have disastrous consequences, both for beekeeping and for agriculture in general.

#### **a. *The alert: the excess mortality of honey bees***

*“For just over a decade, massive honey bee mortalities have been reported around the world - mainly in the United States and Europe.” (1)*

Already in 1994, French beekeepers warned of the excess mortality in their hives, of which imidacloprid was already suspected. (45) (54) The Epilobee survey looked at the health of European apiaries. Combining winter and summer mortalities, the countries with the highest beehive mortality were:

- Belgium 42.5%,
- the United Kingdom (38.5%),
- Sweden (31.1%),
- Finland (29.8%)

Conversely, deaths were lower in Greece (9.1%), Italy (7.6%) or Spain (16.3%). If we look only at the beekeeping season (summer?), France had the highest mortality: 13.6% compared with less than 10% in all the other countries studied. (15)

In the US, while historical loss rates were 10 to 15 % at the end of winter, they reached 30 % in 2014. (18) UNAF estimates annual losses in France at 30%. (48)

According to Gérard Arnold, winter losses should normally not exceed 5%. According to other researchers, this rate should be between 5 to 10%. (47)

More broadly, the beekeeping sector is doing poorly: French production has fallen sharply in recent years :

- less 28% between 2004 and 2010 (5)
- divided by half between the 90s and 2014 (15)
- divided by 3 between the 90s and 2016 (27) (36)

Beekeepers were more than 4,500 to cease their activity each year (in 2013). (5) The FFAP had, on November 6, drawn up "a dramatic inventory of the beekeeping sector". (12)

This decline would be all the more worrying as the organization as a colony would be "*a guarantee of resilience that the bumblebees which live in micro-colonies or the solitary bees which are even more fragile*" do not have (EASAC 2015). (57)

## **b. Pollinators' decline**

We often talk about honey bees, but wild pollinators in general are very important for pollination and disappear quickly. (6)

Indeed, according to a study by Laura Burkle (2013), "the diversity of wild pollinator species has been halved in 120 years" and "the rate of visits of a small flower endemic to this region of North America was divided by four during this period." (6)

IUCN issued a statement on April 2 announcing that in Europe, "*30 of the 68 species of the genus Bombus found on the continent are in decline and 12 are threatened with extinction.*" (17)

It also estimated in 2016 that 16.5% of vertebrate pollinator species (birds, bats, etc.) are threatened with extinction and that more than 40% of bee species in Europe could be threatened. (25)

A study published by Nature in October 2019 observes a drop of 67% between 2008 and 2017 of the weight of arthropods captured on a sample of 150 German meadows, of 78% of their number and of 34% of their diversity. (61)

**c. *The disappearance of insects: the "windshield effect"***

The decline of insects is revealed for all to see by the fact that the windshields of automobiles, even the less aerodynamic ones, are no longer soiled by the impacts of insects along the road. (30) (54)

The study published in 2017 in PLoS One by Hallman et al. (2017) provided proof of this:

*"A study published in October 2017 in the journal PLoS One indeed indicates that the quantity of flying insects fell by more than 75% between 1989 and 2016, in some sixty rural areas in Germany, representative of most landscapes Western Europe dominated by human activities. "* (48) (idem: com (30) (35) (41) (56)

These measures would affect not only Germany, but also, according to Dave Goulson (himself a co-author of the study) France and the United Kingdom with similar farming systems. More broadly, it could be "representative of a much larger situation", in which case we would "be facing an impending ecological disaster." (35)

Vincent Bretagnolle reportedly observed in 2017 in the "*Plaine et Val de Sèvre workshop area*" that the number of *Poecilus cupreus*, a ground beetle abundant in agricultural environments representing (initially ?) 70% of individuals (ground beetles?) captured in the area, was reduced by 85 % in twenty-three years. (35)

**d. *Birds decline***

The MNHN<sup>1</sup> and the CNRS published on March 20, 2018 the results of 2 bird monitoring networks. They evoke a phenomenon of "massive disappearance", "close to an ecological disaster":

*"The birds of the French countryside are disappearing at incredible speed [...]. On average, their populations have shrunk by a third in fifteen years."* (43)

The two surveillance networks have different methodologies:

- The MNHN network (STOC<sup>2</sup> program) brings together the observations of ornithologists.
- The CNRS network has mobilized 160 measuring points of 10 hectares monitored since 1994 in the "CNRS Plaine et val de Sèvre" zone in 450 km<sup>2</sup> of agricultural land.

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1 Museum national d'histoire naturelle (= )

2 Suivi temporel des oiseaux communs (= durable monitorin of common birds)

It would be particularly worrying. Thus, according to the coordinator of the STOC network, Frédéric Jiguet:

*“That birds are doing badly indicates that the entire food chain [food chain] is in bad shape. And this includes the microfauna of soils, that is, what makes them alive and enables agricultural activities.” (43)*

**e. Dramatic consequences**

The pollinators' decline is a critical issue. Their services are in fact estimated at

- \$17.6 billion in the US (18)
- €15 billion in the EU for wild pollinators alone (61)
- €22 billion "to European agriculture" (7) (9)

Along the same lines, the IPBES report published in February 2016 evaluating that *“pollination-dependent crops contribute 35% by volume of crop production globally.”*

*“The decline of pollinators, bees, butterflies and birds, poses a serious threat to global food production. And endangers the livelihoods of millions of people.” (25)*

Bees are *“pollinating insects essential to 84% of plants cultivated in Europe”*. (15)

## **2. The danger of long-term contamination**

Among insecticides, the NNI family included 7 molecules counting for approximately 40% of the world agricultural insecticide market: imidacloprid, thiamethoxam, clothianidin, dinotefuran, acetamiprid, nitenpyram and thiacloprid.

They are mostly used as seed coating. This would make them "systemic" insecticides, the substance circulating throughout the plant as it grows. (26)

The use of NNI as a coating would pollute large areas: 90%<sup>3</sup> of the product is not used by the plant and *“therefore remains in the soil and generally persists there for several years”*. Being soluble in water, molecules can also be transported and permeate the surrounding environment. (26) (27)

**a. Accumulation in soils**

NNIs can persist in soils for several years: 3 years for clothianidin and 10 years for imidacloprid. (36) These substances can thus be taken up by subsequent cultures. (33)

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3 Sur et Stork (20031) estiment cette quantité à 80 à 98 % de la dose peut rester dans les sols. (64)

A study has indeed shown that *"neonicotinoids show a potential for accumulation in the soil and can be taken up by subsequent crops up to at least two years after application"*. Its authors recall, citing a 2005 study, that *"imidacloprid was detected in 97% of 33 soil samples taken from untreated fields, but on which coated corn seeds had been used one to two years before. the taking of samples"*. (13)

#### **b. Diffusion in the environment**

NNIs are said to have the capacity to diffuse in the environment, notably through *"dust clouds generated during sowing, their solubility in water and their stability in soils"*. (55) Several studies indeed show the presence of NNI in untreated areas. Thus, in a study published on November 22, 2015 (Henry et al. 2015<sup>4</sup>), researchers have found imidacloprid in the nectar of rapeseed having not been treated with this substance... at rates comparable to or higher than those of thiamethoxam that had been administered to them. (27)

British researchers have also found, in a study published on October 6, 2015 (Botias et al. 2015<sup>5</sup>) that *"the wild flowers that grow around treated fields absorb neonics and are also a major source of contamination for bees."* (27)

Researchers led by Ségolène Humann-Guilleminot and Fabrice Helfenstein analyzed more than 700 plant and soil samples on 169 plots of 62 Swiss farms. Were contaminated with NNI:

- All conventional plots
- 93% of ORGANIC plots (which have been organic for more than 10 years)
- 80% of "areas of ecological interest"

The sole exposure to one of the investigated NNI, clothiandin, would represent a lethal risk for 5.3 to 8.6% of the 84 species studied and a sublethal risk for 31.6 to 41.2% of these organisms. The concentrations would be lower in untreated fields, which would present a sublethal risk for only 1.3 to 6.8% of the species considered. This, without even taking into account the potential cocktail effects. The researchers therefore believe that NNIs represent an *"environmental risk to adjacent untreated lands, over distances hitherto unknown, with consequences for non-target species."* (55)

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4 <https://royalsocietypublishing.org/doi/full/10.1098/rspb.2015.2110>

5 <https://pubs.acs.org/doi/abs/10.1021/acs.est.5b03459>

Researchers led by D. Wintermantel and V. Bretagnolle analyzed nectar and pollen taken from 300 rapeseed plots spread over the Plaine and Val de Sèvre workshop area. Samples were taken from these fields between 2014 and 2018.

Despite the 2013 moratorium, the concentration of NNI showed *"no downward trend"*. The researchers found traces of NNI in 43% of the rapeseed samples analyzed. They found imidacloprid in 70% of plots in 2014, 5% in 2015, 90% in 2016, 30% in 2017, to rise to 55% in 2018. The vast majority of traces would be less than 1 part per billion. However, on 2 occasions in 2016, researchers reportedly found 45 parts per trillion of imidacloprid in the samples tested, which would be *"five times the expected concentration of product in the nectar or pollen of treated oilseed rape."* The researchers estimated, from an EFSA model, that 12% of the plots were contaminated enough to kill 50% of the honeybees venturing there, the rate going up to 20% for bumblebees and 10% for solitary bees. (61) (64)

Pelosi et al. (2020) studied various soil samples and earthworms from the Plaine and Val de Sèvre workshop area. They found at least one pesticide in all of the samples analyzed; a mixture of at least one insecticide, fungicide and herbicide in 90% of the samples; and more than ten different pesticides in 40% of cases.

The quantities are *"spectacular: 43% of earthworms have an imidacloprid concentration of more than 100 ppb and 8% have more than 500 ppb"*, which is several hundred times what would be found in the nectar of a rapeseed whose semen was coated with this substance. (69)

The distribution of NNIs in the environment is said to be such that they are found in most of the world's honeys. A study published by Science that analyzed 198 honeys from all over the world found traces of NNI in 75% of them... (34) The journalist concludes we have lost control of this technology. (27)

### **3. The link between this decline and NNI rise**

*"Regarding the decline of insects and bees, there is a great deal of evidence pointing to neonicotinoids as the major cause. They are among the most effective insecticides ever synthesized; they are used mostly preventively and systematically, as a coating for seeds, on millions of hectares of field crops; they have a chronic toxicity much higher than their acute toxicity; they have a very broad spectrum of action and target all insects; they are persistent in the environment; they are soluble in water and can thus be transported far beyond their place of application."* (55)

There is a scientific consensus on the deleterious effect of NNIs on wild pollinators, in particular because they are able to act at very low doses on the nervous system of insects in general and bees in particular. They can have neurotoxic effects endangering hives even at sublethal doses. (26)

The danger they represent is such that 233 scientists published an opinion piece arguing that the use of NNIs must be drastically and urgently restricted. (46)

*“Beyond the effect on bees, hundreds of studies published in recent years show, beyond reasonable doubt, that NNIs have negative effects on many types of organisms: arthropods, birds, organisms. aquatic, etc.”* (65)

B. Pompili warned in 2016 that are piling up scientific studies showing the dangers of NNI to not only bees, but to our health and the environment in general. (66) A review of the literature would estimate that their use thus weakens all *“ecosystems by affecting soil invertebrates, the microfauna of rivers, amphibians, etc.”* NNIs would also be one of the causes of the 50% decrease over 30 years of field bird populations in Europe. (26)

#### **a. The introduction of NNIs**

The decline of pollinators (9) (and of biodiversity in general) in the 1990s would have been concomitant with the introduction of a new class of pesticide: neonicotinoids. For Hallman et al. (2017), agricultural practices would be the only explanation for the 75% decline in insect biomass observed between 1989 and 2013. (35)

In 2016, the NNIs reportedly treated 6 of the 28 million hectares of arable land in France. (36)

#### **b. Toxic substances**

NNIs are very effective insecticides... too effective in fact. 60 g of imidacloprid per hectare on 423,000 hectares of beets, represents 25 tons of the product, which is enough to kill 3 million billion bees. (64) In 2003, the CST report in France recognized the dangerousness of imidacloprid on pollinators, which led to its ban. (4) Similarly, fipronil was banned after CSE concluded that its use *“may appear to be 'of concern'”* and *“does not exclude unacceptable risks”*. (10)

EFSA published an opinion in January 2013 that the risks posed by three NNI pesticides (clothianidin, imidacloprid and thiamethoxam) represent *“a high risk to bees”*. This risk went through three routes of exposure:

- the emission of dust by the coatings during sowing;

- contamination by pollen and nectar;
- exposure by “guttation” (the exudation, by the plant, of water droplets). (4) (64)

In 2015, EFSA also judged that these 3 NNIs also represent these risks when used as a spray. (23) EFSA has also recognized a “*high acute risk*” posed to honey bees by dust from corn seed coated with fipronil. (10)

DiBartolomeis et al. (2019<sup>6</sup>) quantified the “*toxic load*” of pesticides used by American agriculture between 1992 and 2014. It would have, over this period been multiplied by 48, almost exclusively because of NNI, which represent 92% of the toxic load over this period. (53)

Researchers led by Florian Millot and Elisabeth Bro observed the probable responsibility of imidacloprid in the death of 70% of 730 wild birds occurring between 1995 and 2014. This would mainly affect grain-eating insects, which would get poisoned by eating seeds coated with NNI. (42)

### c. ***Sublethal toxicity***

In addition to their lethality, NNIs are characterized by “sublethal” effects, that is, not causing death, but weakening the body.

*“For example, exposure to certain pesticides can weaken the immunity of bees and promote the development of pathogens in the colony.” (33)*

For example, Tsvektov et al. (2017) placed bees exposed to pollen contaminated with low doses of clothianidin in an untreated experimental hive. They observed that their life expectancy was reduced by 25% and that “*their behavior differed from that of unexposed individuals, to the point of endangering the survival of the colony.*” (33)

A study published on June 28, 2011 by PLOS ONE (Vidau et al. 2011<sup>7</sup>) exposed bees to very low doses of thiacloprid or fipronil for ten days. They formed two groups: those being healthy and those previously infected with *Nosema Ceranae*, a very common parasite. They observed that 70% and 80% of bees infected with the parasite died, while those simply exposed to insecticides did not have “significant mortality”. It is the “cocktail effect” between the parasite and the pesticide that was lethal. (1)

- Henry et al. (2012) observed that bees exposed to very low doses of cruiser (based on thiametoxam) developed a tendency not to return to their hives. (3)

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6 <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0220029>

7 <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0021550>

- Bryden et al. (2013) tested the ability of a mathematical model to predict the evolution of colonies of bumblebees (*Bombus terrestris*). They fed the insects for 42 days with a sweet syrup containing (or not) 10ppb of imidacloprid, which would correspond "to the high range of the concentration reported in nectar and pollen". At first there is no difference between the treated and control colonies, but after 3 weeks the treated colonies begin to decay. (12)
- The study conducted by Penelope Whitehorn and published by Science in 2012 showed that "colonies exposed to very low doses of imidacloprid produced on average 85% fewer queens than others." (14) m(17)
- Hannah Feltham, Kirsty Parl and Dave Goulson (2014) studied 6 bumblebee colonies of initially identical size. For 2 weeks, the "*colonies were fed in the laboratory with a sugar solution and pollen*", to which was added, for half of the colonies, respectively 7 and 6 ppm of imidacloprid<sup>8</sup>. Then the bumblebees were released into the wild and tracked down with an RFID chip. Treated bumblebees were also successful in foraging, but only returned pollen on 40% of their trips, compared to 63% for control bumblebees. Those who succeeded had, moreover, an hourly efficiency reduced by 31% compared to the control group. In total, the amount of pollen collected was 57% lower for the treated bumblebees. These effects were observed even one month after exposure to the product. (14)
- A report published in 2015 by EASAC<sup>9</sup> also observed that "*very low levels of neonicotinoids have long-lasting sublethal effects on beneficial organisms*". (54)

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8 These dose were allegedly "similar to what the pollinators encounter in nature, when seeds have been coated with the insecticide." Note an insignificant mistake of the journaliste : it was 0,7 for the sugar water.

9 « European Academies Science Advisory Council »

**d. Human toxicity**

We would also observe sublethal effects... on humans! According to Mellissa Perry, a meta-study in which she participated (Cimino et al. 2017) reports *"'associations with unfavorable developmental or neurological consequences': increased risk of autism, memory impairment and tremors, a congenital malformation of the heart (called "tetralogy of Fallot"), as well as another serious congenital anomaly, anencephaly (partial or total absence of brain and skull at birth)."* They insist, however, *"that these suspicions are only indicative"* and stress that their main message would be to draw attention to the lack of data on the subject. This would be all the more problematic as NNIs tend, as we shall see, to end up in waterways and imidacloprid is among the 15 most frequently detected substances in waterways. (28)

Delphine Batho also recalled, in a debate in 2017, that scientific studies have *"established the impact of neonicotinoids on human health with" unfavorable neurological consequences on humans ""*. (31)

**e. The other possible causes: parasites, global warming...**

There could be other causes of bee decline. We generally talk about the appearance of varroa (a parasite), beekeeping practices and global warming. Thus, according to a 2014 IUCN press release:

*"Climate change, intensification of agriculture and changes in agricultural land use are the main threats these species face" (17)*

Nonetheless Dave Goulson has *"never seen clear evidence linking bumblebee and bee declines to climate change"*. In addition, the absence of the term pesticide would "creak" and some would see *"the influence of talks underway between the biodiversity protection organization and Syngenta, a major producer of agricultural insecticides."* (17) While it is true that bad beekeeping practices certainly play a role in the situation, this role has conveniently been blamed by the agribusiness and agrochemical circles. (56)

Hallman et al. (2017) studied all the parameters that could explain the 75% decrease in insect biomass they observed. *"The only parameter that the researchers were unable to control is the nature and evolution of crop protection techniques (ie pesticides) on the farms surrounding these protected areas."* (55)

The idea *"that the general decline of insects is mainly due to climate change, natural pathogens, invasive species, etc."* Would also have been contradicted by the study published in 2019 showing the drastic increase in the "toxic load" of pesticides with the

introduction of NNIs, which was multiplied by 48 between 1992 and 2014. Over this period, it would be composed 92% by NNI. (53)

No other cause would be able *"to explain the homogeneity of the observed decline: warming is sometimes blamed, but it is favorable to certain insects in temperate zones (such as butterflies), but these are also declining. We blame bee diseases and bad beekeeping practices, but bumblebees and hoverflies are also declining, and even faster than bees..."* (55)

#### **f. Direct demonstrations**

Several studies directly show, in vivo, the negative impact of NNIs on pollinators.

- Woodcock et al. (2017) studied the effect of three rapeseed plots, two of which were treated with clothianidin or thiamethoxam, on bees at eleven sites in three countries. The experience involved several tens of hectares. The health of several pollinators<sup>1</sup> in these fields has been monitored for one to two years. Researchers observed a negative effect of NNIs: *"Bumblebees produce fewer queens, and solitary bees produce fewer larvae when exposure to neonicotinoids is high."* (33)
- Three researchers from the University of Helsinki (Hokkanen et al. 2017) observed that rape, an oilseed close to rapeseed, had seen its yields decrease since 1993. In Finland, it was then harvested 1.7 tonnes per hectare compared to 1 , 2 today. The yield loss would have been most severe in areas where NNI use would be most intense. On the contrary, crops that are not very sensitive to the depletion of insects, such as barley and wheat, would not suffer from these drops in productivity. The authors conclude *"only the adoption of neonicotinoid insecticides in seed treatment can explain the drop in yields in several [Finnish] provinces, and at the national level for the shuttle, through a disruption of pollination services by wild insects"*. (30)

One can also see the responsibility of pesticides in general in the decline of pollinators behind the positive effect of organic farming. A study conducted by Vincent Bretagnole (Wintermantel et al. 2019) on the *"Zone-Atelier Plaine & Val de Sèvre"* shows a very positive effect of the proximity of organic plots on apiaries, their brood *"increase by up to 37%, compared to beehives located at the heart of uniquely conventional farms."* This, even though the proportion of organic plots would be 5-15% at less than 1,500 m. (52)

### **g. Impact of non-honey plants**

Pollinators can be exposed to NNIs by means other than pollination (pollen / nectar): guttation and dust from seedlings. (2) (4) (41) (55) The dangerousness of exposure by guttation has been shown by Girolami et al. (2009<sup>10</sup>). The dangerousness of exposure by dust released during sowing has been shown by Greatti et al. (2003<sup>11</sup>). (64)

In addition, NNIs would contaminate soils and thus subsequent crops, as well as wildflowers, and in addition, could "move" with the flow of water, as shown above. This issue would be all the more central as the main argument to support the reintroduction of NNIs decided in 2020 in France was that beets, being harvested before flowering, would not be visited by pollinators. S. Foucart makes fun of this argument by referring to the study by Yamamuro et al. (2019) (59):

*“So during all this time, if the Shinji fishermen had complained to their minister about the practices of their neighboring rice farmers, they would no doubt have been told with confidence that their concerns were unfounded. It is well known: "Fish are not going to forage in the rice fields.””* (66)

Overall, Tsvektov et al. (2017) studied 11 apiaries in a maize growing area and observed that *“colonies close to farms were more exposed to neonicotinoids than colonies far away”*, even though maize is pollinated by wind and not by insects. *“Much of the exposure is through wildflowers, contaminated by agricultural treatments.”* (33)

### **h. NNIs and birds**

Birds would be impacted by NNI in several ways:

- They can ingest seeds coated with NNI, which would lead to direct toxicity, as researchers at ONCFS have shown.
- They can ingest earthworms that have ingested NNIs.
- Their supply of insects would be diminished. This even affects granivores, which would be insectivores at the start of their life, as Christian Pacteau from LPO (= Bird Protection League) emphasizes. (43)

Hallman et al. (2014) would have shown that *“the fall in populations of insectivorous birds was indeed linked to the concentration of neonicotinoid insecticides in the environment (in the Netherlands in this case)”*, even at very low concentrations (20 ng / l surface water). (59) m (44)

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10 <https://academic.oup.com/jee/article-abstract/102/5/1808/2199218>

11 <http://www.bulletinofinsectology.org/pdfarticles/vol56-2003-069-072greatti.pdf>

A study concluding that low doses of pesticides would have little impact and would weigh "three to four times less in the decline of birds than the modification of their habitat", would have done only a limited follow-up, between 2009 and 2011, and partial. On the contrary, several hundred studies show the deleterious effects on non-target invertebrates. (44)

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As for the fact that the bird populations in the city have also fallen by a third, this drop may be related to other factors and does not demonstrate the absence of effect of pesticides on birds. (44)

It would therefore be credible that NNIs are at the origin of the decline observed in the CNRS and MNHN studies of 2018. (44)

A study published in Nature Sustainability (Li, Miao and Khanna 2020<sup>12</sup>) shows a strong link between the use of NNIs and the collapse of nesting birds. (65) Finally, birds could be affected by pesticides accumulated in the bodies of earthworms, a phenomenon highlighted by Pelosi et al. (2020). (69)

### ***i. NNIs and fish***

Masumi Yamamuro et al. (2019) observed that, in a Japanese lake, the wakasagi catches increased from 240 tonnes before 1993 to 22 tonnes in the following years. Those of eels fell from 42 tons to less than 11. The researchers followed the concentrations of imidacloprid over 20 years and the evolution of the abundance of small aquatic organisms. They observed that populations of aquatic arthropods collapsed the same year as the 1993 introduction of imidacloprid. This fall would have caused the fall of the eel and wakasabi populations, which feed on these organisms. This link would be validated by the fact that another species feeding not on invertebrates, but on microalgae, would not have been affected during the period studied. (59)

<sup>12</sup> <https://www.nature.com/articles/s41893-020-0582-x>

#### **4. A counterproductive agricultural model**

This damage is all the more appalling as it would be unnecessary on the one hand because it is not useful for the crops and on the other hand because there are alternatives. Their use would in fact result from the “*paradox of the red queen*” and from the structural problems of the agricultural model of which the farmers would be captive.

##### **a. Useless beekillers**

David Goulson showed the lack of correlation between NNI use and yields in a review published in the "Journal of Applied Ecology, comparing yields (rapeseed and wheat) depending on the amount of NNI used." (13)

The Center for Food Safety (CFS), an environmental NGO, would have “*systematically examined the scientific literature*” and in 2014 only found 4 studies showing gains in yields, against 19 studies finding an absent or insignificant gain. (20) m(40)

The ban on 3 NNI and fipronil has reportedly resulted in above-average, if not much above, harvests. (20)

Bonmatin (2015) observed, through the review of 200 publications, that NNIs “*have only marginal or no use*”. (40)

This would be due to the systemic and preventive dimension of NNIs. The targeted pests would be present on only a small part (4% in the example he takes) of the areas. In addition, their diffusion in the environment would encourage the emergence of resistance. (40)

##### **b. Ecological alternatives**

NNIs should be banned all the more as “*viable non-chemical alternatives exist*”. (23) There would be alternatives “*such as crop rotation, the use of biological control (resorting to natural predators of pests, etc.)*”. (40) This was notably demonstrated in Italy in a study conducted by Lorenzo Furlan. He created a mutual fund fulfilling the same crop insurance role as NNIs. It brought together farmers representing nearly 50,000 hectares, each contributing 3 to 5 € / hectare, ie 7 to 10 times less than the said pesticides. (37) (40) (46) ANSES itself found in 78% of cases of use of NNI at least one non-chemical alternative solution and in 89% of cases of alternative pesticides. (46) The viability of these alternatives and the usefulness of NNIs would become clear from the fact that organic beets would have been little or little affected by the aphid (and therefore jaundice) infestation of spring 2020. (63)

**c. Red queen paradox**

The whole agro-industrial model is at stake: the yields of field crops have tended to stagnate since the beginning of the 1990s (and even earlier for rapeseed and sunflower, which have plateaued respectively since the 1980s and 1970s. ). (27) In fact, the innovations would preserve the yields which decrease because of the damage caused by the previous innovations. This is the paradox of the Red Queen:

*“In reality, the dominant agricultural model seems subject to the paradox of the Red Queen. In a famous scene from Lewis Carroll's book Beyond the Looking Glass, the Red Queen explains to Alice that in the world she has landed in, you have to keep accelerating to stay still. Agriculture is embroiled in a similar frenetic race to stand still. As time passes, each new innovation produces ever weaker beneficial effects and ever greater damage, which are in turn corrected by other innovations, also coming with their externalities... As a result, returns only stagnate at the cost of endless chemical and technical escalation.” (27)*

**d. Trapped farmers**

This would be all the more perverse as the farmers would not even have a choice:

*“It has become very difficult for them to obtain seeds that are not coated with pesticides – the content of which they do not necessarily know. Today, the cooperatives, to which three quarters of them belong, sell 70% of the seeds presented as real “guarantees all risks” and dictate their way of proceeding. “Farmers depend on cooperatives and cooperatives depend on pesticides,” said the UNAF.” (36)*

They would also be influenced by consulting companies, which would be encouraged to recommend the use of pesticides:

*“In Italy, the companies that provide technical advice to farmers are also those that sell them pesticides,” replies Lorenzo Furlan. And we constantly tell them that they will lose their harvest if they do not use these products...” The same observation holds true for France: all the parliamentary reports on the subject highlight this institutional conflict of interest which leads to mechanically upwards the use of phytosanitary products.” (37)*

*“The reason is a structural conflict of interest: technical advice to farmers is provided by those who sell them the pesticide treatments, Mr. Bonmatin summarizes. If this advice were provided by independent agronomists, the situation would be very different.” (40)*

Only the agrochemical industry would emerge a winner from this fool's game...

## **II. Health agencies, independence and risk assessment**

The issue of NNIs would highlight serious shortcomings in the prior risk assessment.

1. The tests carried out to assess the risks on pollinators in the context of marketing authorizations for phytosanitary products are very insufficient.
2. Public policies are late and ineffective.
3. The institutions are complacent, refusing to see the dangerousness of pesticides.
4. The whole thing is a fool's game, letting dangerous molecules enter the market and reacting far too late, letting the agrochemical industry make its profits.
5. All of this relates to the hold of the agrochemical industry on institutions.

### **1. Insufficient tests**

EFSA published a report in 2012 highlighting the inadequacies of the risk assessment procedures of phytosanitary products on bees, which fail to take into account, among others, sublethal effects, exposure by guttation or by dust produced by coated seeds during sowing, effects on larvae, etc. Overall, the toxicity of the substances tested is very largely underestimated. (2) (48) This laxity is measured by the annual loss of 30% of bee colonies and the rapid collapse of the entomofauna. (48)

These issues are said to be concealed by EFSA in its alerts on the toxicity of 4 NNIs in January and May 2013 (10).

#### ***a. An extreme conception of toxicity***

The risk assessment tests, provided for in the EPPO document "System for the assessment of the risk of plant protection products for the environment", take a rather extreme view of toxicity. To qualify as "*low risk*", exposure to a product would simply have to be less than one-10th of the LD50 in less than 48 hours. S. Foucart shows the absurdity of this method by taking the example of cigarettes for humans: their LD50 is 150 packets. Smoking 15 packs a day would therefore be, by following this logic, "at low risk" for humans... (11)

#### ***b. Negligence for sublethal effects***

The tests do not take into account either sublethal effects or chronic effects. Yet we have seen that they are very important for the NNIs. (2) (12)

**c. *Lack of consideration of wild pollinators***

The assessment procedures would only cover honey bees and not wild pollinators. (6)

However, they are more effective: the study by B. Vaissière (2013) observed that flowers visited by honey bees had 14% higher productivity, compared to nearly 100% higher for those visited by wild insects. (6)

At the same time, they are even more sensitive to pesticides than honey bees, which have their organization in colonies, which protects them more than bumblebees, which live in micro-colonies or than solitary bees. A 2015 EASAC report would therefore recommend testing pesticides on wild species. (57)

**d. *The procedure in case of insufficient data***

Marketing Authorizations are issued after a risk assessment by EFSA, which is based on data provided by the company seeking approval. If the data is incomplete, the Commission can still grant MA using a "*confirmatory data request*" procedure. The product is approved, but the company will have to provide additional information at a later date. (62)

**e. *The distinction between scientific and regulatory consensus***

There would be a fundamental problem in the fact that the "*absence of proof, the difficulty or the impossibility of administering the proof are, after all, interpreted as so much proof of the absence of deleterious effects.*" (66)

The case of NNIs would be an illustration of this dichotomy between scientific and regulatory consensus.

*"A regulatory consensus is based on the opinions of expert agencies which judge the compliance of a product with the regulations in force. These are often anonymous opinions, not subject to peer review, based on data generally confidential and inaccessible to criticism, produced and interpreted by the manufacturers themselves." (50)*

This "science" would often be called upon, in health or environmental controversies, to "*silence the protesters*":

*"It is allowed, so Science guarantees us that it is safe "is a convenient slogan, but one that ignores a huge body of work by historians and sociologists of science." (50)*

This is how NNIs came to be considered "safe" when in fact they were very toxic. (50) He deduces from the study showing a link between the introduction of NNIs and the collapse of a fish population in Japan (Yamamuro et al. 2019, (59)) that:

*“No confidence can be placed in regulatory environmental risk assessment systems. Bankruptcy of this magnitude is simply unforgivable.” (66)*

This bankruptcy would also have been highlighted by the study of Pelosi et al. (2020) showing significant bioaccumulation of imidacloprid, even though EFSA rated it as *"at low risk of bioaccumulation"*. (69)

*“Ideally, everything should be overhauled and properly retested for the toxicity on bees of each pesticide present in the environment today, taken alone or in combination.” (47)*

## **2. Insufficient political actions**

Political actions to repair the consequences of the flaws in these tests would be insufficient and overdue. We would see it first with the 2013 moratorium, but also with the reform of assessment tests which has still not been completed. The European Court of Auditors also criticized in a report of July 9, 2020 the ineffectiveness of the European Commission's measures to protect wild pollinators, to which indicators of success or resources have not been allocated. (61)

### **a. A late and ineffective moratorium**

The moratorium decided in 2013 by the European Union banning many uses of 3 NNI and fipronil between December 1, 2013 and 2015 would be a late and insufficient measure. (8) (45)

Indeed, it would take years for NNIs to disappear from the soil, even if the moratorium was total. (8) Worse, the decision would "probably do nothing" as the moratorium is less than the environmental life of NNIs. (13) They should have been banned long ago, being of considerable toxicity and the unacceptable nature of the risk posed by imidacloprid to bees having been known since the 2003 CST report. (9) (13) (45)

Moreover, the 2013 NNI moratorium would not have weakened the decline of bees. (47) Far from being evidence of NNI safety, this is due to:

- The limitation of this moratorium to certain uses and certain NNIs, which has allowed significant amounts of NNIs to be used in France (47), farmers have simply resorted to other NNIs, such as thiaclopride. (61);

- the fact that much of the NNI remains in the soil and persists in it, contaminating later crops and wild flora (47);

Finally, the ban allowed Member States to provide for derogations, which many have done. (61) Thus, this moratorium could, on the contrary, be "*interpreted as a stinging defeat.*" (9) The final ban did not occur until 2018, 24 years after the first alerts. (45)

**b. Failure to reassess assessment tests**

Despite the 2012 EFSA report denouncing the long-known regulatory loopholes and proposing guidelines in 2013, the rules have not changed significantly. (58) In October 2013, consideration of a draft development of new rules was postponed. (11)

As Member States failed to come to an agreement, they entrusted "*to a technical committee unknown to the public*", the SCOPAFF<sup>13</sup>, "*the difficult choice to choose the new authorization rules for pesticides.*" This choice would have to be made between "*bees and pollinating insects on the one hand, and the agrochemical industry on the other*". (48) Its discussions are said to be confidential, which has been widely criticized by NGOs and politicians. (48) (67) Its work resulted in the adoption of an "*update of the principles for evaluating the effects of pesticides on bees*" on July 17, 2019. However, this text would ignore the essential of the EFSA recommendations, the study of which is postponed. (54)

In the middle of summer 2019, the EU is said to have "*quietly postponed*" the introduction of new risk assessment tests against advice from EFSA and the scientific community. (56) On October 23, the European Parliament "*adopted by an overwhelming majority (533 for, 67 against and 100 abstentions) an objection to the reform of the principles for assessing the environmental risks of plant protection products.*" (58)

Following a request from the European executive, EFSA proposed on June 22, 2020, 4 approaches to reform risk assessment. 3 of them would be to "*lower the levels of protection*". (61) It is one of the least protective which was chosen by the Member States. It would "consider as acceptable a reduction in the size of a bee colony exposed to a pesticide, if this reduction remains within a "*range of natural variability*". This would be calculated using an algorithm, "*Beehave*", co-developed by Syngenta. As the "background" pollution is already affecting beehive mortality, this would underestimate the toxicity of pesticides. (67) This method would also not allow an assessment of the risks to wild pollinators. (67)

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13 Standing Committee on Plants, Animals, Food and Feed

On 23 September 2020, EFSA reportedly presented the progress of the reform of the *"risk assessment of pesticides for foragers"* to *"associations representing civil society"*. The latter were alarmed, one of them, Future Generations, going so far as to call the changes *"catastrophic"*. (67)

SCOPAFF met on March 24 and 25, 2021. According to MEP Pascal Canfin, the discussion focused on the mortality considered acceptable in a colony following exposure to a pesticide. Its percentage was to vary "between 7%, a position defended by France, Slovakia and Sweden, and 25% which is defended in particular by Spain and Hungary". The NGO Pollinis warned of the danger that criteria more permissive than those established in 2013 would be adopted. *"This would irreparably precipitate the ongoing disappearance of these insects essential to European cultures instead of remedying it."* (71)

These difficulties can be explained by the scale of the stakes: an *"impact analysis conducted by manufacturers and published in July [2018] on a sample of a few dozen molecules, "79% of the uses of all herbicides, 75 % of fungicide uses and all uses of 92% of insecticides" do not pass the chronic toxicity tests provided for by the EFSA guidelines."* (48)

### **c. Political struggles in France**

The position of the French government is unstable on the issue of NNI. After the government opposed the law proposed by Delphine Batho and Gérard Bapt providing for a total ban on NNIs in France in 2016, Ségolène Royal, then Minister of Ecology, announced to propose a national action plan in favor of pollinators and extend the 2013 moratorium to other substances and other uses. The government would be pushed in this direction by the growing mobilization of civil society: a petition from the FNH<sup>14</sup> and Future Generations calling for the withdrawal of the NNI thus collected 50,000 signatures in three weeks. (22)

### **Disagreement within the government**

In 2017, an interministerial working document studying the possibility of eliminating by ordinance certain restrictions on the use of plant protection products, in particular to reverse the ban on NNIs.

The then Minister of Agriculture, Stéphane Travert, had confirmed this intention, ruling that the ban on NNI was contrary to European law and that there was no existing alternative. The then Ecology Minister, Nicolat Hulot, responded via Twitter by

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14 Fondation Nicolas Hulot

rejecting the possibility. Prime Minister Édouard Philippe announced that the government had decided not to reverse the ban on NNI, which came into effect in September 2018. (31) (32)

### **Postures and impostures**

If France affirmed itself, within the framework of the negotiations around the modification of the health tests, as favorable to the tests proposed by the EFSA, its position would be ambiguous, the pesticides based on sulfoxaflor having been authorized by the ANSES “on the faith of obsolete tests”. (48)

In the same vein, among the 36 deputies who signed a column entitled “*Bees are essential*”, most of them have, in fact, voted or supported proposals promoting the use of pesticides. (49)

### **Looking back to 2020**

Following the beet yellows epidemic transmitted by an infestation of aphids (*Myzus persicae*) in spring 2020, the Ministry of Agriculture announced on August 6 a support plan for the sector providing in particular for exemptions allowing the use of NNI. (64)

A bill allowing exemptions from the ban on NNI was presented on September 3, 2020. This would be justified, according to the ministry, by the fact that beets are harvested before flowering (64) and that the ban of NNI threatens 40,000 jobs. (65) The Confédération paysanne nonetheless argued that it would be market pressure, and not jaundice, which would weigh the most on the sector. The latter would be exposed to three structural problems: “*end of quotas, market deregulation and competition from world sugar*”. (68) The text would not refer to beet verbatim, and NGOs and environmentalists fear that it could benefit other crops, such as maize. (65) D.Batho commented:

*“This bill is based on a form of obscurantism [...]. It ignores the scientific data available and in particular ignores the phenomenon of the disappearance of insects that we are witnessing.”* (65)

According to Delphine Batho:

*“The sugar beet sector has had several years to adapt and find alternatives, but it has done nothing, because it has always lived with the prospect of succeeding in getting around the ban on neonics: since 2016, it has systematically been the same arguments that are put forward to reintroduce these substances”.* (65)

The bill was due to begin consideration on October 5 under “*strong pressure from civil society*”. Thus, called not to vote this bill N. Hulot, about thirty environmental organizations (WWF, Greenpeace, LPO), the Confédération paysanne and about sixty researchers specializing in NNI. The latter denounced “*a serious error, under the pretext of minor or inaccurate reasons, this in view of the immense stakes*”. (68) Despite this, the project was adopted on October 27, 2020. (69) One of the challenges of the new law would be the issue of post crops to treated beets. Farmers demanded the right to replant corn without delay. On February 5, they obtained this authorization on condition of not treating an area of 8 meters on the outskirts of the plots. The study on which this figure was based was in fact misinterpreted. (70)

### **3. Complacent institutions**

The institutions would be complacent with the producers of pesticides, taking a very long time to see the damage caused by the latter. This is what we would have seen with the NNIs and it is still what we see with sulfoxaflor in France and with the marketing authorization policy of the European Commission.

#### **a. Ancient blindness**

The blindness of these assessment procedures has been known from the 2003 and 2005 CST reports (31) (54) (56). These flaws are a “trick” that an elementary school child could figure out in a matter of minutes. (39)

Regarding the toxic effects of NNIs, beekeepers had questioned the authorities about the damage caused as early as 1994. (54) They were established by the CST report published in 2003.

The Epilobee investigation, which nevertheless mobilized 1,300 inspectors and 3 million euros, studied the mortality and not the weakening of the colonies. (15) Mainly, she looked for the presence of pests and diseases, but not pesticides. (15) (16)

This would reflect a political bias:

*“We are therefore in the context of a rather strange exercise, which puts scientific discourse and practice at the service of contingencies external to science. You have to look, but in the “right” direction. You have to find it, but not too much. Above all, to avoid any unwanted discovery. [...] This semantic modesty recalls that of old studies funded by American tobacco companies, which initially attributed lung cancer to air pollution, radon, genetic predispositions and, possibly, to... “way of life” - meaning to cigarette.” (16)*

The same goes for the IUCN<sup>15</sup> press release of April 2, 2014, which did not even mention pesticides among the causes of the decline of bumblebees. (17)

This blindness would also affect American institutions:

*"According to NRDC<sup>16</sup>, neonicotinoid insecticides authorized in the territory have never been evaluated by the EPA and their authorization, although provisional, has never been questioned. The case had led five associations to file a complaint against the federal agency."* (18)

According to Pierre Mineau, co-author of the study showing the drastic increase in the "toxic load" of pesticides used by American agriculture, reports from the EPA anticipated "dramatic effects on the ecology of terrestrial or aquatic systems in which products would be used". He concludes: "Everything that happened was predictable, if not expected." (53)

#### **b. Durable blindness**

The report by an expert from the Ministry of Agriculture observed that "13 of the 195 cases of acute mortality [of hives] reported in 2015 in France were due to pesticides. This statistic would be biased and UNAF would accuse the ministry of hiding pesticide damage from hives through "several statistical biases and tricks leading to minimizing the role of pesticides in bee decline," up to to quote Churchill: "I only believe in statistics when I have falsified them myself." (29)

#### **c. Actual blindness: the sulfoxaflor case**

EFSA is said to have authorized sulfoxaflor, another neurotoxic insecticide, even though its expert report acknowledged: "With the available assessments, a high risk to bees is not excluded and a high long-term risk is indicated for small herbivorous mammals, for field uses on cotton and vegetables". (23)

ANSES also reportedly authorized two sulfoxaflor products in September. The UNAF denounces authorizations made on the sly and translating a double discourse: "We authorize a product lightly and then procrastinate before withdrawing it, after fifteen years." Even N. Hulot's Ministry of Ecology would not have been notified. This insecticide would act like NNIs and would be an NNI not classified as such. (36)

*"It is shameful, scandalous, pitiful and irresponsible towards future generations," says Gilles Lanio, the president of UNAF. I still can not believe it!"* (36)

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15 Union internationale pour la conservation de la nature

16 Natural Resources Defense Council

According to J-M Bonmatin, *"It doesn't make sense any more to evaluate substances in this way, molecule by molecule."* (41)

The Nice Administrative Court nevertheless suspended the MA for these two products (Closer and Transform) after referral by Générations futures. The president of this association, François Veillerette, comments:

*"This file reveals a scandalous situation on the management of European approvals of active ingredients of pesticides which are granted in the absence of essential data on product safety, called confirmatory data, which will not be transmitted until two years later".* (38)

#### **d. Actual blindness: European commission and MA**

Seized by an NGO, the European mediator sent a letter on 22 June to the presidency of the European Commission about the MA procedures in the event of incomplete data. The mediator studied 5 cases of such procedures. In the majority, EFSA had not been consulted. Moreover, the commission would not give reasons for its decisions to issue these authorizations. Finally, for *"pesticides approved under this procedure since 2015,"* confirmatory data *"on how they respond to water treatment has still not been provided."* (62)

#### **4. A "fool's game"**

In the end, all these flaws would lead to a kind of fool's game:

- The tests, when there are any (see the Marketing authorization procedure in the absence of sufficient data), would underestimate the toxicity of phytosanitary products. Marketing authorizations can therefore be granted even to dangerous products.
- The damage takes decades to be identified by complacent institutions.
- The politicians also take forever to come up with solutions and, when he acts, it would be too late and insufficient.

In the meantime, pesticide producers would have had time to make their product profitable. Then, we would have to relaunch this fool's game with each new molecule. In the end, it would be an organized destruction of biodiversity for the benefit of the agrochemical industry. These flaws could also be explained by the latter's hold on institutions...

## **5. The grip of the agrochemical industry**

The lasting maintenance of the insufficiency of the test procedures would result in particular from participation of manufacturers in their conception: *"these protocols were designed by groups of experts infiltrated by the agrochemical industry"*. (39) It is, for example, to agrochemical companies that we owe the tardiness of the ban on NNIs. They would have used, to this end, *"the toolbox of tobacco companies to turn science against itself and sow doubt"*. (45)

### **a. Participation in their own regulation**

Manufacturers have *"in a way, created the very scientific framework in which the evaluation of their products is carried out."* (39) The assessment standards are indeed set in particular by the European and Mediterranean Plant Protection Organization (EPPO) through a process dominated by representatives of the agrochemical industry. (11) A report from Future Generations and PAN would suggest that this would be the rule: *"in 92% of the cases examined, the techniques in question were co-developed by the manufacturers concerned, directly or indirectly."* (39)

Syngenta's hand can be found in the process of reviewing risk assessment tests following the 2012-2013 EFSA reports. Indeed, *"the chosen approach is now based on a model simulating the response of a colony to stress – the model used by EFSA having been co-developed by the agrochemical firm Syngenta, one of the largest producers of pesticides in Europe."* (71) (67)

### **b. The infiltration of institutions**

Industrialists would manage to infiltrate research institutions claiming to be neutral. However, *"the history of science work carried out on the tobacco industry's influencing strategies – in particular that of the American historian of science Robert Proctor (Stanford University) - shows that participation in expertise of researchers in conflict of interest has the effect of biasing its conclusions."* (57)

### **Methods of influence**

Agrochemical lobbies would manage to influence scientists in an insidious way. Thus S. Foucart replied, to an Internet user asking *"Who are the French scientists to have been" bought "by the lobbies?"*:

*"I don't like the term 'bought' and I think the situations in which a scientist is actually 'bought' are very rare. The instrumentalisation of science and expertise is done in a much more subtle way: certain research themes (natural pathogens,*

*etc.) are for example privileged, the questions put by the political leaders to the experts are formulated in such a way that the answers given are ambiguous.*

*However, there are a few particularly shocking situations that I describe in the book, in which experts in the service of regulatory agencies or public administrations, notably in France, the United Kingdom and the United States, have been hired by professionals. agrochemical firms immediately after providing favorable and questionable expert opinions on neonicotinoids, minimizing or relativizing their effects on bees and pollinators.” (56)*

## **FERA**

In March 2015, an article appeared in PeerJ under the signature of David Goulson "with devastating conclusions for the credibility" of FERA<sup>17</sup>, the British food safety agency. He analyzed the data used for one of the latter's reports. He observed that, contrary to the conclusions that had been drawn, the study was in fact the first study to describe the substantial negative impacts of NNIs in real conditions. Asked about this "a spokesperson for FERA has more or less eaten his hat". The main author is said to have left FERA and joined Syngenta in the months that followed. (21)

## **IPBES**

The mission of IPBES<sup>18</sup> claim to synthesize the available knowledge on biodiversity, on the impacts of its erosion and on possible courses of action to preserve it. In short, to be to biodiversity what the IPCC is to the fight against global warming. Yet the task force for its pollinator decline report was made up of employees from Syngenta and Bayer, lacking scientific credit and being there only to "represent their employers" (19):

- Christian Maus is the main author of the chapter on “*pollinator diversity*” and employed by Bayer. He would never have published a paper in this area.
- Helen Thompson, employed by Syngenta, is in charge of the one on the causes of their decline. The controversy is said to be all the more serious as she is involved in the aforementioned FERA study. (24)

*“Of course, private sector experts are very limited: two out of a total of twenty-one in two of the six working groups. As for the other experts, they are academics or scientists from public research organizations. But this does not exclude other conflicts of interest, through funding, links forged between their institutions and the agrochemical industry, remuneration as a consultant, etc. At IPBES, we are*

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17 Food and Environment Research Agency

18 Plate-forme intergouvernementale scientifique et politique sur la biodiversité et les services écosystémiques

*assured that everyone had to submit a statement detailing this type of relationship with industry. It's happy. But, alas, these documents are not public...* (19)

Simon Potts was also co-chair of the IPBES committee. He celebrated the moratorium on 3 NNIs in 2013 and asserted that *"The weight of evidence given by researchers clearly indicates that we need to phase out neonicotinoids. However, he said the opposite 6 months later, judging that there was "currently no consensus on their lethal and sublethal impacts [on pollinators] in the environment."*

This turnaround questions S. Foucart, who also notes that in May 2014 this researcher signed a study on NNI which greatly appealed to manufacturers. In this study, *"neither the financing of the study nor the possible conflicts of interest of its authors were specified..."* (19)

#### **AFSSA**

A 2008 AFSSA report endorsed *"sometimes under questionable conditions of integrity, the vulgate of agrochemists: bee disorders being "multifactorial", new phytosanitary products would play no determining role."* (9)

#### **c. Under pressure**

In the framework of the vote on the 2013 moratorium, European expertise was reportedly subject to *"intense pressure"*. Syngenta is said to have *"demanded, in vain, amendments to the position of EFSA, going so far as to threaten some of its prosecution officials."* (8)

#### **d. Fake neutrality**

The industry would charge the "shilling". That would mean people pretending to be neutral when they are paid by the company to tout the benefits / minimize the problems. This is particularly what the Monsanto Papers would show. (56)

It would have been observed in the review of the study by Henry et al. (2012) published in Science. Indeed, its first author would be James Cresswell, whose laboratory would be supported by Syngenta. This support would have been granted on the same date the comment was accepted for publication... (3)

#### **e. Influence on decision-makers**

Industry would succeed in influencing decisions through policy makers. As part of the 2013 moratorium vote, UK Environment Minister Owen Paterson explained in a letter to Syngenta that he had been very active in organizing the opposition to the

proposed ban. of NNIs. (7) (8) The interests thwarted by the total ban on NNI discussed within the framework of the biodiversity law of 2016 would have *"agitated behind the scenes to do his business"* and would have succeeded in *"winning the ear"* of Stéphane Le Foll, then Minister of Agriculture, who would have asked not to vote for this ban. (27)

One can suspect this influence behind the inaction of SCOPAFF, a *"technical committee unknown to the public"* in charge of *"choosing the new authorization rules for pesticides."* According to the general delegate of the Pollinis association, *"The opacity of such a system is simply undemocratic. It's a lobbyist's dream."* (48) The opacity was also denounced by MEP Pascal Canfin:

*"It is unacceptable that this type of decision is still taken in the utmost secrecy of a committee where we do not even know the positions defended by the states"* (67)

Also as part of the study of new evaluation tests, this association, participating in a committee set up on the subject by EFSA, would denounce *"the intense lobbying of agrochemical manufacturers. They sent at least a dozen letters to EU executive officials vigorously protesting against the EFSA guidance document. "*

Their stakes are indeed considerable: the vast majority of uses of herbicides, fungicides and insecticides would not pass the tests proposed by EFSA. (54) (67)

#### **f. Language elements diffusion**

The influence of industrialists would also be more diffuse, through the issuance of *"language elements"*. This would be the case with the argument supporting the authorization of NNIs for beets on the grounds that they would not be visited by bees:

*"Circulated by agribusiness circles and taken up by the Ministry of Agriculture in its communication, this argument has been widely echoed on social networks by elected officials and political leaders."* (64)

*"Promoted by agribusiness circles, taken up by the Minister of Agriculture, echoed by journalists and multiplied endlessly on social networks by thousands of little hands, a single element of language has swept away all of this. No one is unaware of it any more: "A bee, that will not go foraging in the fields of beetroot. »» (66)*

#### **g. La democracy in danger ?**

All of these would raise questions about our democracy.

*"History makes it clear at least one thing: the state of our environment is often that of our democracy."* (20)

In addition, the misuse of the authority of science would fuel relativism:

*"Because if you have been persuaded that regulation is science, why, when it is obvious that the former is so often wrong, would you still trust the latter?" (50)*

The lack of development of risk assessment tests, all the more incomprehensible as their flaws were known and their harmful consequences proved, as well as the lack of transparency of the process would bring *"opprobrium to the institutions of the Union" and would participate "in a lack of love that could be seen [...] at the ballot box."* (51)

## Chapter 2. Ubiquitous disinformation

Over the course of these arguments, I noticed that the corpus contained a very significant dose of misinformation. We saw 48 points total in the reasoning. Among them, 37 were misinformation, that is, false or misleading. Rather than doing the exhaustive analysis (which would be extremely long, this chapter already being a hundred pages long), I deepened 3 blocks which are extremely important<sup>19</sup> in the story it tells:

1. The fable of counterproductive pesticides.
2. The delay in regulatory response caused by industry influence.
3. The myth obviousness of the ban on NNIs on beets.

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<sup>19</sup> To give you an idea, they highlight the misinformation of 21 of the 48 points in the pitch. This statistic undermines the crucial place of the various elements that we are going to see, but illustrates well that this is a big part of the reasoning that we have just detailed.

## **I. The fable of counterproductive pesticides**

According to S. Foucart, NNIs would be useless (they would not increase yields), especially since there would be perfectly viable alternatives. This is the fable whose absurdity I will demonstrate in this section.

To disentangle the true from the false, I carried out a series of 15 interviews with farmers recruited on Twitter, close to the communities @fragritwittos and @agridemain (which I encourage you all to follow). They are in addition to the 6 interviews I had already conducted for my book on agribashing (Baumann 2021). You will see that the story sold by the journalist does not stand up to the reality told by the farmers.

We will see

1. that his argument around the uselessness of NNIs and alternatives is absurd;
2. that it is also heavily contradicted by farmers and their rhetoric;
3. that S. Foucart attempts to neutralize their voice with the second part of the fable: the idea that farmers would use NNIs because they are dependent on agricultural cooperatives and the latter would benefit from it (which is also disinformation).

## 1. NNIs uselessness

The author argues that NNIs would be unnecessary based on several studies:

- A study finding no correlation between yields (rapeseed and wheat) depending on the amount of NNI used. (13) Likewise, harvests would have been above average after the moratorium (20).
- The literature review of the Center for Food Safety (CFS), an environmental NGO.
- A review of the literature by L. Furlan including 200 studies<sup>20</sup> (40).
- The experiment that L. Furlan is said to have carried out with a compensation fund in Italy. (37) (46)

We will show that this idea is in itself inconsistent with the rest of his remarks; that his performance comparisons are absurd; that the CFS study has no scientific significance; that the literature review by L. Furlan (who is part of the "*Task Force on Systemic Pesticides*") in no way proves the uselessness of NNIs; that the experiment that this same scientist would have conducted has no scientific significance.

### a. *An internal inconsistency*

First of all, we see several inconsistencies:

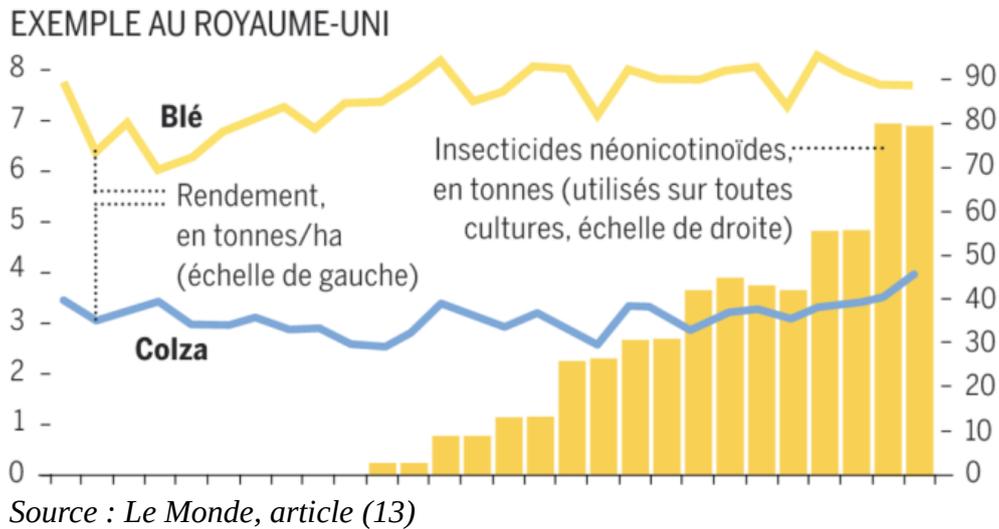
- The spread of NNIs in the environment would cause resistance in pests (20), but not in pollinators and other insects.
- The fact that the 2014-2015 harvests were "above average" would prove that the NNIs were not effective, while he claims, at the same time, that the moratorium would be useless because of the persistence NNIs in soils. However, these are minor points compared to the other issues.

### b. *Comparisons of changes in yields*

The journalist discusses the evolution of yields and compares with the use of NNIs:

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<sup>20</sup> Furlan, L., Pozzebon, A., Duso, C. et al. An update of the Worldwide Integrated Assessment (WIA) on systemic insecticides. Part 3: alternatives to systemic insecticides. *Environ Sci Pollut Res* 28, 11798–11820 (2021). <https://doi.org/10.1007/s11356-017-1052-5>

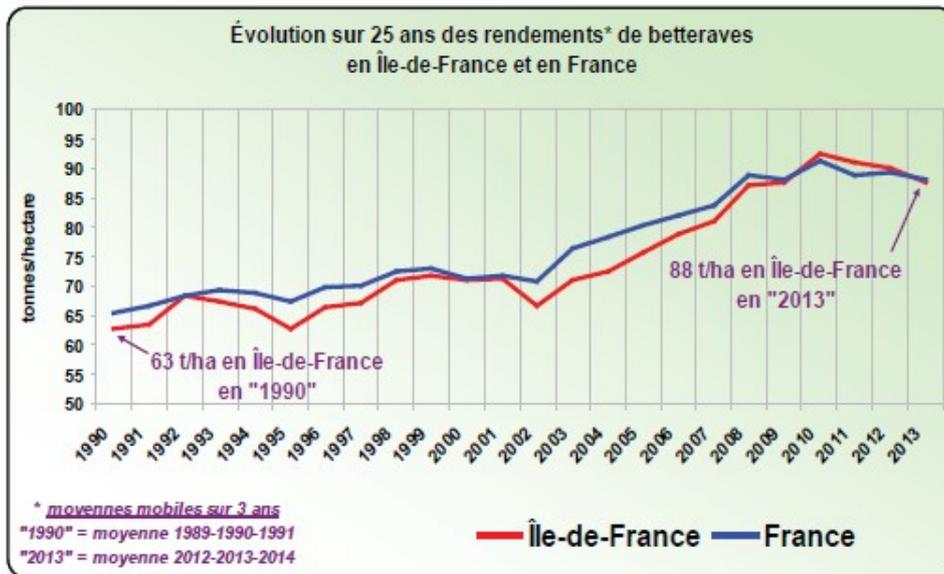


Generally speaking, this type of comparison is of little value for several reasons.

- Farmers can stop or start one crop and replace another. Thus the yield may tend (depending on the context) to stabilize around the quantity from which the crop is profitable.
- New insecticides do not necessarily increase yields, they can replace more harmful and expensive insecticides. If there was no deadlock in rapeseed and wheat, NNIs will simply have replaced pre-existing insecticides, in particular because they are simpler and safer to use (no need to apply), potentially less expensive (it depends on the context) and that they are selective (they kill the pest and little the rest of the entomofauna compared to foliar insecticides).

This graph has an additional problem: it compares the use of NNI for all crops to wheat and rapeseed yields. This does not make sense, at least one should have compared the crop yields to using NNI on that crop. It makes sense that wheat yield is not impacted by the use of NNI on corn ...

The author offers another graph and an interpretation which also have serious flaws (27), but which we will discuss a little later, in point 3 of this I. In addition, we observe an opposite trend with beetroot:



Source : Agreste Île-de-France, statistique agricole annuelle

Source : Agreste Île-de-France, Numéro 138 - Octobre 2016

This, even as the price of a ton of beets collapsed...<sup>21</sup>

### c. Center for Food Safety's study

S. Foucart refers several times to the study published by the "Center for Food Safety" and written by Sarah Stevens and Peter Jenkins: "Heavy costs. Weighing the Value of Neonicotinoid Insecticides in Agriculture". (20) m (40)

This report reviewed and synthesized 19 scientific journal articles studying the relationship between neonicotinoid treatments and the yields of 5 American crops. He concludes that "Numerous studies show that neonicotinoid seed treatment does not significantly increase yields in many settings."

This is not a literature review, since the selection of articles is not systematic. The authors go so far as to include articles which have been interested in the antifungal and herbicidal properties of NNIs... (Pynenburg et al. 2011a and Pynenburg et al. 2011b) This is obviously not relevant, since the NNI are insecticide.

For the rest, it is difficult to see the point of this paper. Indeed, there are endless ways to misuse NNIs. Finding a few studies that show they may not be of interest doesn't say anything valid. **NNIs are not always useful (which is why they are not always used).**

<sup>21</sup> Then, the rise wasn't due to the allocation of beet cultures on more fertile land.

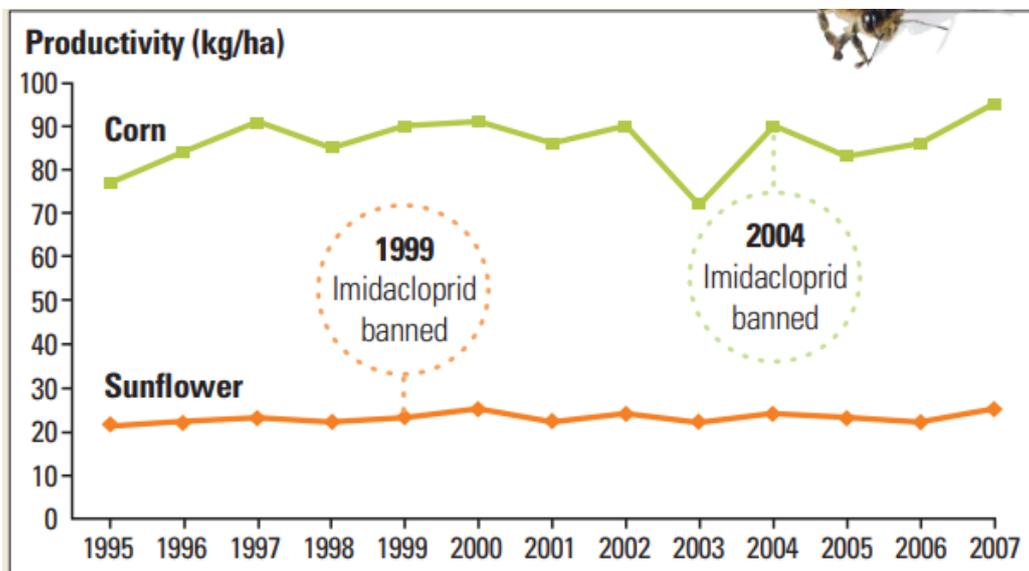
For example, breeders cultivating cereals in mountainous areas in the middle of meadows generally have fewer aphid problems than beet producers in Hauts de France. To equate the interests of NNIs in these two situations to assess overall profitability is absurd.

I took this example because it seems pretty obvious to me (and it came up in interviews), but understand that there are endless variables to consider. Nothing is known about the agronomic relevance of the studies in question and the periods studied seem very short, a few years, while the pressure of pests can be very variable.

The authors summarize an insert from Stokstad in Nature (2013) as follows:

*“[France banned the use of imidacloprid on sunflowers in 1999 and on maize in 2004, but the yields for the two crops up to 2007 show that the productivity was not reduced by the loss of the seed treatment as pest control measure.]” (Stevens and Jenkins 2014)*

Here is the graph:



**Steady.** Farmers kept yields after France banned neonicotinoid-treated seeds.

Source : Stokstad 2013

This graphic is silent: besides the criticisms we have already made on this type of comparison, there were coating alternatives for these products. For corn: Thiamethoxam, clothianidin (affected by the 2013 moratorium) and thiacloprid were available.

Thus, we see an extremely poor literature review (19 articles), which is agronomically meaningless (it would require a logic, an analysis behind the comparisons) and greatly

exaggerates the scope of the data at its disposal. Let us recall the exact terms used by the journalist to present the study:

*“In March 2014, an environmentalist NGO based in Washington, the Center for Food Safety (CFS), for its part systematically examined the scientific literature - that is to say the journals submitting the studies they publish to an expert review. preliminary - to get an idea of the real effectiveness of neonicotinoids. CFS had only found four studies showing yield gains from their use as a seed treatment. Against nineteen studies noting an absent or insignificant gain...”(20)*

*"This finding of a virtual absence of a positive impact from insecticide seed treatments was already underlined in March 2014 by the American Center for Food Safety. The latter had identified nineteen published studies showing no significant increase in yield, against only four suggesting productivity gains.” (Jean-Marc Bonmatin, (40)*

In short, it's disinformation.

At the end of the CFS article, there is an interesting mention:

*« This report was made possible by generous funding from: Ceres Trust, Harriet Crosby, Bellwether Foundation, & Cornell Douglas Foundation. »*

After a little research we find:

- Ceres Trust is a foundation funding various initiatives against pesticides. Its tax return informs us that the foundation had more than \$ 2.7 million in turnover and net assets of \$ 15.69 million in 2016 Interestingly, we observe that almost all of the contributions (\$ 2,002,752 ) come from founder Judith A. Kern (\$ 2M). According to the Genetic Literacy Project, Ceres Trust has notably contributed, since 2012, \$ 1.8 Mn to the Center for Food Safety, \$ 1.5 Mn to Pesticide Action Network, \$ 270,000 to Friends of the Earth...<sup>22</sup>
- Harriet Crosby: Friends of the Earth<sup>23</sup> board member, founder and leader of Fox Haven Farm<sup>24</sup>, anti GMO activist ...
- Bellwether Foundation, the object of which would be "to improve the quality of life of the inhabitants of Saint Louis by supporting innovative programs that have a positive impact on present and future generations. »According to CauseIQ, the institution would have spent \$ 4.6 million in 2019 and would have assets of \$ 56.9 million and mainly focus on the promotion of art...<sup>25</sup> According

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22 <https://anti-gmo-advocacy-funding-tracker.geneticliteracyproject.org/ceres-trust-the/>

23 <https://foe.org/blog/2014-10-great-granddaughter-of-general-mills-founder-urges-c/>

24 <https://foxhavenfarm.org/our-team/#board-of-directors>

25 <https://www.causeiq.com/organizations/the-bellwether-foundation,222635309/>

to the Genetic Literacy Project, they do not would not specifically support the fight against GMOs, offering only general support and would have given between 2012 and 2015, \$ 545,000 to anti-GMO initiatives, including \$ 90,000 to CFS.

- Cornell Douglas Foundation, is a foundation investing in various projects, in particular environmentalists. According to the Genetic Literacy Project, they donated \$ 768,000 between 2012 and 2016 to anti-GMO / pesticide initiatives, including 55,000 to CFS.

So we have a militant association, receiving very important funds for its militancy producing a report which has no scientific interest, but which nourishes this militancy and is taken up without distance, like a transmission belt, by S. Foucart... You see that we are at a level of “conflict of interest” which is a few order of magnitude more important than those denounced by the journalist. However, the latter presents the report as a reference on several occasions... Double standards.

**d. « The task force on systemic pesticides » 2018**

The author also refers (we guess, since he rarely quotes precisely) to this study:

*Furlan, L., Pozzebon, A., Duso, C. et al. An update of the Worldwide Integrated Assessment (WIA) on systemic insecticides. Part 3: alternatives to systemic insecticides. Approximately Sci Pollut Res 28, 11798–11820 (2021). <https://doi.org/10.1007/s11356-017-1052-5>*

This study is part of the work of a group of scientists, formed in 2009 on the common belief that the NNIs are responsible for a collapse of the entomofauna:

*“[Based on existing studies and numerous field observations as well as overwhelming circumstantial evidence, they came to the hypothesis that the new generation of pesticides, the persistent, systemic and neurotoxic neonicotinoids and fipronil, introduced in the early 1990s, are likely to be at least in part responsible for these declines.]” (van Lexmond et al. 2014)*

If the words seem measured, the name of said collective does not leave too many ambiguities: "Task Force on Systemic Pesticides" (TFSP)... Note that the president of this group, van Lexmond, is one of the founders of the World Wildlife Fund (yes, like in WWF). The neutrality of the organization is questionable to say the least.

As for the study itself, it never refers to agronomic variables. They only report very partial elements of the studies: did they observe differences in yield or not for a

given crop depending on the context (climate, soils, etc.)? The section "Neonicotinoids and crop yields" is just a listing of a few studies. First, they start with a warning:

*"Little information is available on the performance of NNIs on yields of [treated] crops. "*

Farmers would therefore spend billions of euros on products of which they would not really know the effect... In short.

The researchers apply a method of reasoning which is perhaps suitable for toxicology, where it is a question of studying the effect of a molecule on the environment to limit the damage, to agronomy, which has for purpose of evaluating the potential benefit of a treatment.<sup>26</sup> There are endless ways to misuse NNIs, listing them all does nothing (except for a manual on how not to use them). It's a bit as if, for a drug, we were studying a lot of bizarre uses (Ex: does aspirin work against an asthma attack? Does it work on a blister? Fracture?) and, considering that many were not effective, we ended up concluding that they should not be used at all... Finally, we do not know their method of review: how did they select their studies? How do you know if it's not cherrypicking?

We also observe dubious reasoning:

*"In Italy, implementing IPM<sup>27</sup> would result in at most about 4% of corn crops being treated with insecticides (Furlan et al. 2017). This means that 96% of these fields would not require any insecticide treatment." (Furlan et al. 2018, p.11800)*

It's like saying the measles vaccine is unnecessary for over 99.99% of the population, because there are only a few hundred cases a year. We are talking about preventive and insurance treatment, which grants collective protection... like a vaccine.

But let's look at the studies they produce:

- The study by Hokkanen et al. 2017, which was also presented by the journalist (30), observing that in Finland, there would be a correlation by province between the decrease in rapeseed yields and the use of seed coating. Here, we do not directly observe the effectiveness of NNIs, there is no decent control of the variables (what about changes in regulation? Land use?), The interpretation of

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26 This reminds me a lot of the fallacious reasoning of Didier Raoult, who defended the effectiveness of hydroxychloroquine against COVID-19, because the molecule works well against malaria... He suggested that there was a kind of curative power absolute HCQ demonstrated by its utility, similar to Furlan et al. (2018) suggests that there would be absolute ineffectiveness of NNIs.

27 Integrated Protection Management. Note that this is again a lie, IPM, assuming to apply only what is necessary, does not exclude the use of NNI.

trends is questionable at best<sup>28</sup>, etc. In the most lenient interpretation<sup>29</sup>, this study means at most that we have to be careful with NNIs on honey crops ...

- Budge et al. (2015) would show that rapeseed yields would not be significantly increased by coating and that there would be a correlation between the loss of bee colonies and the use of NNIs. The second point is irrelevant for the present topic (yield). On the first, the study's authors write unambiguously, “*We also provide the first evidence that farmers who use seed coatings reduce the number of foliar insecticide applications and can reap an economic return.*” We find what I said above: NNIs have replaced other pesticides. To assess the effectiveness of NNIs, it is necessary to monitor the use of other pesticides.
- According to Furlan and Kreutzweiser (2015), “*citing different papers from field trials*”, the effects of coating on grains would be negligible, mainly due to the fact that the majority of pest populations are low. The authors here actually cite their previous paper for the TFSP. I'm just going by stressing that it's pretty normal that NNIs don't add much in the absence of pests to kill ...
- Nogueira Soares et al. (2017) would have shown that “*thiamethoxam improves the physiological performance of melon or watermelon seeds treated with NNI.*”
- Tamindžić et al. (2016) would have shown that three commercial formulations (Poncho, Gaucher and Cruiser), reduced the germination of treated corn seeds.
- Deguines et al. (2014), having studied the evolution of 54 French crops over 20 years, observed that the benefits of agricultural intensification are inversely proportional to the dependence on pollinators and that the benefits of agricultural intensification would be offset by the reduction in pollination. It's not about the effectiveness of NNIs, I'll pass.

Not only do they put studies that have nothing to do there (eg both on germination), but in addition we find what I said above: the process does not make sense. For example, Tamindžić et al. (2016) criticize commercial formulations, namely: isn't it enough to add coating “boosters” (which is done a lot) to counterbalance germination problems? Or is it not just a problem with the production process? This does not say anything about NNIs in general: that the coating can be badly done is not really a scoop.

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28 The central charts in their analysis (Fig. 4-5) clearly has no meaning. For example, the one from which they deduct an increase until 1993 and a decrease after (so that it can be attributed to the NNIs), actually reads as a large plateau (perhaps slightly bearish, which seems to go from about 1, 4 t / ha to 1.3 t / ha) with a peak between 1989 and 1992... It seems that this is the only basis for dating certain decreases to 1993 and therefore to trace a vague correlation with the arrival of NNIs.

29 And that's not rhetorical, the study looks really dubious.

Note that most of the paper is in fact dedicated to "alternatives" (the relevance of which we can greatly doubt<sup>30</sup>). This does not say anything about the effectiveness of NNIs. Last important point: this is an environmental science and pollution review, not agronomy. However, its purpose is strictly agronomic...

So, in the end, we have a paper which says basically nothing on the question of the effectiveness of NNIs, which does not prevent Jean-Marc Bonmatin from presenting it as follows:

*"The first lesson from this synthesis of available knowledge is that in the vast majority of cases, the use of these substances does not increase agricultural yields" (40)*

Note the nuance that allows it to say something that is not necessarily wrong (if there was no deadlock, NNIs simply replaced other insecticides and therefore did not increase yields), while making it clear something quite wrong (NNIs would be useless). Thus, there are two slips here:

- a shift from *"NNIs do not always increase returns"* to *"NNIs rarely increase returns"*;
- we pass from *"NNIs do not increase returns"*, which is not necessarily wrong from a certain perspective<sup>31</sup>, to *"NNIs are useless"*, which is absolutely wrong.

#### ***e. The alternative: the Furlan mutual fund***

One of the heart of S. Foucart's criticism of uselessness against the NNI is the existence of much more viable alternatives. He thus evokes several times an experiment set up by Furlan in Italy (37) (46). It is therefore interesting to dig deeper. Note that the only trace I have found is in the article we just discussed (Furlan et al. 2018). There was no dedicated publication.

Furlan and a group of maize producers (representing 47,558ha) had set up a fund, to which farmers paid on average 3.3 € / ha, which compensated in the event of pest damage. The obligations were as follows:

- Contract signed within 7 days after sowing

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30 It is easy to present a practice as an alternative. These beautiful ideas are often inspiring, but very rarely pass the test of practical reality.

31 If you put NNIs on a crop that doesn't need it, you won't get more yield... Ditto if you replace pesticides that were already managing pests well. At the risk of repeating myself: they are tools and, like all tools, they are useful in some circumstances, useless in others. A fork might be a very practical tool, it is still useless to eat a soup.

- Implementation of good cultivation practices
- Implementation of directive 128/2009 / EC
- Implementation of the suggestions of the “Annual Crops Bulletin”

We note that it is very vague. The only clear data seems to be that they do not use coating insecticides. The experiment would have lasted two years (2015-2016). In total the fund took 160,335 € and only 83,863 € were compensated to the farmers.

Three elements are immediately suspicious.

- First, the lack of publication: the study itself has not been published. Strange for a revolutionary find of this magnitude, right?
- Then, the cultivation practices used are not specified<sup>1</sup>. Haven't farmers just replaced NNIs with other insecticides?
- Finally, the amount seems ridiculously low. The yield per hectare of grain corn is around 9 tonnes in France, with a price per tonne hovering around € 150. By rounding down to € 1,000 / hectare, we obtain a turnover of over € 47 million for the farmers studied. The pests would therefore have represented damage of around 0.18%... I would remind you that, for beet growers in 2020, the overall losses (NNI + drought) were 23 to 30% (ITB 2020). We are not really on the same orders of magnitude... It is all the more "surprising" that the risks covered by insurance are not limited to damage from pests, but also include risks related to bad weather, wildlife (wild boar, crows) and diseases such as Fusarium wilt.

When you dig deeper, it's even worse: everything falls apart.

The researcher will do a kind of simulation of the differences between several strategies (mutual fund with and without IPM, compared to the use of NNI) in terms of the price of pesticides, etc. We see that all these estimates are entirely “wet finger”. It begs the question: Didn't he have hundreds of farmers in his fund that he could have asked about the price of pesticides and IPM? Furlan does not produce any other figures, it is as if compensation was the only variable that was observed.

We must also ask ourselves the credibility of this indicator: how was this compensation managed? We all know that insurance companies often put in place a wealth of restrictions and procedures to limit the payment of risks as much as possible. Were the farmers asking for compensation? Were they granted easily? The vagueness of the conditions could have made compensation impossible: it would suffice to identify a practice contrary to one of the three imposed standards ("good cultivation practices",

directive 128/2009 / EC, suggestions from the "Annual Crops Bulletin") to deny compensation.

Finally, there is also a serious alert: how was compliance with the specifications monitored? How have a few researchers been able to monitor the agronomic practices of more than 47,000 hectares of crops? All this even as the article betrays the fact that the researchers did not even know the volumes and prices of pesticides used by the "studied" farmers.

Finally, the study covers only 2 years; it does not provide information on the pressure of pests or not and does not take into account the cover against infestations of neighboring crops. Being surrounded by treated plots also protects you, limiting pest pressure.

Anyway, is it really any wonder that the study itself was never published?

## **2. NNI and farmers**

As you have seen, S. Foucart does not provide any convincing evidence to justify his categorical assertion, the uselessness of the NNI. This is all the more obvious when you listen to the agricultural world.

### **a. NNIs are not systematic!**

First, farmers do not consistently use NNIs. They only use them if they feel they need them. Thus, they may not apply treatment to some crops and put it on others. For example, Hector explained to me that they used NNIs on rapeseed, but not on corn:

*"- It was not the same insects that were targeted. The semi period is not the same either. Historically, I had no pressure on corn that justified using coatings. "*

David did not use it on corn or wheat, because it did not have enough pests to justify the additional cost, probably because it is located in the Massif Central:

*"- And there are no aphids in those regions?"*

*- There probably are, but for us it's not a problem. Afterwards, for us, mountain breeders. You would contact colleagues, well now there are more, who were making beets in the plain of Limagne (beetroot, corn seeds)... they were on they used NNIs, there is no problem. " (David)*

As we said, NNIs are not some sort of magic solution that would always increase returns. It is a relevant tool in some cases and not in others, like all tools. This does not prevent it from being able to be formidably effective in the right contexts.

## **b. Indisputable efficiency**

None of the farmers interviewed questioned the effectiveness of NNIs and all users praised them. This would have been most evident last year, when aphids, taking advantage of the ban on NNIs on beets (among others), infested the fields. According to Arthur, the yield loss would have been 30% on average and could go up to 70%, even with an irrigation system (since the year had also been very dry).

*"So someone who tells you that neonicotinoids are not effective or are counterproductive..."*

*- Ah well, he's a liar. I see it, it's day and night.*

*- OK. How long did you see it after? When did you see your first drop in yields? [...]*

*- I remember, during this moratorium period, I tried, in certain fields, a coated variety [with NNI] [...] and next to a variety without. Yeah, you were losing 20% of your plants... It was clear." (Etienne)*

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*"Last year I did 75 tonnes [of beets per hectare], because of jaundice, when we should have done 100 tonnes. [...]*

*At 25 euros a tonne, you need to do at least 85 tonnes on average to make money. [...] The grubbing is worth a minimum of 250-260 € / ha, so it is not neutral. The seeds are very expensive. [...] We are around € 300 of seeds per hectare. [...] There are phytos, there is tillage... There is also the availability of land... [...] Beets, I ask myself the question. It's interesting because, agronomically, I can't just make wheat, it's not possible... [...]*

*So today, why I keep beet culture... it's also because there are factories nearby, I'm also convinced that our sugar, we have land to make them, when we make 100 tonnes per hectare of beets is not neutral [...]. A few days ago the [advisor] from Tereos came to ask me what I wanted to do<sup>32</sup>, that's when she told me that I still had two years of commitment, I told her said, I do not do more, I do the same, I do 8.5 (hectares) [...], on the other hand, I need the means, that is to say that if I do not have neonicotinoids and I take a header like last year or like others who made 30 tonnes [per hectare] in other regions, if I don't have the neonicotinoids, I stop. [...] If they don't give us the technical means to make a profit... I'm not going to take a header for fun. It's not possible, I don't have the capacity to take a header with beets." (Ferdinand)*

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*"Yes I use them, I use them [NNI] as much as possible.*

*- Do you see a difference, compared to when you don't use them? [...]*

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32 They can change the quantities to be produced a bit if I understand correctly. Thus, co-operators who want to produce less or produce less can pass on their right to produce to others.

- Since it was forbidden in wheat, I have been invaded by leafhoppers every year. [...] <sup>33</sup> As for the aphid, last year there are plots where I [didn't apply coating because insects infestation] was far below the threshold. And well, last year I got into these loopholes... We do harvest yield mapping. As soon as there is a [plot where I didn't use insecticide], we fall to 50 quintals whereas these are plots that have 95 minimum potential without forcing. These are aphids.

Late virus infection is observed. Because aphids aren't just bad in the fall. If you leave a small population all winter long, behind it is a nuisance. It is characterized by late virosis. I have two [plots] next to each other last year. One that I treated, one that I didn't, I have 25 quintals left. The two pieces were held in much the same fashion from A to Z. [...]

- What were you using NNIs on?

- On beet, all the beets. We have a waiver this year, so I'm using them again. Not so much for aphids. I didn't see aphids as the first element [problematic pest] the day they banned it. For me what was going to be problematic, and I still think it will be problematic in the future [...], it is the underground, it is all that is in the ground. Wireworms, blaniules... there are plenty of bugs [...] things that no farmer has known<sup>5</sup>, because chemicals have been used since the 1970s to control them. We used Curaterre, we used Temik. We put that... The farmers were told at the time "it's bad for nobody", we used it with bare hands, without protection, we put that in the sowing line... [...] The NNI compared to this was a breakthrough. [...]" (Igor)

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"When you experiment with and without and you see that without the culture is ravaged and that there is no problem with it, it's visual enough that you don't need another argument to believe it. The same in cereals. When you have aphid on wheat or barley and your crop catches jaundice, your plants do not develop and then, when spring arrives, everything is yellow and there is nothing growing and only half of your parcel is [metaphorically] burnt, you realize that the product, the gauchon, still had its effectiveness..." (Nicolas)

### c. **The ecological advantage of NNIs**

Beyond the purely insecticidal interest of NNI, there are also several advantages linked to its mode of application: coating. This makes it a very precise insecticide (compared to other insecticides) which, on the one hand, spares farmers, who no longer have to spread, and on the other hand (largely) non-target insects, including the famous "culture auxiliaries"<sup>34</sup>. Authorizing NNIs on beets also has an agronomic advantage: diversifying crop rotations.

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<sup>33</sup> This year, he didn't have leafhoppers, but aphids.

<sup>34</sup> Insects helping pest management. Example: ladybug and hoverfly against aphids.

## A precise insecticide

The fact that the pesticide is inside the coating greatly limits the exposure of farmers, who do not have to handle hazardous products and spray them. This is a theme that Igor has developed a lot:

*“I remember my dad using a bad smelling product a lot. It was Karate-K at the time [1980-90?]. I remember at the time, farmers were not told the product was risky. He had to watch us and had a spray to do. He put us on the spray and he was in the tractor, we were in a cage, but we were on the spray. When there was wind in the wrong direction, well we ate the product. [...] I remember he treated the same plot up to 5 times. Since the neonics, me today the plot, I treat it twice<sup>35</sup>. We still have the potential for harm if we continue to mismanage populations. We can still increase the treatments. [...] If we ban them and the beets remain, the beets will have a minimum of 5 passages [if there are aphids as in 2019-2020]. In the best case. If we want it to work.” (Igor)*

He also explains to me that NNIs are interesting because they are selective:

*“One glaring thing [in the 1990s] was that an insecticide sometimes does more harm than good. Because insecticides [foliar] are not very selective. In general, when you put an insecticide, it kills everyone, it kills all the insects. And that there are plenty of insects out there, but they're not harmful. And that if we kill everyone, well, the first to come back, it will be the pest of the moment against which we want to fight. And that he will have all the room for him. All the strata will be unoccupied, so it can go everywhere. Whereas if we do not make the insecticide, 90% of the strata will already be occupied, where it will not be able to take hold, because there is already someone and to fire someone is not easy. And suddenly it will be less harmful if we do not use insecticide than if we do. It's not easy to assess that<sup>1</sup>. When the need arises, I observe a lot. I have yellow pits, I'm going to see the insects in the ground... This is a huge observation, way more than average. When I feel there is a risk, I go and I have a very high risk tolerance when it comes to bugs.*

*- And yet you used the NNI?*

*- And for me the NNIs It is the most insecticide... it is one of the few insecticides that is selective. All the others are not selective for me. NNIs coat the plant... the only critters that will be impacted are those that will try to eat the plant. Apart from the insects which feed on the pollen if the plant is very small and the dose of NNI is too high, which could have happened for sunflowers, for corn... But for example, in wheat it bothers no one. Flowering, no one or almost no one picks it up. It's not embarrassing.<sup>36</sup>” (Igor)*

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35 Précision de l'intéressé : « avec l'usage des néonicotinoïdes la majorité du temps je ne fais pas d'insecticide. L'année exceptionnellement compliquée, j'en ai fait 2” »

36 He added, “And for me NNIs are the only selective insecticides, which means you choose what they kill. The others are sprayed on, and impact everyone they touch, and you can't really choose who you

## **The benefit of global pest management**

Igor also explains to me that there is also a global logic to crop protection:

*“Beyond that, all the bugs in general, it is managed, not at the level of the plot or at the very very local level. We manage global populations. You even have to see that at the French level. We manage global populations and the fact of not putting neonics on wheat. The fact of having banned NNIs everywhere, not only on beets, also on cereals, it allows aphids to remain on wheat without being harmful. So we leave the population, the population increases. Instead of starting from 0, it starts from a good minimum. And suddenly it explodes... the population increases are exponential and suddenly it becomes harmful the more quickly there is an important tank end.” (Igor)*

He takes the example of flea beetles that are said to have ceased to be managed because some products have been banned and they have become resistant to others. They would take the opportunity to proliferate from the west:

*“Little by little, they are gaining ground, whereas {if we had} [...] had the tools to manage them properly from the start, their nuisance would have been limited to the west of France, and we would put in product that 'there, and there today, I have flea beetles on rapeseed, sunflower, beet... I have damage on these three crops. And damage that can go... rapeseed, it can go as far as the disappearance of the crop if it is not treated [...]; sunflower, it goes until a total loss of the feet [...]; and beetroot, [...] there is a small loss of yield up to 15-20% of the plants can be lost.” (Igor)*

## **Beets and agronomy**

Finally, beet, which is the crop which seems most endangered by the ban on NNIs, has interesting characteristics for diversifying crops and organizing the farm. First, planting different crops at different times of the year helps control weeds. This is called rotation. François told us the principle:

*"Do you use it like a natural herbicide, actually?"*

*- No, it's to break the cycle. It prevents you from ending up with problems that you cannot handle. [...] Rotation does not prevent vulpines from existing, it prevents them from overgrowing so much we can no longer manage them. Since they grow together with the crop, they can end up killing the crop completely. We then speak of a "dead end": this is when we have sown, but cannot to reap. [...]*

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*touch or really at the margin with the treatment schedule. The NNI by coating the seed, only impact the insects which bite, suck, bite the plant. Of course, they can impact those who forage for pollen, which happened when NNIs coated rapeseed, corn or sunflower, but this has not been the case for years. When they were banned [2016] they only coated cereals and beets. Neither is foraged. But during the development of the place they do not impact the insects which will not annoy the plant while the aerial treatment with another product will impact. "*

*You can easily get overwhelmed. We let a [vulpin, a weed] pass, the next shot we don't have one, we have 100, and the next shot we have 10,000, so it quickly becomes unmanageable. That's all the point of rotations.” (Baumann 2021, p.49)*

Rotation is also an organizational asset. This allows work and management of manure stocks for breeders to be better distributed over the year:

*“If you produce 15,000m<sup>3</sup> of slurry and only have 5,000m<sup>3</sup> to store it, you have to empty it three times a year.” (Ferdinand)*

Other crops could play the same role as beets, but they all have downsides:

*“The CAP forces us to make peas. This year was the disaster in peas, I think they made 30 quintals for the best. [...]*

*Then you have to go to the vegetables... but I have 8 ha of beets which I do quite easily, which I do on my own. If I had 8 ha of vegetables I would never do them on my own. [...] It's too much manpower, it's too much [...] risk, investment all that. [...] We are starting to see a little sunflower.” (Ferdinand)*

The potato seems interesting, being able to bring in significant sums, but there are several difficulties: it requires a lot of material, would break the structure of the soil and impoverish the land. (Ferdinand)

Finally, beet also has an agronomic advantage, particularly in soil conservation agriculture.

*“Beets are not a legume, but they work the soil differently. Unlike wheat, which has roots that go to... they are microfilaments that will go 3-4 meters deep. The beet will be a big pivot that will destroy the surface surface of the soil. [...]*

*- It's like radishes in cover crops?*

*- Exactly. [...] In deep soils we don't give a damn, but there are plots with pebbles and clay, for which it is interesting from an agronomic point of view.” (Ferdinand)*

I will come back to this very interesting topic a little later. Finally, there are a multitude of other interests in beet cultivation: the pulps then make feed for livestock, they are essential for making industrial dehydrators viable, which would make alfalfa less profitable. In short, an entire agro-industrial fabric would be torn apart.<sup>37</sup> In addition, they could become more and more interesting with the increase in demand for biomass for methanizers.

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37 <https://seppi.over-blog.com/2020/08/betteraves-a-sucre-et-etat-de-catastrophe-escrologique-voici-a-quoi-on-echappe.html>

#### **d. An agricultural world defending beet NNIs**

Almost all of the farmers were in favor of re-authorizing NNIs on beets. As was the FNSEA (the main syndicate) and the rural coordination<sup>38</sup>. Only the peasant confederation is opposed to it<sup>39</sup>. This is also what came out every time the subject was brought up. For example:

*"- Did you use neonicotinoids?*

*- Not only have I used them, but I defend them, compared to what we had used previously. NNI is a great product, because it is incorporated into the seed. [...] I don't know if you see a beet seed [...], it's a very small star. It's 3 mm in diameter [...]. [...] When you add up what we do in NNI, it's 50 g for one hectare, 10,000 m<sup>2</sup>! In the past, before the NNI, we put 15 kg of Temik. It was a product, it killed worms. And we put on the row of beets. [...] Today, it's [the NNIs] only on the seed. So it's tiny. And leave us alone, there is no bee in the beets, there is no flowering, there is no flower, there is no effect on the bees. [...] What nonsense is it?" (Bernard)*

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*"For me it is an aberration to have removed them. We put in such a low dose... When we compare to the dose of insecticides we put in the open (field?). For me, removing insecticides today is one to two insecticides in the fall for wheat. For beets, the year it was deleted, I stopped because I saw that the alternatives were not working. I made two Teppeki<sup>40</sup>. [...] I have neighbors who did [several] Teppeki, it didn't work out either, we were all [staying] in the same boat. The Teppeki does not work sufficiently when there is a strong aphid pressure. The Movento<sup>41</sup> either. There is no product that is enough. NNI when you see the amount you put in and the impact it has on flora and fauna... Finally the question arises for a minute no more. When we observe a little... In wheat, when I make an insecticide, I see that my population of beetles, I have a lot less, I see that I had spiders before, the spiders they are dead... the insecticides have side effects. And when we had the NNI coatings, all these populations, they were there, they increased. And worse, that means that the partridges, which feed on all these critters, well they have more to eat, the pheasants are the same... It is in our interest to leave the NNI on all non-foraged crops.*

*- Did you read the studies?*

*- I read one in full, Chizé, I read passages from ITSAP studies, not all, I also read passages from Chizé, the CNRS, the History Museum natural, from what they did in common... I see that with me it does not happen at all like that. This is the first*

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38 <https://www.coordinationrurale.fr/interdiction-des-neonicotinoides-lue-fait-fausse-route/> ; <https://www.coordinationrurale.fr/derogation-neonicotinoides-la-cr-demande-un-assouplissement-des-conditions-trop-contraindantes/>

39 [https://www.confederationpaysanne.fr/rp\\_article.php?id=10472](https://www.confederationpaysanne.fr/rp_article.php?id=10472)

40 Le nom du traitement, un pyridine-carboxamide.

41 Le nom du traitement, un kétoénole.

point<sup>42</sup>. I note that most of the ITSAP studies focus on things we weren't allowed to do before the NNI ban and that they have continued to study these things when we weren't. no longer had the right to do them<sup>43</sup>. Coating of sunflowers, coating of rapeseed... [...] Indeed, if we put NNI at doses that we have never put in the fields around rapeseed, which is a foraged plant, and that rapeseed is not big and stuff and that we simulate in the lab, indeed, the bee that eats it will be disoriented. But even the ITSAP studies at the time (2015), the last ones I haven't read, [...] the things they put in the studies, it was not practicable in the fields, it was not possible." (Igor)

#### e. **Summary**

Let us resume:

- It is true that NNIs are not always useful. For example, when the pressure from pests is not sufficient to justify their use or if the farmer has been able to put in place an agronomic solution to reduce it. In fact, when it does, farmers simply don't use these pesticides.
- Just because a farmer uses NNI for one crop does not mean that he uses it for all. Systemic insecticide does not mean systematic insecticide.
- NNIs are crucial for beets. All of the beet growers I interviewed used NNIs.
- Farmer users have a very positive image of NNIs, in particular because of their selectivity. The others did not express an opinion.

Beyond all of these elements, one obvious question endangers the journalist's claims: If they were unnecessary, why would farmers use them? To address this problem and make his story credible, S. Foucart needs to neutralize the words of farmers.

### **3. The neutralization of farmers' voices**

How to explain, if NNIs were counterproductive, that farmers use them? To build his story, the author needs to neutralize the voice of farmers who are expressed particularly through newspapers, agricultural unions and social networks.<sup>44</sup>

To neutralize this popular saying, he uses two main types of mechanics:

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42 Context : he is also a beekeeper.

43 Commentaire : « les choses qu'ils mettaient dans les études à changer par les pratiques qu'ils essayaient dans leurs études étaient impossibles dans les champs, quel intérêt ? »

44 Note that on the one hand S. Foucart argues that EFSA should have taken beekeepers' alerts seriously about the effects of NNIs and on the other hand it neutralizes that of farmers on NNI assets. double standards...

- Describe them as trapped on the one hand because of the conflict of interest between sales and advice and on the other hand because of the grip of cooperatives.
- Assimilate farmers who express themselves to “agribusiness” or to relays mobilized by large companies.

We will start by reviewing the overall reasoning sold by S. Foucart, before delving into the question of advice to farmers, relations with agricultural cooperatives, then that the notion of “agricultural model” is in fact very vague. Finally, we will show how the journalist equates farmers with industrialists in order to remove the subversive dimension of their demands.

In general, to learn more about agriculture, I encourage you to follow the farming communities on Twitter (@fragritwittos and @agridemain) and agriyoutubeurs like David Forge<sup>45</sup>, Etienne agri youtubeur<sup>46</sup>, Thierry farmer of today<sup>47</sup> and many others.

#### **a. *The whole story: "the dominant agricultural model"***

According to the journalist, farmers are trapped in the "industrial model", notably because of the incentives for cooperatives and councils to promote the use of pesticides.

#### **The explanation: the fable of the agricultural model**

To explain why more farmers do not adhere to the practices tested by L. Furlan in Italy, the journalist writes:

*“The Italian experience seems almost too good, too easy. Especially since farmers spend a lot of money on treatments... Why did such an initiative wait thirty years before seeing the light of day? “In Italy, the companies that provide technical advice to farmers are also those that sell them pesticides,” replies Lorenzo Furlan. And we constantly tell them that they will lose their harvest if they do not use these products...” The same observation holds true for France: all the parliamentary reports on the subject highlight this institutional conflict of interest which leads to mechanically upwards the use of phytosanitary products. In France, agricultural cooperatives are the masters of the game.” (37)*

*“The literature review conducted by the researchers asks: why do farmers spend large sums on chemicals that are mostly unnecessary? “The reason is a structural*

45 <https://www.youtube.com/channel/UC3l2JpG0vN8xMkvvfCwavcQ> ;

46 <https://www.youtube.com/user/TheApeNNIns3>

47 <https://www.youtube.com/channel/UCKpXbgTztfWrrNLx4w1EYKw> ; he also wrote a book which I think is very interesting: <https://www.agriculteurdaujourdhui.com/danslesbottes/dans-les-bottes-de-ceux-qui-nous-nourrissent-le-livre/>

*conflict of interest: technical advice to farmers is provided by those who sell them the pesticide treatments," Mr. Bonmatin summarizes. If this advice were provided by independent agronomists, the situation would be very different. »» (40)*

Note the connection with the L. Furlan study (which we have shown to be of no scientific value) and the idea of NNIs' uselessness. The latter cannot exist without this story. This myth is "continued" with a quote from a UNAF representative:

*"But farmers have little choice: it has become very difficult for them to obtain seeds that are not coated with pesticides – the content of which they do not necessarily know. Today, the cooperatives, to which three quarters of them belong, sell 70% of the seeds presented as genuine "all-risk guarantees" and dictate their way of proceeding. "Farmers depend on cooperatives and cooperatives depend on pesticides," said UNAF." (36)*

These elements are part of a recurring discourse: there is a "model" of "industrial", "dominant" agriculture that is opposed to organic agriculture. This idea is detailed in the article on the "paradox of the red queen":

*"In reality, the dominant agricultural model seems subject to the paradox of the Red Queen. In a famous scene from Lewis Carroll's book Beyond the Looking Glass, the Red Queen explains to Alice that in the world she has landed in, you have to keep accelerating to stay still. Agriculture is embroiled in a similar frenetic race to stand still. As time passes, each new innovation produces ever weaker beneficial effects and ever greater damage, which are in turn corrected by other innovations, also coming with their externalities... As a result, returns only stagnate. 'at the cost of endless chemical and technical escalation.'" (27)*

### **A story with multiple authors**

Note that, if we have spoken of S. Foucart, this story is in fact quite widely repeated. It can be found in the introduction to the WIA of TFSP<sup>48</sup>:

*"Although systemic pesticides can be highly effective at killing pests, there is clear evidence from some farming systems that current neonicotinoid use is unnecessary, providing little or no yield benefit. Agrochemical companies are at present the main source of agronomic advice available for farmers, a situation likely to lead to overuse and inappropriate use of pesticides." (Van Lexmond et al., 2015, p.3)*

So it's a story written by many hands.

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48 Task Force on Systemic Pesticides

### **A dubious story**

First of all, we observe that the author only bases his assertion on opinions. The researchers concerned<sup>49</sup> do not present any study on which to base their arguments. However, there are several innuendos that seem questionable:

- Pesticides would be more and more toxic and the agrochemical industry would push in this direction
- Farmers would make most of their phytosanitary choices on the advice of pesticide vendors. What about specialized magazines? Decision support software? Agricultural cooperatives? Think tanks? Colleagues? Chambers of agriculture?
- Admitting that this is the case, what would prevent farmers from switching providers based on the results? All consulting professions (doctors, lawyers, etc.) have an "inefficiency premium": often the less effective they are, the more they are needed (that's one of the problems of agency theory). This is solved simply on the one hand because of professional integrity<sup>50</sup> and on the other hand because of the competition: the badly advised person will simply stop working with the dishonest consultant (and probably speak badly about him or her).
- Admitting that there is an influence, would it be such as to rise the demand for pesticides?

Indeed, it is the overall consumption of neonicotinoids that the journalist is talking about here. We would therefore need a huge influence, the specific purpose of which is to sell precisely these pesticides. In addition, this grip should make it possible to conceal the so-called alternatives, the merits of which the author praises to us. If the vaunted model was so virtuous, why is it not better known? There is nothing to prevent word of mouth and there are many networks of farmers. If that worked, the practice would "spill out" quickly.

The mere fact that there is no source for obviously dubious material is enough to indicate there is manipulation here. However, I wanted to go further and explore the subject by interviewing farmers.

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49 Note that you find them a lot, especially J-M. Bonmatin, among the people mentioned or questioned by S. Foucart.

50 It should be remembered that this has been demonstrated in particular by the psychopathology of work (Yves Clot, Marie-Anne Dujarier, Christophe Dejours, etc.): people generally want to do their work "well", with quality criteria that can conflict with those of their management.

## **b. An agrochemical industry pushing toxicity?**

Farmers told me a lot about the fact that they had less and less molecules available, less and less solutions to respond to infestations. S. Foucart's speech, alleging that industry is developing increasingly toxic molecules, may therefore come as a surprise. In fact, S. Foucart bases this claim to a large extent on a “study” which observed that the “toxic load” would have been multiplied by 48 between 1990 and 2014, almost exclusively because of the NNI, which would represent 92% of the “toxic load” over this period. (Dibartolomeis et al. 2019) (53) (54) (55)

These researchers created an indicator, the acute toxicity load of insecticides<sup>51</sup> using the mass of insecticides sold in the United States and the LD50 oral toxicity to bees as a benchmark<sup>52</sup>, as well as the environmental persistence of pesticides.

However, the amount of product you put in does not say anything about the amount of product that will reach an insect or an animal and almost all coated NNIs will simply degrade in the ground. On the contrary, during foliar application, the product sprinkles on all the insects present or which will subsequently come into contact with the product. We have a study that does not really have a scientific reach, but has a media impact.<sup>53</sup>

In fact, pesticides have an improving ecotoxicological profile, because the standards are more and more demanding and the products are increasingly safe. Thus, approximately 70% of the substances authorized in 1991 are no longer authorized today. (Interview E.Pommaret) Moreover, we see it on the graph proposed by Dibartolomeis et al. (2019): organophosphates fell from around 34,000 tonnes in 1992 to around 12,000 tonnes in 2014; and N-Methy carbamate from about 8,000 tonnes to about 1,500 tonnes over the same period. However, these pesticides tend to be relatively dangerous for humans<sup>54</sup> and many molecules belonging to these groups have been removed.

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51 Acute Insecticide Toxicity Loading (AITL)

52 Ce choix n'est pas justifié : « [Dans notre travail, nous utilisons la toxicité des abeilles mellifères comme indicateur pour d'autres abeilles et insectes utiles sur les terres agricoles des États-Unis, car les données disponibles semblent démontrer que l'abeille mellifère est sensible à la toxicité des pesticides chimiques et l'insecte possédant l'ensemble de données le plus complet disponible. Jusqu'à ce que davantage de données sur d'autres insectes soient disponibles, l'utilisation de l'abeille mellifère comme indicateur pour d'autres espèces est une approche raisonnable pour montrer comment les charges de toxicité des insecticides ont changé au fil du temps] » [je traduis] Ils n'utilisent que la LD50, pourquoi auraient-ils besoin de plus de données ?

53 Note that the study was founded by the oldest environmental NGO, Friends of the Earth, that one of the authors is a scientist from the organization and that the other 4 authors were paid by the NGO... (see declaration of interests <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0220029>)

54 <https://www.msmanuals.com/fr/professional/blessures-empoisonnement/intoxications-empoisonnements/intoxication-par-les-organophosphor%C3%A9s-et-les-carbamates> ; [https://fr.wikipedia.org/wiki/Intoxication\\_aux\\_organophosphor%C3%A9s](https://fr.wikipedia.org/wiki/Intoxication_aux_organophosphor%C3%A9s)

"Agrochemicals" are developing more and more solutions to manage pests while minimizing the ecological impact. Eugenia Pommaret, Director of UIPP<sup>55</sup>, for example told me about biocontrol<sup>56</sup> and pheromones:

*"[Take the example of pheromones. They can be used in integrated crop protection to perform insect counts. Thus the farmer detects the presence and quantity of insects. If the infestation threshold is reached then an intervention is triggered. Conversely, if it doesn't pass that point, the use of insecticide is not necessary. This practice makes it possible to reduce the quantity of treatments by identifying the presence of the insect and by verifying whether the nuisance threshold is reached or not.] "*

This practice would be very useful for "integrated pest management"<sup>57</sup>.

*"[Integrated pest management is nothing new. INRAE and the technical institutes have worked a lot on this principle and this work continues.] The first examples that I have in mind are the larvae of ladybugs to control aphids or the use of trichogramma. This technique is used to control the [corn borer](#), a caterpillar that ravages the ears of corn. In the wild, natural pests of moths, microwasps, have been observed.] They lay their eggs in moth eggs. So they will completely wipe out the corn borer at the egg stage and prevent the borer population from having adverse effects on corn. [This technique has been around for over 30 years and is widely used.] "*

However, these products would also be subject to an expensive authorization process:

*"[Just because it's a natural solution doesn't mean it's not without risk. Authorization procedures before placing products on the market exist precisely to ensure that crop protection solutions do not present an unacceptable risk to humans or the environment under the recommended conditions of use. The authorization processes are indeed long and expensive, but this is precisely to ensure that the solutions that will be placed on the market offer the necessary guarantees of efficiency and security.]"*

The director even considers that, "perhaps in the future", we will no longer speak "of insecticides, but of insect repellents, that is to say, of substances, based on what is already done naturally, which could ward off insects [...], without necessarily killing them." Farmers are said to be using more and more [biocontrol](#) products, the share of

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55 « Union de la Protection des Plantes et des cultures » ; le syndicat des fabricants de phytosanitaires. <https://www.uipp.org/>

56 <https://agriculture.gouv.fr/quest-ce-que-le-biocontrôle>

57 "The concept of integrated pest management was developed in the late 1950s, following the problems created by the widespread use of synthetic pesticides. Its original principle stems from a harmonious association of biological control methods with traditional chemical methods and a treatment decision based on the level of populations of harmful organisms in the plot considered." (Perron 1999)

these products having risen from less than 7% of phytosanitary sales in 2010 to more than 20% in 2020.

On this topic, Terre-Net writes :

*“Product sales in 2018 break down as follows: 63% natural substances, 19% chemical mediators, 11% macro-organisms and 7% micro-organisms. In terms of targets, insecticides and fungicides are the most represented with respectively 39 and 32%. Herbicides (16%) and molluscicides (6%) follow.”<sup>58</sup>*

We can also mention decision support software, which makes it possible to optimize production and therefore to use, at constant yields, fewer pesticides, and are a growing solution.

### **c. Influenced farmers? Advice and sales**

Let's go back to the first “level” of S. Foucart's story: farmers would be manipulated by sellers of phytosanitary products, who would push them so much for consumption that they would use NNIs when they did not need them.

After a little discussion with the farmers, we see 4 elements emerging that contradict this vision: farmers are entrepreneurs, who get training continuously, who experiment and who often seek to use as little pesticides as possible.

#### **Farmers-entrepreneurs**

First of all, farmers are entrepreneurs and agronomists, who need to limit their costs, the market having become very tight.

*“When you have a very significant return potential, everything has to be on top, maximum. When you make cereals with low potential, you manage the margin differently. Since you don't hope to do much, try to make sure it doesn't cost you too much in terms of treatments. We could do 2 fungicide treatments, we could add 3 nitrogen instead of 2, but all that comes at a cost. And your cereal, even if you put it in optimal situations, you will not make 100 quintals anyway. [...] If in the end when you harvest you gained 2-3 quintals, but you lost money for every quintal you produced, economically it is not profitable.*

*- And you don't have the cooperative that would try to push you a little more? Co-ops have an incentive for you to have higher returns, right?*

*- No. We coop... we don't have that problem. I don't know how it goes elsewhere, but it's true that I'm surprised when I listen to talk about "pressure from cooperatives"... no, we the coop, it behaves... even the private sector, eh, it will not necessarily seek to push to the maximum. Anyway today, the operator is a*

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58 <https://www.terre-net.fr/observatoire-technique-culturelle/appros-phytosanitaire/article/une-croissance-de-24-en-2018-216-150936.html>

business owner. If the speaker is trying to make forced sales on products he doesn't need, well, the speaker takes the door and someone else takes the place, eh. Today there is no one telling me what to put in the fields or how to do this or that. I am a business owner. When I need advice, I consult. [...] Then afterwards I decide what I want to do and what I think is best for my animals, for my cereals, for my wallet... I am not under any pressure. [...]

This is kind of what I often criticize. We are infantilized a lot. We have the feeling that the farmer is not an entrepreneur capable of making his decisions; that his decisions are necessarily dictated to him by Pierre, Paul, cooperation, Big Pharma or likes... Well, in fact today... [...] [Farmers] They are guys who are capable of running a business and they are capable to make their decisions.” (David)

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“Today the farmer will be happy with his technician as long as he [improves his income]. If there is a use of the product that is justified, that brings more yield, better quality or all the arguments that one could find... for me there is no problem, I use it. If the product doesn't help me and costs me too much, I don't see the point in double or triple doses.” (Etienne)

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“Farmers are treated a bit like idiots. If I don't need a phyto product, I'm not going to put it on, I don't give a fuck. I'm not going to use 4 fungicides because the technician tells me to use 4 fungicides. In fact, our technicians tend to underestimate the risk.” (Ferdinand)

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"Nah no, that's completely wrong, we're free to do whatever we want anyway. We are still our bosses at home. In my own system, I feel free anyway. No one forces me to put anything like treatment, pesticide or fungicide on my crops.” (Loic)

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“There was a time when, indeed, I think there was a time when they [consultant salespeople] were pressured. I'm not saying that's kind of what keeps them going, but still. Afterwards, I think the farmers who are not stupid. If you are going to see your wheat with your technician, that your leaves are super healthy, that there is no disease, that there is nothing and that your technician says to you "go ahead and treat", wait you go. look a little weird you're going to say to yourself "no but he really takes me for a gogole or what." Now farmers have education levels equivalent to or even higher than those of technicians. There comes a time, maybe in my father's or my grandfather's time, when necessarily... It was not already the same time, when we asked them to produce, because we had to produce a lot, and, between quotes without restrictions, that today the products cost so much to use, that if your technician says to you "go ahead, do it" and that it is not justified, there comes a moment when even he loses in credibility and next year, if your production costs compared to your neighbor are 1.5 times higher, there comes a

*time to ask yourself questions. And today the technician, and I speak for mine, has more of an incentive to sell you decision-support tools than to load you with products.” (Nicolas)*

This does not prevent them from sometimes not making the best decisions. For example, a farmer reminds me of a neighbor who followed what his consultant technician told him at the cooperative. After joining a group of farmers, he realized he could reduce the doses he was using drastically. They are not omniscient, agronomy is extremely complex.

### **Always-in-training farmers**

Farmers are trained through multiple channels: chambers of agriculture, cooperative training, adult training centers, specialized magazines (Réussir), farmers' groups (GEDA<sup>59</sup>, CETA<sup>60</sup>, BASE<sup>61</sup> or Cle2sol<sup>62</sup> association, etc.), Agroleague (an online community of farmers<sup>5</sup>) and even... social networks<sup>63</sup>:

*“Even I, a farmer, I discovered a lot of things via my fellow farmers on Twitter: productions that I had no idea, ways of producing that I did not know... Even farmers are far from knowing all the trades and all the ways of farming colleagues. [...]*

*Last year for example, I had a plot where the chamber had set up a trial, where there were several different varieties and where at the end, we compared each variety to find out which had the best wheat yield. , the best straw yield, which had behaved better in the face of disease... This is the kind of thing that can be implemented. Then there are more technical training in the classroom on different subjects.” (David)*

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*"How did you get trained in direct seeding?*

*- Agricoool<sup>64</sup> a lot, on the forum and then I went to the XX CUMA, which has direct sowing [material] and I started to sow... After I was also at an association, cle2sol [...]. [...] Afterwards, one cannot say that I am an expert in direct seeding. [...] An enlightened amateur, yeah.” (Julien)*

Likewise, David Forge presents his many sources of information: where he takes weather information, raw material prices, the plant health bulletin, newspapers (e.g.

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59 Groupes d'Étude et de Développement Agricoles.

60 Centre d'études techniques agricoles. <https://www.cetadeFrance.fr/qui-sommes-nous/histoire-des-ceta>

61 Biodiversité, Agriculture, Sol et Environnement. <https://asso-base.fr/>

62 <http://www.cle2sol.fr/>

63 La prévalence de ce mode de formation résulte probablement d'un biais de sélection

64 <http://www.agricool.net/forum/>

wikiagri.fr, agricultural France), Youtube, Twitter and “field exchanges” (in person)<sup>65</sup>. He also recounts training with his chamber of agriculture on soil conservation agriculture and his visit to an organic farm as part of a "tour of the plain" organized by his chamber of agriculture<sup>66</sup>. In general, the exchange between farmers is a very important source of information. Bernard sums up: “*All farmers are in continuous training.*”

### **Farmers who experiment**

Many of the farmers interviewed spoke of their experiments: “*I tried such and such a crop, it did not work*”, “*I tried to reduce the dose of glyphosate on a plot by 25%, it made 50 quintals. instead of 75*”, and so on.

Sometimes the test is successful, as for Damien, interviewed for my book on agribashing, who tested squash, a kind of pumpkin he had discovered in New Zealand. He found in practice that it was best not to use pesticides:

*"You have years when there is a greater illness pressure. Especially in powdery mildew, this is the one that slows us down the most. Sometimes, powdery mildew arrives quite early in the growing cycle, which suddenly slows down, which penalizes us on the growth and maturity of the fruits. At the beginning, 4-5 years ago, we tried [to treat]. We had had a big attack on a few plots [...] and whether we do it or not, there was no impact on the yields. "*

Another told me about trying to get closer to soil conservation agriculture<sup>67</sup> (SCA):

*“Since the installation, it hasn't changed much, because quite quickly I went to put some winter cover crops. That is to say between two crops, between wheat and corn for example, we plant a crop, which I am doing this afternoon, to cover the ground.*

*- So you do ACS?*

*- It's not quite conservation agriculture. In conservation agriculture, we no longer work the soil at all. I almost tried, but I went back because I felt that on my farm it wasn't working. [...]*

*When you have livestock manure, it is complicated, because there is a lot of traffic on the soil. We also have small plots [...] in small plots conservation agriculture is complicated too. In fact, we are rather without plowing, superficial work [...] and we try to cover the soil as long as possible. It's super technical [SCA] too*

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65 « Mes sources d'information agricole sur internet - 2016 » <https://www.youtube.com/watch?v=Fb-OVthocDM>

66 « Une ferme de grandes cultures en bio, chez Philippe - 2020 » <https://www.youtube.com/watch?v=SjFyJJtewA>

67 Flagship practice of agroecology, consisting in short in not tilling the soil and using "cover crops" (crops intended to be destroyed) to fertilize the soil and protect it from erosion.

*follow. Even with two full times to follow that, it would be very difficult to get there. [...]*

*We wanted to approach a colleague from SCA, always working very superficially. Unfortunately we noticed that our soils were compacted, and worse our corn, which is a fast crop, short cycle [...], no longer had time to put its root system in place and, suddenly, was very sensitive to water stress.” (Christophe, Baumann 2021, p.25)*

Igor implements many practices to limit its use of pesticides:

*“I mix the varieties to limit the risk. There are agronomic practices that come before. It's like the rest. Weed control: rotation helps. [...] Insecticides are the same, when I say that I put oilseed rape away from where there were oilseed rape and sunflowers years before, it is to prevent the flea beetles from developing there. [...] The fungicides are the same. We have plenty of reasoning. The product is the last step, is when all other reasoning doesn't work. ”*

Marion has managed to dispense with fungicides for her cereals by combining different species: wheat, barley, triticales... which she can then feed to her cattle.

### **Observant and parsimonious farmers**

It emerges from all my interviews that farmers treat as little as possible and observe a lot (depending on their constraints). This is obviously necessary in order to learn (to know what is working and what is not), but also to see infestations or the development of diseases coming and react quickly. Many of the problems they face have exponential growth: weeds, fungi, insects... Reacting quickly is important.

This is clearly illustrated by Nicolas:

*"Frankly, I don't treat because it makes me happy, it costs me an arm and a leg so if I can avoid putting them on, I avoid putting them on. But you have products where you know that, if you don't put them on, you will either catch up or you will catch up and you will also take a header. This is called peasant common sense. It's not a pleasure to put them on, but you know [...] it's insurance. [...]*

*The less I use the sprayer, the happier I am. The basic program on cereals for example, I will do the weeding, then, depending on the diseases, depending on the year, I do fungicides, regulators. Like this year, for example, we had a rather cold and dry month of March-April, so I didn't do a growth regulator. Since it was cold and dry, I didn't do the [first] fungicide, because there was no disease, but I did the second. However, June was not too rainy, so I didn't do the third. So on my wheat this year, I only did a weeding, a catch-up on thistles and a fungicide.” (Nicolas)*

This is not a recent trend:

*“We were already questioned about phytosanitary products. And that's where I heard for the first time, in 1980, [...] talk about sustainable agriculture. [...] But it is true that I was already in this spirit of reducing inputs. Why add more when necessary? Protecting yourself all the time is good, but it comes at a cost and it is not necessarily good for the user and for the consumer. This evolution I had already had, for more than 40 years [now]. And when I took over the family farm, I saw that my father was doing the same, that he reduced between the recommendations that could be made to him, either by the traders or the cooperatives, he tried to systematically reduce the quantities.” (Bernard)*

### **Reactions against infantilization**

You yourselves can see regularly that farmers (or para-farmers) resent this myth and the contempt it carries. For example, they have recently been very reactive to an article calling for machine-less agriculture, and then to the ensuing discussion with the InPACT association (@InPACTnational):



**Denis Beauchamp**  
@GrainHedger

...

C'est marrant ces gens qui proposent des « solutions » pour le monde agricole , qui sont refusées par 99,99% du monde agricole .

A un moment il faut un peu d'humilité quand même et arrêter de rêver debout



«Les agriculteurs exercent leur métier dans des conditions économiques intenab...  
FIGAROVIX/GRAND ENTRETIEN - Dans l'ouvrage Reprendre la terre aux machines, L'Atelier paysan revient sur l'histoire de notre complexe agro-industri...  
[lefigaro.fr](https://www.lefigaro.fr)

10:27 AM · 8 août 2021 · Twitter for iPhone

<https://twitter.com/GrainHedger/status/1424286069944684549>

-  **Denis Beauchamp** @GrainHedger · Aug 10 ...  
Une bonne fois pour toute : quand quelqu'un dit d'un agriculteur qu'il est « obligé » d'investir, qu'il est « contraint » de travailler de cette manière , qu'il est « victime » d'une machination/d'un système ; et bien c'est de la condescendance mal placée .
-  **Etienne Agri** @agrikol · Aug 10  
Replying to @InPACTnational and @rigben07  
Non non, j'ai choisi en mon âme et conscience et honnêtement très heureux de mon métier.
- 🗨 19    ↻ 65    ❤ 312    ↗
-  **Denis Beauchamp** @GrainHedger · Aug 10 ...  
En faisant cela, vous enlevez jusqu'à sa dignité .
- Les agriculteurs sont libres de faire leur métier . Ils n'achètent pas des trucs juste parce qu'un commercial est passé à la ferme, pas plus que vous n'achetez bêtement en fonction d'une pub.
- 🗨 5    ↻ 2    ❤ 82    ↗
-  **Denis Beauchamp** @GrainHedger · Aug 10 ...  
Les agris décident leurs investissements et leurs achats selon leurs besoins et leurs capacités .
- Nous n'avons pas besoin de misérabilisme. Merci 🙏
- 🗨 6    ↻ 3    ❤ 118    ↗

<https://twitter.com/agritof80/status/1425006696838094883>



**Antoine Thibault**  
@AgriSkippy

...

Jadis gueux, péquenauds, ploucs, bouseux et culs-terreux...

Aujourd'hui esclaves d'un agro-système

Les mots changent mais la condescendance reste.

[Translate Tweet](#)

10:34 AM · Aug 10, 2021 · Twitter for Android

<https://twitter.com/AgriSkippy/status/1425012641089609741>



**Antoine Thareau**  
@PleineLa

...

Vraiment certains savent, et nous les agris, on est trop con pour juger, compter, choisir...  
Putain quelle condescendance...

[Translate Tweet](#)



**InPACT** @InPACTnational · Aug 10

Replying to @InPACTnational @agrikol and @rigben07

Tant mieux, si vous êtes satisfait de votre investissement.

D'autres sont plus endettés, plus stressés, obligés de s'agrandir et moins libres que jamais. Pour éviter ça, nous ouvrons le débat, souvent limité dans la profession au concours du plus gros... investissement.

11:03 AM · Aug 10, 2021 · Twitter for Android

<https://twitter.com/PleineLa/status/1425019845406515201>



**ChristopheB.**  
@agritof80

...

Replying to @GrainHedger

C'est vraiment une question auquel je n'ai pas réponse :

Pourquoi autant de gens prennent les agriculteurs pour des abrutis sans cervelle ?

[Translate Tweet](#)

10:10 AM · Aug 10, 2021 · Twitter for Android

<https://twitter.com/agritof80/status/1425006696838094883>



Luna De Kereondec  
@kereondec



Dans ma vie professionnelle j'ai gagné de l'argent, j'en ai bcp perdu aussi, j'ai fait des investissements, certains payants et nécessaires, d'autres plus futiles ou de confort, j'ai regretté des choix, mais je les assume, j'ai évolué ou j'ai persisté, je suis un entrepreneur...

[Translate Tweet](#)



Etienne Agri @agrikol · Aug 10

Replying to @InPACTnational and @rigben07

Non non, j'ai choisi en mon âme et conscience et honnêtement très heureux de mon métier.

10:16 AM · Aug 10, 2021 · Twitter for Android

<https://twitter.com/kereondec/status/1425008080450904081>

#### **d. Influenced farmers? Cooperatives and constrained choices**

According to S. Foucart, the cooperatives have a hold over the farmers, to whom they *"dictate their way of proceeding"*. UNAF sums it up: *"Farmers depend on cooperatives and cooperatives depend on pesticides."* (36) In reality, if there is indeed an important debate in agriculture on the dependence on cooperatives and, above all, the behavior of some, there is nothing that comes close to the constraint that the author draws.

Indeed: farmers have the choice of their crops, their cooperatives and their distribution channels in general; they are not obliged to buy their phytosanitary products or seeds from their cooperative; the very idea of "pressures" does not make sense: what is S. Foucart talking about?

#### **An important agricultural debate**

The question of cooperatives in the agricultural world seems to be at the heart of many divisions. Indeed, many denounce certain drifts, such as a tendency towards

gigantism, a lack of transparency (in particular on invoices) and very questionable governance practices which would make it possible to "lock in" the management. In the end, the agricultural cooperative, designed to be a tool at the service of farmers, would tend to earn a living of its own not being aligned with the interests of its cooperators.

However, even the harshest criticisms are nuanced. Thus, Arthur, who told me a lot about the reprehensible practices in terms of management and governance of certain cooperatives, concludes:

*"The job of a farmer is a job [...] where you have to have a certain freedom. And I'm very scared, whether in the field of cooperatives, in the field of ADOs, in the field of many things... it is that we are being deprived of our freedom. This is where I am very vigilant, where I have concerns and where I hope I am wrong. And besides that I want to stress that there are cooperatives that are [...] really good, there are some who are vigilant, who stay close to the field and to the farmers." (Arthur)*

It may happen that the farmer is to some extent "dependent" on the cooperative. For example, in milk and beets, the farmer can hardly sell to someone else. For beet, this results from the cost of transport: since you produce an enormous biomass (> 80t / hectare), you must have a factory nearby. There is therefore very little choice in France: apart from a few sweets, you have to go through Tereos, Cristal Union or Saint-Louis (which is not a cooperative). For milk, there are many players, both cooperative and private. The stability seems to be linked to the collection routes or to a custom:

*"Yes, in the world of milk, buyers (whether cooperatives or the private sector, that doesn't change the problem much), they have an advantage, because you're a little linked to them, you don't leave when you want and anyway you don't necessarily have someone else who's going to want to come and pick you up, so you can say 'I'm not happy I want you to pay me more for the milk', we'll tell you 'if you want to go bah go ahead'. If you change collector once or twice in your career, it's the end of the world." (David)*

However, even this "dependency" has nothing to do with the allegations of the journalist. At no time did it emerge that there could be pressure to sell crop protection products. The points of tension seem to be mainly on governance, the purchase price of production, contractual transparency and the use of members' money. Nothing to do with a constraint to have one practice rather than another. In addition, cooperatives are also dependent on their cooperators: if they do anything, they can be penalized.

### **The choice of the cooperative (or the private)**

First of all, farmers often have several supplier-distributors (the breeders-farmers interviewed often had 4, Igor was working with 6 cooperatives and 7 private companies) and, apart from the cases mentioned above, the choice is free, especially in wheat (which is the main crop in France).

*“Originally [in the 1970s and 1980s] there was one (only) cooperative. I have not known. And the person who ran the cooperative was rubbish. From time to time we came to deliver, they refused to give the delivery slip. So we weren't paid. We had delivered a load, and your load was a gift for the coop. The weights on the stuff, that was rubbish. Finally, there was no control, there was nothing... So people got fed up and little by little everyone organized themselves at home to store in order to be able to market elsewhere<sup>68</sup>.” (Igor)*

Even for milk and beet, there are sometimes possibilities. For example, a group of mountain breeders realized that supermarkets sold their milk more expensive than others because it was "from the mountains". They then organized themselves into an association to directly market their milk (APLM, Association of mountain milk producers) and created their brand, “Mont lait” (=“Mountain milk” but sounding like “my milk”).

Several of the farmers interviewed do not even work with cooperatives at all or sell their produce to a cooperative and buy their phytosanitary products from a trader or other cooperative. For example, I was able to talk to a farmer who sold his pork to one cooperative, his calves to another, made direct sales, consumed part of the production from his fields, sold the rest to a broker and supplied himself. at traders!

Finally, even in cases where the farmer is "stuck" with a cooperative, there is still a choice to stop production, for example by planting something other than beets or raising cattle for meat. Not to mention that the cooperative members, having voting rights at general meetings, can assert their demands. It is therefore in the interests of cooperatives to not despise the interest of their cooperators.

### **No obligation on sales of phytosanitary products**

Farmers are not forced to buy their phytosanitary products from their cooperative. They can go through private traders or through the internet. The prices offered by the cooperative are not always the most advantageous. The competence and integrity of the technician are selection criteria:

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68 He precised afterwards: “but we do not change the way we work quickly given the investments that this represents. ”

*"In recent years, I've taken on a trader, then we also work a bit with the cooperative... We work a bit with everyone. [...] It's a bit of a feeling. I have been working with the private sector for a few years, because I find the technician, it is... how to put it... I find it good. And sometimes he says to me "this is not worth treating". I find he has an economic reasoning too. He doesn't tell me "you have blueberries, it's a disaster", [he says] "you have less X blueberries per m<sup>2</sup>, it's going to cost too much for the gain in yield, it's useless "... I appreciate his approach." (Julien)*

S. Foucart's claims are all the more absurd as NNIs seem to allow less insecticide use:

*"- I ask the question because, one of the things that Foucart says is that the NNIs are counterproductive and that, if we used them, it is because the cooperatives were encouraged to sell the phytos and that, suddenly... and given that farmers depend on cooperatives, which depend on phytos, that makes use of NNIs.*

*- It costs me more to pass insecticides afterwards, than to use NNIs as a farmer. I guess the co-op takes a percentage markup every time. So the co-op needs to make money selling [foliar] insecticide rather than selling NNIs. [...] And then the NNIs, when we could use them on wheat [...], when we make our farm seeds ourselves, we are free to use the dose we want. And the Férial<sup>69</sup>, we put half-dose and half-dose, which was more than enough for what we wanted." (Igor)*

Second, this does not prevent cooperatives from being able to give advice that is more focused on increasing yields than increasing profits:

*"The crop cooperative needs a volume of merchandise to market at the end of the year, that's what they're making money on, so they'll do anything to secure that. Whereas the farmer needs a margin to be profitable and to support his family. So he doesn't necessarily need maximum output, if it costs him 3 times as much." (Igor)*

It is nevertheless risky: as we have seen, the farmer, if he realizes it, is very likely to lose confidence in his advisor, to look elsewhere and to talk about it around him. In any case, it has nothing to do with "pressures" to explain the use of unnecessary pesticides.

### **No obligation on seed sales**

The sham is even more blatant with seed sales: farmers always have the choice of using farm-saved seed. However, it is a task that requires time and the intervention of a contractor to sort and process the seeds. There is also a need for specific know-how in the harvested crop. In addition, the seeds purchased guarantee a specific genetic heritage and a certain germination rate. As for the "F1" hybrids, they are much less productive after the first generation, so farmers buy them back to maintain genetic purity and its benefits.

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69 De l'imidaclopride : <https://agrobasesapp.com/france/pesticide/ferial>

Farm seeds represent an important part of straw cereal seeds. For example, for common wheat in 2014, 56% of areas were sown with and 5% with a mixture of farm seeds and certified seeds. (Agreste 2018). For other crops, such as beets or oilseed rape, it is much rarer. Indeed, while the grain of wheat can be reseeded as marketed, the cultivation of beets is different depending on whether you cultivate them for their seed or for their flesh. Beyond that, farmers can buy their seeds from many actors: cooperatives, traders, etc.

I had the chance to discuss the subject with François Burgaud, from SEMAE:

*"- How can farmers obtain seeds?*

*- Since the 1960s, farmers have had three ways of obtaining seed. The first, which has almost completely disappeared, [...] is to make their own seeds of their own varieties. Here they are, they have fields with local varieties, which have been there since their ancestors, they keep part of the harvest and they reseed it. This is what existed until I would say in the 1950s as the main source of supply. The second source of supply, which developed from the 1950s, but particularly from the 1960s, is to buy seeds which are today called certified seeds, meaning whose quality is controlled by an official authority, and these certified seeds represent, all species combined, 90% of the market. And then there is a third possibility, which has never completely disappeared, it is what is called farm-saved seeds, meaning the farmers buy seeds of new varieties on the market, but afterwards, instead of buying back seeds, they keep part of their harvest. [...]*

*In the early 1960s, when the French state created compulsory certification, it represented roughly 80% in cereal seeds. It decreased every year until the 1980s, when it was more than about 40% and then it increased again and it now represents about 50% [under the influence of the fall in the price of cereals straw (wheat, barley, etc.), which was linked to the end of guaranteed prices]. Today, if I summarize, the French farmer primarily sources certified seeds; second, in some species, such as wheat, barley, mainly straw cereals, also as farm seeds; and very marginally in seeds of varieties that belong to it.*

*- So it's only in all that is straw cereals that farm seeds represent 50%? Anything that is seed of beets, rapeseed, green beans, etc. Is this marginal?*

*- Oh, it's more than marginal, it's 0%. The immensity of rapeseeds are hybrids, so if you reseed it, it is not at all the same thing you will have in your field [...] 1. Making beet seed is not at all the same job... 2 If you like, the difference is simple. When you have a field of wheat, [...] that wheat can make flour as well as seed. Depending on whether this wheat, you are going to crush it or put it in the ground, it will make flour or seed. But the starting grain is exactly the same. On the contrary, when you grow a beet, what you harvest is not beet kernels. If you want to make beet seeds, it's a special job, it's like carrot seeds. [...]*

- What is the point of buying these seeds rather than picking up those from last year? [...]

- Basically, it really depends on how the manager manages his time, that of his employees and what he has to make them do. It's just like people repainting their homes or not. As I told you, growing wheat seed is not very complicated, unlike many other species, as long as the original seed is the variety you want. Afterwards, if you are producing cleanly (which a lot of wheat growers do), i.e. your field is not full of barley, oats, weeds, which you have sown in the right when you reap at the right time and you have nice kernels, which germinate well, that makes you a good seed. Afterwards, the question is that despite everything you will have to sort it out a little, you will have to do it... and in general you have it cleaned by contract work companies, then you will eventually want to do them treat... So in the time, the farmers treated themselves by putting the seeds with a powder that they wet in a concrete mixer... well, they realized that it was still not ideal, so you will too contact a contract work provider... so at the end of the day, the calculation is simple: what do I gain, either financially or [in time] by making farm seeds rather than buying them. "

We have therefore mainly mentioned this organizational dimension, but there is also an agronomic logic. For example, Igor adds a variety of wheat to their mix each year if they find one they "like". His current mixture thus counted 7 varieties. Along the same lines, David Forge tells in a video (which I encourage you to watch a lot, he goes much deeper into what we have just touched on) his choice to integrate two new varieties, more resistant to diseases, to his wheat mixture and more broadly its seed practices. Note that he makes farm-saved rapeseed.<sup>70</sup> This is just an overview of farming practices, which deserves a full-fledged book.

Igor, however, clarified that some cooperatives could impose certain conditions:

*"Be careful with seeds... on beets, for example, there have always been restrictions at Tereos... not always the same but always the obligation to buy from Tereos a certain volume of seeds and the obligation to use only varieties approved by the coop. "*

This point did not come out in any other interview. It is likely that the theoretical constraint is, in practice, so insignificant that no one thought it appropriate to tell me about it. We guess that

- the obligation to purchase seeds makes it possible to anticipate and have economies of scale and to coordinate with seed farmers and that
- the obligation on varieties makes it possible to better standardize harvests.

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<sup>70</sup> <https://www.youtube.com/watch?v=B5YxRIZakwA> ; Il évoque d'ailleurs les NNI vers 8 minutes. De manière générale, sa chaîne recèle de nombreuses vidéos très techniques et intéressantes.

Tereos replied that "that cooperative members are completely free to purchase their phytosanitary products and seeds from the supplier of their choice". [The brevity of the answer might be explained by the terror corporate have of having their words dishonestly exploited, which the studied journalist illustrates perfectly]

This point needs further study

### **Pressure from cooperatives?**

You should have understood by now, the cooperatives cannot have had the role attributed to them by the journalist and "put pressure" on the farmers to sell them pesticides which would be counterproductive. This is so absurd that none of the farmers interviewed considered this possibility. When I asked the question, I was always answered as if I were asking if the technician-salesman was trying to sell more than necessary<sup>71</sup>... What would the terrible pressures described by S. Foucart be like? We do not know.

### **Farmers forced to buy coated seeds from NNIs?**

Finally, I was taken aback by this passage, attributed to a representative of the UNAF:

*"But farmers have little choice: it has become very difficult for them to obtain seeds that are not coated with pesticides – the content of which they do not necessarily know." (36)*

It seemed absurd to me, but I was surprised to find, after sharing my dismay on Twitter, that an agronomist was telling me that was true. So, dark conspiracy or misunderstanding? In fact, it is quite right... and not at all. S. Foucart illustrates (again) here that one can misinform by saying something relatively true.

Indeed, all the farmers who spoke to me about coating mentioned a "basic treatment". A farmer, whom I asked if he could buy without, told me that his cooperative had at least basic treatment. These are in fact low doses of pesticides intended to prevent the seed from rotting in the soil and, sometimes, to improve germination ("starter" fertilizer). It has nothing to do with NNIs in terms of toxicity. It even seems negligible. In fact, among the farmers I interviewed, many do not use NNIs or for some crops and not others. Coating, on the other hand, seems systematic.

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71 Which, let us remember, is in no way "pressure". When an appliance salesperson tells you that one TV is better than another, that doesn't make you less free.

The reporter suggests that the coatings in question are NNIs or comparable substances. However, there are many coatings: fungicides, non-NNI insecticides, fertilizers... Above all, their toxicity is much lower than the NNIs.

As for the impossibility of finding anything else, that seems very doubtful to me. The instinctive response of some farmers was indeed that this was not possible. However, I also had other responses:



En réponse à [@AlexBaumann75](#) [@Fragritwittos](#) et 4 autres personnes

Oui.  
Les coopératives lorraines via leur station de semences proposent des semences avec la technologie thermoseed. Traitement par la chaleur et c'est tout.  
Précision en MP si besoin

8:11 PM · 13 août 2021 · Twitter for iPad

<https://twitter.com/LeluOlivier/status/1426245021280395268>





**Alexandre Carré**  
@alexcarre49



En réponse à @AlexBaumann75 @Fragritwittos et 3 autres personnes

Oui, c'est tout à fait possible. Les semences biologique sont non traitées et il est également possible d'acheter des semences "conventionnelles" non traitées.

6:23 PM · 13 août 2021 · Twitter for Android

<https://twitter.com/alexcarre49/status/1426217736976408579>



**DenisLaizé**  
@DzL49



En réponse à @AlexBaumann75 @Fragritwittos et 4 autres personnes

Oui il y a des vendeurs qui en ont. Souvent pour les gammes bio, semences non traitées

11:56 AM · 13 août 2021 · Twitter for Android

<https://twitter.com/DzL49/status/1426120343471677442>

So the answer is yes. It is also obvious: nothing prevents a farmer from obtaining "organic" seeds from a reseller<sup>72</sup>. More broadly, it seems obvious to me that it can be found online. Second, what the UNAF said was not necessarily wrong: it is perhaps more difficult to find untreated seeds, simply because they are less interesting and therefore less in demand.

A quick search of agrileader.fr, an online shopping site for agricultural supplies, confirms this. As NNIs are now almost completely banned, I just went to see the beet seeds<sup>73</sup>. There are 5 varieties available, only forage beets: Monro, Rivage, Brick, Splendide and Ribambelle. Only one of these can only be purchased as NNI asphalt ("Shore). The others can be T2 treated (= the "basic" coating we were talking about) or untreated (Ribambelle and Splendide). Technically, we can say that it is "more difficult" to find untreated varieties: this is the case for only 2 of the 5 varieties. Does this mean

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72 Néanmoins, notez que les semences AB aussi peuvent utiliser des traitements de semence : Cerall, Copseed, vinaigre blanc et poudre de graine de moutarde (<http://itab.asso.fr/activites/lestraitementsdesemences.php>). Je ne sais pas s'il s'agit d'enrobage par contre.

73 <https://www.agrileader.fr/463-betteraves>

that it is "difficult"? No. This is all the more obvious if we do a simple search for "untreated seed" on google. I immediately found the site agriconomie.com, where the unprocessed offer is plentiful<sup>74</sup>. So all you have to do is go to a website to find treated or untreated seeds.

Above all, it should also be remembered that farmers are free to grow their own seeds, which many do for straw cereals. Thus, not only is the journalist's allegation misleading, but is also false (but defensible, since they used a relative "it has become very difficult to...", hiding the fact that this very relative "difficulty" was largely the result of low demand).

Thus, there is some truth to the initial claim: untreated seed may be more difficult to find than treated seed. However, there is a total disconnect between this part and the meaning that the context gives it:

- most seed treatments are not NNIs and are of negligible environmental toxicity;
- it is still very easy to find untreated seeds.

By suggesting that farmers were forced to buy treated seeds from NNIs, S. Foucart misinforms.

### ***e. A single agricultural model?***

We have shown that all the elements of the demonstration leading to the "paradox of the red queen" (27) were false. Now let's tackle this last idea, that of an agricultural system that pushes the use of increasingly powerful pesticides to maintain yields. The heart of this fable is the stagnation of yields and the existence of a dominant agricultural system, which would determine the consumption of pesticides. We will show that these two elements do not hold either.

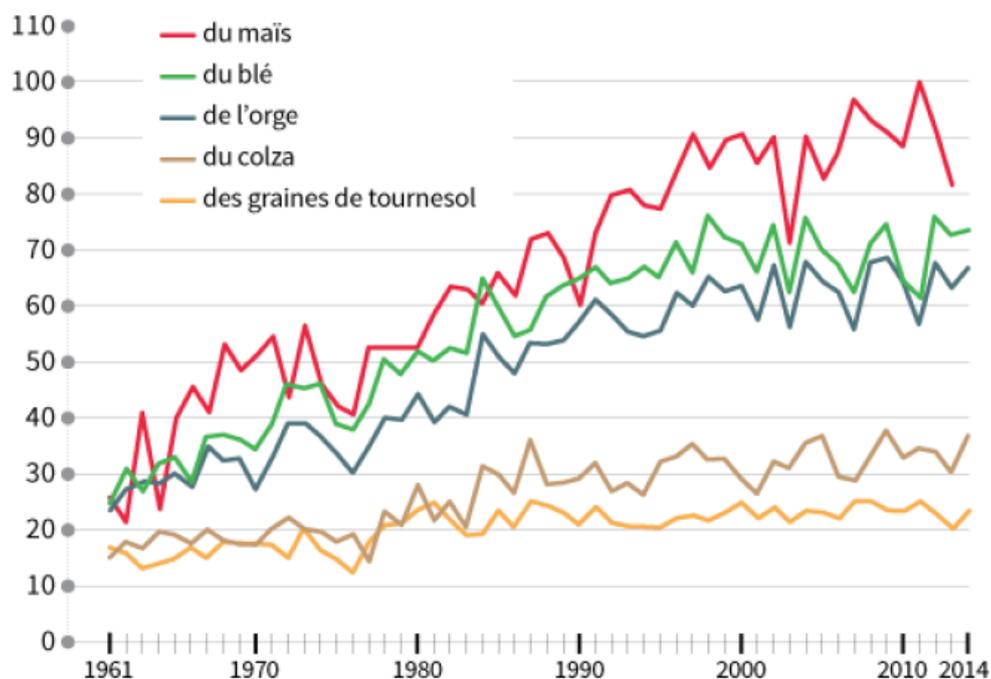
#### **The basis: stagnating yields?**

The "basis" on which the author builds his "demonstration" of the Red Queen paradox is a graphic on agricultural yields in France:

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74 <https://www.agriconomie.com/semences/cereales-a-paille/semence-de-ble-tendre/pc952>

### EN FRANCE, RENDEMENTS, EN QUINTAUX PAR HECTARE



SOURCE : FAO

*Yields of several major crops, in France, between 1961 and 2014. FAO/LE MONDE (27)*

Here is his interpretation, taking up the end of the previous paragraph:

*“The result: yields stagnate only at the cost of endless chemical and technical escalation.*

*Because, in France, the use of pesticides is growing without falling, but the yields of barley, wheat and corn have not increased since the mid-1990s, according to the United Nations Food Organization. and agriculture. Those for rapeseed have leveled off since the mid-1980s. Those for sunflowers since the end of the 1970s. Thus, at the beginning of the 1990s – ie before the famous neonics were put on the market – the yields of major French crops were not overall not very different from those of today, but the production of honey (an indicator of the health of pollinators) was then more than three times higher than the current one, according to the National Union of French beekeeping...” (27)*

We can see several problems with the naked eye:

- Corn still seems to be on an increasing slope.

- The yield of rapeseed and sunflower seeds stagnated between 1960 and 1977, then increased (+ 50% for the first; + 20% for the second) before being re-stabilized (from 1985 for the first and from 1980 for the second). How does this relate to the NNI? Could the paradox of the red queen also explain the stagnation in the 60s?
- Why does he not talk about beet yields, which the NNIs seem to have made it possible to greatly increase?

Obviously, the most obvious flaw is that the journalist controls absolutely no variable: the number of extreme episodes (frosts, droughts, etc.), environmental standards (pesticides, water use), changes in agricultural practices (in in the 90s, reasoned agriculture developed more and more, which favors profitability over yields), etc.

Finally, it only provides information on a few cultures. What about the others? It turns out that beet yields went from 65 tonnes / ha in 1990 to 85 in 2013 (Agreste Île-de-France, Number 138 – October 2016). This, even as the price of a ton of beets collapsed...<sup>75</sup>

Last interesting point: it emerges from my interviews that, from the 90s, French farmers stopped looking primarily for yield, which had been the spirit (driven by society, let us remember) since the end of WWII, to reduce more and more inputs and adopt a logic of profitability. So it seems that S. Foucart ultimately blames farmers for actually wanting to get out of a productivist trend...

### **The missing agricultural model**

The notion of an “agricultural model” is difficult to understand. Is there a "baker model"? A “SAAS model”? An “Edtech model”? A "carpenter" model? A “taxi” model? A “lawyer” model? What would the agricultural world have so specific to deserve this qualification and what would it encompass?

In the end, the notion of an agricultural model seems extremely hollow. While it is true that the agricultural world has several important specific institutions (SAFER, chambers of agriculture, cooperatives, etc.), this does not say anything about its practices and business models. Most of the farmers I interviewed had many different productions and different business models.

This is the case, for example, of those I interviewed for my book on agribashing:

- Damien grows corn, barley, rapeseed, beans, broccoli and squash

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<sup>75</sup> Meaning that the increase was probably not the result of a more fertile land allocation to beets.

- At the time of the interview, Ernest had two rotation cycles: Beet-durum-corn-durum and rapeseed-durum-soft wheat-barley-soybean-corn.
- François grows canned peas, flax, rapeseed, corn, chicory and wheat, which he rotates between his different plots. He is also a breeder (milk).

These choices have commercial and agronomic dimensions. Business models were varied. François and Ernest have subscribed to cooperative shares to process their beets. Damien sells squash partly to an industrialist and partly to Rungis. François sells his peas to an industrialist.

I explored these questions further in the interviews I did for this book. First of all, there is a multiplicity of productions: milk, meat, wheat, corn, barley, peas... These productions interact with each other. This is particularly the issue of crop rotation, practiced by all the farmers interviewed. Different plants do not sow at the same times and are not susceptible to the same diseases. Varying them allows you to break the cycle of weeds and diseases, to vary the molecules used, etc. This is because when you are growing a crop, you are usually confronted with weeds growing at the same time as them. It is also an organizational asset, it allows work to be spread over the year and, for breeders, to better manage their manure stocks. Finally, there are economic issues: not all farms have the same opportunities.

You also have an infinity of small arrangements. Thus, Marion was able to eliminate its use of fungicides on its wheat by sowing a mixture of different cereals: barley, wheat, triticale... This was however only possible because they were intended for feeding its cattle. Conversely, livestock droppings are used to fertilize fields and this can impact agronomic practices. Etienne explains to me:

*"We are not in the cereal plain, we still have animals, pastures and a lot of manure to bury. [...] This is what makes our soils fertile, eh, I use very little chemical fertilizer. And so you have to mix the soil to a minimum... SCA is really zero tillage, just the sowing line. I do more on a light SCA, with work on the first 10 centimeters, to really mix, reincorporate the droppings into the earth. You can't leave the manure on the ground like that [...]."*

Then, you have very different agronomic practices: first of all the different types of tillage (plowing, no-tillage, SCA, etc.), the different varietal strategies (eg: mixing cereal species for self-consumption, mixing varieties, etc.), different observation - reaction strategies (I'm waiting to see this to apply this; I look forward to seeing this and dealing with that), etc.

All these elements can be combined freely: for example, you can perfectly use advanced agronomic practices to use very few phytosanitary products and only work with a cooperative or else stick to the agronomic bases and have many supply and distribution channels. All this can be done with small as with very large farms, in combination with breeding or not ...

Where is the “agricultural model” of which S. Foucart speaks?

### **Dubious alternatives**

It is all the more incomprehensible that the agriculture presented as an alternative is either

- organic farming, which uses pesticides and has cooperatives and agronomic advice ...
- agronomic practices... already widely used in this "dominant agricultural model", such as crop rotation (this is even the rule more than the exception...).

When it comes to organic farming, it is no less "industrial" than conventional farming. It's just another specification. Moreover, Christophe Caroux, president of “*Bio en Hauts-de-France*”, recently called, in reaction to a publication highlighting copper pollution, to “*rethink the structure of the sector, the race for yield, and review the choice varieties to favor those which are resistant to diseases*”<sup>76</sup>. It should also be remembered that spinosad, a neurotoxic insecticide toxic to bees, even at doses comparable to the most aggressive NNIs<sup>77</sup> (and moreover acts on almost the same nicotinic receptors as NNIs)<sup>78</sup>.

When it comes to agronomic practices, the absurdity of the journalist's words is evident from the study of soil conservation agriculture, which I found interesting to present to you here.

### **Illustration: soil conservation agriculture**

This is arguably the main trend in "agroecology": soil conservation agriculture, SCA. This practice, or rather these sets of practices, show several realities that completely destroy the monolithic and smooth image that S. Foucart paints of agriculture. SCA is based on three pillars:

- Use covering cultures

76 <https://terres-et-territoires.com/terre-a-terre/culture/agriculture-bio-le-cuivre-pointe-du-doigt>

77 <https://ephy.anses.fr/ppp/success-4> ;

78 <https://twitter.com/MichaelMickha/status/1212028480818470913/photo/3> (Merci à Michel Tavernier d'ailleurs pour la précision)

- Diversified rotations
- No tillage

It has several strengths. Notably :

- It increases the organic matter of the soil ("this is what makes fields profitable in the long term" Igor).
- The soil is more coherent, it is more resistant to erosion. It is for this reason that all the mountain farmers interviewed practiced ACS or no tillage. As their fields are often sloping, they are exposed to significant risks of erosion.
- The crop is more resistant to extremes (drought / floods).
- There is less expense and wear and tear associated with the use of the tractor.
- You are not exposed to the problem of stones (which must be removed for plowing) in the fields.
- Leaving the soil in place favors the work of earthworms and, with the cover, the biodiversity of the soil.

SCA is very popular and, among the farmers interviewed, 4 claim it, 5 are without plowing and only 4 practice plowing (two of which tried without)<sup>79</sup>. This is probably a selection bias, but you can see that this innovation is successful and that effective agronomic advances are spreading throughout the farming community.

This is not, however, a magic solution. It is also very technical and can take a long time for observation and monitoring. One of the main difficulties seems to be decompacting the soil. Compact soil is soil where seeds have difficulty germinating and where roots cannot spread. This is why the humidity and having small fields makes the practice more difficult:

- Moisture makes the soil more likely to compact under the wheels of agricultural machinery.
- The fact of having small plots means that you cannot have very large equipment, which makes it possible to limit the passage per hectare.

Plowing has many agronomic roles and doing without them is not easy. One of them is being able to manage weeds. SCA farmers therefore only have chemical or agronomic solutions (which have their limits) to manage weeds. The use of glyphosate, when there

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<sup>79</sup> There were, in addition, 2 winegrowers (not really concerned therefore) and one non-response.

is a need to "start from scratch", is widespread. Likewise, if the logic is to reduce inputs as much as possible (fertilizers, herbicides, insecticides, etc.), there may still be a need for them. Moreover, the beet growers questioned (of which 3 were in ACS) used all NNIs.

The most extraordinary thing is that one of the pillars of this agriculture, plant cover, is compulsory in many regions! The "nitrate" directive (91/676 / EEC), which was applied at the end of 1991, prompted a more rigid framework for the spreading of livestock manure and made it necessary to install covers:

*“This is how, on nearly 70% of the French UAA<sup>80</sup>, farmers are required to set up intermediate nitrate trap crops (Cipan) in the fall, in order to capture, during this wet period, nitrogen residues from crops and nitrogen resulting from the mineralization of organic matter. In thirty years, the Cipans given birth, today forming the large family of plant covers recognized for their multiple uses and agronomic virtues. [...]*

*We have shown that cover crops has a technical interest, notes Serge Letellier, agronomic manager of the Gersycoop cooperative in the Gers. Our members have reduced their charges and / or lowered their returns, and the mindset has changed: cover crops is now seen as an investment rather than a cost. "On the territory of this organization, fields made up of unstable silt and clay-limestone soils on hillsides are sensitive to erosion.”<sup>81</sup>*

To go further, I recommend the article from terre-net.fr that I have just cited, which is very interesting and clear. You can obviously also follow and ask questions to farmers on Twitter, many of whom are implementing innovative practices and sharing on this topic.

In short, we therefore have the main stream of agroecological agriculture which combines very well with the use of phytosanitary products (it would even be difficult to do without, especially for glyphosate). What remains, faced with this reality, of the fable of the paradox of the red queen?

### **Anticipation: unionism and agriculture**

Let us finish with one of the other mechanisms widely used by those who carry these discourses on the “*agricultural model*” (S. Foucart is far from being the only one): the idea that the FNSEA would be a sort of appendix of this model and that all its members or representatives would carry this vision of agriculture. They thus draw a very negative image of this union, which would force many people to adopt an

80 Useful agricole area

81 <https://www.terre-net.fr/observatoire-technique-culturale/strategie-technique-culturale/article/couverts-vegetaux-un-outil-agronomique-multifonction-217-169794.html>

agriculture that does not care about its environmental impact. This image makes no sense (is your chess club forcing you to promote a certain specific view of chess?), but it is not the purpose of this insert.

It seemed interesting to me to specify that, among the farmers interviewed, there was no identifiable correlation between agricultural practices (no tillage, setting up original agronomic practices and reducing the consumption of phytosanitary products, selling the production directly, etc.) and unionism (or non-unionism). Even the vision of cooperatives is not clear-cut, several of the FNSEA farmers interviewed making critical statements about cooperatives (especially on the excesses of the bigger ones). An FNSEA executive even told me about challenging the term “exploitations” (used to designate farms in France):

*“Then afterwards he (a former minister) unrolled his vision of agriculture a bit and one of the first things he said (I found that very... it's even more true now than at the time.), is that the term exploiter is completely inappropriate [...], because in fact a farmer does not exploit [...], a farmer does not exploit animals, it does not exploit the land, it does not exploit people, etc. The more we use [this word], we don't realize it [...], but outside our sphere, it can have negative connotations. [...] That's just the word, we don't have to change anything actually. [...] I cultivate my grandfather's land [...], today my land, the land of my late grandfather, they are much more suitable for cultivation than 30 or 40 years ago. Whereas if they were "exploited", we could no more cultivate. Like a mine! A mine [...] when it is finished mining, there is no more ore. Whereas land or a farm is different.*

*- Okay. Because you add value to your work tool?*

*- Yeah ! Exactly. We maintain it, we give it value.”*

In short, I have nowhere seen the hegemonic vision that some activists portray of it. It was unfortunately necessary to clarify it, this criticism being omnipresent on the subject (once again, in order to muzzle the farmers, who are a large majority to vote for the FNSEA in the various agricultural elections). Thus, the journalist appropriates several elements of debates in the agricultural sphere (trade unionism, cooperatives, etc.) to integrate them into his own storytelling, even if it means completely distorting them.

### ***Assimilation to pesticide manufacturers***

After the aphid infestation that decimated, among other things, beet fields in 2020, S. Foucart faced a problem: many farmers were calling for NNIs, especially on

social networks. This was obviously contradictory with his storytelling of farmers being the victims coerced by the pesticide sellers.

One of the most popular arguments was that bees are not visited by pollinators, being harvested before harvest. Here is what the reporter wrote about the argument:

*“Circulated by agribusiness circles and taken up by the Ministry of Agriculture in its communication, this argument has been widely echoed on social networks by elected officials and political leaders.” (64)*

Thus, farmers were then assimilated to "agribusiness circles".

*“Promoted by agribusiness circles, taken up by the Minister of Agriculture, echoed by journalists and multiplied endlessly on social networks by thousands of little hands, a single element of language has swept away all of this. No one is unaware of it any more: "A bee, that will not go foraging in the fields of beetroot.” (66)*

Here the farmers are either in "agribusiness circles" or its "thousands of little hands". The author, by thus equating farmers with pesticide manufacturers or their agents ("little hands"), neutralizes the risk that their voices represent for his argument. This method of neutralizing agricultural speech is however older. In the same idea, you have:

*“Let us recall that the introduction of these substances in Europe, in the mid-1990s, and their massive adoption by the dominant agricultural model coincided with the acceleration of the decline of honey bees and, above all, with a collapse of the whole of entomofauna.” (45)*

Here, the farmers disappear: it is no longer them who buy / use the NNI, it is "the dominant agricultural model".

*“But, say the agrochemicals who market these products [NNI], we have to feed humanity. " (30)*

By asserting that this is the agrochemists' argument, he leaves open (and very likely) the interpretation that the 'we must feed humanity' argument is that of the agrochemists. In fact, this is a lot the farmers' argument. As in the previous case, the implicit is that they would be the agents of the agrochemicals. This is obviously absurd and insulting. For those who have the slightest doubt, I encourage you to follow the farmers on social networks1: @agridemain and @fragritwittos on Twitter, as well as the many extension workers on Youtube (David Forge, Thierryagri, Agrikol...).

**Thus, there is nothing which holds in the argument developed by S. Foucart starting from the alleged uselessness of the NNI:**

- **they are effective if used well;**

- **farmers are not incompetent victims subject to the pesticide consumption injunctions of their cooperatives;**
- **here is no "agricultural model" which would assume a certain use of pesticides.**

## **II. The delay in the regulatory response caused by the influence of industry**

A central point of the journalist's reasoning is that the ban on NNIs has been slowed down by the influence of the agrochemical industry. To keep this fable going, S. Foucart invented

1. a consensus or scientific obviousness from the 2003 CST study;
2. influence mechanisms that would have had an effect on the regulatory process (sending letters, paying something to the laboratory that hires the researcher, etc.) and
3. an identity between the present situation and the practices of the tobacco industry to delay recognition of the carcinogenic nature of smoking.

The whole is summarized in the following passage:

*“So 2003 could have marked the beginning of the end of the controversy. But that was not the case. Agrochemical companies used the toolbox of tobacco companies to turn science against itself and sow doubt. Use rigor and accuracy in the instruments to delay awareness of the risks as much as possible.” (45)*

This point also helps to reinforce what the journalist writes on risk assessment procedures: if pesticides are useless, regulation loses its complexity, which lies in the balance between environmental risks and practical benefits. If pesticides were unnecessary, there would be no justification for limiting the assessment tests and the flaws identified by EFSA in its 2012 opinion would indeed be inadmissible.

### **1. Invent a consensus / scientific obviousness**

For the author, the ban on NNIs would have been obvious very early on. So he wrote in 2013, commenting on the moratorium:

*“The first is that of wasted time. A decade ago, an expert report commissioned by Jean Glavany, then Minister of Agriculture, concluded that imidacloprid posed an unacceptable risk to bees. It also showed that the standard risk assessment tests were unsuitable for the methods of application of the new molecules (seed coating, etc.). By taking this 2003 report seriously, we could have avoided much of what has happened since.” (13)*

Likewise, regarding the opinion of EFSA, the same year:

*“Yet such an opinion could have been formulated by EFSA on the basis of scientific knowledge available ten years ago.” (9)*

In several other articles, he also claims that this report exposed flaws in risk assessment procedures, which would be a "trick" that an elementary school child could figure out in a matter of minutes. (39) In reality, things are far from that simple. Let's go back to his presentation of the severity of the damage, the dangerousness of NNIs and the assessment procedures.

**a. *The severity of the damage***

First, S. Foucart greatly exaggerates the extent of the consensus on a decline in biodiversity, mainly through the abusive mobilization of the study by Hallman et al. (2017). It repeats the heavily biased study by Hallman et al. (2017) and greatly expands its reach.

**Abusive mobilization of Hallman et coll. (2017)**

This is the journalist's flagship study, to which he refers in 17 of his 71 articles:

*"Hallmann CA, Sorg M, Jongejans E, Siepel H, Hofland N, Schwan H, et al. (2017) More than 75 percent decline over 27 years in total flying insect biomass in protected areas. PLoS ONE 12 (10): e0185809. "*

We will see that the presentation and use of it is far from flawless. While it only concerns a few German protected areas, the author will generalize and attempt to extend its scope to all German protected areas (36) (37), to "Germany" (43) (51) and even to "Europe" (39) (41) (45), sometimes by affirming it in the conditional. (37) (39) (51) (53) (54)

In addition, the areas studied go from "[representative of low-lying protected areas in Western Europe included in landscapes dominated by human activity]" to "representative of most landscapes in Western Europe dominated by human activities." (48) (53) (54)

Finally, while the study simply evokes the possibility that this decline is caused in part by "the intensification of agricultural practices", the journalist makes the authors say, directly (36) (56) (44) or implicitly (54) that the most likely cause would be the increased use of pesticides and, above all, NNIs. He will even say a perfect untruth, which is quite rare:

*"The only parameter that the researchers were unable to control is the nature and evolution of crop protection techniques (ie pesticides) on the farms surrounding these protected areas." (56)*

Thus, while this study has a very debatable scientific interest, S. Foucart presents it implicitly as defining a clear consensus, misinforms about its scope and distorts the

conclusions of the authors relative to the causality of the observed phenomenon. The subject deserves to be deepened, so we will study this sham in detail.

***L'étude elle-même***

A team of researchers used “Malaysian traps” between 1989 and 2014 on 63 locations in German protected areas “*[representative of low-altitude protected areas in Western Europe included in landscapes dominated by human action]*<sup>82</sup>” on different durations:

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82 « in Germany, representative of Western European low-altitude nature protection areas embedded in a human-dominated landscape »





Year	Number of locations	Number of locations sampled previously	Number of Samples	Mean exposure time	St. Dev exposure time
1989	8	0	162	146.62	12.81
1990	2	0	62	228.50	34.65
1991	1	0	10	146.00	
1992	4	0	54	118.75	15.50
1993	4	0	39	109.50	59.74
1994	4	0	60	170.75	72.83
1995	2	0	41	144.00	93.34
1997	1	0	20	162.00	
1999	2	0	56	196.00	0.00
2000	2	1	47	174.00	11.31
2001	3	2	81	190.00	0.00
2003	3	1	80	201.00	7.81
2004	2	0	48	200.00	5.66
2005	4	0	70	198.75	30.53
2006	2	0	26	188.00	0.00
2007	2	0	15	192.00	0.00
2008	2	0	24	162.00	0.00
2009	4	0	23	120.50	2.89
2010	2	0	12	85.00	0.00
2011	1	0	4	68.00	
2012	2	0	23	158.50	4.95
2013	8	2	126	175.50	21.71
2014	23	19	348	212.74	11.21
2015	1	1	10	224.00	
2016	7	7	62	190.86	12.56

<https://doi.org/10.1371/journal.pone.0185809.t001>

*Table 1. Overview of malaise-trap samples sizes.*

Most, 37, of the locations were studied for only one year, 20 locations over two years, 5 over three years and 1 over four years.



*Exemple de piège malais*

They would observe a 76.7% decline in above-ground insect biomass over the period studied. This decline would be *"very similar for all locations that have been sampled more than once."*

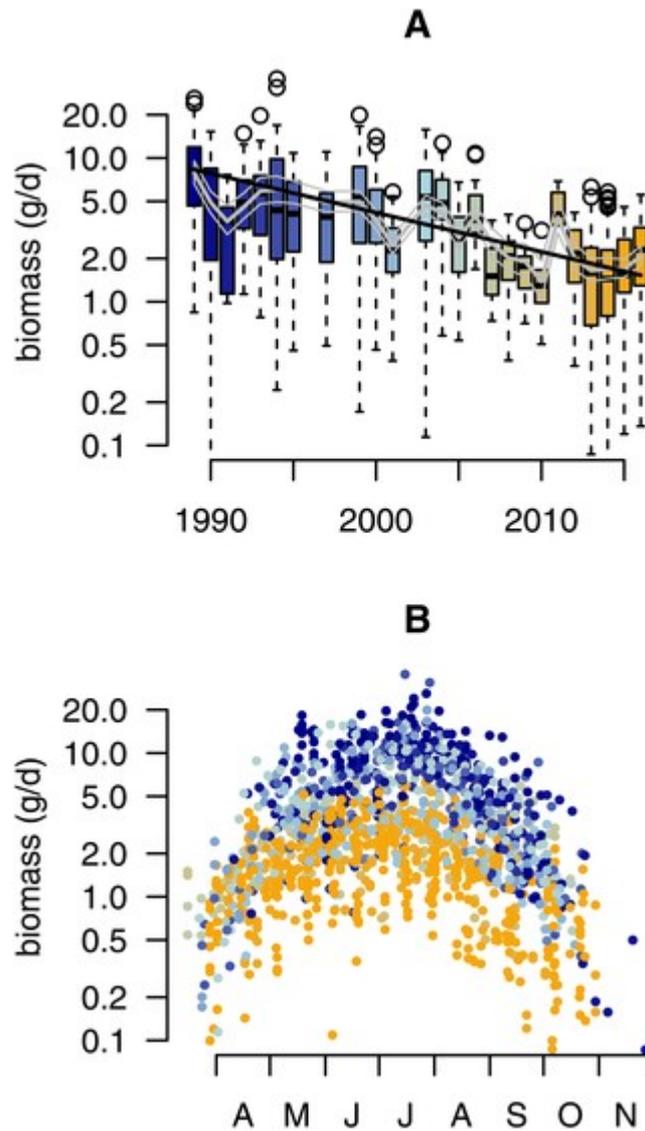
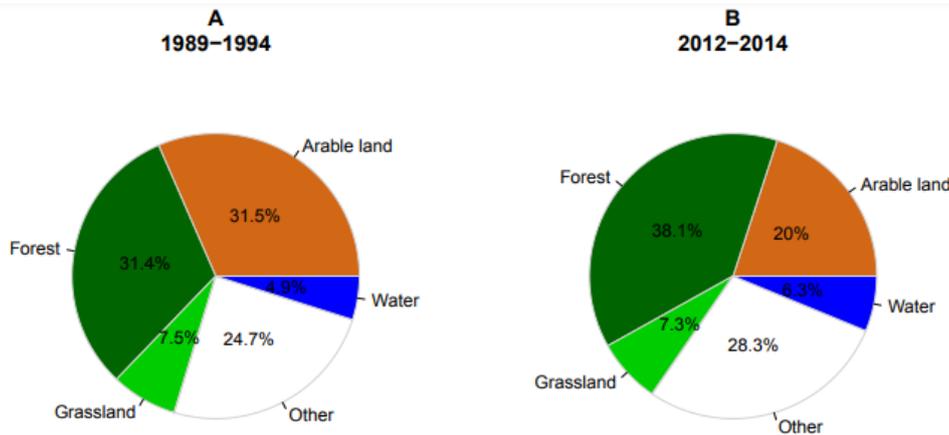


Fig 2. Temporal distribution of insect biomass.

The authors study other variables to try to identify what could be the cause of this decline. To take climate change into account, the authors added the averages of temperature, precipitation and wind force, provided by 169 climate stations located within 100 km of the traps.

It would also have taken into account land use within 200m of the traps:



S3 Fig. Land use and plant species richness changes.

They would indeed have observed that « *Preliminary analysis of the relationship between log biomass and landuse variables, on a subset of the trap locations, indicated that land use elements at 200m radius better predicted insect biomass than elements at 500 and 1000m radius, similar to findings elsewhere for wild bees.* »

Finally, they would have taken into account the changes linked to the insect habitat (grasses, bushes and trees) and the Ellenberg indicators (nitrogen, pH, light, temperature, humidity) within 50 m of the traps during the same seasons as the sample collection.

They observe that no variable can explain the observed fall:

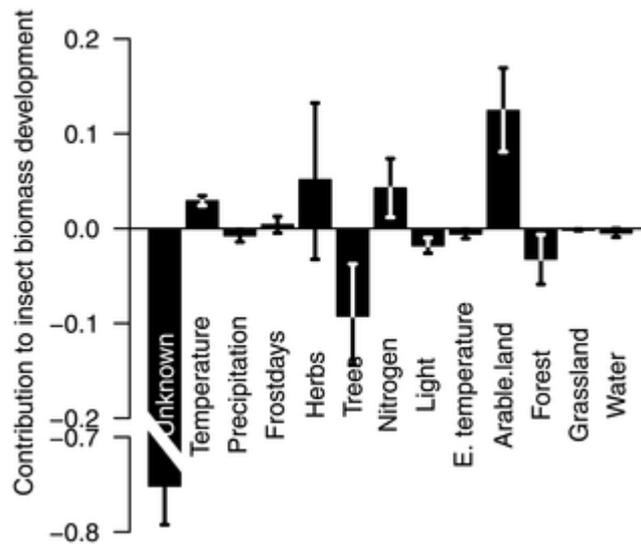


Fig 5. Marginal effects of temporal changes in considered covariates on insect biomass.

According to the authors, this would show that the landscape and climate change could not explain this major decline in biomass. The fact that the latter extends over all the durations studied, regardless of the type of habitat or the configuration of the landscape, would suggest that large-scale factors are involved.

The authors consider only two elements of this scale. First, climatic variables were not taken into account, such as prolonged droughts or lack of light. They believe that the intensification of agricultural practices” (« e.g. pesticide usage, year-round tillage, increased use of fertilizers and frequency of agronomic measures ») "*[could be a plausible cause]*".

Indeed, the reserves in which the traps were placed are said to be almost all (94%) surrounded by agricultural fields. Part of the explanation could therefore be that adjacent fields drain part of the insect populations. Finally, they recall that the intensification of agriculture has been associated with a global decline in the biodiversity of plants, insects, birds and other species in the current landscape.

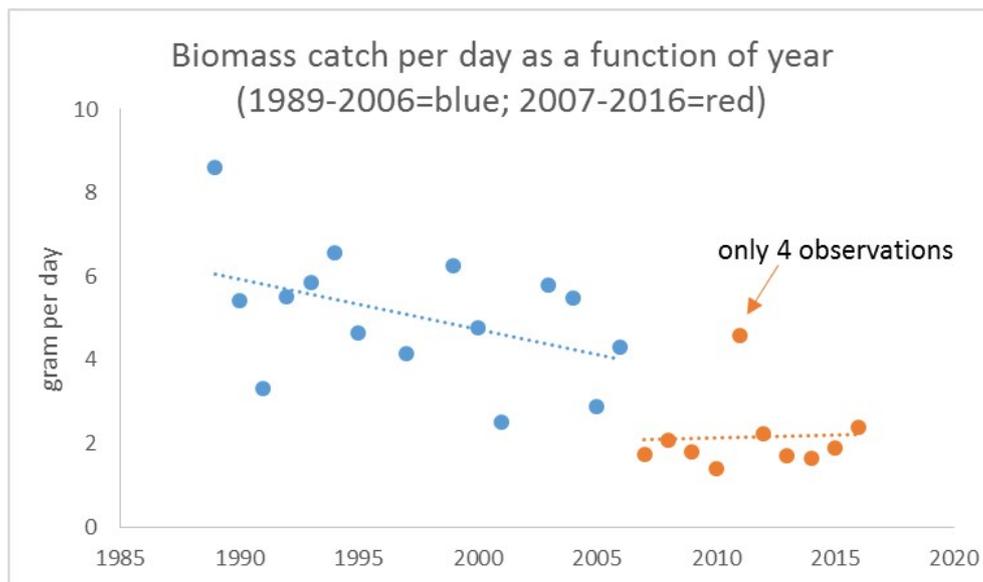
### ***A questionable reach***

The results of this study seem insignificant, mostly because the samples were not taken from the same places. They don't monitor a progression over time, other than in 2014, the year it looks like they took stock. However, the progression is presented as linear ...

Walter Krämer, German statistics professor, had notably told Die Welt:

*“The sampling was done below the usual scientific reliability. These are random locations that have been changed over and over again. The data are therefore of poor quality and cannot be generalized. Statistically, there has been a lot that has been done in a sub-optimal way.”<sup>83</sup>*

This is all the more problematic as the study has a problem raised by a comment under the article Plos One<sup>84</sup>, taken up by Philippe Stoop on the EuropeanScientist.com<sup>85</sup> site and which is clearly apparent to anyone looking at the data produced by Hallman et al. :



Mean insect biomass catch per day as a function of year. Blue symbols ( $n=15$ ) represent the years 1989-2006, red symbols ( $n=10$ ) represent the years 2007-2016.

Crédits : ronecology.nl

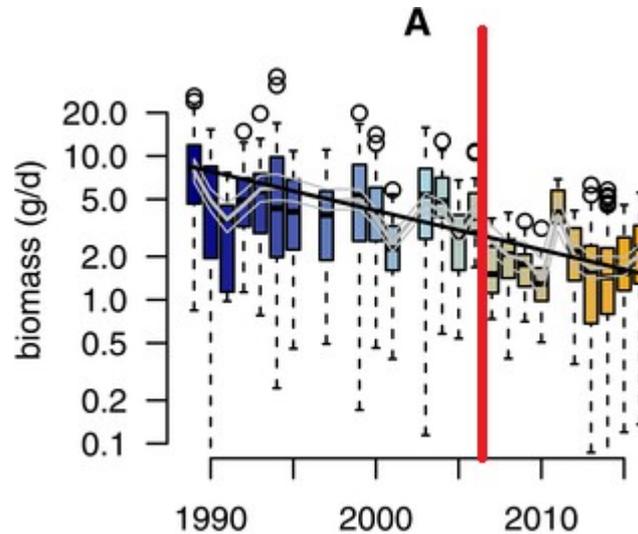
We can clearly see a break between 2006 and 2007. We also see that the first point, 1989, seems to be an anomaly: the weight of insects captured decreases by around 40% the following year, and the median of this period is to this level ...

83 Traduction de Seppi : <https://seppi.over-blog.com/2018/04/ces-droles-d-oiseaux-du-cnrs-du-mnhn-et-du-monde-planete-episode-vi.html>

84 <https://journals.plos.org/plosone/article/comment?id=10.1371/annotation/461e660c-4307-4ed7-b522-2697700e88eb>

85 <https://www.europeanscientist.com/fr/environnement/lexinction-de-75-des-insectes-comment-nait-une-legende-scientifique/>

Let's go back to the graph produced by simply adding a red bar to show the cleavage between the two periods. The problem is visually obvious<sup>86</sup>:



We do not see a clear trend different from stagnation to the left and right of the bar.<sup>87</sup> In short, the authors rely on poor quality data, observe that they do not find a cause for their evolution and deduce that the only possibility is that agriculture is responsible... It seems scientifically 'a little' light to me.

We can also ask ourselves: Why agricultural changes, which the authors present as “the only variable” which could explain the observed fall, are not controlled? Shouldn't this be a hypothesis to test? In addition, it does not seem very difficult: it would have been sufficient to define the most problematic practices, study their penetration over time in the surrounding farms (Interviews? Ministry data?) And compare with the evolution of the populations of insects.

Finally, it should be noted that these researchers observed a 75% drop in the biomass of insects captured between 1989 and... 1991. Either before the introduction of NNIs in Europe...

<sup>86</sup> Besides, I think that the choices of scale, by scientists, are difficult to justify other than by the desire to conceal this from the reader.

<sup>87</sup> We can nevertheless see several concerns with the graphic presentation: using different colors presupposes a link between the before and the after, an effect that reinforces the regression line and, above all, the use of a non-proportional scale, without we perceive its usefulness. It is all the more delirious as some points are off the scale (fig.2B)... From there to say that there was an intention to cover up... There is a step that we will not take. (If you followed, you will have noticed that, it is an insinuation largely inspired by S. Foucart: one affirms something by saying that one does not affirm it. Well, at the same time, there, there is when even a hell of a doubt...)

### ***A questionable interpretation***

The journalist refers to this study 17 times. From its first citation on May 29, 2017 to the last article studied (March 26, 2021), there have been 42 articles. He therefore quoted it in more than 1 in 3 articles over this period... The author often gives the study a scope that it does not. Take the article from October 18, 2017 (35), dedicated to the study.

He claims the study blamed the observed decline on intensification of agriculture. While this is clearly implied (which leaves the integrity of researchers in doubt), it is absolutely not asserted by its authors (and, a fortiori, not demonstrated).

The author also writes:

*"The major factor explaining such a rapid collapse," argue the authors, "is the intensification of agricultural practices (increased use of pesticides, synthetic fertilizers, etc.)." (35)*

However, Hallman et al. (2017) do not even mention this term ... S. Foucart attempts, through D. Goulson, to generalize:

*"Formally, the measures published only concern Germany. "But France or the UK have very similar farming systems that use the same inputs as in Germany," explains Dave Goulson (University of Sussex, UK), co-author of this work. We can't say for sure, but I would therefore say that there is a good "chance" that Germany is representative of a much larger situation. If this is indeed the case, then we are facing an impending ecological catastrophe.""*

While this is indeed one of the study's co-authors, this is not a conclusion that can be drawn: he gives only his own opinion. The journalist thus claims to justify the scope he gave at the beginning of the article to the study:

*"In less than three decades, insect populations have probably fallen by almost 80% in Europe." (35)*

### ***Often incorrect references***

The journalist presents this study in a very variable way. Here are how he references it after article (35):

- *"Since 1989, German protected areas have lost around 80% of their flying insect populations. A figure which most likely reflects the situation in the rest of Europe. The most plausible cause identified by researchers is the increased use of pesticides, including neonicotinoids used in seed coatings." (36)*
- *"Work published at the end of October has for the first time quantified the disaster of conventional farming practices on biodiversity. In thirty years, nearly*

*80% of flying insects have disappeared from protected natural areas in Germany and everything indicates that this observation is valid elsewhere in Europe.” (37)*

- *“And in this wonderful world, 75% to 80% of flying insects have not disappeared from Europe in less than three decades – as suggested, for the real world, a study published last October.” (39)*
- *“One of the latest was published in October 2017 in the journal PLoS One. She notes a rapid collapse of all insect populations in Europe, with, as the main suspect, the intensification of agriculture, and in particular its appetite for insecticide treatments based on neonics. In total, according to this work carried out in Germany, 75% to 80% of the biomass of flying insects have disappeared in less than thirty years.” (41)*
- *“According to their work, published in October in the journal PLoS One, the number of flying insects has declined from 75% to 80% in Germany.” (43)*
- *“populations of flying insects may have declined in Europe by nearly 80% over the past three decades, according to a German study published in October 2017.” (45)*
- *“For the SNPN, the urgency is in one number: “Recent research in Germany, adds the learned society, has shown a collapse of the total biomass of flying insects, of nearly 80% in three decades.”” (46)*
- *“A study published in October 2017 in the journal PLoS One indeed indicates that the quantity of flying insects fell by more than 75% between 1989 and 2016, in some sixty rural areas in Germany, representative of most of the landscapes of Western Europe dominated by human activities. With, among the main suspects, the “new technologies of plant protection”, according to the researchers.” (48)*
- *“A recent German study indicates that, over the last twenty-seven years, the biomass of flying insects has decreased by more than 75% across the Rhine and probably in all European landscapes dominated by human activities. - what everyone can see in the agonizing and unchanging cleanliness of our windshields.” (51)*

- *“Study carried out on 63 German protected areas. The decline in the biomass of winged insects measured in Germany plausibly mirrors the decline in all lowland areas of western Europe dominated by human activities.”* (53) (54)
- *“The biomass of flying insects fell by more than 75% between 1989 and 2016 in around 60 protected areas in Germany. [...] This abrupt decline in the abundance of insects in the European countryside coincides with the introduction of new generations of systemic pesticides – neonicotinoids and fipronil – used preventively as coating seeds, on millions of hectares of large cultures.”* (54)
- *“According to a study, published in October 2017 in the journal PloS One, the biomass of flying insects fell by more than 75% between 1989 and 2016 in around 60 protected areas in Germany. [...] Research published in October 2017, based on data from 63 German protected areas monitored over 27 years shows a decline in overall flying insect biomass of 75%. [...] The only parameter that the researchers were unable to control is the nature and evolution of crop protection techniques (ie pesticides) in the farms surrounding these protected areas.”* (56)
- *“Research published in October 2017 using data from 63 German protected areas monitored over 27 years shows a decline in overall flying insect biomass of 75%.”* (57)

Ainsi vous voyez plusieurs malfaçons :

1. Representativeness: the areas studied go from “[representative of low-altitude protected areas of Western Europe included in landscapes dominated by human action]” to “representative of most of the landscapes of Western Europe dominated by human activities.”(48) (53) (54) The mention “protected area” often disappears.
2. The extent: we go from 63 protected areas in Germany to “German protected areas” (36) (37), “Germany” (43) (51) or “Europe” (39) (41) (45). He will use the conditional to say that it extends across Europe (“A figure that most likely reflects the situation in the rest of Europe.” (36); “as suggested” the study (39), “Everything indicates that this observation is valid elsewhere in Europe” (37) ...). (51) (53) (54)
3. The cause: we go from "the intensification of agricultural practices are a plausible cause" to "The most plausible cause identified by researchers being the

intensification of the use of pesticides, including neonicotinoids used in seed coating" (36) or even "pesticides" (56). The most radical sham is notably the mention of the article (54): "This abrupt decline in the abundance of insects in the European countryside coincides with the introduction of the new generations of systemic pesticides – neonicotinoids and fipronil – used preventively by coating seeds, on millions of hectares of field crops. This is not evident from the study, or even from the data.

The author therefore hijacks the meaning of the study extensively. In short, you have a very "borderline" scientific study 1 which is abused by S. Foucart.

But it is not all ...

### ***A scandalous diversion***

The interpretation given to us by the journalist in article (44)<sup>88</sup> somewhat explains all the diversions he makes of this study.

*“We show that this decline is evident regardless of habitat type and that changes in weather conditions [temperature, precipitation and wind speed], land use and habitat characteristics cannot explain this. global decline,” the researchers conclude. As the authors did not have access in the regions studied to changes in the use of plant protection products by farmers, they were unable to correlate the observed decline with pesticides.”*

It leaves to the reader's imagination the reasons why the authors did not have this access. It obviously implies that this data would have been refused by the ministry or would not exist (which seems to me doubtful). However, it does not appear from the study that they sought to obtain it. They simply claim that they could not control for the variable "intensification of agriculture".

*“But their work helps to rule out the main possible causes unrelated to agriculture. Changes in the practice of this are therefore the most plausible causes because, they write, “the intensification of agriculture, including the disappearance of margins and new methods of crop protection [that is, say the coating of seeds by new generations of systemic insecticides] is associated with an overall decline in the diversity of plants, insects, birds and other common species”.”*

The study, as we have already shown, does not claim that agriculture is involved, nor that it is "the most plausible cause", but "could" be "a plausible cause".

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88 Seppi a également fait un commentaire de cet article, mettant en évidence d'autres points : <https://seppi.over-blog.com/2018/04/ces-droles-d-oiseaux-du-cnrs-du-mnhn-et-du-monde-planete-episode-vi.html>

Note that here the journalist explains the juxtaposition effect used by Hallman et al. Indeed, the latter do not specify this "because". More broadly, he says what the study suggests. We thus see in the hand of S. Foucart himself the power of the insinuation to transform, in the reader, a suggestion into an affirmation.

Here you have the final slide: how to go from 'intensification of agriculture' (which included, let's remember, (« e.g. pesticide usage, year-round tillage, increased use of fertilizers and frequency of agronomic measures ») to "the NNI"? This, even though the study does not even mention NNIs.

*"The authors of this work have little doubt about the involvement of neonicotinoids in the decline of biodiversity in general. "We must adopt international restrictions on the use of neonicotinoids without delay and prevent their replacement by equally dangerous products," write researchers who participated in this publication, in a column published in Le Monde. "*

This assertion is simply false. The mention "The authors" is thus interpreted as "all the authors", while only 2, Dave Goulson and Hans de Kroon, out of 12 participated in the said opinion paper<sup>89</sup>. It is also misleading, suggesting that this is the result of the study, when it is only an opinion. But the journalist achieved his goal: he sold the idea that this study would prove beyond a reasonable doubt how dangerous NNIs are.

### **The extent of the decline in the scientific literature**

There is hardly a consensus on the extent of the "decline" in biodiversity and pollinators. After quick research, it is rather uncertainty that seems to be the dominant posture:

*"Despite the studies carried out, it is still difficult to clearly perceive the geographic extent and intensity of the decline due to a lack of reliable data as well as a lack of bee taxonomic experts. In addition, there are few meta-analyses jointly interested in (i) the evolution of biodiversity considering all taxonomic groups of pollinators, either in terms of abundance or specific diversity; (ii) the phenology of pollinators (eg, spring bees, summer bees); (iii) over periods corresponding to several decades (but see Biesmeijer et al., 2006 and Carvalheiro et al., 2013); (iv) robust and standardized census methodologies in order to be able to compare data among the diversity of studies (Westphal et al., 2008). Data on the diversity and especially the abundance of pollinators remain sparse, except for a few taxonomic groups, or geographic regions (Freitas et al., 2009; Vanbergen, 2013; Nieto et al., 2014). For example, a red list has been established for wild bees in Europe. The authors of this list estimated that more than 50 % of the data relating to wild bees are deficient following a lack of in-depth monitoring*

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89 [https://www.lemonde.fr/idees/article/2018/03/21/il-est-temps-d-arreter-le-grand-manege-des-pesticides\\_5274463\\_3232.html](https://www.lemonde.fr/idees/article/2018/03/21/il-est-temps-d-arreter-le-grand-manege-des-pesticides_5274463_3232.html)

(Nieto et al., 2014). Great Britain, the Netherlands and Belgium nevertheless have adapted databases allowing the monitoring of the distribution of pollinators at the spatial and temporal level (Carvalho et al., 2013; Potts et al., 2015).” (Noël et al. 2018)

“Seasonal losses of western honey bees in Europe and North America vary greatly by country, state or province and from year to year, but in recent decades (at least since the large-scale introduction of Varroa), it has often been higher than the 10-15% previously considered normal (established but incomplete) 1. Data for other regions of the world are largely lacking {2.4.2.3, 2.4.2.4, 3.3.2, 3.3.3,3.3.4, 3.3.5}.” (IPBES 2016, p.21)

"[In conclusion, solid data is needed from all over the world to assess the status and trends of insect abundance, their biomass, species diversity, and the functions (beneficial or harmful to humans) that they perform. Ultimately, this requires a radical change in funding (Leather, 2019). Blaming the situation on incomplete and potentially biased data may generate short-term attention, but may ultimately be counterproductive if it turns out that the claims have been exaggerated.]”(Thomas, Jones and Hartley 2019)

Biesmeijer et al. (2006) observe that there would have already been a decline in bees in the 1980s and that this does not seem to affect hoverflies<sup>90</sup> (which would even have tended to grow in the Netherlands).

Unlike climate skepticism, these criticisms are not made by a few isolated and discredited researchers, but by many researchers. The only consensus seems to be that there are many alarming studies, reassuring others, that the whole is worrying and needs to be deepened.

### **The effect on agricultural production**

This question of the decline of biodiversity is all the more questionable as S. Foucart gives it a specific scope:

*“The decline of pollinators, bees, butterflies and birds, poses a serious threat to global food production. And endangers the livelihoods of millions of people.” (25)*

The decline is expected to be such that it endangers pollination. However, no data is provided in this regard. Nowhere does the author show that the decrease in pollinators would be such as to endanger pollination.

Note that the reporter also exaggerates the impact of pollination on agricultural production. Indeed, according to him, bees are *“pollinating insects essential to 84% of plants cultivated in Europe”*. (15) I don't know where he got that number from.

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<sup>90</sup> Des sortes de petites guêpes qui sont d'ailleurs un prédateur du puceron.

Along the same lines, the IPBES report published in February 2016 estimated that “*pollination-dependent crops contribute 35% by volume of crop production globally.*” (25) However, the error of good faith can be defended here, the figure being very ambiguous. When IPBES specifies, the figure is much less impressive:

*“It is estimated that 5-8% of current global agricultural production, representing an annual market value of \$ 235-577 billion (in 2015, US dollars) globally, is directly attributable to animal pollination .” (Potts et al. 2016)*

Note that for this damage to occur, all pollination would have to be destroyed. So, without denying that pollination is a very important service, one that must be protected, the journalist exaggerates its scope extraordinarily. It does not seem to me that we have observed in France a drop in productivity linked to a drop in pollination.

I also asked a union of fruit producers (the National Association Pommes Poires<sup>1</sup> (ANPP), bringing together 1,400 farmers) and a technical institute (the Interprofessional Technical Center for Fruits and Vegetables, CTIFL). The first replied that their members have not given them “any information concerning a drop in productivity linked to a possible drop in pollination. The second confirmed that “*no decrease in productivity [linked to pollination] has been demonstrated*” by their “*observations and experiments*”. We’re not even talking about a small drop, but no drop! Such a discreet apocalypse...

### **b. The dangerousness of NNIs**

S. Foucart also exaggerates the date on which we would have been aware of the toxicity of NNIs. For him, action should have been taken as soon as the beekeepers were alerted, in 1994 (which is also the date of marketing of seeds coated with the NNIs...) or in 2003, with the publication of the CST report. In reality, these elements were far from being able to justify a ban.

#### **Have we known since 1994?**

First of all, the journalist presents the dangerousness of the NNI as something obvious, which should have been recognized from the first alerts of beekeepers in 1994 (45) (54). First of all, it should be noted that this date is a bit strange, since this is the year that the Gaucho was marketed in France. We are talking about the start of commercialization, therefore with a very limited market penetration rate. I have not found a reference to this date other than in a UNAF article from 2013<sup>91</sup>. Gil Rivière Wekstein traces them back to 1995 in his book on the NNI. (Wekstein River 2006)

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91 <http://www.rhone-apiculture.fr/Neonicotinoides-L-Union-europeenne-ne-doit-pas-transiger-L-UNAF-demande-une.html>

For a certainty that should have determined the action of health agencies, it seems a little light ...

Either way, placing these alerts as something that should have reflected scientific certainty does not make sense. People's perception of the "effects" is often very misleading. For example, many people complain about side effects from installing Linky meters. Others will claim that homeopathy cures them. More recently, unvaccinated people complain of pathologies in the presence of unvaccinated people. Should we ask for a moratorium? Should we believe everything people say on the pretext that very occasionally it turns out to be about right? Shouldn't this have resulted, for S. Foucart, in the ban of the vaccine against covid-19, given the many side effects denounced (invented) by many popular movements?

### **Have we known since 2003? The CST report**

The journalist mentions a lot (8) (9) (13) (31) (45) (46) (56) the report issued by the CST in 2003 (Doucet-Personeni et al., 2003):

*“Yet such an opinion could have been formulated by EFSA on the basis of scientific knowledge available ten years ago. [...] In its report, delivered in September 2003, the CST had already firmly concluded that imidacloprid (marketed under the name Gaucho) presented an unacceptable risk to bees. [...] It took more than a decade to be convinced that organizing the permanent presence, on millions of hectares, of the most powerful insecticides ever invented could possibly have an effect on these insects that are bees.” (9)*

*“The first is that of wasted time. A decade ago, an expert report commissioned by Jean Glavany, then Minister of Agriculture, concluded that imidacloprid posed an unacceptable risk to bees. It also showed that the standard risk assessment tests were unsuitable for the methods of application of the new molecules (seed coating, etc.). By taking this 2003 report seriously, we could have avoided much of what has happened since.” (13)*

I went to see said report. Here is the conclusion of his synthesis (I highlight in bold):

*"In the current state of our knowledge, according to the scenarios developed to assess exposure and according to the uncertainty factors chosen to assess the hazards, the PEC / PNEC ratios obtained are cause for concern. They agree with the field observations reported by many beekeepers in large crop areas (corn, sunflower), concerning the mortality of foragers (scenario 4), their disappearance, their behavioral disorders and certain winter mortalities (scenario 5). )*

*As a result, the coating of Gaucho® sunflower seeds leads to a significant risk for bees of different ages, with the exception of pollen ingestion by foragers when making balls (scenario 3).*

*As regards the Gaucho® coating of corn seeds, the PEC / PNEC ratio is, as for sunflower, worrying in the context of pollen consumption by nurses, which could lead to increased mortality of those. - here and to be one of the elements of the explanation of the weakening of the populations of bees still observed in spite of the ban of Gaucho® on sunflowers.*

*Finally, since other factors may contribute to the weakening of bee colonies, more research should be done on the frequency, mechanisms and causes of these symptoms.” (Doucet-Personeni et al. 2003, p.11)*

They end up offering additional work:

*“The report should be gradually enriched with future work by members of the CST metrology sub-group. It will be:*

*Carry out a risk assessment of the same type as that carried out for imidacloprid, for fipronil. Analyze the other factors involved in bee losses (diseases, beekeeping and agricultural practices, genetic varieties for cultivated and treated plants, influence of terpenes, etc.) in close collaboration with the network sub-group Make an inventory of bee disorders observed in other countries.” (Doucet-Personeni et al. 2003, p.12)*

You can see that we are very far from an inflammatory report. I did not find the words "unacceptable risk" in the report.

In addition, the report suffers from some criticism. According to Gil Riviere-Wekstein (2006), Gerald Arnold was of questionable impartiality and had a central position in the CST. It was his team that would have defined the studies to be taken into account. (p.240 et seq.) and that its sorting would have resulted in excluding most of the industrial studies and retaining "almost all" of those by J-M. Bonmatin. The agricultural journalist brings other criticisms that I think are credible. He also reports the comments made by Hervé Gaymard (Minister of Agriculture at the time of the CST report and the resulting ban on imidacloprid) in an interview given to VSD on November 18, 2004 and which can be found quoted in a parliamentary motion for a resolution:

*“In the case of the Regent and the Gaucho, there was a media frenzy which was undoubtedly not foreign to the regional elections of 2004. But the problem is that scientific studies now say that this mortality of the bees would not be due only to the incriminated pesticides, and there, not a word in any newspaper of 20 hours. There are indeed double standards. Why would these new studies be less reliable than the others that led me to ban the two pesticides? And I can reveal to you that*

*they show that the excess mortality of bees is also observed in departments where these products have not been used ".*"<sup>92</sup>

Without going further into this controversy<sup>93</sup>, it brings serious evidence that this report was not undisputed.

### **Was it obvious ?**

Regarding the danger of NNI, it should first be noted that almost all the studies cited by S. Foucart... are after 2010 (61 out of 67). Before that date, he only mentions the CST studies (2003-2005) and:

- Suchail 2001: *"Discrepancy between acute and chronic toxicity induced by imidacloprid and its metabolites in Apis mellifera"*, observing chronic toxicity at doses 60 to 6000 times lower than those producing the same effect in acute intoxication studies.<sup>94</sup>
- Sur and Stork 2003, *"Uptake, translocation and metabolism of imidacloprid in plants"*, on the fact that plants take up only a small part of imidacloprid.
- Greatti 2003, *"Risk of environmental contamination by the active ingredient imidacloprid used for corn seed dressing. Preliminary results"*, dealing with NNI contamination through dust from corn seedlings.
- Girolami 2009, *"Translocation of Neonicotinoid Insecticides From Coated Seeds to Seedling Guttation Drops: A Novel Way of Intoxication for Bees"*, on bee exposure to NNIs through corn guttation.

Almost all of them focus on imidacloprid and not on NNIs in general and are only laboratory studies. Also, these are just a few studies on a few aspects. In short, nothing to do with a "scientific consensus" or even a certainty "beyond reasonable doubt". This is all the more clear if we read the CST report (Doucet-Personeni et al. 2003):

*"Only 2 studies of repeated administration of oral imidacloprid have been validated. One leads to an LD50 of 12 pg / bee over 10 days (Suchail, 2001), the other to an NOEC of 1700 pg / bee / 10 days (Decourtye, 2000). Studies of chronic oral intoxication by the metabolites of imidacloprid also give divergent results with an LD50 of 12 pg / bee over 10 days for all metabolites or an NOEC*

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92 <https://www.assemblee-nationale.fr/13/propositions/pion0347.asp>

93 Gérald Arnold seems to mock the multifactorial analysis of colony collapse : [https://controverses.minesparis.psl.eu/public/promo11/promo11\\_G10/index9902.html?page\\_id=46](https://controverses.minesparis.psl.eu/public/promo11/promo11_G10/index9902.html?page_id=46) (whereas, as we have seen, this clearly appears to be the state of scientific knowledge). Gil Riviere-Wekstein speaks in more detail about this person and his arrival in the CST (2006, p.137-142).

94 Note that another chronic toxicity study had been done the year before (Decourtye, 2000) and was much more reassuring.

*between 2740 and 8000 pg / bee over 10 days. 10 days for urea derivative and 6 chloronicotinic acid<sup>95</sup>.” (Doucet-Personeni et al. 2003, p.8)*

This is just one example, which highlights the cherry picking of S. Foucart (who only speaks of Suchail's study and never of Decourtye's study, strangely). More broadly, the entire CST report is very measured, even if it shows that there were real risks to be studied.

Finally, AFSSA had monitored, between 2002 and 2005, 120 bee colonies in 24 beehives and had found “*no statistical relationship between the presence of residues and the adult and larval bee populations, nor with mortality. colonies*”. (Aubert, Faucon and Chauzat 2008) On the contrary, there was a strong presence of “*Varroa destructor, viruses and concurrent diseases such as noseiosis.*” (Faucon and Chauzat 2008) In addition, they observe the frequent presence of tau-fluvalinate and coumaphos, in particular in waxes (Aubert, Faucon and Chauzat 2008, p.12), two insecticides:

*“Coumaphos is an acaricide used for the treatment of varroasis. It has been frequently found in beekeeping matrices with the exception of Eure and Yonne. The official coumaphos-based veterinary medicinal product (Perizin®) was not available in France during this investigation. Homemade preparations have been made from Asuntol®, a medicine used to treat dogs. »(Aubert, Faucon and Chauzat 2008, p.15)*

Without contesting the toxicity of imidacloprid and fipronil, which were banned in the European Union, the science was clearly not fixed at the time. Thus, the author absolutely does not demonstrate that the health authorities should have given credit to the (alleged) UNAF alerts in 1994, nor that the dangerousness of NNIs was clearly demonstrated in 2003.

On the subject, I invite you to read the very interesting book by Gil Rivière-Wekstein, "Bees, the ecological imposture", published in 2006 and which speaks a lot about this period and how the NNI became a controversial subject.

### **What are the scientists saying?**

We consistently find in the scientific literature on the causes of pollinator decline the idea that the latter is multifactorial (Potts 2010, p.348; Oldroyd 2007). Even studies cited by the journalist point to the existence of doubts:

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95 Metabolites of imidacloprid, which is what it breaks down over time.

*“The contribution of seed coating to neonicotinoid insecticides to pollinator decline remains controversial. (Potts et al. 2010<sup>96</sup>, 2016<sup>97</sup> ; Blacquièrè et al. 2012; European Union 2012<sup>98</sup> ; EFSA 2013a, b, c ; Godfray et al. 2014<sup>99</sup>, 2015<sup>100</sup>).” (Hokkanen et al. 2017)*

The uncertainty is evident in this passage, yet it comes from an article co-authored by Dave Goulson and Jean-Marc Bonmatin (two of the researchers most often cited / interviewed by S. Foucart):

*“[All viruses and other pathogens linked to colony collapse have been observed to be present throughout the year, even in 'healthy' colonies. The fact that colonies remain healthy despite the presence of these infectious agents supports the theory that colony collapse is caused by a combination of factors. Farooqui (2012)<sup>101</sup> analyzed the different hypotheses considered by science while seeking an explanation for the colony collapse syndrome. The research points to a combination of mutually reinforcing causes. Among these, the role of neonicotinoid insecticides has gained more weight in view of the latest independent scientific results.]” (Van der Sluijs et al. 2013)*

These would be three articles published... in 2012<sup>102</sup>. When we read the Farooqui article in question, we are struck by its moderation:

*« Abnormality in biogenic amines-mediated neuronal signaling impairs their olfactory learning and memory, therefore foragers do not return to their hive – a possible cause of CCD [Colony Collapse Disorder]. This overview is an attempt*

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- 96 Potts SG, Biesmeijer JC, Kremen C, Neumann P, Schweiger O, Kunin WE (2010) Global pollinator declines: trends, impacts and drivers. *Trends Ecol Evol* 25:345–353
- 97 Potts SG, Imperatriz-Fonseca V, Ngo HT, Biesmeijer JC, Breeze TD, Dicks LV, Garibaldi LA, Hill R, Settele J, Vanbergen AJ (2016) The assessment report on pollinators, pollination and food production: summary for policymakers. Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn
- 98 European Union (2012) Existing Scientific Evidence of the Effects of Neonicotinoid Pesticides on Bees. European Parliament, Directorate General for Internal Policies, Policy Department A: Economic and Scientific Policy. IP/A/ENVI/NT/2012-09 PE 492.465
- 99 Godfray HCJ, Blacquièrè T, Field LM, Hails RS, Petrokofsky G, Potts SG, McLean AR (2014) A restatement of the natural science evidence base concerning neonicotinoid insecticides and insect pollinators. *Proc R Soc B* 281:20140558
- 100 Godfray HCJ, Blacquièrè T, Field LM, Hails RS, Potts SG, Raine NE, McLean AR (2015) A restatement of recent advances in the natural science evidence base concerning neonicotinoid insecticides and insect pollinators. *Proc R Soc B* 282:20151821
- 101 T. Farooqui, « A potential link among biogenic amines-based pesticides, learning and memory, and colony collapse disorder: a unique hypothesis », *Neurochem Int*, 62 (2012), pp. 122-136
- 102 - M. Henry, M. Béguin, F. Requier, O. Rollin, J.F. Odoux, P. Aupinel, J. Aptel, S. Tchamitchian, A. Decourtye, « A common pesticide decreases foraging success and survival in honey bees », *Science*, 336 (2012), pp. 348-350
- P.R. Whitehorn, S. O'Connor, F.L. Wackers, D. Goulson, « Neonicotinoid pesticide reduces bumble bee colony growth and queen production », *Science* (2012), p. 351
- E. Stokstad, « Agriculture Field research on bees raises concern about low-dose pesticides », *Science*, 335 (2012), p. 1555

*to discuss a hypothetical link among biogenic amines-based pesticides, olfactory learning and memory, and CCD. » (Farooqui 2012)<sup>103</sup>*

We are VERY far from the register of evidence and consensus. We are talking about "possible cause" and discussing a "hypothetical link".

Recall that the journalist called this posture piece of language for pesticide producers (to vilify a 2008 AFSSA study). It was actually the state of research...

### **A questionable correlation**

Finally, let's respond to another element that S. Foucart uses to allege or imply that the link is obvious: the correlation between the "decline" of pollinators and the arrival of NNIs and the idea that this correlation is an important clue. (35) However, several things question. First of all, it does not control any variables. Take for example the evolution of bee colonies which, although it is not an indicator providing direct information on the state of pollinators, since it is largely determined by variables other than the mortality of hives, is often used. (Ex: van Engelsdorp and Meixner 2010). As soon as you take a step back, you see a very different reality from what the journalist describes:

*« [Les statistiques [du nombre de colonies aux US] démontrent un déclin entre 1947 et 1972, entre 1989 et 1996 et une récente chute en 2005. Les rapports de journaux de l'industrie [apicole ?] suggèrent de plus hauts taux de morts hivernales de colonies depuis l'avènement de la mite parasite Varroa destructor dans les années 1980, causant des pénuries temporaires de colonies saines (pour la saison de la pollinisation des amandiers) qui ne sont pas pris en compte par les données NASS [= les statistiques évoquées en début de citation].] » (National Research Council 2007, p.3)*

*« Le déclin de 1985 à 1996 est probablement lié à l'arrivée de la mite trachéale Acarapis Woodi (détectée en 1984) et de la mite Varroa destructor (détectée en 1987). » (National Research Council 2007, p.40)*

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103 <https://www.sciencedirect.com/science/article/abs/pii/S0197018612003051>

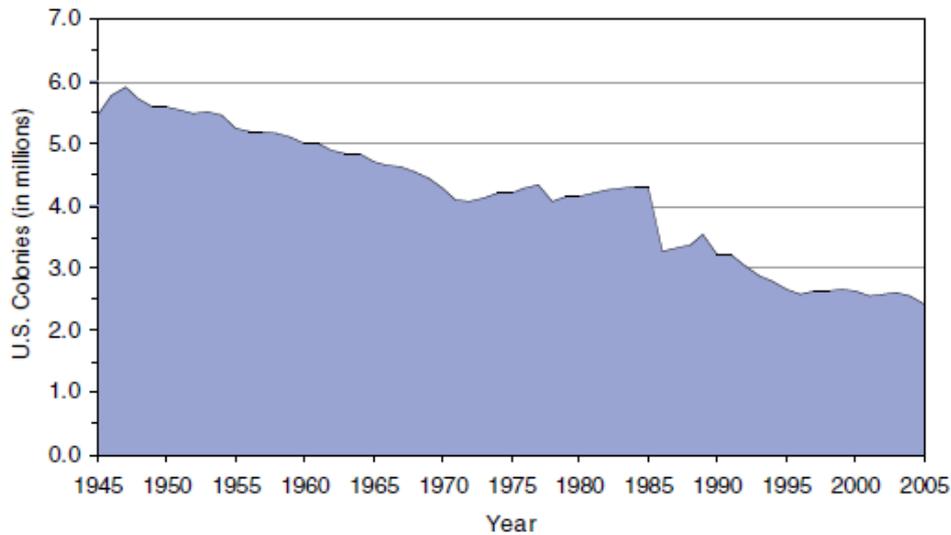


FIGURE 2-1 U.S. honey bee colonies, 1945–2005. Data compiled from USDA-NASS (1995, 1999, 2004a, 2005, 2006a).

*National Research Council 2007, p.40*

Note that here we can see the strength of cherry picking<sup>104</sup>. If you only look at the evolution after 1990, on the one hand you have the feeling of an overall decline and on the other hand it appears as a novelty (whereas the decline between 1946 and 1972 is much more spectacular and constant). In fact, the number of colonies was stable between 1995 and 2004.

The journalist often comments on short durations, which allow this cherry picking to be fully expressed. Only once has he taken a step back:

*"The diversity of wild pollinator species has been halved in 120 years" and "the visit rate of a small flower endemic to this region of North America has been reduced by four during this period." (6)*

He only referred to this study once ...

Another problem is the disconnect between the data he shows and the idea that NNIs are persistent. Indeed, NNIs did not enter the phytosanitary market instantly, they increased little by little. In addition, if they were truly persistent, the dose in the environment should increase exponentially: on the one hand due to the increase in treated surfaces and on the other hand due to the accumulation of these treatments in the environment.

104 « En rhétorique ou dans toute forme d'argumentation, le cherry picking (litt. « cueillette de cerises »), ou picorage dans le contexte financier, est la mise en avant des faits ou données qui donnent du crédit à son opinion en passant sous silence tous les cas qui la contredisent. » (Wikipedia)

The toxic effects should therefore also accelerate very strongly as the use of NNIs spread. This fact is never tested. On the contrary, none of the variations mentioned by the journalist seems to respond to this logic.

**c. Risk assessment procedures**

« [Au début du XXe siècle, presque personne ne se souciait de la qualité de l'environnement et de son impact sur la santé humaine. C'était l'époque de la croissance industrielle sans limite et d'une croissance « chimisation » de la société, surtout après la seconde guerre mondiale.] »<sup>105</sup> (Ragas 2011<sup>106</sup>)

First of all, you should know that phytosanitary regulations are relatively recent, there is very little (if any) regulation on environmental risks until the 1970s. For example, arsenic salts were used. and sulfuric acid from the early twentieth to the 1950s. Organochlorines, the first representative of which is the famous DDT. The latter is used from the 1940s and will be used until the 1970s. The image of pristine and pure nature before the NNI is a fable.

Note that the book "Silent Spring", which raised awareness about the lasting damage that can be caused to the environment, dates from... 1962. It has been a long time since biodiversity has been disappearing under the action of pesticides. Unless it is also a fable...

**Arbitration necessary**

Then, the risk assessment procedures are discussed since the beginning of their existence. It is their very principle to be debatable, since they reflect an arbitration:

- If they are too flexible, excessively hazardous pesticides are put into service.
- If they are too hard, too few phytosanitary products are put into circulation, which reduces agricultural yields, discourages research and closes the market to new entrants (the tests being too heavy and the risks of failure too great, only the large structures could afford to progress in the field) and less frequent crops (which results in depleting the diversity of viable crops for farmers). Note that this would close the way for "green" pesticides, which are nevertheless very active and interesting research avenues for agronomy.

However, the procedures are already very demanding.

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105 Traduit de l'anglais par l'auteur.

106 A.M.J. Ragas (2011) Trends and challenges in risk assessment of environmental contaminants, Journal of Integrative Environmental Sciences, 8:3, 195-218, DOI: 10.1080/1943815X.2011.597769

## Quick presentation of the evaluation

I was able to talk to the director of the UIPP, who gave me more details about the European system.

It is structured in two levels: one European, the other national. The molecule will first have to be authorized at European level and listed in [Annex 1 of European regulation 1107/2009 of 10/21/09](#). For this, it will have to respond to an initial battery of tests. However, it cannot be used this way: each of its formulations must, for each use, be the subject of an additional evaluation by the national health agency ([ANSES](#) in France).

*“For the different uses, there is a specific assessment that is made at Member State level depending on the use that is requested. The same active substance can be found in dozens of different products with different uses. For example, if there is a use against aphid on the vine, [another use] against aphid on carrot, each time studies specific to each use must be presented. [...] Behind the issuance of an MA, [...] there is already a preliminary phase which reviews all the potential impacts. This covers [aspects] of health, environment and also efficiency, because it is [also] necessary to prove [that the product brings agronomic interest, in other words that it is effective.]”*

Health studies will include aspects of this use with this formulation for the applicator, residents, walkers and consumers. Those on the environment relate to the impact of phytosanitary products on water, air and biodiversity. This procedure is extremely expensive, and the cost of authorizing a new molecule is estimated to be around 250 million euros.

*“[Research in plant protection is quite similar to that in human medicine. To give you a few figures, it takes more than 11 years of research and development to find a new solution until it hits the market.] “*

The studies would be based essentially on *“prediction models, in relation to water, in relation to the soil, in relation to biodiversity that allow us to predict the behavior of substances, products once they are used in under conditions of use as on the label”*. Nevertheless, then, there is a whole arsenal to observe what are, in practice, the impacts of the authorized product:

*“In addition, there is the pharmacovigilance tool. France, to my knowledge, was the first country to put it in place. It is therefore a follow-up in real condition, with actual data there, which goes back to [ANSES](#). Data on the qualities of water, air, human health, in relation to the actual use of the product. There, we are no longer on the models. “*

*“[The evaluation files are based on studies that must be provided ([active substances](#)) ([formulations](#)), and on European evaluation guide documents which are themselves*

based]” on “prediction models, in relation to the water, relative to soil, relative to biodiversity that allow us to predict the behavior of substances, products once they are used under conditions of use described on the label”. Nevertheless, then, there is a whole arsenal to observe what are, in practice, the impacts of the authorized product:

*“[In France, the a priori risk assessment system, that is to say in the context of marketing authorization applications, is supplemented by a system for monitoring possible adverse effects, called phytopharmacovigilance .] France, to my knowledge, was the first country to implement it. It is therefore a follow-up in real conditions. The data collected goes back to ANSES. These data relate to the quality of water, air, human health, in relation to the actual use of the product. [Thus they usefully complement the data generated as part of the authorization files.]”*

These new data are compiled by ANSES and can be used in particular in the context of periodic product reassessments. They can also be used by ANSES, even before re-authorization, to reinforce the conditions of use (eg: window of use).

*“We have seen enormous developments in France with specific obligations that other countries did not have. For example, when it came to using corn seeds treated with deflectors, [to prevent dust dispersion during sowing].”*

If undesirable effects are reported, [ANSES](#) may even, before the Marketing Authorization expires, re-evaluate the product and possibly ban it.

Each time the MA ends, you have to file for a new one:

*"Each time the product is renewed, it is renewed in the light of new scientific knowledge and new requirements, because in the meantime the tests are always evolving and substances are not evaluated with the same ones. criteria than 20 or 30 years ago. "*

About 70% of the molecules authorized in 1991 are no longer in commerce today, either because regulations have excluded them or because the companies have not sought to continue their exploitation.<sup>107</sup>

### **The complexity of toxicology**

The risk assessment is terribly complex, which is not news. For example, the problem of sublethal effects has been known since the 1920s, when the effects of chronic exposure to lead were observed. The principle that there would be a threshold before which there would be no effect was shattered as early as the 1940s, when scientists “discovered that radiation and genotoxic carcinogens can cause damage by a

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<sup>107</sup> This is consistent with my interviews of farmers, which evoke having fewer and fewer products available.

*mechanism. biological completely different from those produced by other forms of toxicity.” (Ragas 2011)*

*“[The problem of determining at what doses an agent is safe, i.e. non-carcinogenic, cannot be resolved unless an acceptable level of risk is defined, however low, rather than claim absolute security.]” (Mantel et Bryan 1961<sup>108</sup>)*

Toxicology is infinitely complex and, if we wanted to achieve risk 0, we would no longer create any drug, any food supplement, any pesticide, we would ban anything that could emit fine particles, etc. In short, we would turn into a third world country 40 years ago (with the mortality that goes with it).

### **The importance of pesticides**

Finally, let's remember something we often forget: using pesticides is NECESSARY in agriculture. In many cases, an infestation, whether by insects, fungi or weeds, can result in COMPLETE DESTRUCTION of the crop. This is not a myth, an invention of Monsanto or of a mysterious agro-industrial-chemical-Monsanto-FNSEA lobby. It's reality.

Agronomic practices (long rotations, soil conservation agriculture (ACS), "low-volume", choice of varieties, etc.) make it possible to reduce inputs, not to eliminate them (or in very specific cases, such as cultivation. of cereals of several species for self-consumption by a Massif Central farmer interviewed). I interviewed several farmers and all of them used agronomic practices, some very complex and sophisticated, to limit their inputs. All used pesticides (and many regret the ban on NNIs).

The journalist provides no evidence that the flaws in the assessment procedures exposed in the 2012 EFSA report<sup>1</sup> were obvious. He is content to assert it by highlighting a few shortcomings recognized by EFSA, when a considerable body of work should be studied: deepening and referencing the protocols, studying the economic and ecological reasons behind them, etc. Even a specialist researcher who would allow himself such casualness would not be credible.

**Thus, this consensus on the impact of NNIs is an invention of S. Foucart. The credibility of this invention rests on its multiple techniques of manipulation and on the ignorance of the general public of the complexity and the stakes of these subjects.**

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<sup>108</sup> <https://academic.oup.com/jnci/article-abstract/27/2/455/907154>

## 2. Invent the influence on regulation

The recognition of this (invented) consensus would have been delayed by the influence of the industry on the setting of health standards and on scientific reports. To defend this thesis, S. Foucart invents an influence and gives it credibility with his manipulation procedures. This influence would be betrayed by conflicts of interest.

To make his conception of the conflict of interest credible, the journalist presents environmental groups and industry and health agencies as fundamentally different sets. This mechanism essentially has two branches:

- An asymmetry in the credibility of scientific studies (he presents in the most negative light the studies that contradict him and highlights those that suit him; presents scientists with the slightest connection to industry as lobbyists)
- An asymmetry in the presentation of the “pressures” exerted. We have already seen it above: any "pressure" from industry is presented as terrible lobbying and any "pressure" from environmental groups is presented as a legitimate popular demand. Let us recall this short quote, which demonstrates it perfectly:

*“The vote took place in a context of great tension, between intense lobbying by agrochemical companies and strong mobilization of the beekeeping sector.” (8)*

However, first of all, let's explore one of the foundations of this disinformation: a distorted view of the agrochemical industry.

### a. A caricatured presentation of the sector

The journalist's entire argument is based on a caricatured vision of the industry, which is said to develop increasingly toxic pesticides. We have already seen in part “I.3. An agrochemical industry pushing toxicity? Of this chapter that it did not hold. The author also presents a caricatured image of regulatory tests<sup>109</sup>:

*“A regulatory consensus is based on the opinions of expert agencies which judge the compliance of a product with the regulations in force. These are often anonymous opinions, not subject to peer review, based on data generally confidential and inaccessible to criticism, produced and interpreted by the manufacturers themselves.” (50)*

However, it is not the manufacturers themselves who perform these tests, but laboratories which have specific accreditation (Good Laboratory Practices, GLP) and are audited.

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109 On le voit à la marge dans cette série d'article, mais il est tout de même présent. Cet argument revient néanmoins énormément dans les articles du journaliste sur le glyphosate.

*"- Suddenly, if a laboratory tried to please manufacturers to bring in more contracts, would it be penalized?*

*- I think these are risks that no lab would take. Because it is her accreditation that is at stake." (Eugenia Pommaret, interview)*

**b. Good and bad scientists**

As we saw in the second chapter, S. Foucart presents as having no scientific value any work produced by a person with even a distant link with industry.

*"During its last conference, at the end of 2011 in Wageningen (The Netherlands), seven new working groups were formed on the issue of the effects of pesticides on bees, all of which are dominated by researchers in conflict of interest situations. The participation of experts employed by agrochemical firms or private laboratories under contract with them varies between 50% and 75%." (2)*

At no time does it justify the relevance of this posture. Why would scientists employed by an industrialist suddenly lose all freedom of expression and all scientific integrity? It is even more incomprehensible to the employees of private laboratories: why would they flatter the firms? Why would they agree to compromise themselves? For what concrete advantages?

It is as if he absolutely denies any form of integrity among researchers who choose to work in or with industry! Any vague potential interest would justify them putting it aside altogether and bending over backwards to meet the expectations of the pesticide producer. It turns absurd when he talks about researchers employed by laboratories with contracts with firms. There is no longer even a direct interest!

To compare, imagine: you work at Mac Donald, are you systematically going to push your friends to eat there? Even as soon as you get the chance? Likewise, imagine a janitor who works for Monsanto: does that make him someone who will defend the firm through thick and thin? What is the difference with a scientist?

Public researchers are also subject to the same issues:

- They must be attractive to public authorities in order to be able to mobilize subsidies.
- They can be encouraged to appeal to a specific audience to gain notoriety, credibility and sell various services (the most obvious being the book).

I have already mentioned in *Le Cancer Militant* (Baumann 2021) the many rewards, social, psychological or material, that activism can generate<sup>110</sup>. Note that we have seen this mechanism at work precisely on the subject of the NNI: Vincent Bretagnolle, researcher at the CNRS militant against the NNI, has converted into political capital, the notoriety he has gained through his publications and his takes of position. He was in fact on the EELV list “*Our terroirs, our future, ecology now*” for the regional elections of Nouvelle-Aquitaine in 2021. In short, if S. Foucart sincerely applied his conception of the conflict of interest, he would no longer quote anyone...

**c. *Industry’s direct pressures***

The author presents as terrible the pressures from industry to describe, in fact, trivial acts. Here for example:

*“This time, European expertise came under intense pressure. Several letters sent by Syngenta to the EFSA general management, made public by the non-governmental organization Corporate Europe Observatory (CEO), show that the Swiss agrochemist has demanded, in vain, amendments to EFSA's position , going so far as to threaten some of its prosecutors1: “We ask you to formally confirm that you will rectify the press release by 11 am, write Syngenta executives to an EFSA official on January 15. Otherwise , you will understand that we are considering legal options.”” (8)*

Letters, realize! Legal remedies! It is easy to imagine the fear felt by the officials who received these letters... You get it, it is ridiculous: these organizations have dedicated legal services and are used to this kind of challenge. Dealing with appeals from organizations unhappy with your regulations is part of the daily life of any regulatory body. S. Foucart, however, presents this as "intense pressure".

**d. *Accusations that "flop"***

The precariousness of S. Foucart's accusations is perfectly clear when he came forward to criticize IPBES and IUCN. He attacked them before they released their report and ultimately found nothing to say. In neither case did he come to a conclusion: it is as if he had never been wrong.

**IPBES**

The author strongly questions the credibility of IPBES in several articles, noting that two employees of agrochemical companies are responsible for chapters of the report on pollinator decline. (19) (24)

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<sup>110</sup> Sur ce sujet, vous pouvez également lire Daniel Gaxie, dont vous trouvez facilement les textes en ligne.

The report in question having in the end produced a report in line with his expectations, he repeats it in an article and qualifies the institution as "IPCC of biodiversity" (as it stood). He nevertheless maintains his suspicions, affirming in the same article that "*This paragraph [on the role of pesticides] will be scrutinized*" (25). In the end, he had nothing to say...

This did not prevent him when, when asked about it in the context of the promotion of his book, to state in substance that the presence of employees from the industry had nevertheless had an influence:

*"It is impossible to determine the impact that this person's participation in the work of IPBES had in the end, but the history of science work carried out on the tobacco industry's influence strategies – in particular those of the American historian of science Robert Proctor (Stanford University) - shows that the participation, in expert work, of researchers in conflict of interest has the effect of biasing its conclusions."* (57)

Heads up, he wins; stack, you lose.

#### **L'UICN**

The journalist extensively questions the integrity of IUCN in his article of May 5, 2014 (17), as we have seen above. Yet he cites this organization as a reference in the article on IPBES, just a few months later (19):

*"The International Union for the Protection of Nature (IUCN) estimates that 16.5% of vertebrate pollinator species (birds, bats, etc.) are threatened with extinction, and up to 30% for species islanders. "*

Once again, no questioning a posteriori. His complaints came to nothing: neither confirmation nor mea culpa.

#### **L'AFSSA**

What S. Foucart writes about AFSSA is quite terrible:

*"But it is true that certain 'expertises' have maintained political power in a 'socially constructed' ignorance<sup>111</sup> on the subject. The history of science will probably judge with severity the various reports – such as the one made in 2008 by the defunct French Food Safety Agency (Afssa) - taking up, sometimes in questionable conditions of integrity, the vulgate of agrochemists: since bee disorders are "multifactorial", new phytosanitary products do not play a decisive role. "*

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111 Note the use of the term, which no doubt flatters sociology students, but means nothing: in absolute terms, all action is "socially constructed"...

It provides absolutely no evidence to support any industry influence on these estimates. These allegations are all the more defamatory<sup>112</sup> since, as we have seen, the multifactorial nature of the collapse of the hives was (and still is) simply the state of research, which can be found in both public and public researchers. at health agencies.

### **La FERA**

The journalist refers to a report by FERA (the British health agency) and heavily suggests that he was influenced by Syngenta. (21) (24) What factual elements does it provide?

1. A researcher very involved in the denunciation of NNI, Dave Goulson, finds by analyzing the raw data of the report, conclusions contrary to those of the latter.
2. “*Asked by the Guardian, a spokesperson for FERA more or less ate his own hat.*” (21)
3. Helen Thompson is believed to be the lead author of the study and, shortly after reporting her findings, joined Syngenta.

Regarding the first point, one can immediately underline that this is only the opinion of a researcher. Is this criticism founded or not? We do not know. The author writes, “*This reanalysis has not been contested.*” Should we believe it? Does that mean it's fair or that no one bothered to answer it? Either way, even admitting that the criticism is correct, that would prove nothing: there would just be a bias that was not taken into account. What could be more ordinary? Moreover, by reading the article in question (Goulson 2015), we see that the demonstration seems a little surprising. For example:

*"[Chemical residues were often below the limit of detection (LOD), and simulated values between zero and LOD were randomly assigned assuming a uniform distribution.]"*

So he invented data in a totally arbitrary way (why choose “a uniform distribution”? We don't know.) Without going into it, we can clearly see that he is making some rather strange and complex calculations. We are really in the register of scientific discussion, not of denouncing an obvious sham (for an example of this register, I refer you to what we said about the study by Hallman et al. 2017).

Regarding the second point, it is difficult to see what S. Foucart is talking about: it is doubtful that the headgear of the spokesperson in question is edible. This is probably an

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<sup>112</sup> By the way, I mean it literally: I find it hard to understand that the state does not sue for this kind of talk, thus refusing to protect its agents and its institutions.

allegory that he admitted the report was biased and wrong. However, it is unclear and finding the article in question would have been much easier if he actually cited it<sup>113</sup>... I found a Guardian article on the subject containing a reaction from a spokesperson for FERA<sup>114</sup>. This is what he says:

*"Dr Thompson's move is a reflection of her expertise and international reputation within the scientific community. There is no conflict of interest. There are very specific rules for civil servants governing the acceptance of appointments outside the civil service."*

Another post, post Goulson's study, is more promising<sup>115</sup>, a spokesperson for FERA saying:

*"[In the executive summary of our 2013 report, we clearly state that our experience did not allow clear conclusions to be drawn about the impact of NNI coating on bumblebee health. While there was an absence of evidence to support the hypothesis that NNIs cause damage to bees, this did not support the conclusion that they were benign.] "*

In short, the study would not have been conclusive. So where does he "eat his hat"? I do not see. Note that what he says has nothing to do with David Goulson's claim that the study is "*the first study to describe [their] substantial negative impacts in real life.*" (21)

Regarding the third point, we find the extreme vision of S. Foucart of conflicts of interest. Concretely, how would the researcher have done? Would she have skewed her report first without her colleagues noticing, then went to Syngenta and said, "*Look, I helped you even though you didn't ask me, now hire me and give me a great deal!*"? Or would Syngenta have dispatched a secret agent to offer her the exchange of good deeds, at the risk of being exposed and prosecuted for corruption? You see that as soon as you dig, the journalist's story is full of loopholes. If you want a "story" that is plausible, you can tie those elements together very differently: Faced with pressure from environmentalists, Thompson saw his career (and life, because seeing his credibility constantly questioned isn't pleasant) to FERA to close and chose to join the private sector. Not only does S. Foucart prove nothing, but in addition hypotheses that are totally contrary to his storytelling are more credible than the absurdities he puts forward.

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113 I wonder if there is not another manipulation behind this lack of rigor: it implies that we should take his word for it, that it would be superfluous to check what he says and more. more to discuss it.

114 <https://www.theguardian.com/environment/2013/jul/26/government-bee-scientist-pesticide-firm>

115 <https://www.theguardian.com/environment/2015/mar/26/uk-drew-wrong-conclusion-from-its-neonicotinoids-study-scientist-says>

### **The design of industrial standards: the general insinuation**

The author defends the idea according to which manufacturers would have had a significant influence on the creation of the tests to be carried out to approve pesticides and that this would explain in particular the flaws highlighted in these procedures by the EFSA report of 2012. (2) (39)

However, it allegedly "shows"<sup>116</sup> that industry-related scientists were involved in their development processes:

- *"The participation of experts employed by agrochemical firms or private laboratories under contract with them varies between 50% and 75%. The other members are experts from national health security agencies or, more rarely, scientists from public research. Pesticide manufacturers therefore play a key role in the design of tests that will be used to assess the risks of their own products on bees and pollinators."* (2)
- *"Manufacturers have therefore, in a way, created the very scientific framework in which the evaluation of their products is carried out".* (39)

*"How is it possible ? It's not very complicated: these protocols were designed by groups of experts infiltrated by the agrochemical industry. In a report released this week, Pesticide Action Network (PAN) and Future Generations suggest that this example is not isolated. On the contrary, it falls within a standard. The two NGOs reviewed twelve standard methods or practices used by public expert agencies to assess the health or environmental risks of "phytos". Result: in 92% of the cases examined, the techniques in question were co-developed by the manufacturers concerned, directly or indirectly."* (39)

We find his absurd conception of the conflict of interest: any presence of a person with a vague connection to the industry would be a kind of indelible stain. It rarely specifies how (beyond generalities) this conflict of interest would be implemented in practice.

He did venture there once, however. This is what we are going to see now.

### **The design of industrial standards: the EPPO**

In the article (2), *"The bankruptcy of the evaluation of pesticides on bees"*, the journalist claimed to explain the flaws in the evaluation procedures highlighted by a 2012 EFSA report by the influence that had manufacturers on the enactment of said procedures.

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<sup>116</sup> I do not know if his allegations are true, the author presenting no source.

We will extensively presented the (many) manipulation methods of this article in the fourth chapter. This time, let's just study the facts he raises that can support his thesis:

- The *"guidelines for these tests were notably issued by the European and Mediterranean Plant Protection Organization [EPPO]"*. The others would be decreed by the OECD.

So we have some guidelines issued by this EPPO.

- This organization allegedly delegate to the "International Commission on Plant-Bee Relationships (ICPBR) - the task of developing the basic elements of these famous standardized tests. "

The author suggests that this commission would be entirely responsible for this development, in particular noting that the EPPO would have "no in-house expertise". This does not really make sense given that it is made up of GOVERNMENTS and that after this commission has issued its report, the latter mobilize experts to assess it and are ultimately the sole decision-makers.

But back to the ICPBR.

- The fact that the final recommendations of the group are based on a *"consensus approach"* would *"de facto place the recommendations from the organization in the hands of the industry. Because the ICPBR is open to any participation and agrochemical companies are well represented. In 2008, of the nine members of the bee protection group, three were employed in the agrochemical industry, one was a former employee of BASF and another future employee of Dow Agrosciences. "*

First of all, he insinuates that being a future or former employee of a company qualifies as its "representative". Does he believe that there is some kind of eternal blood pact when you go into this kind of business?<sup>117</sup> Did the future employee already know the future? It is not even made clear whether or not the employees represented their employer. Even being an employee does not mean that your words are dictated by your employer (unless you may be there to represent them). So the fact that the "firms" dominate the group is debatable and it would still only be a working group, which should present its work to the whole, which should present it to the Member States ...

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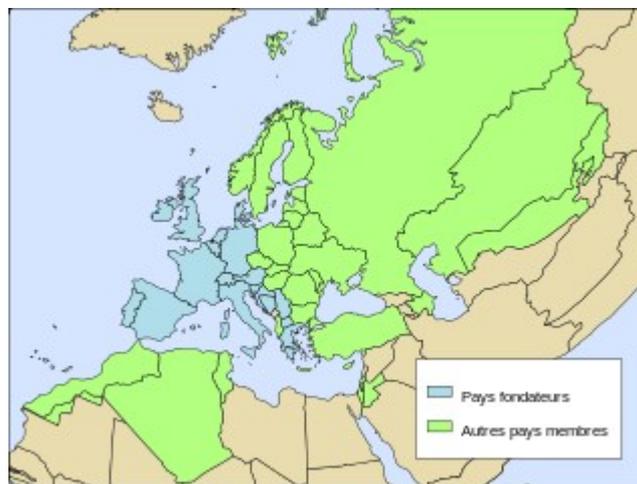
<sup>117</sup> I use a term that evokes rituals because that is the image that S. Foucart implicitly promotes, the idea of a sort of secret brotherhood from which one could never leave. This is part of a conspiracy style and which I will discuss in more detail another time.

Second, how would this consensus approach put the process "in the hands" of the industry? I don't even see what to discuss: not only does S. Foucart not justify his allegation in any way, but I don't even see what it could possibly be. Above all, it seems absurd: it totally contradicts what the journalist said, suggesting that a group could, thanks to the numbers, dominate the whole ...

But it is not all!

- *"In 2009, a few months after the Bucharest conference, the final recommendations of the ICPBR were submitted to the EPPO. But before being adopted as official standards, they are subject to review by experts mandated by each EPPO member state. "*

After being reviewed in plenary session, the recommendations are therefore submitted to the dozens of EPPO governments for consideration, as follows:



Source : Wikipedia

We note the presence of all the former Soviet bloc, Turkey, Jordan... It is difficult to see how these countries would have agreed to seek to support Syngenta (Switzerland), Bayer-Monsanto (Germany), Dow- Agrosience (US), BASF (Germany), etc. This is all the more ridiculous since the USSR itself joined the EPPO in 1957<sup>118</sup>...

- Résumons

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118 [https://www.eppo.int/ABOUT\\_EPPO/brief\\_history](https://www.eppo.int/ABOUT_EPPO/brief_history)

Thus, to summarize, we would have three employees of the “agrochemical industry”<sup>119</sup> and two former or future employees who would have decisively determined the conclusions of a group of 9 people (knowing that they should have convinced them all), then presented their work to other groups and would have convinced them collectively, unanimously, of its relevance. Then, it would have been necessary that NONE of the 52 Member States and their experts saw a problem, whereas there would be a “scientific consensus” on the matter (cf the preceding part)... And, all at the risk for the 3 scientists employed in agrochemicals to be identified as lacking scientific integrity by their peers. A hell of a story, don't you think?

We have a procedure completely dominated by governmental institutions (which is logical, given that it is the principle of the organization...), which the journalist tries with a cart of rhetorical mechanisms (see chapter 2) to pass off as a system in which the influence of industry could play to the full.

You see, even if we limit ourselves to what the author presents, we see that the main thesis (“manufacturers set the rules that govern them”) absolutely does not hold up. It is the governments and their regulatory agencies that have the power. This, by not even commenting on the veracity of what he is saying (which would be difficult, since he does not source anything...)<sup>120</sup>.

I do not go back to another claim from his article:

*“During its last conference, at the end of 2011 in Wageningen (The Netherlands), seven new working groups were formed on the issue of the effects of pesticides on bees, all of which are dominated by researchers in conflict of interest situations. The participation of experts employed by agrochemical firms or private laboratories under contract with them varies between 50% and 75%. The other members are experts from national health security agencies or, more rarely, scientists from public research. ”*

Indeed: we have indeed already seen that this conception of the conflict of interest was delusional; he does not source his allegation; what we have just presented further invalidates his vision, it would still be necessary to convince all the other scientists,

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119 Note that this can refer to a company that does not market NNI, a small company or even a lab working on a green fertilizer ...

120 I found a paper that would be by Gavin Lewis, “Vice-chairman of ICP-BR Bee Protection Group” and present the forum that was held in 2008 in Bucharest (<https://ojs.openagrar.de/index.php/JKA/article/view/117>). We see elements that seem to support what S. Foucart says (“A major part of this meeting was given over to a revision of the EPPO guideline 170 and the associated risk assessment scheme, which forms the basis of regulatory evaluations for the effects of pesticides on honey bees in the EU.”). However, the interpretation to be given is by no means obvious and the stakeholders should be questioned to see it more clearly. It is likely that, as we have seen when he talks about cooperatives, S. Foucart takes a “real” element and manipulates it to make it say what he wants.

which is absurd and even logically incompatible with the idea according to which there would have already been a consensus on the dangerousness of NNI at this time.

**Thus, S. Foucart invents an influence that the agro-industry would have on the establishment of regulatory standards.**

### **3. The references to the tobacco industry**

The author will repeatedly imply or claim that it was through the same practices used by the tobacco industry that the agrochemical industry succeeded in delaying the ban on NNIs.

The tobacco industry has used many ploys to delay recognition of the carcinogenicity of tobacco as much as possible, and then second-hand smoke. This was revealed in 1998, when the US court ordered the tobacco industry to release its internal documents. A WHO report<sup>121</sup> published in 2000 notably denounced pressure from the tobacco industry:

*“The contents of tobacco industry documents reveal that tobacco companies have acted for many years with the deliberate aim of countering efforts by the World Health Organization (WHO) to control tobacco use. This subversive action was very complex, received significant funding and generally remained invisible.” (Zeltener et al. 2000)*

These practices allegedly consisted in particular of communication campaigns aimed at discrediting the WHO:

*“The documents show that the tobacco companies have instead sought to divert attention from major public health problems, to reduce the budgets devoted to the decision-making and scientific activities of the WHO, to pit other United Nations agencies against the WHO.”, to convince developing countries that the WHO tobacco control program was a pro-industrialized program implemented at the expense of developing countries, to distort the results of important scientific studies on tobacco and to discredit WHO as an institution.” (Zeltener et al. 2000)*

The industry often lurked behind "various supposedly independent pseudo-academic, public policy or business organizations." The authors describe such practices in detail over 22 pages. I encourage you to read the document, it is really terrifying. Here are just two excerpts:

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121 Zeltener T, Kessler DA, Martiny A, Rander F. « Les stratégies utilisées par l'industrie du tabac pour contrer les activités de lutte antitabac à l'Organisation Mondiale de la santé. » Résumé d'orientation. Rapport du Comité d'experts sur les documents de l'industrie du tabac. OMS, juillet 2000

*“If we can manipulate the press, we can, for the first time, spark controversy in areas where public opinion feels there is none. This, of course, requires being able to secure the support of top scientists... obviously the industry cannot [sic] come across as sponsoring the activity or funding the travel of participants. This will have to be done through donations to foundations or independent institutions...”(an industrialist) (Zeltener et al. 2000)*

*“The tobacco companies have worked to adopt epidemiological standards that would prevent governments from relying on the IARC study and have worked to build a strong, supposedly independent scientific coalition to advance the interests of the tobacco industry in the plan. legislative challenge by challenging the use of certain types of studies as the basis for policy development.” (Zeltener et al. 2000)*

The practices of the tobacco industry have also been extensively exposed in Robert Proctor's "Golden Holocaust" and "The Merchants of Doubt. How a handful of scientists have masked the truth about societal issues such as smoking or global warming"<sup>1</sup> by Naomi Oreskes and Erik M. Conway. They have also been recognized by the courts and resulted in very heavy sentences.<sup>122</sup>

S. Foucart insinuates that the agrochemical industries would follow the same practices that the tobacco industry would have had to reinforce his discourse on the influence of the industry. Here are some examples:

*“We search in vain for the words" agriculture ", " agricultural practices "... We rub our eyes. It is as if an epidemiological study on the causes of lung cancer had not only failed to question participants about their tobacco consumption, but that, moreover, the words "cigarette" or "smoking" were excluded from its study. report. [...] This semantic modesty recalls that of old studies funded by American tobacco companies, which initially attributed lung cancer to air pollution, radon, genetic predispositions and, possibly, to... “way of life” - c that is to say with a cigarette.” (16)*

*“In short, it's a bit like assessing the smoking risk by making guinea pigs smoke one cigarette a year.” (39)*

*“So 2003 could have marked the beginning of the end of the controversy. But that was not the case. Agrochemical companies used the toolbox of tobacco companies to turn science against itself and sow doubt. Use rigor and accuracy in the instruments to delay awareness of the risks as much as possible.” (45)*

*“I think it would be a big exaggeration to say that lobbies have infiltrated the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). But*

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<sup>122</sup> For more details, you can read the articles of AFIS (<https://www.afis.org/Tabac-et-cigarette-electronique-Un-exemple-de-fraude-scientifique-mise-en>) or of S. Foucart ([https://www.lemonde.fr/societe/article/2012/02/25/les-conspirateurs-du-tabac\\_1647738\\_3224.html](https://www.lemonde.fr/societe/article/2012/02/25/les-conspirateurs-du-tabac_1647738_3224.html)).

*it is true that among the key authors of the first report of this organization, which dealt specifically with pollinators and their decline, there was an employee of the industrialist Syngenta. Researchers have also strongly protested, in the journal Nature, against this obvious conflict of interest – all the more so since the scientist in question was, at the time of her participation in the work of IPBES, at the center of 'intense scientific controversy. It is impossible to determine the impact that this person's participation in the work of IPBES had in the end, but the history of science work carried out on the tobacco industry's influencing strategies – in particular those of the American historian of science Robert Proctor (Stanford University) - shows that the participation, in expert work, of researchers in conflict of interest has the effect of biasing its conclusions.” (57)*

He reinforces this link by frequently referring to tobacco:

*“To understand, it may be helpful to do a little thought experiment. Take a group of young, healthy men. Make sure they all weigh around 70 kg. Then lock them up for two days and force them to smoke enough cigarettes to kill half of them. Read off the quantity of cigarettes inhaled to achieve this: You just got what toxicologists call the "lethal dose 50" over forty-eight hours (or LD50-48 hours). This is the amount of a poison that, given over a two-day period, has a one in two chance of killing an individual. Based on the toxicity of nicotine alone, it is likely that the LD50-48 hours of the blond cigarette is in the order of 150 packets per individual. Then divide this amount by ten. At this point, you still don't know what the result is (i.e. fifteen packets).*

*To nothing? Think again: the experience and the calculation that you have just carried out bring you "scientific proof" that cigarettes are a product of "low risk" for humans, as long as their consumption remains below the threshold of fifteen packs per day . At five packs of blondes per day, you are therefore very much below the risk threshold.” (11)*

*“For example, an epidemiological study showing the proportion of smokers affected by lung cancer does not, in itself, establish a causal link between smoking and the disease. But that doesn't mean that this causal link doesn't exist.” (44)*

*"Thus, the European decision to ban these three 'neonics' comes at a time when the damage they have caused is immense and undoubtedly already partially irreversible. Kind of like a doctor who waits until he is diagnosed with lung cancer before advising his patients to quit smoking. Or change the brand of cigarettes.” (45)*

As we have shown, this parallel is indefensible: there is no consensus on the effects of NNIs like on the ones of tobacco and the influence denounced is ridiculous. The journalist only adds specific elements that might make one think about it: it is only a logic of evocation ("*it looks like*") and not of demonstration. It is a manipulation technique aimed at concealing the weakness of the elements he identifies and

reinforcing the fable he invents: "*there would be a scientific consensus (as had been the case with tobacco)*"; "*There would be influencing practices (such as those implemented by the tobacco industry)*".

**Thus, S. Foucart builds his argument around the lateness of the regulatory response against NNIs on the invention of scientific consensus and influence; invention which it reinforces with explicit or implicit references to the practices of the tobacco industry.**

### III. The obviousness of the ban on NNIs on beets

A final important point is the idea that the ban on beet NNIs would be obvious. The author first constructs this idea on the context he has defined throughout his "work":

1. He recalls the consensus he invented, thus capitalizing on it.
2. He uses the technique of sliding from the pragmatism to the hygienism to connect his theories with scientific elements and to support this idea of consensus.
3. It relies on this fictitious consensus to heavily denigrate all disputes.
4. This whole reasoning is made explicit and reinforced by the theorization of "biodiversity-skepticism" (by analogy to climatoscepticism) in a more recent non-corpus article.

#### 1. The reminder of the consensus

S. Foucart implicitly or explicitly invokes the invented consensus of which we spoke above. Here is an explicit reminder:

*"Beyond the effects on bees, however, a considerable scientific literature documents the deleterious effects of neonics on all ecosystems. Hundreds of studies published in recent years show, beyond reasonable doubt, the full extent of the damage that these substances cause not only on pollinating insects, but also, and above all, on all arthropods, on birds in agricultural areas, on aquatic organisms, etc." (65)*

It's more implied here:

*"The scientific world is no exception. At the end of September, in Liberation, a consortium of some sixty international researchers specializing in the effects of "neonics" also expressed its opposition to the bill. This is, write the interested parties, "a serious mistake, on the pretext of minor or inaccurate reasons, given the immense stakes for which you are fully responsible today". "This error forces us to step out of our usual reserve to reaffirm to you the disastrous impacts of neonicotinoids, the subject of a reintroduction proposed by your government," they added." (68)*

The author thus presents this consortium as "the scientific world" or in any case its representative (opposition effect). This passage contains a lot of innuendos:

- The arguments supporting the reauthorization are only "pretexts".

- The error would be indisputable and of extraordinary magnitude.

You see here how the invention of consensus or evidence comes close to denigrating opponents: if it is consensus / evidence, then there is bound to be a hidden agenda, different from the arguments put forward. We will come back to it shortly after.

## 2. From pragmatic to hygienist

The journalist defends this consensus thanks to the technique of moving from a pragmatic logic (which is based in principle on scientific data, with a logic of doses), to a logic that I qualify as hygienist, because it is not acts more than defending the absolute purity of nature in the face of contamination (it is no longer a question of a logic of presence). In this case, it slips from "*NNIs are dangerous*" to "*No NNIs should be left in the environment.*"

### a. 12 août 2020 (64) article

The article from August 12, 2020, "With or without flowering, neonicotinoids pose risks to pollinators" (64), perfectly illustrates this mechanism.

The author responds to a statement from the Ministry of Agriculture announcing the reintroduction of NNIs on beets. This success would be based "*largely on an apparent common sense argument: since sugar beet is harvested before flowering, it does not constitute an attractive crop for bees and pollinators. The treatment of beet by coating seeds would therefore be without risk for these insects.*"

In fact, the ministry's decision was based on the idea that without pollination, the prejudice caused by NNIs was less important than the prejudice caused by their ban. A pragmatic logic therefore. Nonetheless, the journalist says the decision would be based on the fact that the coating would be "*safe*" for the bees, which in the common sense means "*no negative effects*". We are moving from a pragmatic logic ("*We must ban if the negative effects of NNIs are too high*") to a hygienist logic ("*We must ban if the NNIs have any negative effects*"). Once he sets that focus, he elaborates on it for the rest of the article.

Note that to reinforce this slide, he will refer to the work of EFSA by neutralizing the objections they raise:

*"These phenomena are not a fringe science: they were taken into account by the European Food Safety Authority (EFSA) in its 2018 expertise on 'neonics'. The findings of EFSA - an agency little suspect of environmentalists - had led to the ban of the main neonicotinoids in Europe, in all their uses. Regarding neonically*

*treated sugar beet, EFSA rated the risks of guttation water as "low", but independent academic work from the industry is lacking on the subject. As for the contamination of the environment around the treated beet plots, the European agency was unable to conclude that there was no risk for bumblebees and solitary bees, due to a lack of data.” (64)*

On the effect of guttation, we find the journalist's conception of "good science": work with the slightest connection to industry would have no scientific value. Note that he poses his opinion as "worth" more than the opinion of EFSA. It implicitly presents the "low" risks as sufficient to justify the ban when this vocabulary, in fact, in the sense in which EFSA uses it, means the opposite.

The lack of data on contamination outside the treated plot is surprising, given that the author always presents the subject to us as being well known<sup>1</sup>. Why should we consider the opinion of a journalist (and a few researchers?) To be superior to that of a health agency on the subject? He suggests that the lack of data would justify the most absolute ban possible. This completely ignores the challenges of health regulations that we presented previously (I. of this chapter).

**b. *“Fish are not going to forage in the rice fields.”***

Another argument, developed in the article (66), takes up the study by Yamamuro (et al. 2019) observing a very strong correlation between the use of NNI in rice fields and the collapse of the populations of two fish in one nearby lake. The journalist draws the parallel between this case and that of beets, concluding:

*“Thus, during all this time, if the Shinji fishermen had complained to their caretaker minister about the practices of their rice-growing neighbors, they would no doubt have been answered with assurance that their concerns were unfounded. It’s well known: “Fish, it’s not going to loot in rice paddies. »»*

He refers to complaints that beekeepers allegedly addressed to the ministry warning of the effect of NNIs as early as 1994 (54) and the argument that "*bees do not pollinate beets*" (which are harvested before flowering). Thus, the message of the article is as follows: the effect of the use of NNIs on beets is the same on pollinators (or comparable) as that of the use of NNIs in the Japanese rice fields studied by Yamamuro et al. (2019).

You see the strength of the insinuation: this link is in no way demonstrated, is absurd (we are talking about rice fields overlooking a lake, water is therefore omnipresent), but it still appears credible by the derision and rhetoric. We are moving from a pragmatic

logic, the scientific study which seems to hold up<sup>123</sup>, to a hygienist logic: since it is possible that NNIs have an effect outside pollination, they must be prohibited.

### 3. The denigration of disputes

As we have already seen in the part on the treatment of objections (chap. 2), S. Foucart has a whole arsenal to deal with objections. He has repeatedly (with IUCN (17) and IPBES (19) (24) (25)) made comments that sound like warnings. He combined together these two logics of intimidation and dealing with objections to lobby against the reauthorization project. Thus, he takes up the words of François Veillerette:

*"François Veillerette, director of the Générations futures association, denounces" an unacceptable setback which shows that this government easily bends under the weight of the agrochemical and industrial agriculture lobbies, and has given up being the leader of the fight against bee-killing insecticides in Europe".*" (63)

Besides the obvious disparagement, we see two important things here:

- The neutralization of the voice of the many farmers who requested reauthorization by assimilating them to the producers of pesticides and to "lobbies". (what we have seen above I.3.)
- The door wide open left to a conspiratorial interpretation ("the weight of the lobbies").

We find this allegation and this neutralization of the word of the farmers under the pen, directly, of the journalist:

*"Promoted by agribusiness circles, taken up by the Minister of Agriculture, echoed by journalists and multiplied endlessly on social networks by thousands of little hands, a single element of language has swept away all of this. No one is unaware of it any more: "A bee, that will not go foraging in the fields of beetroot.""*" (66)

He also repeats these words of MP Delphine Batho:

*"This bill is based on a form of obscurantism," Judge Batho. It ignores the scientific data available and in particular ignores the phenomenon of the disappearance of insects that we are witnessing."* (65)

Those who promote this bill are therefore qualified as obscurantists... Note how the journalist "hides" behind political figures to make extreme remarks, thanks to the technique of "improper citation" that we presented in the second chapter.

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<sup>123</sup> At least from the point of view of a non-specialist; in contrast to that of Hallman et al. 2017 which is obviously flawed.

#### 4. The explicit invention of consensus: "biodiversity-skepticism"

The journalist implicitly constructs the idea of a scientific consensus around an apocalyptic decline of insects (and especially pollinators) and that researchers contradicting him would be a minority who should be suspected of conflicts of interest. This claim is explained in the article of May 24, 2021, which I did not include in the corpus studied because it does not directly evoke the NNI: *"The "biodiversity-skepticism", more discreet than that against the climate change, is in a sense much more worrying"*.

Here are some excerpts:

*"The relativization and denial of the collapse of biodiversity are now being built in the most highly rated scientific journals," observes Stéphane S. Foucart, journalist at "Le Monde", with concern in his column. "*

*"A new 'skepticism' is emerging. It is tackling the other great environmental crisis, that of biodiversity; it is undoubtedly already at work in the government's choice to sharply reduce its support for organic farming<sup>124</sup>. More discreet than its climate twin, this "biodiversity-skepticism" is in a sense much more worrying. Because it is rooted in scholarly literature itself. It is not in the talk shows of the 24-hour news channels that it is built, but in the most highly-rated scientific journals."*

The author explicitly draws a direct parallel between climate skepticism and challenging declining biodiversity. However, the decrease in biodiversity is an extraordinarily complex subject (how to reduce it to a single indicator?) And far from being consensual. He will nevertheless defend this idea by briefly evoking studies published in prestigious journals contesting or relativizing the decline of biodiversity, then opposing them an argument that he presents as sufficient to relegate them to the rank of quibbles.

*"In November 2020, Nature published, for example, a study relativizing the Living Planet index, developed by researchers in partnership with WWF, and according to which 68% of vertebrate populations have disappeared from the surface of the Earth in half a century. The authors argued that this was an alarmist presentation, with the trend being pulled down by only a small proportion of sharply declining species, on the order of 3% of vertebrate species. By removing these species on the verge of extinction from the analysis, the catastrophic decline disappeared!"*

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<sup>124</sup> This mention undoubtedly refers to the CAP under discussion, which would be misinformation, this CAP increasing support to organic agriculture. Obviously, the lack of precision makes it impossible to be sure...

*We are perhaps there, in reality, on the borders of science and the game of bonneteau<sup>1</sup>. Because, as my colleague Perrine Mouterde noted in the article she devoted to the debate, the authors of the study were much more discreet about the fact that, if we also remove the species from the analysis which proliferate in contact with humans, we see that the fall in vertebrate populations remains very strong, over 40% in half a century. Should we really put the disappearance of the common snipe, the European greenfinch or the white wheatear into perspective on the grounds that pigeons and crows proliferate, thriving on our waste? "*

Thus, the author presents the Living Planet index (the creation of an NGO) as having a scientific authority superior to a meta-study published in Nature and discards the latter's conclusions into... a paragraph. You saw above that, to be taken a little seriously, even the Hallman et al. (2017), which nevertheless has serious and obvious flaws, requires a certain deepening. In this case, the study is much more complex, using different sets of statistics and complex calculations, and yet the reporter discards it in one paragraph ...

Above all, he presents as a strong argument the fact that a colleague had made calculations and showed that by excluding not only species in strong decline, but in addition those which proliferate near humans, the decline of populations would be greater than 40 %. However:

1 / He presents the article of a journalist as being a force of contradiction such as to suggest that the many scientists who took part in the study would be "bonneteurs" (that is to say basically d crooks in gang).

2 / The origin of this 40% figure is unknown. The article the journalist is referring to does not contain this information at all.

3/ 40% being well below 68%, it would still be justified to criticize the Living Planet index (and therefore to incur the qualifier of "biodiversity-skeptic").

4 / It does not specify how it defines the species "*proliferating in contact with humans*", not why it refers to "*common snipe, European greenfinch or laughing wheatear*" (are they part of the 3 % of rapidly declining species excluded by the Nature study?), nor why pigeons and crows would be representative of all "*species proliferating in contact with humans*" or why the latter would be less of "*biodiversity*" than the others.

5 / To finish, let us simply quote the paragraph which summarizes the problem highlighted by the said study:

*« [Le calcul de la moyenne géométrique entre les populations est l'approche la plus courante et la plus simple, mais elle est fortement influencée par les*

*extrêmes. Par exemple, imaginez un écosystème dans lequel une population a diminué de 99 %. Même si une deuxième population était multipliée par 50 ou si 393 populations augmentaient de 1 % (c'est-à-dire une augmentation nette importante), une moyenne géométrique montrerait un déclin catastrophique de 50 %]. »<sup>125</sup>*

In short, the journalist in fact makes no argument and is *in fine* simply denigrating scientists who do not agree with him.

You can clearly see here that he is trying to create a scientific consensus from scratch, claiming to be the arbiter between science which is sincere and that which simply seeks to deny the obvious for occult reasons. All with absolutely ridiculous arguments. The danger of S. Foucart's approach appears in this article: he seeks to define science, to claim this power.

To detail how manipulative this article is would, I think, be superfluous. The rest is of the same ilk as the passage we commented on and we have already shown that it makes explicit the construction of a false consensus by the journalist, which was implicit in the corpus commented on. I will simply end with the conclusion proposed by Seppi, which sums up the article well:

*"Barded by his activism, the author of the column is the arbiter of elegance when it comes to the truth about the decline of biodiversity; rejects studies - which are themselves syntheses or meta-analyses of studies (166 long-term studies with 1,676 sites in the case of van Klink et al., more than 5,300 time series for Crossley et al.) - because they do not support the "collapse" thesis; vituperates journals that published ecologically and politically incorrect articles. And qualifies as "biodiversity-skepticism" which is nothing other than the scientific approach."<sup>126</sup>*

**Thus, S. Foucart takes advantage of the consensus invented by him and uses manipulation mechanisms to defend the total ban on NNIs and put pressure against the re-authorization of NNIs on beet (voted at the end of 2020).**

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125 Traduit de l'anglais : Leung et coll. « *Clustered versus catastrophic global vertebrate declines* », Nature, 18 novembre 2020

126 <https://seppi.over-blog.com/2021/05/le-biodiversite-scepticisme-la-nouvelle-trouville-savonarolesque-de-m.stephane-foucart.html>

## **Chapter 3. A few systematic manipulations**

We have shown that the arguments defended by S. Foucart heavily misinformed. Still, they probably seem believable to most readers and are picked up overwhelmingly. How does he do this? In fact, he uses information manipulation techniques to make his case work. I have identified a few that come up often:

1. the juxtaposition;
2. improper quotation;
3. objections management;
4. the double standards;
5. the shift from a pragmatic logic to a hygienist logic;
6. biased presentation of scientific data.

Of the 71 articles, only 8 do not (at first examination) include such processes.

## I. The juxtaposition

The juxtaposition consists of presenting two elements in succession, suggesting their links. This method of constructing discourse is omnipresent in S. Foucart. These mechanics can operate at multiple scales: within a single paragraph, between multiple paragraphs, or even at the article scale. They can also have several roles: to build a furtive logical structure, to neutralize a point or to insinuate.

### 1. Stealthily building a logical structure

The main purpose of juxtaposition is to create a logical structure without explaining it. For example, instead of saying “*Marcel was seen at the scene of the crime, he is therefore guilty*”, we can say “*Marcel was seen at the scene of the crime. Some people think he's guilty.*” Depending on the context, these two examples can be understood identically.

Take this example:

*“Although decided, the three opinions delivered by EFSA are not surprising. Laura Maxim, researcher at the CNRS Institute of Communication Sciences (ISCC) and one of the best specialists in the controversies that have accompanied the use of these substances, notes that “ten years ago, the Scientific Committee and technical [a group of experts set up in 1999 by Jean Glavany, Minister of Agriculture] had reached the same conclusions about imidacloprid .” (4)*

The sequence of sentences suggests that L. Maxim endorses the view that the opinions delivered by EFSA were “*not surprising*”. Yet that is not at all what the quote attributed to him says. The fact that a country report concluded in this direction about one molecule does not reflect some sort of consensus on the effect of a whole family of molecules.

The mere juxtaposition of the two sentences makes it possible to suggest (I do not see, however, what other interpretation to adopt) the idea promoted by S. Foucart.

### 2. Neutralize

juxtaposition is widely used to neutralize objections. We will see this point, objections management, in more detail later, but here is already a somewhat original quote:

*“Solicited by Le Monde, Vincent Bretagnolle (CNRS) and Bernard Vaissière (National Institute for Agronomic Research), two specialists in these subjects, welcome this work but warn that they are only correlative: they do not provide*

*definitive proof of causality. The fact remains that, of all the variables examined, write the Finnish agronomists, “only the adoption of neonicotinoid insecticides in seed treatment can explain the drop in yields in several [Finnish] provinces, and at the national level for the shuttle, through disruption of pollination services by wild insects”.*

*Despite an increasingly indefensible case, the manufacturers of these substances are determined to defend them tooth and nail before the European regulator, to keep them at full force on the market. An intense lobbying campaign is underway in Brussels and in the Strasbourg parliament – its outcome will be very interesting. ” (30)*

Here, we have an objection: the results would only be correlative. The "Rest that" announces its neutralization. The overall conclusion of the paragraph is clearly that there would be causation, but it is not explicit. The objection actually serves here to emphasize its neutralization.

Then S. Foucart goes on to speak of the fact that the NNI have an increasingly indefensible case. There is no explicit link between the two paragraphs. Yet the implication is clear: the study in question, providing evidence for a causal link, makes the NNI case "increasingly indefensible". Thus the juxtaposition effect makes it possible, without explaining it, to give scope to the commented study and to neutralize the mentioned limit, the simply correlative nature of the observations.<sup>127</sup>

It can work at the article level. This is for example the case in the second article, which we have already presented in detail. It started with a question:

*"Is the culprit rather incompetence or the accumulation of conflicts of interest? Impossible to decide. But the question now arises: how could the notoriously deficient bee risk assessment tests have been used for nearly twenty years to approve the latest generations of insecticides?" (2)*

Even though he presents it as "*impossible to decide*", ALL of the rest of the article supports the idea that the build-up of conflicts of interest is responsible. Incompetence here is a form of objection to the assumption that the accumulation of interest is responsible. He neutralizes it by apposition. What is stated at the beginning ("*Unable to decide*") is erased by the article as a whole.

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<sup>127</sup> Notez que B.Vaissière et, surtout, V.Bretagnolle, sont deux chercheurs que S. Foucart cite et met en avant à de très nombreuses occasions et qui défendent justement ... la dangerosité des NNI et le fait qu'il faille les interdire.

### 3. Insinuate

More broadly, the juxtaposition allows the suggestion that an argument is fallacious or that an entity is more or less corrupt. Here is an example with the addition of an objection override:

*“I think it would be a big exaggeration to say that lobbies have infiltrated the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). But it is true that among the key authors of the first report of this organization, which dealt specifically with pollinators and their decline, there was an employee of the industrialist Syngenta.*

*Researchers have also strongly protested, in the journal Nature, against this obvious conflict of interest – all the more so since the scientist in question was, at the time of her participation in the work of IPBES, at the center of 'intense scientific controversy.*

*It is impossible to determine the impact that this person's participation in the work of IPBES had in the end, but the history of science work carried out on the tobacco industry's influencing strategies – in particular those of the American historian of science Robert Proctor (Stanford University) - shows that the participation, in expert work, of researchers in conflict of interest has the effect of biasing its conclusions.” (57)*

Here, S. Foucart creates the objection, then neutralizes it. In the end, the message is that the "lobbies" have infiltrated IPBES and that this would have had consequences on its work. The affix allows this infiltration to be insinuated (and the idea that it would have consequences for IPBES reports) while explicitly denying it.

Note the structure, which is very reminiscent of the phrase *“I'm not racist / sexist / conspiratorial, but...”*, which is systematically a prelude to racist / sexist / conspiratorial talk.<sup>128</sup>

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128 Elle est d'ailleurs tellement fréquente que je l'ai retrouvée dans tous les discours sexistes et racistes que j'ai analysés dans mon livre le Cancer Militant.

## II. Improper citation

Quoting is very ordinary and even a good practice to give a really accurate picture of what a person is saying. However, it is also a process that can be abused to convey an implicit message. This wrongful practice of quotation, as used by S. Foucart, has three roles:

1. create distance;
2. make his point credible, for example by referring to someone who will be presented as an authority (eg David Goulson or Vincent Bretagnolle on bees);
3. repeating a vehement or extreme statement, for example from an activist, without endorsing it (which allows him to produce radical remarks without losing his appearance of neutrality and objectivity).

By citation we can understand "reference". I have indeed observed on a few occasions that these effects could be produced without specifically citing the words, by simply referring to them (but this is quite rare).

### 1. Create distance and discredit

The simple fact of quoting an opponent, instead of synthesizing his remarks, makes it possible to create distance: "*he says that, I do not comment on the relevance or the precise content*". In doing so, he may announce a certain mistrust in the meaning and sincerity of the subject, so as to leave open useful interpretations of the argument developed by S. Foucart which would be much more difficult with a synthesis.

This is a very useful tool for dealing with objections and, more broadly, for insinuating.

#### a. *One of the tools for handling objections*

We have already discussed how this technique is used to handle objections in the article on IUCN, which we discussed earlier. Let's take another excerpt. This is his way of presenting Mr Potts' response to his "turnaround" (which we will see did not appear to be one) on NNIs between positions 6 months apart:

*"Why this turnaround? Asked in May by Le Monde, he replied: "As any good scientist should be, I am open to new evidence, and my opinions may change with new discoveries" - without saying more about these "new discoveries"."* (19)

This passage will tend to create suspicion in the reader, the remarks of Mr Potts, however perfectly valid, appearing as a simple pretext. The informational content is

quite poor. Reporting his words could perfectly be summed up as follows:

*“When questioned in May, he replied that he had changed his mind following new evidence. He did not tell us which ones. ”*

Even if you keep the little end sentence (which doesn't add anything: he owes them no information), the suspicion aroused is less than with the quote.

**b. A subtle innuendo**

More broadly, it is a technique used to insinuate, while being perfectly "undetectable": you will never be criticized for having quoted someone. You have it for example in the article (2) (The bankruptcy of the evaluation of pesticides on bees), paragraph 18:

*"Are these experts in a conflict of interest situation? Are they competent? Impossible to know. "The list of these experts is not secret: it is accessible to the governments of our member states who wish it, but it is not made public," says Ringolds Arnitis." (2)*

The person cited, a representative of the EPPO, whose integrity was questioned by S. Foucart, appears here as someone caught in the act. The author does not at any time discuss this argument, which is quite viable. It slips on as if it were a simple pretext not worth dwelling on.<sup>129</sup> However, the measure described is quite logical: if the experts have responsibilities, it is entirely logic to keep their identity of the general public, to avoid pressure (from industrialists as from environmentalists).

**c. An effective combination with the apposition effect**

Let us return to the passage, which we have just spoken of, where S. Foucart questions the reasons for a supposed change of opinion by M. Potts:

*"Why this turnaround? Asked in May by Le Monde, he replied: "As any good scientist should be, I am open to new evidence, and my opinions may change with new discoveries" - without saying more about these " new discoveries"." (19)*

We saw that the citation here was intended to create a distancing supposing a distrust of the words of the researcher. Let's read on:

*“Along with eight academic researchers (including another member of the IPBES expert committee), in May 2014 in the journal Proceedings of the Royal Society B, Mr. Potts signed a scoping study on the evaluation of the effects of these famous neonicotinoids. The paper appealed to both industry and the Crop*

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<sup>129</sup> Notez qu'il glisse en même temps une autre idée : les gouvernements ne feraient pas attention à ces choses ... sans doute parce qu'ils seraient eux-mêmes dans la combine ?

*Protection Association – the UK's pesticides union – circulated it in a press release. But the sorrowful spirits immediately noted that, in contravention of the journal's publication rules, neither the financing of the study nor the possible conflicts of interest of its authors were specified... Solicited, the publishing editor of the publication assured Le Monde, at the beginning of July, that he would ask the authors for details. Four months later, these have still not been brought.” (19)*

This element is absolutely not logically linked to the previous remarks. Yet the interpretation is clear: it would mean that his turnaround should not have happened by chance and that it would have fallen into the camp of the industrialists. However, S. Foucart does not really present any factual basis for this idea. An organization is free to answer an article. How many dozen requests are answered each year? As for the issue of conflicts of interest, let us recall that Mr Potts is one of the senior executives of IPBES and that S. Foucart himself has qualified the latter as "IPCC of biodiversity"... weren't they just too busy to answer a troublemaker? By adding the elements together, the author conceals the weakness of the whole. So Mr Potts's answer is thus clearly seen as a mere pretext, when it is a valid answer. We can see how the taking of distance by the quotation reacts with the use of the affix.

## **2. Build credibility**

The quotation also helps to give credibility to his remarks by invoking the words of an expert: *“I am not the one saying it, it is a famous researcher”*. This process can be used very well. This is generally the case when S. Foucart writes an article on a new scientific study and leaves the floor to its authors. So, for example, for article (1), which dealt with a study showing the sublethal effects of NNIs:

*“On its own, infection by Nosema ceranae causes only limited mortality,” explains Frédéric Delbac, professor-researcher at the Microorganisms, genomes and environment Laboratory (Blaise-Pascal University in Clermont-Ferrand, CNRS) and co-author of the 'study. Likewise, the exposure levels to which we subjected the bees were very low, in the order of a hundredth of the dose from which we observed 50% mortality.”” (1)*

There is nothing wrong with that, it is even good practice in popular science.

### **a. Reinforce questionable opinions**

However, it can also be used to give credit to more questionable words. We saw this above when he invoked the opinion of "researchers" on the “agricultural model”. For example, you have this short passage about flaws in risk assessment procedures:

*"These shortcomings are, in the words of a French apidologist who requested anonymity and researcher in a public body," an open secret." (2)*

The fact of quoting "an apidologue" makes it possible to use, without losing credibility, the expression "open secret". At the same time, it helps to support the idea that there is something hidden. We are a long way from the relevant use of the quotes just discussed. It also helps hijack credibility. This passage illustrates this mechanism well with regard to the Epilobee survey, which focused on mortalities and the presence of diseases or parasites:

*"On the other hand, no pesticide measurements were made in the beehives analyzed. A point that arouses sharp criticism in the scientific community: "This study is a bit strange, said ironically the apidologist David Goulson, professor at the University of Sussex (United Kingdom). They spend over 3 million euros studying bee health and don't even mention the word "pesticide"! "*

*In fact, the word is absent from the thirty pages of the published report. "The chosen protocol considers only one category of factors that can cause bee disorders: pathogens and parasites," adds the apidologist Gérard Arnold, research director at the CNRS. If you only look for infectious agents, there is no risk of finding pesticide residues. This choice is political, not scientific. "" (15)*

Quoting these opinions makes it possible to sell the idea that *"this choice is political, not scientific"*, even though it is difficult to see the factual basis of their affirmation. They do not even provide any information on the price of this kind of surveys and the additional cost of additional analyzes.

Here is another example:

*"In a letter addressed to the French biologist Anne Larigauderie, the executive secretary of IPBES, and of which Le Monde has obtained a copy, Klaus-Werner Wenzel, professor of medicine at the Charité University Hospital in Berlin, said to himself" shocked by an obvious conflict of interest affecting members of a large panel of experts". (24)*

Here he gives public and general significance to the private words of a professor of medicine. Here is another, relating to the decision of the Nice court to suspend the MA for sulfloxaflor:

*"Asked by Le Monde, the lawyer for Générations futures, Me François Lafforgue, welcomes the court's decision. "It puts a stop to this logic of systematic use of pesticides. Today, the legal response is adapted to the situation, and it is now hoped that the political response will follow on the harmful effects of pesticides on human health, including the creation of a victim compensation fund. "*

*The lawyer also wants to see it "as a positive signal in the context of the review of the registration of glyphosate". On Monday, November 27, the member states of the European Union are due to decide, in an appeal committee, on the re-registration of the famous herbicide." (38)*

The judgment in question did not have this significance for several reasons: it was only a first instance decision and a temporary interim measure until the legality of the MA was reassessed. Note that he additionally speaks of impact "on human health", referring to a risk that seems very, very doubtful.

By attributing the remarks to a lawyer, the author gives it credibility and shifts the responsibility for the manipulations mobilized: disinformation to create fear (effect on human health) and an attempt to bring glyphosate closer to sulfloxaflor and NNIs.

### **b. The combination with the affix**

It is also possible to use a quote in combination with the apposition to make a scientist say what he is not saying. Here is a passage from an article criticizing the uselessness of the moratorium decided in 2013:

*"The second reason to be depressed about the European decision is that it will probably not help. The moratorium (two years) is indeed shorter than the lifespan of these molecules in the environment. In a review published this year in the journal Current Opinion in Environmental Sustainability, Jeroen van der Sluijs (University of Utrecht) and his co-authors explain that "neonicotinoids show a potential for accumulation in the soil and can be taken up by subsequent crops. up to at least two years after application". (13)*

The natural interpretation will be that the researchers' words match the original statement, that the moratorium would be of no use. Yet the researchers are not saying the moratorium will do no good, but that NNIs can persist for more than 2 years...

### **3. Endorse extreme or politicized remarks**

The quotation also makes it possible to take up and support comments that are politicized or too questionable without actually being the author, thus allowing the journalist to maintain an appearance of neutrality. More specifically, it is about:

- promote a political agenda;
- speak under cover or
- to resume militant impulses.

**a. Promote a political agenda**

Here is an example of promoting a political agenda by proxy:

*“The beekeepers gathered in UNAF have for their part already announced that they would not be satisfied with this proposal. They want a total and definitive ban of these systemic plant protection products, suspected of being the major cause of the decline of honey bees and wild pollinators.” (5)*

This allows S. Foucart to promote a political measure (which is the one he promotes in the entirety of his "work") without showing it, while retaining an appearance of independence.

Here is another example:

*“EFSA confirms what has already been shown by abundant scientific evidence: neonicotinoids are a serious threat to bees and the future of agriculture,” comments Marco Contiero, agricultural policy officer at Greenpeace Europe. The Commission should extend their ban to cover all uses of neonicotinoids, on all crops, and end its current policy of exemptions. Viable non-chemical alternatives exist and the European Union should encourage farmers to use them.” (23)*

Here a representative of Greenpeace presents what he thinks the European Commission should do. Strangely, this sticks precisely to what S. Foucart implicitly suggests... This approach can also be part of a logic of credibility. For example, here are some words from a researcher, V. Bretagnolle, about NNIs:

*“None of these three countries has succeeded in reversing the trend: to achieve a tangible effect, practices have to be changed over considerable areas. Otherwise, the effects are imperceptible. It is not a problem of farmers, but of an agricultural model: if we want to halt the decline of biodiversity in the countryside, we must change it, together with the farmers.” (43)*

He promotes the idea that "the dominant agricultural model" should be radically changed. Not only does S. Foucart capture the credibility of the intervenor's function (researcher), but in addition he makes him convey a political discourse (difficult for him to assume, since this would endanger the aura of neutrality that he is trying to create).

Likewise in this passage:

*“The authors of this work have little doubt about the involvement of neonicotinoids in the decline of biodiversity in general. “We must adopt international restrictions on the use of neonicotinoids without delay and prevent their replacement by equally dangerous products,” write researchers who participated in this publication, in a column published in Le Monde.” (44)*

**b. Speak in cover**

Abusive quotes can also be used to express a questionable idea that is potentially questionable or politically engaging while keeping an appearance of neutrality. Take this example, concerning the desire expressed by the Minister of Agriculture (2017) to reverse the biodiversity law for legal reasons, due to the lack of alternatives for some NNIs.

*“The deputy (PS) of Deux-Sèvres Delphine Batho, at the origin of the amendment on" neonics ", in the law for biodiversity and the reconquest of landscapes, considers that" no legal quibbling can justify that we come back to French law". [...] “The European regulation authorizes member states to take precautionary measures,” she explains. Germany and Italy have made use of this possibility to ban certain neonicotinoids beyond European provisions. Finally, she recalls, "scientific studies have established the impact of neonicotinoids on human health with" unfavorable neurological consequences on humans”.” (30)*

Here the quote allows the journalist

1. to characterize the targeted argument as "legal argument", suggesting that it would have been a mere pretext to reverse the ban;
2. To claim that NNIs have been shown to cause neurological damage to humans (which is highly questionable).

Letting the MP say it makes the remarks far more credible than if these remarks were made by S. Foucart and it allows her to take responsibility for the questionable allegation of the Minister on the health impact of NNIs.

The fact that S. Foucart speaks under cover is perfectly visible in this paragraph:

*"According to our information, France is among the member states in favor of the application of the new tests. But Mr. Laarman warns against possible fooling games. "If France or other states are in favor of this overhaul of the system," he said, "let them take a public stand and campaign! "Because the French position is ambiguous: new generation insecticides, based on sulfoxaflor – a molecule marketed by Corteva (ex-Dow Agrosiences) - were thus authorized in 2017, in France, by the National Agency for Health Security of food, environment and work (ANSES) on the basis of obsolete tests. The authorization was immediately challenged by the UNAF in court, with success.” (48)*

He says something, picks up militant remarks continuing what he said, then clarifies the scope of the latter. Laarman’s intervention is part of the very structure of what S. Foucart says. Note at the same time that he implies that ANSES would be at the orders of the government, which seems to me extremely dubious.

**c. *Echo the militant impulses***

Finally, the quotation makes it possible to take up and support the militant outbursts, which reinforce the scope of the arguments promoted by S. Foucart. For example, here is a reaction to the MA for sulfoxaflor:

*"It is shameful, scandalous, pitiful and irresponsible toward future generations," says Gilles Lanio, the president of the UNAF. I still can not believe it!" (36)*

A reaction to the suspension of the Sulfoxaflor MA:

*"This file reveals a scandalous situation on the management of European approvals of active ingredients of pesticides which are granted in the absence of nonetheless essential data on product safety, called confirmatory data, which will not be transmitted until two years later, notes François Veillerette, spokesperson for Future generations. This situation must end as soon as possible, and we call on the French ministers concerned to act quickly on this issue." (38)*

A reaction to the re-authorization for NNI on beets at the end of 2020:

*"François Veillerette, director of the Générations futures association, denounces" an unacceptable setback which shows that this government easily bends under the weight of the agrochemical and industrial agriculture lobbies, and has given up being the leader of the fight against bee-killing insecticides in Europe". (63)*

### III. Objections management

There is something striking in S. Foucart's articles: nothing effectively contradicts his storytelling. The arguments against it are either

1. presented in such a way that they have no force (especially with the technique of abusive quotation that we have just seen),
2. or immediately "*debunked*" by the author, often in a way that is irrelevant.

#### 1. Neutralization

The neutralization of objections involves generally a lot of juxtaposition and citation, as illustrated in article (15), in which S. Foucart condemns the fact that a report on beehives mortality didn't investigate the role of pesticides. You have a passage where two researchers are outraged, going so far as to say that not being interested in pesticides would be a "*political choice rather than a scientific one*" (we spoke about it in the section on the improper citation). S. Foucart then gives us the manager's response:

*"We have agreed with the Commission to develop, over the first two years, a robust assessment method for the health of colonies, in order to be able to compare countries," replied Gilles Salvat, director of animal health at ANSES. If we had done a very large number of additional samples and analyzes up front, the cost would have been prohibitive. In the future, more focused studies will be done."* (15)

Foucart does not say anything about it and goes on and continues to criticize the study, arguing that "*as such, the results already seem to exclude the sole responsibility of natural pathogens in the mortalities observed*" and that the choice of hive mortality as an indicator would minimize the situation.

Thus, it completely neutralizes the response of ANSES, without ever responding to it. On the contrary, he adds, indicators more extensive than the mortality of hives, including for example sublethal effects, being probably much more expensive to study. The objection is treated as if it is worthless. This innuendo is reinforced by the distance put by the quotation, an effect of which we have already spoken, which also adds an atmosphere of suspicion.

One form of neutralization is hijacking. So let's take this simple sentence:

*"But, say the agrochemists who market these products, we need to feed humanity well. (30) [Subsequently, the author argues that NNIs would not have a positive effect on returns.]*

In reality, this argument is mainly carried by farmers. By attributing it to "agrochemists", it operates a diversion having the effect of:

- Facilitate his argument. The latter would indeed be much more difficult to maintain when confronted with the voice of farmers.
- Discredit the carriers of this discourse, who are relegated to the rank of henchmen or executors of agrochemists.<sup>130</sup>

Generally speaking, the idea that NNIs are inefficient is hardly compatible with reality: most farmers are highly skilled technicians, many of whom are even engineers. He therefore systematically belittles them, presenting them as toys of strength that surpass them.

You will also find this neutralization method in:

- « L'UICN, Syngenta et le déclin des bourdons » (17), avec les arguments de Ana Nieto (paragraphe 11 et 12)
- « Disparition des abeilles : comment l'Europe a renoncé à enrayer leur déclin » (53), paragraphes 17 et 18

## 2. Contradiction

Foucart systematically presents himself as an authority having to decide between two positions. He uses this posture to present what is not as an effective counter-argument. For example, here is what S. Foucart writes about the Epilobee study in the article just after the one we just spoke about:

*“The architects of the study argue that it would have cost to take samples from all the beehives visited. It's fair game. But let's read the thirty pages of the published report: the word "pesticide" is not there. The word "insecticide" either, not even an understatement as benign as "phytosanitary product". We look, in vain, for the words "agriculture", "agricultural practices"..." (16)*

Once again, S. Foucart does not speak once again of the argument in question: the cost of analyzes. He does not mention the budgetary choice at all, but the fact that the term "pesticide" does not appear in a report... not dealing with pesticides. Yet he presents this as a perfectly effective counter-argument. He even implies that it would be because the term pesticide was not "benign" that he was discarded.

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<sup>130</sup> We notice this very frequently on social networks: anything that does not correspond to a certain orthodoxy is enough to attract accusations of being sold to the interests of agrochemicals.

## IV. Double standards

Double standards is a term for treating two similar situations differently. This technique is used by S. Foucart to mark the "good guys" and the "bad guys" in his story, even in the absence of any objective element distinguishing them. He mainly uses it on the one hand to present in a positive light the pressures of NGOs and politicians in favor of his ideas; and on the other hand in its presentation of conflicts of interest.

### 1. The good and bad pressures

Foucart presents pressures from a different perspective, depending on whether they come from activists or businesses. This difference is perfectly illustrated by this single sentence:

*“The vote took place in a context of great tension, between intense lobbying by agrochemical companies and strong mobilization of the beekeeping sector.” (8)*

The action of companies is an "intense lobbying", while the action of the beekeeping sector is a "strong mobilization". The first refers to the idea of occult negotiations, the second to popular enthusiasm... Similarly, he writes that, in the context of the vote on the 2013 moratorium:

*“This time, European expertise came under intense pressure. Several letters sent by Syngenta to EFSA's senior management, made public by the non-governmental organization Corporate Europe Observatory (CEO), show that the Swiss agrochemist has demanded, in vain, amendments to EFSA's position, going so far as to threaten some of its prosecution officials<sup>131</sup>: "We ask you to formally confirm that you will rectify the press release by 11 am, write Syngenta executives to an EFSA official on January 15. Otherwise, you will understand that we are considering legal options. "*

*On the other hand, a considerable mobilization was organized by the beekeeping unions, as well as environmental movements like Greenpeace or Pesticide Action Network. The NGO Avaaz prides itself on having obtained more than two and a half million signatures for the ban on neonicotinoids.” (8)*

Thus, on the one hand, sending letters and threatening to "consider legal options" (which means "to launch appeals" against the administrative decision, that is to say one of the most ordinary things in the world) would be "intense pressures", which would weigh unduly on the shoulders of the agency...

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131 Note that he suggests that they would be personally threatened, when they are simply announcing that they will use their avenues of appeal against the contested decisions...

On the contrary, the pressures coming from political organizations are presented as legitimate<sup>132</sup>.

There would be the “bad” pressures, those from industry which would occur despite the lack of transparency, and the “good” pressures, those from politics and NGOs, which would need transparency to be exerted. Here are some other examples of pressure from environmental organizations, always presented in a very positive way. For example, on discussions around a ban on NNI in 2015:

*“The government is, on the subject, pushed by the voluntarism of certain parliamentarians, but also by a growing mobilization of civil society. Launched at the end of April by the Nicolas Hulot Foundation and the Générations futures association, a petition calling for the withdrawal of "neonics" has collected some 50,000 signatures in three weeks.”* (22)

On the re-authorization of NNIs in 2020:

*“It is under strong pressure from civil society that the deputies were to begin, Monday, October 5, the examination in session of the bill authorizing the partial return of neonicotinoid pesticides, banned since 2018 for the risks they present on biodiversity in general and bees in particular. The day before, questioned by Le Journal du dimanche, the former minister of ecological and solidarity transition, Nicolas Hulot, called directly on the deputies "not to vote [this bill] law".*

*In the same edition of the JDD, around thirty environmental organizations and agricultural unions, including WWF, Greenpeace, the Bird Protection League and the Peasant Confederation, conveyed the same message to the national representation: “Tomorrow, your vote will engage you, in the present and towards future generations. In the midst of a health and ecological emergency, the French, their children and grandchildren will judge your willingness to prioritize – or not – their health and the environment.””* (68)

Note that his very strong criticism of the pressures exerted by the agrochemical industry does not combine well with his demands for more transparency, which he repeatedly voices directly (51) or through the Pollinis association. (48) Indeed, if it were coherent, it would defend the anonymity of decision-makers, to prohibit the industry from putting pressure on them. We may wonder if he does not regret, on the contrary, that NGOs cannot exert more assiduous and more personal pressure on the institutions...

## **2. Extensive conception of conflicts of interest**

The author has an extremely broad conception of conflicts of interest when it comes to the agrochemical industry and basically non-existent outside of it. *In fine*, he

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<sup>132</sup> Notez que c’est implicite et ressort clairement du fait que S. Foucart leur donne leur parole ou les met en avant constamment. Encore une fois, c’est implicite.

presumes that all scientists involved in any way with industrialists to be compromised and the others of impeccable integrity. Conversely, he presents public scientists whom he recognizes as having no conflicts of interest as irreproachable and having superior credibility. This, while no concrete difference is demonstrated. In fact, he uses it to deny the words of some scientists and to dub those of he agrees with.

**a. The "bad scientists"**

"Bad" scientists are quite clearly (although it remains implicit) defined in the following passage:

*"During its last conference, at the end of 2011 in Wageningen (The Netherlands), seven new working groups were formed on the issue of the effects of pesticides on bees, all of which are dominated by researchers in conflict of interest situations. The participation of experts employed by agrochemical firms or private laboratories under contract with them varies between 50% and 75%." (2)*

All researchers employed "by agrochemical companies or private laboratories under contract with them" would be in "conflict of interest". This is nonsense: an employment contract is not some kind of absolute bondage pact.

More broadly, all the work in which they participate would be affected by this imprint and therefore suspected of being "under the influence" of the industry and willfully biased. This is notably what emerges from his comments on the IUCN (16) (17), IPBES (25) report

It's pretty clear in this passage:

*"An elementary school child can figure out the deception in a matter of minutes. But it was not until nearly fifteen years of decline in beekeeping, the first signs of a massive collapse of all the entomofauna and the protests of civil society and parliamentarians, for the European executive to s 'questions the integrity of risk assessment procedures, and asks EFSA to take a closer look ...*

*And this is just one example: other protocols for assessing risks for bees, now questioned, considered chronic toxicity tests unnecessary, considered the loss of 30% to 50% to be acceptable. % of brood, etc.*

*How is it possible? It's not very complicated: these protocols were designed by groups of experts infiltrated by the agrochemical industry. In a report released this week, Pesticide Action Network (PAN) and Future Generations suggest that this example is not isolated. On the contrary, it falls within a standard. The two NGOs reviewed twelve standard methods or practices used by public expert agencies to assess the health or environmental risks of "phytos". Result: in 92% of*

*the cases examined, the techniques in question were co-developed by the manufacturers concerned, directly or indirectly.” (39)*

The mere presence of people linked to industrialists would explain the extent of the flaws in the assessment protocols. Likewise, he writes, around the discussions on the re-authorization of NNIs on beets in 2020:

*“Regarding neonically treated sugar beet, EFSA rated the risks of guttation water as 'low', but independent academic work from the industry is lacking on the subject.” (64)*

Work loosely related to industry would therefore be of no value.

### **b. The “good scientists”**

Opposite, scientists not working with industry are said to be of irreproachable integrity:

*“If we are to be dismayed, this dark week should not, however, make us forget that many scientists from public research organizations or universities participate in groups of experts with the sincere desire to put their knowledge at the service of society. And that they do it without recognition, to the detriment of their own research activity, and therefore of their careers.” (21)*

Scientists affiliated with other entities would therefore not have, by definition, "the sincere desire to put their knowledge at the service of society"... We can almost explicitly see who the "good guys" and the "bad guys" are ...

Yet there are many ways to monetize one's position as a researcher through activism. For example, G-E. Séralini, a researcher for a public establishment, had organized a communication campaign around his study observing, according to his allegations<sup>133</sup>, a carcinogenic effect of GMO corn. He had sent the information to several newspapers, requiring them not to consult researchers. All the press echoed the study, unanimously echoing its conclusions. He thus had a lot of exposure for his book, that of Corinne Lepage and a film about his study, all of which came out in stride. I don't know if you realize: we are talking about a MOVIE. It is not a few pennies, but tens or hundreds of thousands of euros which are at stake. To my knowledge, he has had no sanction for this terrifying scientific imposture<sup>134</sup> and was able to finance and carry out by following many other research.

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133 The scientific community has proven that this study proved nothing at all and has been contradicted by large-scale studies.

134 L'article Wikipedia ([https://fr.wikipedia.org/wiki/Affaire\\_Séralini](https://fr.wikipedia.org/wiki/Affaire_Séralini)) est très complet.

More broadly, I detail the many business models that can reward activism in Militant Cancer (Baumann 2021a) and Agribashing (Baumann 2021b). Note that among these potentially interested players, we find newspapers, which gain a large and reactive audience, ideal for making content viral ...

Therefore, if S. Foucart were coherent, he would not cite any scientist...

## V. The shift from the pragmatist to the hygienist

Foucart often tends to mobilize serious elements of thoughts, such as a scientific study, and attribute it a unreasonable message. I call this mechanism passing from pragmatic reasoning to hygienist reasoning.

The first type relates to an effect, to a utility: *“it has such an effect on this in such circumstances, to prevent it we can do this or that.”* On the contrary, hygienist logic tends towards a form of purity: *“it is wrong, it must be suppressed, Nature must be purified of it.”*<sup>135</sup> S. Foucart often relies on the first to pass the second.

For example, in the article (44), he claims to contradict a study which would have shown that *“Low doses of pesticides have little impact”* on birds by arguing that *“there are several hundred studies published in the scientific literature showing unambiguously the deleterious effects of neonicotinoids on non-target invertebrates”,* mammals and birds and that NNIs are extremely concentrated pesticides: one gram of imidacloprid could" kill as many bees as 7.3 kg of DDT " . (44)

We therefore start from pragmatic and reasonable elements: NNIs have negative effects on non-target organisms and are extremely concentrated pesticides. Then, we are sliding towards a hygienist logic, where only “purity” would count: even at “low doses”, NNIs would be dangerous. The implication here is that the actual exposure dose would not matter.

To make this transition, S. Foucart uses two levers.

- On the one hand, the vagueness of the term "low dose". In the sense that the study understands it (Foucart gives too few elements for it to be easily found), this should describe a low dose relative to a precise reference frame, undoubtedly the concentration of NNI found in the fields processed in normal time. We can guess that this refers to the remains of NNI in fields that had been treated in the past and have ceased to be treated. On the contrary, in the sense that S. Foucart understands it, it describes a low dose with regard to a kind of common sense.
- On the other hand, he mentions the effect of NNIs on non-target populations without specifying the dose. They would not be *"toxic at certain doses and*

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<sup>135</sup> Plus simplement, on peut dire qu'il s'agit de généralisations abusives, mais je ne pense pas que ce serait très précis. La distinction entre les deux raisonnements a encore besoin d'être affinée, mais elle sera l'objet d'un livre dédié.

*under certain conditions"* (which studies will show), but absolutely toxic. The notion of dose disappears, we are indeed in a hygienist logic.

Thus, the problem supported by many scientific studies serves as a pivot to sell irrational and hygienist discourse. Metaphorically, it serves as an anvil on which S. Foucart leans to forge his message. You see, this is a very fine machine and difficult to identify.

## **VI. Biased mobilization of scientific studies**

Foucart creates an alternate scientific reality where the facts he uses to base his argument are credible beyond a reasonable doubt. For this, it uses two mechanics:

1. The invention of scientific consensus
2. The invention of evidence

### **1. The invention of scientific consensus**

Foucart often suggests that there is a scientific consensus on what he describes. I counted 20 articles using this mechanic. Note that I am not discussing here the existence of a scientific consensus that there is a decline in biodiversity or that NNIs are dangerous. I am criticizing here the consensus and the evidence that S. Foucart invents. Indeed, "a decline" is not "the decline described by S. Foucart" and "the dangerousness" is not "the dangerousness described by S. Foucart".

This mechanism involves, in particular, the evocation of the words of specialists, of "hundreds of works" or of the condemnation of the obscurantism of its opponents. This also involves an absence: S. Foucart never speaks of studies that do not go in his direction (unless to discredit them).

#### **a. Specialists' words**

Blurred expressions like "the specialists", will come to give the impression of mass, as if "all" the specialists (or whatever term used) had this opinion. For example, here is a reaction to the EFSA report confirming the risk of the 3 NNIs:

*"Nothing very surprising for specialists. "Such risks have already been demonstrated well beyond honey bees or wild bees, since it is the entire biodiversity of terrestrial and aquatic invertebrates that is subject to the deleterious effects of these substances," says Jean-Marc Bonmatin, researcher (CNRS) at the Orléans Molecular Biophysics Center and author of numerous works on the subject." (41)*

The journalist suggests that the opinion of all specialists (or a majority) is reflected in Bonmatin's remark.

#### **b. Hundreds of works supporting his story**

As soon as the topic gets a little popular, there are easily "hundreds of works" on it, some going one way, some going another. Here S. Foucart insinuates that all these

studies go in this direction, which would characterize a sort of consensus. Here is an example :

*“Of course, bees do not forage in beet fields. But this argument, used as a piece of language by the government, masks a reality supported by hundreds of recent scientific works.” (66)*

It does so in particular through the Minister of Ecological Transition, B. Pompili, in March 2016:

*“Scientific studies are piling up. Today, (...) we can say what we want, neonicotinoids are extremely dangerous, they are dangerous for bees, but well beyond bees, they are dangerous for our health, they are dangerous for our environment, they contaminate waterways, they contaminate flora, including wild flora. They stay in the soil for a very long time. (...) We will not be able to say that we did not know.” (65)*

We do have a one-sided accumulation effect: scientific studies "pile up", implied in the case against NNIs, and that would justify their ban. It conceals the fact that many are going in the opposite direction. The invention of consensus is very clear in this paragraph:

*“Beyond the effects on bees, however, a considerable scientific literature documents the deleterious effects of neonics on all ecosystems. Hundreds of studies published in recent years show, beyond reasonable doubt, the full extent of the damage that these substances cause not only on pollinating insects, but also, and above all, on all arthropods, on birds in agricultural areas, on aquatic organisms, etc.” (65)*

However, nothing could be further from the truth: not all NNIs are equally toxic and the issue of banning NNIs on beets is not the subject of any scientific consensus.

**c. *The obscurantism of its opponents***

The paragraph following the one just quoted builds on this so-called "consensus" to condemn the "obscurantism" of the decision to allow NNIs on beets.

*“This bill is based on a form of obscurantism,” judge Batho. It ignores the scientific data available and in particular ignores the phenomenon of the disappearance of insects that we are witnessing.” (65)*

This is the corollary of the invention of consensus: once it has been invented, it can be used to label those who challenge it as anti-science or obscurantist.

## 2. The invention of obviousness

Foucart transforms several subjects of study into "obvious facts", which (this is implied) only a patent dishonesty or total blindness would allow to ignore. Thus, he writes of the flaws in the procedures for evaluating pesticides:

*“An elementary school child can figure out the deception in a matter of minutes. But it was not until nearly fifteen years of decline in beekeeping, the first signs of a massive collapse of all the entomofauna and the protests of civil society and parliamentarians, for the European executive to s 'questions the integrity of risk assessment procedures, and asks EFSA to take a closer look...”(37)*

One of the most common obviousness S. Foucart puts forward is that of "clean windshield syndrome" as evidence of a decline in insects, the evidence that "it is now possible to cross France while keeping the windshield of his car almost free of all traces of insects. This comes up in 6 articles (22) (30) (35) (37) (51) (54).

This is presented very seriously by V. Bretagnolle:

*“So the existence of large-scale effects would not be surprising. The estimate of the decline remains striking. "This is the translation of what everyone can notice when they get into their car," concludes Vincent Bretagnolle. Twenty years ago, you had to stop every two hours to clean your windshield because there were so many insect impacts, today it is not necessary at all. »» (35)*

This “evidence” is used regularly to “sell” a radical collapse in biodiversity. Here is an example:

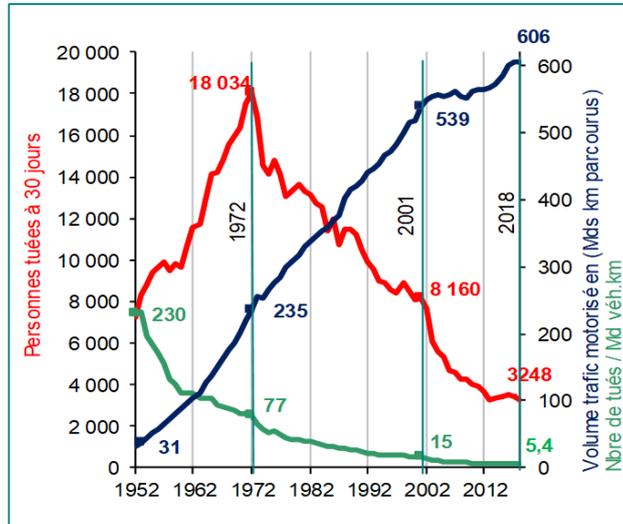
*“And there is an emergency. Work published at the end of October has for the first time quantified the disaster of conventional farming practices on biodiversity. In thirty years, nearly 80% of flying insects have disappeared from protected natural areas in Germany and everything indicates that this observation is valid elsewhere in Europe<sup>136</sup>. You only have to look at the grilles and windshields of our cars, often free of any insect impact.” (37)*

He uses the windshield argument to support the study by Hallman et al. (2017). However, the author offers absolutely no scientific study or collection of testimonies confirming it. It does not even take into account the evolution of road traffic, which has roughly doubled since 1980.

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136 Note the juxtaposition effect: it suggests that the study results in an effect not only of agriculture, but in addition to conventional agriculture. Two things that Hallman et al do not say at all. (2017), which we will see in detail in the next part.

**Évolution comparée de la mortalité et de la circulation routière entre 1952 et 2018**



Source : [www.onisr.securite-routiere.gouv.fr/politique-de-securite-routiere/historique-de-la-securite-routiere](http://www.onisr.securite-routiere.gouv.fr/politique-de-securite-routiere/historique-de-la-securite-routiere)

Even if this feeling may be well founded (I was not very old in the 90s), road traffic has increased a lot since the 70s... The insects may have ended up adapting to the increase in traffic road.

In short, there are endless reasons other than an 80% overall decline that could explain it. This is why in principle, to assert this kind of thing, we use scientific studies...

## **Chapter 4. Some articles deepened**

We have seen many examples of small manipulations. However, this does not show how deep and complex they can be in and their power to misinform. Indeed, they interact with each other, with the content of the article and with its structure.

To give you a better overview, we will analyze 4 articles:

1. July 9, 2012: "The failure of the evaluation of pesticides on bees"
2. May 3, 2013: "Gaucho, Cruiser and Poncho insecticides smoke the hive"
3. May 5, 2014: "IUCN, Syngenta and the decline of bumblebees"
4. August 12, 2020: "With or without flowering, neonicotinoids represent risks for pollinators"

## **I. 9 juillet 2012 : « *La faillite de l'évaluation des pesticides sur les abeilles* »**

This fairly long article poses the whole of the argument that S. Foucart will develop over the next 9 years around the involvement of agrochemicals in the risk assessment procedures of pesticides.

Above all, its mechanism of affirmation by innuendo is used extensively.

### **1. The story**

This article shows remarkably the mechanics of innuendo. Here is another reading of the story of the article, highlighting the different stages of the history that S. Foucart sells here.

#### **a. *Prelude: closing the field of possibilities***

Recall the beginning of the article:

*"Is the culprit rather incompetence or the accumulation of conflicts of interest? Impossible to decide. But the question now arises: how could the notoriously deficient bee risk assessment tests have been used for nearly twenty years to approve the latest generations of insecticides? "*

You can see that nothing is stated clearly: one would not know whether it was "incompetence" or "conflict of interest" which would be "guilty". We know, however, that it would either be one or the other. The author thus closes the field of possibilities.

#### **b. *Orient surreptitiously***

From the start, he guides the reflection:

*"This failure is all the more disturbing as some of these benchmarks were updated in 2010 ..."*

Why would this failure be "troubling" if it was about incompetence? It would then be appalling, shocking, but not "disturbing". This term implies that there is something hidden and suspicious... like a conflict of interest. The author thus directs, implicitly, from the beginning towards an answer to the choice presented at the beginning.

#### **c. *Build credibility and set the scene***

The author then sets out the framework, recalling at length several technical aspects of the weaknesses of regulatory tests and their consequences. In doing so, he

gives credibility to his speech overall, citing several technical data and scientific studies. The message here is that the flaws are obvious, well-known, and the subject of “*an increasing number of studies published in scientific journals since the mid-2000s.*” Above all, this leads to the question “*why?*”, (= How such an absurdity can exist?) Which will be studied next.

He distills the idea of something hidden, shameful even further with the intervention of the anonymous apidologist.

- The term "secret" refers to something secret, shameful (like a conflict of interest...)
- The fact that he requested anonymity suggests that he would say something that could harm him, as if there were forces trying to keep these loopholes a secret. This may be overinterpretation (there are endless reasons to prefer anonymity), but this is the only time anonymity is specified; what he says is absolutely banal; this considerably reinforces the conspiracy that is distilled, as we shall see, in the article (and generally in his work).

This practice of giving the floor to others by clearly endorsing what they say is fairly systematic in S. Foucart. This allows him to clear himself (“*I’m just quoting*”) while clearly promoting a speech.

Finally, note an important manipulation here: regulatory tests must make trade-offs between certainty (infinitely long to obtain) and uncertainty. However, the author does not say anything about the terms of this arbitration, suggesting that the pre-marketing tests should require absolute certainty. This allows him to cover up part of the question and justify the split he posed earlier: They are either stupid or malicious.

#### **d. *The explication***

The question arises very logically: “*Why such inertia?*” “The question already finds the beginning of an answer in the title of the part: from “generous sponsors”... The author gives a voice to beekeepers by letting them, in essence, recount the suspicions and the steps that would have enabled them to let the cat out of the bag<sup>137</sup>: the involvement of the EPPO in the design of the test guidelines.

*“Why such inertia? How, and by whom, are these test protocols for suspected severe myopia developed? In 2006, we asked ourselves, a little late it is true, the*

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<sup>137</sup>This is the only interpretation of this passage that seems viable to me, the informational content within the framework of S. Foucart's argument being summed up to “*EPPO intervenes in the design of test guidelines*” (which I am not sure of the veracity: I asked them, they answered me no...).

*question of how were approved at European level the substances that we suspect to be the main cause of the decline of bees, says Janine Kievits, a Belgian beekeeper, member of the European Apicultural Coordination. Reading the annexes to the European directive on phytosanitary products, we noticed that the guidelines for these tests were notably issued by the European and Mediterranean Organization for the Protection of Plants [EPPO]. " Other guidelines are issued by the Organization for Economic Co-operation and Development (OECD) and are complementary to those of the EPPO. "*

The beekeeper cited specifies that the tests would be "in particular" enacted by the EPPO. The term "enacted" refers to a regulatory power and not an advisory one. Would the EU be devoid of discretion over the EPPO decision? I highly doubt it. Note the interest of the spokesperson's strategy: S. Foucart can always avoid this imprecision by stressing that it is not he who is speaking...

**e. *The EPPO's role***

EPPO would be an intergovernmental organization. Having no in-house expertise, it would delegate to the ICPBR *"the task of developing the basic elements of these famous standardized tests."*

The author gives no source at this stage: the directive, the nature of the EPPO, the terms of this delegation, etc.... The ICPBR would be a *"quasi-informal"* structure. The author does not specify what he means by that and we do not see what it could be. However, we can clearly see a usefulness of this mention: it feeds the idea that there would be hidden, occult things.

The small group of beekeepers who had embarked on this investigation went to a meeting of this structure in 2008. It fits into the register of the investigation to uncover a hidden reality.

**f. *The financing from agrochemicals***

This is an important point of the article: the conference would have started by thanking its "generous sponsors: BASF, Bayer CropScience, Syngenta and DuPont". (4 companies producing fertilizers and pesticides)

*""When we heard that this organization was meeting to reform the famous standardized tests, we went to the conference, says Ms. Kievits. It was in Bucharest, in October 2008. "*

*The small delegation of three beekeepers therefore attended the meeting. First surprise, says Janine Kievits, "the discussions begin with a speech thanking the generous sponsors: BASF, Bayer CropScience, Syngenta and DuPont". Contacted*

*by Le Monde, the ICPBR working group on bee protection confirms the financial support of the main manufacturers of pesticides. But adds that the main source of funding was the costs of attending the conference. And that "without this external funding, the amount of participation fees would have been higher", thus preventing "a maximum participation of delegates not from industry" "*

This passage shows another technique of S. Foucart: his objections management. The ICPBR's response will not be supported or repeated by any element presented by S. Foucart. On the contrary, the idea of hidden conflicts of interest is present throughout the article.

In this way, the objection is automatically passed off as the contempt of someone who is caught in the act and tries to find an excuse. Since he mentions the objection, S. Foucart is credible. On the contrary, the sheer force of storytelling, of the "flow" that it imparts to its story, undermines the objection. All without having had to discuss it a little bit.

#### **g. *The conference***

Then the 3 beekeepers recount their experience of the conference:

*"The three beekeepers are still attending the report of the working groups on the update of the standardized tests. "We were in a very cordial atmosphere, with very friendly people who offered things that were radically unacceptable, believes Ms. Kievits. To give just one example, one of the risk calculations presented amounted to defining a product as ' low risk 'as long as the bee is not exposed to the chronic "lethal dose 50" [which kills 50% of a population exposed over a long period]. Therefore the product is' at low risk' if it is not kills only 49% of bees! For us, it was just amazing. It was to die for! " "*

The precision *"in a very cordial atmosphere, with very friendly people who proposed things that were radically unacceptable"*, showing a dissociation between the atmosphere, *"with very pleasant people"*, and the fact that the latter offer "unacceptable things" is maybe anecdotal... or maybe not.

First of all, we do not see what it brings informally. If we look at the level of symbolism, this precision evokes a frame of reference, that of leaders disconnected from reality and able to order atrocities without batting an eyelid. It is a frame of reference which is important for the conspiracy, which we will discuss later, which is central to the overall work of S. Foucart.

Back to our beekeepers.

*"On several comparable points, beekeepers are asking for the opportunity to send comments, hoping to change the final recommendations of the working group.*

*"We sent our comments within two weeks, but not one was accepted," says Ms Kievits. These same criticisms were addressed, in copy, to ad hoc agencies in EPPO member states. None responded, with the exception of the Swedish Chemicals Agency (KEMI). In a letter of which Le Monde has obtained a copy, two ecotoxicologists from the Scandinavian agency say they "fully" adhere to the bitter comments of beekeepers ...*

*Why did the ICPBR not accept the requests of the beekeepers? "*

This is undoubtedly the most astonishing point of this passage on several levels: S. Foucart presents as a mystery the fact that an international organization bringing together chemistry scientists and government agencies ignored the suggestions of 3 visiting beekeepers<sup>138</sup>...

He gives the answer:

*““The group’s final recommendations are based on a consensus approach, with agreement being reached in plenary,”the ICPBR told the ICPBR. This consensual approach de facto places recommendations from the organization in the hands of the industry. Because the ICPBR is open to any participation and agrochemical companies are well represented. In 2008, of the nine members of the bee protection group, three were employed in the agrochemical industry, one was a former employee of BASF and another future employee of Dow Agrosciences.”*

Which is terrible:

- The author does not consider any other possibility. The elements presented are therefore presented as the exclusive cause. However, he does not make it explicit. He just asks a question, then says things. It is again the strategy of juxtaposition, which consists in creating a logical link without making it explicit. Here the "because" is left entirely to the reader's imagination.
- His argument itself does not hold water at all. If it's consensual, anyone can block the process. It is therefore, on the contrary, unfavorable to large groups.
- The mere fact of being a former, current or future employee of an agrochemical company would make you its representative... The author show no evidence supporting the slightest his allegations. An employee who is not on a mission for his company has no particular obligation towards them and agrochemicals is not a quasi-mafia space where this would be the case (what S. Foucart suggests).

#### **h. The next conference**

The author moves on to a section titled "Conflicts of Interest".

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<sup>138</sup> I caricature, they were members of the prestigious "European beekeeping coordination"...

*“During its last conference, at the end of 2011 in Wageningen (The Netherlands), seven new working groups were formed on the issue of the effects of pesticides on bees, all of which are dominated by researchers in conflict of interest situations. The participation of experts employed by agrochemical firms or private laboratories under contract with them varies between 50% and 75%. The other members are experts from national health security agencies or, more rarely, scientists from public research. Pesticide manufacturers therefore play a key role in the design of tests that will be used to assess the risks of their own products on bees and pollinators. ”*

We see here the absurd conception of conflict of interest used by S. Foucart. To be "independent", one would have to be employed neither by the firms themselves nor by the private laboratories (why this precision?) contracting with them.

We then see the slide: the scientists who would correspond to this conception of the conflict of interest are considered to be the proxies of the companies: *"The manufacturers of pesticides therefore play a decisive role ..."*

Finally, note that S. Foucart gives nothing to support these figures or to justify that the mere presence of said experts characterizes a "decisive role". Indeed, we do not know exactly how these meetings are organized, what the balance of power is, etc.

#### **i. Bucharest's epilogue**

*"In 2009, a few months after the Bucharest conference, the final recommendations of the ICPBR were delivered to the EPPO. But before being adopted as official standards, they are subject to review by experts mandated by each EPPO member state. Are these experts in a conflict of interest situation? Are they competent? Impossible to know. "The list of these experts is not secret: it is accessible to the governments of our member states who wish it, but it is not made public," says Ringolds Arnitis. In 2010, the new guidelines are adopted by the member states of the organization and published in EPPO Bulletin."*

Why should the identity of these experts be public? Why would the general public have anything to say about it? The author presents this as obvious, when it makes no sense. Besides, it seems to contradict what he just wrote: hadn't he said that some of the members of the working groups had "a decisive role"? There he shows that there are other experts who have a decisive role... How many other decisive role exist?

*"The judgment of the experts commissioned by the EPPO member states raises a few questions. In the case of Sweden, the expert representing this country, from the Ministry of Agriculture, approved the new standards while two of his peers from the Swedish Chemicals Agency came, by letter, to bring their support for*

*critical comments from the European Apicultural Coordination. The judgment of the experts therefore varies widely depending on their employer..."*

We can see here why we have to be very careful in public relations, especially with activists. The opinion of the Swedish agency's ecotoxicologists says nothing about the agency's opinion, or even what they themselves would have decided if they had had to choose. It is always easier to say that the loopholes are revolting, than to make a trade-off between the objectionable option and its alternatives.

Despite this, S. Foucart uses the support of two members of the agency to promote the idea that the expert chosen by Sweden would be influenced. It also implies that the Swedish ministry would defend the interests of the agrochemical industry...<sup>139</sup>

*"And France? The approval of the new 2010 standards was carried out under the supervision of an ecotoxicologist from the General Directorate of Food (Ministry of Agriculture) - which represents France at EPPO. However, this scientist participated in the work of the ICPBR and is none other than the main author of the recommendations submitted... She therefore assessed and approved her own work. Former employee of Syngenta (ex-Novartis), she then went through various public bodies (INRA, Afssa, Ministry of Agriculture). She is now employed by the agrochemist Dow Agrosciences. "*

We can admit that it is debatable that a scientist assesses the work to which she has contributed. However, if she participates in EPPO as a representative of the ministry, why should the ministry hire someone else for this work? We have no evidence to compare this choice with practices and context.

Once again, we see the delusional conception of the conflict of interest of S. Foucart: the fact of having been in a private company would affect you with a sort of absolute, indelible and definitive stain: the "*conflict of interest*".

## **2. Analysis**

As you have seen, the article is very long, talks about a lot of things and involves a lot of manipulative processes while not giving an overall conclusion. You have to put it back flat to understand the magnitude of the manipulation.

### **a. The story summarized**

Let's go back to the process very quickly, removing all the details and explaining the implicit connections:

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<sup>139</sup> L'expert appliquerait les consignes + il a approuvé les standards (favorables à l'industrie) = on lui a demandé d'approuver les standards, dont, rappelons le, l'adoption ne peut s'expliquer que par des conflits d'intérêts.

1. There would be significant loopholes in the well-known and long-standing regulatory testing.
2. The reason for this inertia would appear by studying "How, and by whom, are developed these test protocols suspected of severe myopia".
3. Three beekeepers are said to have researched, discovered the role of EPPO and ICPBR, attended a meeting of the latter and sent their criticism to its organizers, as well as to European health agencies.
4. The reason why "*the ICPBR did not accept the requests of the beekeepers*" would be the influence of conflicts of interest (?) And industry due to the consensual approach of the groups. Working (?).
5. Pesticide manufacturers would play a decisive role in the design of the tests because between 50 and 75% of the members of the working groups are "in a situation of conflicts of interest" because they are employees of said firms or laboratories. private "*under contract with them*".
6. Before being "*adopted as official standards*", recommendations are subject to review by experts mandated by EPPO member states. The fact that their identity is not public would raise suspicion of conflicts of interest.
7. The fact that an expert from the Swedish ministry approves the new tests, while 2 experts from the Swedish health agency criticized them shows that the "expert judgment therefore varies widely depending on their employer" (= a conflict of interest).
8. The expert from the French ministry is said to be in a conflict of interest. You see that the fact of adding the hidden logical connectors clarifies the matter a lot.

**b. *Push in the answer to the original question***

Overall, let us recall that the question asked at the beginning of the article is to decide whether the culprit of the fact that "*risk assessment tests for bees, which are notoriously deficient, have been used for nearly twenty years to approve the last generations of insecticides*" is incompetence or "*the accumulation of conflicts of interest*".

However, throughout the article, he argues that it is "*the accumulation of conflicts of interest*" that is responsible. He doesn't even mention that it could be incompetence or some other possibility.

The conclusion, "*the accumulation of conflicts of interest is responsible*", will however remain to be guessed: S. Foucart does not explain it, he remains in the register of insinuation.

### **c. *Structure analysis***

The course therefore follows a structure where it begins by presenting the problem (the flaws in the assessment procedures), then draws on the experience of beekeepers, to unfold its response: those responsible would be the conflicts of interest. The pivot of this article is therefore that 3 beekeepers (what is their expertise in the field of pesticides?) Are surprised that their opinion on the procedures for evaluating pesticides at an event to which they are not invited is ignored...

We actually have an extremely weak argument giving the scope of the subject dealt with. The author presents just a possibility (while presenting it as a certainty), but does not provide serious evidence to support it.

### **d. *Conspiracy theory?***

This article mobilizes a conspiracy style, consisting of having fundamentally conspiratorial statements by dressing them behind the description of a "system". Let's go back to the first sentence:

*"Is the culprit rather incompetence or the accumulation of conflicts of interest? "*

The person responsible would not even be an entity, but a phenomenon: the accumulation of conflicts of interest. However, he goes next to talk about an organization: the agrochemical industry. We see it quite explicitly in this quote:

*"This consensual approach places the recommendations from the organization de facto in the hands of the industry. "*

However, we remain on a very general perspective. Concretely, it always comes down to the biggest companies: BASF, Bayer CropScience, Syngenta, Monsanto, DuPont...

### **e. *Conclusion***

So, you see that the real content of S. Foucart's article is not obvious and requires a lot of research to be explained. Even if you read the article carefully, you can

miss most of the innuendo. It was only after reading all of his articles that I was able to identify some mechanics.

## II. 3 mai 2013 : « Les insecticides Gaucho, Cruiser et Poncho enfument la ruche »

In May 2013, the European Commission announced the ban of 3 NNIs (imidacloprid, clothianidin and thiamethoxam) on the basis of an EFSA report, published the same year, questioning their dangerousness for pollinators. This article is in reaction to this event.

### 1. EFSA's opinion 'could have been expressed' ten years ago

S. Foucart defends the idea that this decision would actually be a defeat:

*“Late and pusillanimous, the Commission’s decision appears rather to be a symptom of a tremendous failure of risk assessment systems. And, more generally, a serious lack of vigilance on the part of the public authorities on questions of environmental risks – the same mistake that led to the chlordecone scandal (Le Monde, April 17) in the French West Indies.*

*In fact, agrochemical companies are by no means losing out in their confrontation with beekeepers and conservationists. On the contrary. Pesticides in the spotlight today clearly should have been taken off the market many years ago. ”*

Indeed, EFSA’s opinion that the 3 NNIs in question (imidacloprid, clothianidin and thiamethoxam) could “yet have been formulated by EFSA on the basis of scientific knowledge available ten years ago.” He bases this assertion on the report made by the CST in 2003.

### 2. Interlude

Before presenting the latter, let us note the first sentence of the second paragraph:

*“In fact, agrochemicals are by no means losing out in their confrontation with beekeepers and conservationists. ”*

The journalist therefore presents the regulatory issue as a clash between two camps, as a "war". This eases conspiratorial doubt in two ways. First, there are rarely neutral people on a battlefield. Second, it denies a possible integrity of the industrialists (everything is permitted in war<sup>140</sup>), also obliterating the fact that it is they who produced or financed a large part of the studies that were used to ban their pesticides ...

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<sup>140</sup> This also applies to activists, but S. Foucart never considers this hypothesis ...

I call that polarization<sup>141</sup> and it is a recurrent practice in what I call "activism cancer". (Baumann 2021)

### **3. The CST's report**

*"In 2001, the Minister of Agriculture, Jean Glavany, brought together a group of experts (the Scientific and Technical Committee for the Multifactorial Study of Bee Disorders, or CST), made up of researchers from universities and public research organizations (CNRS, INRA, etc.). In its report, released in September 2003, the CST had already firmly concluded that imidacloprid (marketed under the name Gaucho) presented an unacceptable risk to bees. Without, of course, ruling out the contribution of natural pathogens (virus, varroa).*

*Above all, the experts wrote, the scenarios of exposure of bees to imidacloprid were "in agreement with the field observations reported by many beekeepers in large-scale areas, concerning the mortality of foragers, their disappearance, their behavioral disorders and certain winter mortalities ". The CST report, if it led to the Gaucho ban in France, was then conveniently forgotten. And this although it would have been easy to extend it to other neonicotinoids. The moratorium proposed in 2013 by Brussels is therefore a decade late. "*

So there are many details, probably very accurate, about the report in question, but none of these elements support his argument. It shows that a study by a ministry in an EU country concluded that an NNI was dangerous.

You see that we are far from the generality of a decision of the European health agency on 3 NNIs. It does not in any way demonstrate that the moratorium would be "a decade late". To do this, it would have been necessary to do a (complete) review of the literature on the subject and see if it was credible enough to justify the ban. One can seriously doubt it, almost all the studies referred to by S. Foucart in his articles being... after 2011. The main one, which he cites in 17 articles, is that of Hallman et al. (on the -75% of insect biomass) and it dates from... 2017 (and it is, as we saw in the second chapter, very questionable).

This is one of the techniques that comes up often in his work. It presents elements as if they are actually answering a question, when they are absolutely not.

### **4. The question of persistence: the slide from pragmatic to hygienist**

*"This late moratorium also ignores scientific facts established by agrochemists themselves. The three targeted molecules will only be withdrawn for two years, while their persistence in the environment can exceed several years. In addition,*

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<sup>141</sup> In short, it consists of posing two camps and a single choice: to rally one or the other.

*they will only be suspended for certain uses: they will continue to be used for winter cereals on the grounds that these are not in contact with bees. The three neonicotinoids will therefore continue to accumulate and disperse in the environment. "*

Here we see a very interesting slide. The persistence of a product is assessed by its half-life, that is to say the time needed to degrade half of the dose of the product. The disappearance is not instantaneous, it is gradual. However, he suggests that the mere fact that the half-life of these products could be several years would mean that the moratorium would be ineffective. This assumes either that the dose would not decrease or that the dose is irrelevant.

We can defend the idea that the first interpretation would be valid, however the author does not envisage that the remaining uses imply a use of NNI (therefore an addition in the environment) equivalent to the reduction linked to the degradation of the previous quantities.

It is therefore the second interpretation (the dose does not matter), which is the good one. However, this rejection of the idea that "the dose makes the poison" is central in the speech of S. Foucart. I call this logic hygienist, because it is about valuing physical "purity" as an absolute. We are moving from a pragmatic logic (NNIs at such doses cause such effects) to a hygienist logic (no NNI must remain in the environment).

## **5. Conspiracy's theory return**

*"The Commission has therefore not fully taken note of the state of knowledge accumulated on these new generations of insecticides. But it is true that certain "expertises" have maintained political power in "socially constructed" ignorance on the subject. The history of science will probably judge with severity the various reports – such as the one made in 2008 by the late French Food Safety Agency (Afssa) - echoing, sometimes in questionable conditions of integrity, the vulgate of agrochemists: since bee disorders are "multifactorial", new phytosanitary products would play no determining role. "*

We note first of all that S. Foucart claims to know "*the state of accumulated knowledge*". He presents it as a consequence of what he said before, although he has not presented anything convincing. It helps him legitimizing what he said before which is, as we have seen, a hygienist discourse, not a scientific discourse. This handling of the obvious is, I think, another important mechanism used by S. Foucart: "*Obviously, there is no point in specifying*". We feel it present throughout this article. He builds on that feeling of obviousness to put together a rather terrifying paragraph.

He first asserts that *"certain "expertises" have maintained political power in "socially constructed" ignorance on the subject."* There are a lot of implicit messages here:

1. The knowledge produced by expertise would be disinformation, nurturing ignorance instead of fighting it. S. Foucart does not justify it.
2. The intention that expertises would have to misinform is simply insinuated, but quite obvious: how, if not, to explain that, having as their object to reveal reality, said expertises make political power "ignorant"?
3. We find the principle of conspiracy: we evoke the reference of sociology to hide a clearly conspiratorial statement. Thus ignorance would be "socially constructed", a term broad enough to include conspiratorial thoughts while being defensible (what is not socially constructed?).

The rest of the paragraph is no better:

1. The thesis that *"bee disorders are" multifactorial "*, *new phytosanitary products play no determining role"* would be a "language element" for industry. This would not be a position long defended by many scientists.
2. AFSSA is said to have *"echo"*. This implies that the industry has given AFSSA the necessary language to convey. (this is more clear in french)
3. This would have been the case *"sometimes under questionable conditions of integrity"*. The author does not specify which ones and does not source his point, leaving the reader free to imagine any conflicts of interest or embezzlement he wishes.

The message is clear: the industry has been successful in influencing AFSSA to obey it. We are indeed in a conspiratorial logic. It would be such that *"the history of science"* should judge it severely. We enter the register of the trial which is not without evoking the call for a new social order: *"once the revolution is made, you will leave your heads there..."*

## **6. Obviousness and complacency**

*"It took more than a decade to convince oneself that organizing the permanent presence, on millions of hectares, of the most powerful insecticides ever invented could possibly have an effect on these insects that are bees. It remains to be convinced of this other truism: these products will not disappear overnight from the environment. It will be well over two years before the full effects of their withdrawal are felt. "*

We find his almost automatic practice of innuendo: the EFSA opinion is not cited. Yet the whole article is about it... In fact, the meaning of the first sentence is "*EFSA's report was obvious anyway*". This link, however extremely simple to formulate, is left to the reader's imagination.

The author pushes the central point of the article (the EFSA opinion should have been given ten years earlier) by presenting it as obvious, and this... without providing the slightest evidence. The fact that pollinators could be exposed to significant doses was not obvious and took a long time to be established by the scientific community. This pure rhetoric continues the previous paragraph, which goes into bombastic excess. This tone reminds me a lot of that of the salesperson who adds tons of it to sell his product ...

To give him credibility, he recalls an obvious fact referring to what he said earlier: NNIs will not disappear in two years. This helps to give credibility to what he said a little earlier, without the reader being too aware of it, and to shed light on it: the NNI would have to have completely disappeared for there to be any improvement. We find the hygienist logic of which I spoke earlier: the dose would not make the poison. This confirms our interpretation of the penultimate paragraph ("Late, this moratorium...").

## 7. Summary

Thus this apparently benign article is in fact loaded with a dense web of innuendos that radically broadens the possible interpretations. We can have a reading of this article "moderate":

*There was a failure of the pesticide rating system. The EFSA has been extremely negligent in not taking seriously the alert given by a study by a Member State showing as early as 2003 the dangerousness of NNIs. The moratorium is too small and comes too late to be able to hope to have a sufficient effect.*

We can also have a "radical" reading:

*Agrochemicals have managed to delay bans for more than ten years, especially with the help of institutions like AFSSA which have acted like their PR firms. The reaction, the moratorium, is too small to see any effect. This reflects a failure of the risk assessment which questions: how can we not see such evidence (the dangerousness of NNIs)? Above all, why?*

There is no "the one correct interpretation". A bit like these drawings which change in nature depending on the perspective with which we look at them, this article changes according to its reader. Some "radical" people will take the most extreme sense and conspiracy, which will strengthen their convictions; some "moderates" will take the

meaning "moderate", while catching the seeds of extremism which will swarm their minds; others, finally, will only take the informational dimension.

This allows the author to promote an agenda in a low-key way.

### **III. 5 mai 2014 : « L’IUCN, Syngenta et le déclin des bourdons »**

This article responds to an April 2, 2014 IUCN press release on threats to pollinators, European bumblebees.

#### **1. The report**

According to this report, “30 of the 68 species of the genus *Bombus* found on the continent are in decline and 12 are threatened with extinction.” The organization specifies:

*"Climate change, intensification of agriculture and changes in agricultural land use are the main threats these species face"*

#### **2. The polemic**

*"Nothing, a priori, that is controversial. However, solicited by Le Monde, several researchers are very cautious about the wording of the text. Words barely covered, some see it as the influence of ongoing talks between the biodiversity conservation organization and Syngenta, a major producer of agricultural insecticides.*

You can already see the insinuation that will be the theme of the entire article: that of a collusion of interest between IUCN and agribusiness. Note here that S. Foucart's formulation makes the accuracy of his remarks very defensible: there is no doubt that "some" have this opinion. This type of formulation makes it possible to endorse any speech that is too questionable to be seen as its bearers. Here are a few examples that should help you put this practice into perspective: *"some see this as a sign that the death penalty should be brought back"; "Some see it as proof that immigrants are delinquents"*, and so on.

*"The word 'pesticide' appears only once in the press release and again in the fifth paragraph, in a quote attributed to a European official," squeaks an apidologist who requested anonymity. "I have never seen clear evidence so far linking bumblebee and bee declines to climate change," adds Dave Goulson, professor at the University of Sussex (UK) and specialist in biology pollinators. "*

This is the heart of the controversy: the absence of the term "pesticide". Yet IUCN does speak of *"intensification of agriculture"*. The suspicion caused by this absence would nevertheless be reinforced by the recommendations:

*" That's not all. The solutions proposed by the IUCN in its press release to protect wild pollinators are precisely those recommended by the agrochemical industry:*

*"establishment of borders and buffer strips around agricultural land rich in flowers" and "preservation of meadows". At no time has the IUCN mentioned restricting the use of certain plant protection products - a solution that has already been partially implemented at European level, with the moratorium in force since December 2013, in particular on three molecules called "neonicotinoids". "*

Note how insignificant these elements are. They will however feed 12 paragraphs attempting to sell a collusion between IUCN and Syngenta...

### **3. The negotiations**

*"For Jean-Christophe Vié, deputy director of the IUCN species program, these suspicions amount to 'slander'. "We don't receive funds from Syngenta," he says. There are ongoing discussions, but there is no agreement reached. If an agreement is reached, we will provide the information on our website, posting the terms. This is our policy of transparency. The prospect of such an agreement is causing tensions within the organization. These have been simmering since Syngenta's participation in the IUCN World Conservation Congress, held in Jeju (South Korea) in September 2012. The Swiss agrochemist did not respond to requests from the World.*

By specifically citing the IUCN executive, S. Foucart takes some distance from his remarks, implying that they would be questionable (while there is nothing shocking or explicitly contested). It is interesting to see that, depending on the context, the same practice (citing a third party) can have different meanings (we have seen that this could also be used to endorse the speech of a third party).

Then the mention of *"tensions within the organization"* is of no use, except, again, to create an atmosphere of doubt and plots. Likewise, the mention of Syngenta's refusal to answer implies that the company would have something to hide, without contributing anything: I do not see why they should have agreed to speak with this journalist who had shown his activism for years.

*"According to an internal IUCN letter obtained by Le Monde, discussions are well and truly underway. The document, dated March 5, calls for a one-and-a-half-day "high-level meeting" between a dozen IUCN officials and as many senior executives from Swiss society. Scheduled for April, the meeting was postponed, according to our information, in May. It is made possible by decision C / 82/19 of the Council of IUCN, which makes it possible to "explore the potential for collaboration between IUCN and Syngenta", with a view to deciding on a "future contractual relationship. 'by the end of 2014'. The letter specifies that one of the objectives pursued is "to identify areas of convergence and divergence [between*

*the two organizations] in order to achieve tangible and positive changes" and "to create a space for constructive dialogue on the points of disagreement "... "*

This paragraph is extraordinary in that it does not contain any concrete information useful in assessing the existence of a potential conflict of interest. However, the choice to present these elements is not neutral:

- On the one hand, it suggests that there is indeed something to be inferred from it.
- On the other hand, the author chooses extracts that remain very vague about the nature of the discussions between IUCN and Syngenta, leaving it to the imagination to interpret.

In addition, this paragraph evokes the theme of journalistic investigation: inaccessible documents (an "internal mail" (obtained legally of course?) and a decision of the organisation), reinforcing the idea that there is something hidden at work. Thus, the reader can, if he presumes that S. Foucart gives information in this paragraph, read *"the letters and internal texts of IUCN implicate it in a collusion of interests with Syngenta"*. This, even though there is actually nothing to remember.

*"In addition, Jean-Christophe Vié recalls that the assessments of the organization are entrusted to outside scientists. Still, Mr. Vié himself admits to being "surprised" that the five experts appointed by IUCN "did not tick the "pesticides box""". In the list of threats identified for each of the 30 species in decline, climate change is mentioned for 23 of them, alongside other causes, such as "changes in agricultural practices"."*

Here the "surprise" of J-C. Vié is used to discredit his position and cast doubt on the absence of a conflict of interest. The end of the paragraph prepares the next passage by underlining the contrast between not checking the pesticide box as a threat, which would be "surprising", and checking climate change.

So this whole part is disproportionate to the information it carries. I have summarized it in the summaries (Annex 1):

*"For Jean-Christophe Vié, IUCN executive, these suspicions amount to "slander". The organization is reportedly not receiving funds from Syngenta and, while discussions have been underway since 2012, there would be no deal reached. Still, Mr Vié "himself admits to being" surprised "that the five experts appointed by the IUCN did not tick the" pesticides box """. "*

The other elements are details that only help to construct the innuendo that I have detailed.

#### 4. Climate change, pesticides and bumblebees

In this passage, S. Foucart will defend that climate change is not considered a threat to bumblebees in the scientific literature.

*“For several researchers interviewed by Le Monde, the shoe pinches. Because only one duly published experimental study provides the basis for attributing these declines to climate change. Conducted by two researchers from the University of Mons (Belgium) - one of whom was also a member of the IUCN panel - the study in question suggests, in fact, a correlation between the abundance of bumble bee populations and warming in a region of the Pyrenees. But it remains limited to a small area and does not seem to have convinced the scientific community too much: published in 2012 in the Annales de la société entomologique de France, it has, according to the Scopus database, never been cited by further work.*

*“However, there are many studies showing the effects of agricultural insecticides on bumblebees, protests a biologist. In particular, Penelope Whitehorn [University of Stirling] published a major work in the journal Science in 2012 showing that exposure of common bumblebees to doses of imidacloprid [a neonicotinoid insecticide] found in nature, reduced by 85% the production of queens in a colony. ”*

*The study, one of the most cited on the subject, concluded: "Given the scale at which neonicotinoids are used, they are likely to have a significant negative impact on bumblebee populations in the developed world. About 15 studies, published over the past two years, document a variety of deleterious effects of agricultural insecticides on bumblebees. ”*

Here, we may be surprised: the negative effect of global warming on biodiversity in general has been the subject of numerous publications and has been for a very long time. Nevertheless, the author actually uses a rather sophisticated manipulation: he puts forward two innuendo:

- The experts should have relied only on studies known to the researchers questioned by S. Foucart.
- Only studies dealing specifically with the effect of global warming on bumblebees would be relevant. However, the effects of global warming are still extremely small compared to what they are (probably) going to be. If the fauna and flora are specific to each region, it is not for nothing: climatic conditions are important. Experts might have been able to extrapolate the likely consequences from other data.

So what he says is reasonably credible: It is uncertain whether a study specifically focused on European bumblebees. Better, S. Foucart echoes here the "researchers" that he would have questioned. In the worst case, he can always discard a possible mistake on them. This is the technique of improper quotation, we studied in chapter 3.

Note that it does not specify what type of researcher this is, as there are a multitude of different specialties in biology (the vast majority of which are far removed from the impact of climate on bumblebees).

## 5. Unequal debate

*"The threats listed for bumblebees summarize what can lead to extinction risks at European level, and are not intended to be a complete description of all threats to the species in question at the local level, answers Ana Nieto, responsible for the conservation of European biodiversity at IUCN. In fact, it should be noted that very widespread species can often experience severe declines in some areas, for example due to pesticides, but remain common elsewhere. According to the IUCN assessment, a dozen species are even seeing their populations increase overall. Ms. Nieto adds that the only link of interest declared by the five experts is funding of 8,000 euros obtained from agrochemical companies in 2009 by the University of Mons, from which two of the five experts are.*

*As for the evidence making warming a major part of the decline, Nieto replied that it also relies on preliminary results from the European STEP (Status and Trends of European Pollinators) program, which has not yet been published.*

The experts therefore relied on studies to which the researchers interviewed by S. Foucart did not have access. Note that he does not at any time discuss substance, such as the study protocol or its results. However, these are not alarmists and therefore hardly compatible with what he had just said.

Instead, he will raise the issue of conflict of interest, presumably to discredit the study. Indeed, some readers will say to themselves *"these are only industrial denials, as usual"*, read the paragraph quickly and only retain the information: *"there was a conflict of interest for 2 of the 5 experts."*

## 6. A new target

*"Asked by Le Monde, the coordinator of the STEP project, Simon Potts (University of Reading), cited in the IUCN press release, defends the work of the organization. He points to the fact that "while pesticides can be potentially involved in population declines, there is no direct evidence." The studies showing their deleterious effects concern, according to him, only the most common species*

*(Bombus terrestris), not the really endangered species, some of which do not live in field crops areas.”*

The author thus "slips" on Mrs. Nieto's very serious objections by turning her narrative towards Simon Potts. The remainder of the article will thus aim to question the integrity of the latter.

*“This state of knowledge allows for a variety of opinions. Reacting to the European moratorium on three neonicotinoid insecticides, Mr Potts declared in April 2013 to the Guardian: “The moratorium is excellent news for pollinators. The weight of evidence given by researchers clearly indicates that we need to phase out neonicotinoids. There are several alternatives to their use, and farmers will benefit from healthy pollinator populations. ”*

*But six months later, before the ad hoc British parliamentary committee, the researcher spoke the opposite way: “In the short term, a ban would have enormous negative implications for the livelihoods of farmers and for food security. ”*

*Why such a turnaround? “As any good scientist should be, I'm open to new evidence, and my opinions may change with new findings,” says Potts, without elaborating.”*

The criticism made by S. Foucart is absurd on three levels.

- The two postures are not about the same subjects: an additional source of mortality does not mean additional risk of extinction. Threatened bumblebees are not necessarily in agricultural areas and exposed enough to pesticides to jeopardize their species. Climate change has a much larger and systematic scale.
- The two postures are not contradictory: one may wish for the elimination of NNIs without believing that they will probably extinguish bumblebees.
- There is a 6 month interval between the two opinions.

However, S. Foucart suggests that it would be suspicious, always insinuating that there is something hidden, "eel under rock". Once again, he presents the speeches of the person he is "fighting" as not very credible.

## **7. A sophisticated effect: the reversal of the burden of proof**

The logical construction of the article is very interesting in that it reverses the burden of proof. Here, S. Foucart tries to demonstrate the existence of a conflict of interest which would explain the fact that the IUCN would not have retained pesticides as a risk that could cause the extinction of bumblebees. In the end, the author treats the

subject as if it were for IUCN to demonstrate that it and the work on which the experts it has mobilized are based are not the object of any suspicion of "*conflict of interest*".

The presupposition behind this reasoning is that all institutions deciding in any way in favor of companies would be tainted by conflicts of interest and that only those demonstrating their absolute lack of connection with industrialists would not be "*rotten*". We find the "*double standards*" that we have already spoken of. This message is obviously not made explicit.

Worse, it will not affect everyone equally. Indeed, this presupposition is necessary for the speech of S. Foucart to have a meaning. If you read this article with no confidence in it, then you will not be sensitive to the presupposition at all (you will just think "this is nonsense!"). On the contrary, if you have faith in the sincerity and skill of the journalist, you will be forced to integrate this assumption to make this belief coherent.

This is really a weapon of surgical disinformation, which has a precise target: other readers will not be able to clearly identify it.

## **8. A confusion effect**

Finally, this article mobilizes an effect of accumulation or confusion: the elements follow one another in what seems to be an impenetrable mess. At the start, we talk about an arrangement between the IUCN, represented by M. Vié, then another executive of the organization presents arguments, then S. Foucart discusses the supposed conflicts of interest of a member of the organization. having produced one of the documents on which the experts hired by the IUCN were based... Each subject is barely touched on without, as we have seen, adding the slightest substance to the argument. The confusion is such that, even after reading the article several times, I confused Mr Vie and Mr Potts ...

This confusion is fueled by the lack of logical connectors between the different elements. No "because" or "therefore": all the connections are left to guess.

This "clutter" aspect helps to conceal the absence of a convincing argument and to highlight the many innuendos and assumptions. In the end, we only remember the existence of conflicts of interest that would have influenced IUCN. In short, the argument promoted by S. Foucart.

## **9. Summary**

You see that the understatement is tangible here: IUCN would have been bought / influenced by Syngenta not to mention pesticides in its report. Even though the arguments opposed to S. Foucart's theory are very reasonable, he will succeed in presenting them implicitly as being simple justifications presented by people caught in default.

It's an important lesson in public relations. By responding to a journalist like S. Foucart, you are going on his turf. He will be free to present your words in any way that suits him.

#### **IV. 12 août 2020 : « Avec ou sans floraison, les néonicotinoïdes représentent des risques pour les pollinisateurs »**

The article "*With or without flowering, neonicotinoids pose risks to pollinators*" is interesting, since it is entirely devoted to the contradiction of the argument for re-authorizing NNIs on beets that pollinators do not visit them.

##### **1. Discredit**

The first step of the article is to lay down a discrediting framework for the supporters of the argument that S. Foucart will contradict in this article.

*" To analyse. After the beet growers, the corn growers in turn want to be able to lift the ban on neonicotinoids. Friday August 7, the day after the press release from the Ministry of Agriculture announcing the reintroduction until 2023, on beet, of this class of pesticides banned since 2018, the corn union called on the government for similar measures.*

*The success of beets is largely based on an apparent common sense argument: since sugar beets are harvested before flowering, they are not an attractive crop for bees and pollinators. The treatment of beet by coating seeds would therefore be without risk for these insects. Circulated by agribusiness circles and taken up by the Ministry of Agriculture in its communication, this argument has been widely echoed on social networks by elected officials and political leaders. "*

The argument in question is denigrated as piece of language "*circulated by agribusiness circles*". Note that he said just before that the reintroduction of NNIs on beets was a "*beet farmers success*". He therefore includes the latter in "agribusiness".

*"According to a now recurring pattern, he has also been dubbed by scientific personalities generally speaking outside their field of expertise. "If the insecticide was banned for the wrong reasons, it would be a political mistake not to re-authorize it, for example declared, on August 8, on Twitter, the doctor and academic Jean-Loup Salzmann, former president of the Conference of University Presidents (CPU). By coating the seed of a non-flowering plant, there is no danger to foragers. Politics must be based on science.""*

Thus, the only people who would support the contested argument would be those who pick up on elements of agribusiness and scientists "*generally speaking outside their purview.*"

Note the use of the quote that is used here to discredit: *"Look, he makes that argument when he doesn't speak in his area of expertise."* Also note the *"generally"*, which disappears completely as the article unfolds.

## 2. Guttation and seed dust

He then presents as valid and indisputable contradictions some very debatable arguments. Let's take them one by one.

*"However, numerous scientific studies have shown that even in the absence of flowering of the treated crops, neonicotinoids represent a high risk for bees, pollinators and insect auxiliaries of crops. Water droplets (or "guttation water") exuded by plants, and which pollinators may come to drink, are, for example, a route of exposure. This was highlighted in 2009 by Italian researchers, and published by the Journal of Economic Entomology."*

Here we see several things:

- First, the author expands the field of study: he no longer talks about beets, but about the impact of NNIs in the absence of flowering.
- Then, we see a very nice juxtaposition effect between the first and the last two sentences. Indeed, he implies that the study he cites would be one of "many scientific works" showing "a high risk to bees." However, the study in question<sup>142</sup> does not prove that guttation represents a "high risk", but that the drops in question do indeed contain NNIs. It does not assume that the bees stop there.
- Finally, the said study relates to corn, not beet. However, a study observed that the guttation of sugar beets would be "very rare" and the exposure of bees to these droplets would be unlikely<sup>143</sup>. (Solé 2020) We can see here all the interest of the extension, at the beginning of the paragraph, of the frame: thus S. Foucart does not lie, he simply does not talk about beets...

*"Another danger is that pneumatic seed drills, which inject coated seeds into the soil, can, by abrasion effect on the seeds, generate clouds of dust. Around treated plots – on vegetation, soil or surface water – this dust deposits insecticide at*

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142 Girolami et coll. (2009), Translocation of Neonicotinoid Insecticides From Coated Seeds to Seedling Guttation Drops: A Novel Way of Intoxication for Bees, *Journal of Economic Entomology*, Volume 102, Issue 5, 1 October 2009, Pages 1808–1815

143 Wirtz et coll. (2018), Investigations on neonicotinoids in guttation fluid of seed treated sugar beet: Frequency, residue levels and discussion of the potential risk to honey bees, *Crop Protection*, volume 105, mars 2018, pages 28-34

*concentrations that present a risk for certain non-target insects. This effect was shown in 2003 in a study published by the Bulletin of Insectology. "*

The cited study<sup>144</sup> refers to corn planters in... 2001! Not only have the seed drills been improved to drastically limit this risk, but in addition the corn seeds are much larger than the beet seeds:

*""The seeds are not all the same size, they do not have the same surface area. Depending on each seed, the type of coating is not the same, it is adapted", explains Madame X, specialist in ecotoxicology tests. "You cannot extrapolate from corn seed to beet seed, for example, "which would be like comparing a rugby ball to a ping-pong ball. Obviously, their properties are different." (Solé 2020)*

Back to S. Foucart:

*"These phenomena are not a fringe science: they were taken into account by the European Food Safety Authority (EFSA) in its 2018 expertise on 'neonics'. The findings of EFSA – an agency not suspect of environmentalist agenda – had led to the ban of the main neonicotinoids in Europe, in all their uses. Regarding neonically treated sugar beet, EFSA rated the risks of guttation water as "low", but independent academic work from the industry is lacking on the subject. As for the contamination of the environment around the treated beet plots, the European agency was unable to conclude that there was no risk for bumblebees and solitary bees, due to a lack of data. "*

This passage is very rich:

- It gives the impression of validating the importance of these mechanics ("they are taken into account by the EFSA").
- At the same time, it discredits the agency's view of guttation as low risk on the grounds that *"there is a lack of independent academic work from the industry on the subject."* It does not specify anything and does not justify in any way how this would be a viable argument (why the mere presence among the authors of a scientist with a vague connection to "the industry" would deprive the studies of credibility?)
- Finally, it presents the fact that EFSA could not *"conclude that there is no risk [...] due to lack of data"*, as proof that there is indeed a high risk.

Finally, note that by affirming in passing that EFSA is *"not suspect of environmentalist activities"*, it implies (or in any case it is a probable interpretation) that it would

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144 Greatti et coll. (2003), Risk of environmental contamination by the active ingredient imidacloprid used for corn seed dressing. Preliminary results, Bulletin of Insectology 56 (1) : 69-72, 2003

therefore be traditionally favorable to industrialists, which is part of its overall argument.

Here we see a mechanism that S. Foucart often uses to deal with objections: he presents questionable arguments as if they were perfectly effective contradictions. At the same time, he turns his sentences subtly enough that they aren't inaccurate. In this case, this whole paragraph is based on the mention, at the very beginning, of the willingness of corn growers to benefit from the exemptions. The author uses it as a pretext to turn "the viewfinder" towards the question of non-honey plants in general, which allows him to "hit" on beets by talking about corn (which exposes insects much more, for guttation and seedling dust).

### 3. Contamination

The author then presents EFSA's stance and explains:

*"In contrast, EFSA considered that the treatment of sugar beet with neonics was deemed to be 'high' risk for all pollinators considered in its assessment, due to contamination of subsequent crops on the treated plots. A very significant proportion of the insecticide applied to seeds, from 80% to over 98% (according to data published in 2003 in the Bulletin of Insectology), indeed remains in the soils. Honey crops or attractive to bees, untreated but sown the following year, can thus be contaminated and present a high risk to pollinators. "*

Nothing shocking here. However, here comes the objection and its treatment:

*"The agriculture ministry said in its statement that restrictions would be imposed to limit this effect. But, since 2018 and the expertise of EFSA, new work has better documented the great persistence of neonicotinoids in the environment and their ability to diffuse there, without the mechanisms of their migrations being fully elucidated."*

Thus, the author presents himself as offering as more knowledgeable than the EFSA, which would not have taken into account the work according to him to modify its conclusions had it been aware of it. After presenting the EFSA report in a positive way, he uses it to promote his own analysis.

He will then present two studies that we have already seen elsewhere, which show contamination by NNIs of areas that have not been treated for several years or always with these pesticides. As always, he presents them as reflecting the state of the art, as free from any serious contradiction.

He concludes with a very nice juxtaposition effect, with a paragraph recalling the toxicity of NNIs:

*“One of the characteristics of neonicotinoids is that they are toxic at very low exposure doses. For example, the application of 60 grams of imidacloprid (the main neonic) per hectare, on the 423,000 hectares of sugar beet cultivated in France, is equivalent to about 25 tonnes of product, or enough to kill 3 million billion bees (4 nanograms of imidacloprid per bee is enough to kill 50% of an exposed population, according to the reference summary published in 2014 in Environmental Science and Pollution Research). Counting one centimeter per hymenoptera, that would represent a chain of dead bees of about 30 billion kilometers, or some 40,000 round trips from the Earth to the Moon. ”*

This is irrelevant to the question he was discussing, since the doses of NNI are proportional to their toxicity and this is already taken into account by the EFSA assessment. However, this will strengthen the previous argument by apposition effect: on the one hand we assume a logical link with the previous paragraphs (when there is none) and on the other hand we close the discussion exposed on a feeling of dread, which will come to "mark" the memory (and thus reinforce the idea that the NNI have a frightful effect).

## Conclusion

We have therefore shown that S. Foucart developed a very rich and complex argument promoting the ban on neonicotinoids and the idea that institutions would be complicit with industrialists; that important blocks of this argument were either perfectly false or considerably misleading; that the journalist nevertheless succeeded in making his story credible with the help of extremely powerful information manipulation mechanisms.

Thus, disinformation is not unintentional, but results from a well-thought-out strategy and the role of manipulation is not *ad hoc*, as is the case in almost all newspapers<sup>145</sup>, but systemic and dedicated to promotion of a precise argument. These are the means he uses to sell a vision of the world and hide its inconsistencies.

We therefore highlighted a very large-scale disinformation project by a journalist very integrated into the journalistic world, awarded several prizes and distinctions, who works in one of the main dailies in France, often thought as the most serious (Le Monde). What does that say about journalism?

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145 Which is a problem.

## **Annexe 1 : The 71 articles**

I started, around April 2021, by collecting all the articles written by S. Foucart for Le Monde (> 2000), then I identified those that dealt with NNI. I have noted 71, the first of which dates from July 8, 2011: "*The massive decline of bees is being elucidated*".

### **1. July 8, 2011 : « *Le déclin massif des abeilles est en voie d'éluclidation* ».**

This article starts from an observation: "*Massive mortalities of honey bees have been reported all over the world – mainly in the United States and Europe*". This would be "*all the more worrying given that about a third of the food consumed globally relies on crop pollination, of which bees are the main agent.*"

According to a study published by PloS One (Vidau et al. 2011), a combination of exposure to insecticides and natural parasites is "*arguably the cause of the decline*".

She observed that exposure to very low doses (of the order of 1% of the LD50) of fipronil and thiacloprid did not cause significant mortality on its own. However, it proved to be lethal for 70% and 80% respectively of bees infected with a common intestinal parasite, *Nosema ceranae*, which alone causes only limited mortality. This would be proof of a "*cocktail effect*" and "*could lead to a review of the authorizations of phytosanitary molecules.*"

### **2. July 9, 2012 : « *La faillite de l'évaluation des pesticides sur les abeilles* »**

A report commissioned by EFSA highlighted significant weaknesses in the risk assessment procedures for plant protection products on bees. These would fail to take into account, among others, the sublethal effects (ref to the PloS One study in the previous article), exposure by guttation or by dust produced by coated seeds during sowing, the effects on larvae, etc. Taken together, the toxicity of the substances tested would be greatly underestimated.

This would nevertheless be an "open secret" and the maintenance of these errors would result from the methods of defining the evaluation protocols. The latter would in fact be set by the European and Mediterranean Plant Protection Organization (EPPO), which would delegate the task to the ICPBR ("International Commission on Plant-Bee

Relationships”), through a process dominated by representatives of the agrochemical industry.

### **3. September 23, 2012 : « Le chercheur, l’agrochimiste et les abeilles »**

French researchers led by Mickaël Henry had observed, in a study published by Sciences (Henry et al. 2012), that bees exposed to low doses of Cruiser (NNI: thiametoxam) tended not to find their hive. They had estimated that a colony not exposed to the studied insecticide, thiametoxam, grew by 11% per month during the flowering period of rapeseed. This estimate would be consistent with “four years of monitoring over 200 colonies”.

The journal Science published a "technical commentary" by British researchers contesting the 11% rate. According to them, it is 40%. This rate would come from "Observations carried out in the 1980s, on only three beehives, and outside the context of the rapeseed crop studied by French researchers ..."

The first author of the commentary would be James Cresswell. However, his laboratory, the University of Exeter, is said to be "supported by... agrochemist Syngenta, owner of the Cruiser." "In fact, on August 8 this company funded a researcher position whose mission would be" to assist Dr. James Cresswell in his research ". It was also on that date that Mr Cresswell's technical commentary was reportedly accepted for publication.

### **4. January 16, 2013 : Pesticides : un risque enfin admis pour les abeilles**

EFSA published an opinion that considered three NNI pesticides (clothianidin, imidacloprid and thiamethoxam) to pose "a high risk to bees". This risk went through three routes of exposure:

- the emission of dust by the coatings during sowing;
- contamination by pollen and nectar;
- in the case of corn treated with thiamethoxam, exposure through “guttation” (the exudation of water droplets from the plant).

He recalled the criticism of the report mentioned in the article of July 9, 2012, having highlighted the shortcomings of the risk assessment protocols. The risks recognized by EFSA would come as no surprise, however, as a group of experts reached "the same conclusions about imidacloprid" in 2003.

## **5. February 9, 2013 : Un plan de soutien contre le déclin de l'apiculture**

Beekeeping is said to be in decline: "French production fell by 28% between 2004 and 2010; at the same time, the number of beehives fell by 20% and that of beekeepers by 40%. Each year, more than 4,500 people go out of business. "

To fight against, the Minister of Agriculture at the time, Stéphane Le Foll would have released an envelope of 40 million euros to professionalize the sector through training.

He would also like to create an "observatory of pesticide residues in the environment of bees (pollen, nectar, etc.)", which would displease beekeepers:

*"We have been observing the impact of pesticides on our hives for seventeen years and there have been many scientific studies to corroborate our warnings," says Olivier Belval, president of the National Union of French beekeeping (Unaf ). Help financially a sector which suffers a huge bleeding from bees? You might as well throw money down a bottomless pit! "*

The author then evokes the 2-year moratorium decided by the European Commission after the opinion of EFSA (mentioned in the previous article) and reports that the UNAF has announced that it is not satisfied by the minister's program and that 'she wants "the total and definitive ban of these systemic phytosanitary products".

## **6. March 1, 2013 : Le déclin des insectes pollinisateurs menace les rendements agricoles**

If we often talk about the decline of honey bees, it is wild insects that are the first pollinators.

A study by Bernard Vaissière (INRA), "one of the best specialists in the subject", shows that the flowers visited by honey bees have a fruit productivity 14% higher, while those visited by wild insects have a productivity "close to twice as much". It was based on data "collected by some fifty international researchers on the pollination of 41 types of crops [...] spread over the five continents".

This study would be "major" according to Jason Tylianakis, in a commentary published by Science.

Nevertheless, they are disappearing quickly: according to a study by Laura Burkle published by Science, "the diversity of wild pollinator species has been halved in 120 years" and "the rate of visits of a small flower endemic to this region of North America has been divided by four during this period. "

The author concludes by recalling the proposed suspension of the 3 NNIs mentioned above and the shortcomings of the certification tests, which, in addition to the criticisms already mentioned, also do not assess the risks on wild pollinators.

## **7. April 29, 2013 : Abeilles : trois pesticides interdits dans l'Union européenne**

The European Commission is expected to suspend 3 NNIs (imidacloprid, clothianidin and thiamethoxam) for two years from December 1, 2013, with fifteen European Union states supporting the measure.

In a letter revealed by an English weekly to Syngenta, UK Environment Secretary Owen Paterson "explains that London" has been very active "in organizing opposition to the Brussels proposal. And adds, "Our efforts will continue and intensify in the coming days. ""

On the contrary, Tonio Borg, the European Commissioner for Consumer Health, affirms his willingness to promote the ban and do his utmost to protect bees. The qualified majority was not reached, the European Commission should decide. (?)

## **8. April 30, 2013 : Bruxelles va suspendre pour deux ans trois insecticides tueurs d'abeilles**

The article reproduces the news from the previous article, as well as the reference to the letter to Syngenta. He also recalls the context:

*"In January, EFSA issued an assessment of the risks presented by the three molecules to bees. Its conclusions are unsurprisingly unfavorable to agrochemists. At the end of 2003, the Scientific and Technical Committee for the Multifactorial Study of Bee Disorders (CST), set up by the French Ministry of Agriculture, had already issued a very negative assessment on imidacloprid. "*

European expertise was said to have come under "intense pressure". Syngenta is said to have "demanded, in vain, amendments to the position of EFSA, going so far as to threaten some of its prosecution officials." Opposite, the NGOs Greenpeace, Avaaz and Pesticide Action Network would be very mobilized.

Nevertheless, we should put it into perspective: according to biologist David Goulson, the partial moratorium would only be a good start, it would take years before NNIs disappear from the soil, even if the moratorium was total, which is not the case.

## **9. May 3, 2013 : Les insecticides Gaucho, Cruiser et Poncho enfument la ruche**

Still with regard to the same announcement from the European Commission (probable suspension on December 1 of the 3 NNIs), S. Foucart puts into perspective: "Hailed on Monday April 29 as a victory by the beekeeping world and environmental organizations", "it can also, on the contrary, be interpreted as a crushing defeat. "

Indeed, the decision of the commission would be late, which would be the "symptom of a tremendous failure of the risk assessment systems". The agrochemical companies would thus come out "by no means losing their clash with beekeepers and conservationists. »(Implied they would have had time to make a profit?) NNIs should have been banned many years ago. Indeed, they are "the most effective insecticides ever synthesized" and, used in seed coating, the plant secretes them throughout its life. "It turns millions of hectares of field crops into insecticide fields by default. "

Their deployment, in the mid-1990s in France, would have corresponded to a sharp acceleration in the decline of pollinating insects. In 2003, an expert group set up by the French government had already concluded that "imidacloprid (marketed under the name Gaucho) presented an unacceptable risk to bees". Yet it was not until 2013 that EFSA issued an opinion condemning the 3 NNIs, on the basis of which the proposed ban on NNIs was proposed. This moratorium would therefore be "a decade late". It would also be limited, affecting only certain NNIs and certain uses (eg use for winter wheat would remain authorized).

This inertia is linked in particular to certain "expertises", such as that of AFSSA1 in 2008, "taking up, sometimes under questionable conditions of integrity, the vulgate of agrochemists: bee disorders being" multifactorial ", new phytosanitary products would play no determining role. "

## **10. May 27, 2013 : Abeilles : un quatrième insecticide épinglé**

EFSA reportedly issued a "severe" opinion on the risks posed by fipronil (a 4th NNI), recognizing a "high acute risk" posed to domestic bees by corn seed dust coated with this NNI. She was unable to perform a full risk assessment due to a lack of data. However, she believes that the risk is likely to be low for crops not frequented by bees. The opinion would point out "hollow that regulatory tests to assess the risks of new generations of insecticides - used, like fipronil, in seed coatings - are unable to detect the potential effects of these molecules on bees. »

The EU confirmed on 24 May the entry into force of the moratorium on the other 3 NNIs on 1 December.

Fipronil was already banned in 2005 in France, following a CST report concluding that the use of this NNI “may seem“ worrying”and“ does not rule out unacceptable risks”. »

## **11. October 12, 2013 : Le tabac et les abeilles**

This article would present the method of risk assessment for honey bees defined by the document "System for the assessment of the risk of plant protection products for the environment" of the EPPO.

To be qualified as “low risk”, exposure to the substance should be less than the LD50 in less than 48 hours divided by 10. S. Foucart would show the absurdity of this method by taking the example of cigarettes for the human: the LD50 is 150 packs. Smoking 15 packs per day would therefore be, by following this logic, "at low risk" for humans ...

EFSA reportedly proposed new guidelines in the summer of 2013 "based on the actual state of scientific knowledge". Their eventual adoption, however, was postponed. [He implicitly asserts that the EPPO document would indeed be the guideline followed]

## **12. November 7, 2013 : Pesticides : les mathématiques au secours des abeilles**

A study conducted by John Bryden and published in Ecology Letters (Bryden et al. 2013) observed that exposure to very low doses of NNI can: "cause colony collapse without having an acute lethal effect on each of the group insects. " At the same time, the FFAP had, on November 6, drawn up "a dramatic inventory of the beekeeping sector".

The researchers had developed a mathematical model simulating the evolution of the colony and tested it with bumblebee colonies that were fed pollen containing 10 parts per billion imidacloprid for 42 days. Their model would have been validated. During the first 20 days, the treated colony evolves similarly to the control colony. Then, after this "tipping point", the "treated colonies decline, while the control colonies continue to grow. "

Foucart puts into perspective:

*"" These works do not constitute biological proof, but are rather a tool which allows us to possibly understand how things can happen, for his part sums up a French apidologist. A dozen similar models have already been built. "*

This would, however, be further proof of the flawed nature of the risk assessment procedures. [Reminder of the 2012 EFSA opinion]

### **13. December 7, 2013 : Un moratoire inutile sur les insecticides tueurs d'abeilles**

There would be no reason to celebrate the moratorium suspending certain uses of fipronil and 3 NNI for 2 years.

First, we would have wasted time: an expert report commissioned by the Minister of Agriculture and published in 2003 already concluded that imidacloprid posed an "unacceptable risk".

Second, the decision will "probably do nothing" as the moratorium is less than the lifespan in the environment of the NNIs. A study published in the journal *Current Opinion in Environmental Sustainability* reportedly concluded that "neonicotinoids show the potential to accumulate in the soil and can be taken up by subsequent crops for at least two years after application." Its authors recall, citing a 2005 study, that "Imidacloprid was detected in 97% of 33 soil samples taken from untreated fields, but on which coated corn seeds had been used one to two years. before the samples are taken".

Finally, NNIs would not be effective. David Goulson is said to have shown in a review published in the *Journal of Applied Ecology*, the lack of correlation between yields (rapeseed and wheat) and the amount of NNI used.

### **14. January 30, 2014 : Insecticides : les bourdons perdent le nord, même à très faible dose**

Researchers led by Dave Goulson studied 6 colonies of bumblebees of initially identical size. The study was in two stages:

- For 2 weeks, the "colonies were fed in the laboratory with a sugar solution and pollen". For 3 of the 6 colonies, 7 or 6 parts per billion of imidacloprid were added to the sugar and pollen, respectively. These rates are said to be "comparable to what pollinators encounter in nature, when the seeds have been treated with the insecticide. "
- The bumblebees were then traced with a small RFID chip and placed in the wild. Bumblebees treated with imidacloprid were also successful in foraging, but returned pollen on only 40% of their trips, compared to 63% for control

bumblebees. Those who succeeded had, moreover, an hourly efficiency reduced by 31% compared to the control group.

In total, the amount of pollen collected was 57% lower for the treated bumblebees. These effects were present even one month after the end of exposure to the product. Other studies have reportedly shown negative effects of NNI on the bumblebee. For example, the study conducted by Penelope Whitehorn and published by Science in 2012 showed that "colonies exposed to very low doses of imidacloprid produced on average 85% fewer queens than others. "

### **15. April 7, 2014 : En Europe, le déclin des abeilles frappe lourdement les pays du Nord**

Bees are "pollinating insects essential to 84% of plants cultivated in Europe". The decline of bees would not have been specifically studied, which was done with the "Epilobee" study. It shows that the countries of northern Europe have the highest death rates: 42.5% (Belgium), the United Kingdom (38.5%), Sweden (31.1%), Finland (29.8%) and France (27.7%), against 9.1% for Greece, 7.6% for Italy and 16.3% for Spain.

During the beekeeping season, it is for France that mortality is highest during the beekeeping season: 13.6%, against less than 10% in all the other countries studied.

The study funded by the EU and piloted by ANSES mobilized > 1,300 inspectors who visited 3 times between 2012 and 2013 nearly 3,300 apiaries totaling 32,000 bee colonies. They noted the mortalities and the presence of the main pathogens of bees such as varroa and nosema parasites. However, they did not measure the presence of pesticides. The term is missing from the 30-page report:

*"This study is a little strange," quips the apidologist David Goulson, professor at the University of Sussex (United Kingdom). They spend over 3 million euros studying bee health and don't even mention the word "pesticide"! "*

According to the apidologist Gérard Arnold, research director at the CNRS, the choice not to identify pesticide residues would be "political, not scientific. Gilles Salvat, director of animal health at ANSES replies that the cost of such analyzes would have been prohibitive.

The results would exclude the responsibility of only natural pathogens in the high mortalities, diseases affecting only a small proportion of hives (in France, 1.5% for American foulbrood, 1.2% for varroa and less than 1% for nosema). It would also be a shame if the environment of the hives was not described, which

precludes "the search for possible links between the mortalities and the types of agriculture practiced near the hives." "

Finally, the fact that only mortality was retained minimizes the severity of the population, not taking into account the weakening of the colonies.

## **16. April 13, 2014 : Déclin des abeilles : les mots qui fâchent**

The Epilobee study published on April 7 by the European Commission reportedly failed to address the issue of pesticides, even as research shows the harmful effects of pesticides. S. Foucart's comment is difficult to synthesize:

*"We are therefore in the context of a rather strange exercise, which puts scientific discourse and practice at the service of contingencies external to science. You have to look, but in the "right" direction. You have to find it, but not too much. Above all, to avoid any unwanted discovery.*

*The architects of the study argue that it would have cost to take samples from all the beehives visited. It's fair game. But let's read the thirty pages of the published report: the word "pesticide" is not there. The word "insecticide" either, not even an understatement as benign as "phytosanitary product". We look, in vain, for the words "agriculture", "agricultural practices"... We rub our eyes. It is as if an epidemiological study on the causes of lung cancer had not only failed to question participants about their tobacco consumption, but that, moreover, the words "cigarette" or "smoking" were excluded from its study. Report. [...]*

*This semantic modesty recalls that of old studies funded by American tobacco companies, which first attributed lung cancer to air pollution, radon, genetic predispositions and, possibly, to... "way of life" - that is, ie to cigarettes. That science is being practiced in a context where it is not possible to state such a trivial fact as the harmfulness of insecticides to insects should give us deep concern. Not necessarily for the bees but, above all, for what it says about our society. "*

## **17. May 5, 2014 : L'UICN, Syngenta et le déclin des bourdons**

IUCN issued a statement on April 2 announcing that in Europe, "30 of the 68 species of the genus *Bombus* found on the continent are in decline and 12 are threatened with extinction. "The organization specifies:

*"Climate change, intensification of agriculture and changes in agricultural land use are the main threats these species face"*

The absence of the term pesticide would make an apidologist "squeal", and Dave Goulson has "never seen clear evidence linking bumblebee and bee declines to climate change."

*"Words barely covered, some see it as the influence of ongoing talks between the biodiversity conservation organization and Syngenta, a major producer of agricultural insecticides. "*

The solutions proposed in the press release would also be the same as those recommended by manufacturers: "setting up borders and buffer strips around agricultural land rich in flowers" and "preserving meadows". At no time does IUCN mention the restriction on the use of certain phytosanitary products ".

For Jean-Christophe Vié, IUCN executive, these suspicions amount to "slander". The organization is reportedly not receiving funding from Syngenta and, while discussions have been underway since 2012, there would be no deal reached. Still, Mr Vié "himself admits to being" surprised "that the five experts appointed by the IUCN did not tick the" pesticides box "".

Of 30 species in decline, climate change is mentioned as the cause for 23 of them. However, and this would be where "the shoe pinch" according to several researchers, this link would be based only on a single experimental study, carried out by one of the researchers of the panel, observing a correlation between the abundance of the populations of bumblebees and warming in a region of the Pyrenees. She "does not seem to have convinced the scientific community too much", never having been cited.

On the contrary, many studies would show the negative effect of insecticides on bumblebees, such as the study by Penelope Whitehorn published in Science.

## **18. June 24, 2014 : Barack Obama lance une stratégie nationale pour sauver les abeilles**

Barack Obama, then US President, would have launched by decree on June 20 a "federal strategy for the health of bees and other pollinators".

The losses of apiaries, traditionally of the order of 10 to 15% at the end of winter, reached 30%, which would be all the more dramatic as pollination would contribute to the tune of 24 billion dollars to the American economy. .

The decree specifies that the NNI will be evaluated.

## **19. November 9, 2014 : Pourquoi le « GIEC de la biodiversité » est mal parti**

Created in April 2012, the mission of IPBES<sup>1</sup> would be to synthesize available knowledge on biodiversity, on the impacts of its erosion and on possible courses of action to preserve it. In short, to be to biodiversity what the IPCC is to the fight against global warming.

However, it is not certain whether she will earn comparable credit. Indeed, one of his first reports will be on pollinator decline, and in the task force there are scientists employed by Syngenta and Bayer. These, having no scientific credit, would be there only to "represent their employers".

*“Of course, private sector experts are very limited: two out of a total of twenty-one in two of the six working groups. As for the other experts, they are academics or scientists from public research organizations. But this does not exclude other conflicts of interest, through funding, links forged between their institutions and the agrochemical industry, remuneration as a consultant, etc. At IPBES, we are assured that everyone had to submit a statement detailing this type of relationship with industry. It’s happy. But, alas, these documents are not public...”*

The suspicion would be all the more permissible given that Simon Potts is co-chair of the IPBES committee. He celebrated the moratorium on 3 NNIs in 2013 and asserted that “The weight of evidence given by researchers clearly indicates that we need to phase out neonicotinoids. However, he said the opposite 6 months later, judging that there was "currently no consensus on their lethal and sublethal impacts [on pollinators] in the environment. ”

This turnaround questions S. Foucart, who also notes that in May 2014 this researcher signed a study on NNI which greatly appealed to manufacturers. In this study, "neither the financing of the study nor the possible conflicts of interest of its authors were specified ..."

This casts doubt on the impartiality of the organization.

## **20. March 16, 2015 : Inutiles tueurs d’abeilles**

At the end of 2012, economists from a think tank supported by Bayer and BASF, the HFFA<sup>1</sup>, studied the socio-economic value of NNIs. The study, funded by Bayer and Syngenta predicted "a form of agricultural Armageddon if the infamous neonicotinoids are suspended", estimating losses of up to 17 billion euros and 50,000 jobs.

However, the ban on 3 NNI and fipronil has reportedly resulted in higher, if not much higher, harvests than average. This should come as no surprise, with some publications discussing the usefulness of NNIs. Thus, the Center for Food Safety (CFS), an environmental NGO, "systematically examined the scientific literature" and found only 4 studies showing gains in yields, against 19 studies finding no or insignificant gain. Agrochemists would come to entertain the idea that NNIs are indispensable. Thus, a bill was "brushed aside by the overwhelming majority of senators. " Foucart concludes:

*"History makes it clear at least one thing: the state of our environment is often that of our democracy. "*

## **21. March 29, 2015 : Noire semaine pour l'expertise**

This article begins by talking about the IARC opinion classifying glyphosate as a probable carcinogen. The agency would have expected its opinion not to pass "like a letter in the mail", given the vast economic interests it would upset.

However, IARC is surprised that part of "this response" comes from the German health agency BfR1. His criticism could be explained "perhaps" by the fact that a third of the experts on it belong to manufacturers marketing glyphosate-based products. On March 24, Médiapart also revealed that experts responsible for evaluating drugs had been "secretly paid as consultants by the pharmaceutical industry during their terms of office".

The day after these revelations appeared in PeerJ under the signature of David Goulson an article "with devastating conclusions for the credibility" of FERA2, the British food safety agency.

He analyzed the data used for one of the latter's reports. He observed that, contrary to the conclusions that had been drawn, the study would in fact have been the first study to describe the substantial negative impacts of NNIs in real conditions.

Asked about this "a spokesperson for FERA has more or less eaten his hat". The main author is said to have left FERA and joined Syngenta in the months that followed.

## **22. May 19, 2015 : Ségolène Royal au secours des abeilles**

Ségolène Royal (then Minister of Ecology) was to present, on Wednesday, May 20, to the Council of Ministers, a national action plan in favor of pollinators. In particular, she announced that she wanted not only to defend the continuation of the moratorium, but also to extend it to other substances and other uses.

This strengthening of the government's position would be recent, the government having issued a negative opinion on the law proposal of Delphine Batho and Gérard Bapt providing for a total ban of NNI in France in 2016.

He was urged to do so by the growing mobilization of civil society: a petition from the FNH1 and Future Generations calling for the withdrawal of the NNI thus collected 50,000 signatures in three weeks.

### **23. August 27, 2015 : Les experts européens aggravent le cas des pesticides tueurs d'abeilles**

An EFSA expert report published on August 26 a study evaluating that the 3 NNIs already targeted by the moratorium and the 2013 study (clothianidin, thiamethoxam and imidacloprid) represented "high risks" for bees in spraying (the moratorium and the previous study focused on their use in seed coating).

According to Marco Contiero, agricultural policy officer at Greenpeace Europe, this would confirm "what has already been shown by abundant scientific evidence: neonicotinoids are a serious threat to bees and the future of agriculture". They should be banned all the more as "viable non-chemical alternatives exist and the European Union should encourage farmers to use them." "

With the 2-year moratorium coming to an end, EFSA will reassess the affected NNIs. Continuation of the ban would not be straightforward, as EFSA recently cleared sulfoxaflor, another neurotoxic insecticide, even as the report acknowledged: "With the assessments available, a high risk to bees is not excluded and a high long-term risk is indicated for small herbivorous mammals, for field uses on cotton and vegetables".

The authorization aroused the ire of beekeeping organizations and NGOs.

### **24. February 23, 2016 : Parmi les experts du principal rapport sur la pollinisation, deux salariés de l'industrie chimique**

Two employees of agrochemical companies have important roles in the IPBES report on pollinators:

- Christian Maus is the main author of the chapter on "pollinator diversity" and employed by Bayer.
- Helen Thompson, employed by Syngenta, is in charge of the one on the causes of their decline.

This would damage the credibility of IPBES.

IPBES Vice President Robert Watson puts it into perspective: "There are only two salaried industry scientists out of the nearly 80 researchers participating in the report." This had already been denounced in 2014 in a publication by three researchers: Axel Hochkirch, Philip McGowan and Jeroen van der Sluijs, who also criticized "the lack of explicit rules in the appointment and selection of experts".

The controversy would be all the more serious as Helen Thompson was engaged in another controversy, on a FERA study concluding in 2013 to the lack of effect of NNI on bumblebees, while a reanalysis of the raw data by Dave Goulson in 2015 in PeerJ concluded otherwise. Christian Maus would never have published any work on this subject.

## **25. February 26, 2016 : Le « GIEC de la biodiversité » consacre l'importance cruciale des pollinisateurs**

Overall, the IPBES report concludes:

*"The decline of pollinators, bees, butterflies and birds, poses a serious threat to global food production. And endangers the livelihoods of millions of people. "*

He estimates that "pollination-dependent crops contribute 35% by volume of crop production globally. "

The share of wild species in pollination would be underestimated. The decline of their populations is observed in Western Europe and North America (there is a lack of data to confirm this elsewhere).

IUCN estimates that 16.5% of vertebrate pollinator species (birds, bats, etc.) are threatened with extinction and that more than 40% of bee species in Europe may be threatened.

NNIs are not ignored, but are not the subject of recommendations. The paragraph where they are mentioned "will be scrutinized" because of the involvement of agrochemical workers among the experts.

## **26. March 15, 2016 : Tout comprendre aux pesticides néonicotinoïdes**

On May 10, a ban on NNIs was proposed, under the biodiversity law. In this context, S. Foucart offers a synthesis on the subject.

He recalls the distinction between the 3 main types of pesticides: insecticides, fungicides and herbicides. Among insecticides, the NNI family is made up of 7

molecules representing approximately 40% of the world agricultural insecticide market: imidacloprid, thiamethoxam, clothianidin, dinotefuran, acetamiprid, nitenpyram and thiacloprid.

Their particularity would be their main mode of application: the seed coating. This would make them "systemic" insecticides, the poison circulating throughout the plant. There is a scientific consensus on the deleterious effect of NNIs on wild pollinators, in particular because they are able to act at very low doses on the nervous system of insects in general and bees in particular. They can have neurotoxic effects endangering hives even at sublethal doses.

NNIs are said to be all the more dangerous as a study has shown "that bees preferentially forage on contaminated plants rather than those which are not." Their use would pollute large areas: 90% of the product would not be used by the plant and would "therefore remain in the soil and generally persist there for several years". Being soluble in water, the molecules could also be transported and permeate the surrounding environment.

A literature review would estimate that their use thus weakens all "ecosystems by affecting soil invertebrates, the microfauna of rivers, amphibians, etc." NNIs would also be one of the causes of the 50% decrease in 30 years of field bird populations in Europe.

3 of the 7 NNIs have already seen their uses restricted by the EU since the end of 2013. S. Foucart ends by questioning: "But other uses are still authorized and four other neonicotinoid substances are still used without restrictions. Until when ? "

## **27. May 7, 2016 : Néonicotinoïdes : le paradoxe de la Reine rouge**

On May 10, the Senate was due to consider the biodiversity bill and, in particular, "the thorny issue of bee-killing insecticides, the now famous neonicotinoids."

Nothing would be taken for granted "as the interests thwarted by this provision are agitated behind the scenes to make it its business. "

These interests would have "managed to win the ear" of Stéphane Le Foll, then Minister of Agriculture, who would have asked not to vote for this ban. Foucart asks, "What to think of this argument? ", Knowing that" none of the various restrictions on the use of these substances produced any loss of performance. "

The dominant agricultural model is said to be "subject to the Red Queen paradox" in reference to Lewis Carroll's book *The Other Side of the Looking Glass* (= *Alice in Wonderland?*). In one of her scenes, "The Red Queen explains to Alice that in the world she has landed in, you have to keep accelerating to stay still. Likewise, agriculture would be "in a similar frenetic race to stand still. "

Each new innovation would have lower beneficial effects and cause greater damage, which always requires more phytosanitary innovations. This would manifest itself in stagnant yields despite an increase in the use of pesticides since 1990. On the contrary, honey production was according to the UNAF then 3 times greater than it would be now.

In addition, it would be impossible to contain NNIs. French researchers<sup>1</sup> have notably found a dose of imidacloprid in rapeseed nectar comparable to that of thiamethoxam with which the plant had only been treated. Similarly, researchers have shown that wild flowers near fields treated with NNIs were also contaminated by these pesticides. We would have lost control of this technology.

## **28. February 6, 2017 : Les insecticides néonicotinoïdes tueurs d'abeilles... et d'humains ?**

A review of the literature published on February 2 in the journal *Environmental Health Perspectives* examines the effect of NNIs on human health.

She reports "associations with unfavorable developmental or neurological consequences': increased risk of autism, memory disorders and tremors, a congenital malformation of the heart (called "tetralogy of Fallot"), as well as 'another serious birth defect, anencephaly (partial or complete absence of the brain and skull at birth). "

Melissa Perry and her co-authors "insist that these suspicions are only indicative" and point out that their main message would be to draw attention to the lack of data on the subject (Cimino et al. 2017). This would be all the more problematic if NNIs persist in the environment and are diffused in the environment. Thus, Delphine Batho underlines: "Imidacloprid is one of the 15 most frequently detected substances in waterways, whereas it was in 50th place less than ten years ago".

## **29. March 24, 2017 : Abeilles et pesticides : polémique entre les apiculteurs et le ministère de l'Agriculture**

The UNAF would accuse the ministry of hiding the damage of pesticides on beehives by "several means and statistical sleight of hand leading to minimize the role

of pesticides in the decline of bees", going so far as to repeat the maxim of Churchill: "I only believe in statistics when I have falsified them myself. " He was reacting to the publication under the signature of an expert from the Ministry of Agriculture of an article observing that only "13 of the 195 cases of acute mortalities reported in 2015 in France were due to pesticides. "

There would be several biases:

- The statistical unit, the event, does not take into account the scale of the disaster: a hive affected by a disease weighs as much as a declaration of 100 beehives poisoned by an insecticide.
- As poisonings are not, like certain diseases, subject to compulsory notification, they are reportedly underreported.
- Pesticides are said to have sublethal toxicity, the fact of only retaining acute poisonings would minimize their impact.

The ministry responded that the published article had no statistical ambition.

### **30. May 29, 2017 : « Mais où sont passés tous les insectes ? »**

The decline of insects is manifested by the fact that the windshields of automobiles, even the less aerodynamic ones, are no longer soiled by the impacts of insects along the road.

Science has "all the trouble in the world to quantify this discreet disappearance", however a study published by Science focused on this subject.

In 1989, entomologists from the Krefeld Entomological Society set a series of traps in a wetland, Orbroich Bruch Nature Reserve (Germany) and quantified the amount of insects captured. The same device in 2013 captured an 80% lower mass of insects. The iteration of the operation in 2014 found similar results. The main suspects, according to this study, are the NNIs. Their use is said to be defended by agrochemists who market these products on the grounds that they are important to feed humanity.

However, the depletion of entomofauna is also a problem for farmers, as shown in a study published in late April by the journal *Arthropod-Plant Interactions*. Three researchers from the University of Helsinki observed that rape, an oilseed close to rapeseed, had seen its yields decrease since 1993. In Finland, it was harvested 1.7

tonnes per hectare compared to 1.2 today. It would be in the areas where the use of NNI would have been the most intense that the loss of yields would have been the greatest.

On the contrary, crops insensitive to the depletion of insects, such as barley and wheat, would not suffer from these drops in productivity.

According to Vincent Bretagnolle and Bernard Vaissière, if it's just a correlation. However, the Finnish authors write "only the adoption of neonicotinoid insecticides in seed treatment can explain the drop in yields in several [Finnish] provinces, and at the national level for the shuttle, through a disruption of pollination services. by wild insects".

Foucart concludes:

*« Malgré un dossier de plus en plus indéfendable, les fabricants de ces substances sont bien décidés à les défendre bec et ongles devant le régulateur européen, pour les maintenir à toute force sur le marché. Une intense campagne de lobbying est en cours à Bruxelles et au parlement de Strasbourg – son issue sera très intéressante. »*

### **31. 27 June 2017 : Les pesticides tueurs d'abeilles créent les premiers remous au gouvernement**

RMC on June 26 revealed an interministerial working document examining the possibility of eliminating by ordinance certain restrictions on the use of phytosanitary products, in particular to reverse the ban on NNIs.

The then Minister of Agriculture, Stéphane Travert, had confirmed this intention, ruling that the ban on NNI was contrary to European law and that there was no existing alternative. The then Ecology Minister, Nicolat Hulot, dismissed the possibility on Twitter.

Prime Minister Édouard Philippe then announced that the government had decided not to reverse the ban on NNI, which entered into force in September 2018. At European level, a committee of the European Parliament validated, on June 22, the European Commission's plan to ban the 3 NNIs.

On the other NNI molecules, the data are less important, but already old expertises, for example those of the CST in 2003 and 2005 have already pointed out that the risk assessment methods of these substances were inadequate.

On the unconventionality of the global ban on NNIs, Delphine Batho notes that the European regulation allows member states to take precautionary measures; that other countries have also extended the ban on NNIs beyond the ban imposed by the EU and

that scientific studies have "established the impact of neonicotinoids on human health with" adverse neurological consequences on human health. "To be human" .

### **32. 27 June 2017 : Matignon éteint en urgence la polémique sur les pesticides**

This article contains the same elements as the previous one. He adds in particular:

*"The episode reinforces the feeling that the President of the Republic strongly imprints his will on the government, including on technical matters. During his campaign, Emmanuel Macron had indeed assured that he would not take a step back on the issue of bee-killing pesticides. For his part, Édouard Philippe, when he was in the Hemicycle, had not voted to ban them. "*

### **33. 29 June 2017 : Deux études à grande échelle confirment les dégâts des néonicotinoïdes sur les abeilles**

Two studies published on June 30 by Science "extinguish the last doubts that could - possibly - remain" on the damage caused by the NNI.

The first was conducted by Ben Woodcock at 11 locations across Germany, the UK and Hungary. On each site, 3 farms cultivated rapeseed, two of which were treated with an NNI. The experiment spanned several dozen hectares.

According to Dave Goulson, this would be "the largest field experiment conducted on the impact of neonicotinoids on bees". Note that the study would be funded by Bayer and Syngenta. On each farm, the health of one type of honey bee, bumblebee and wild bee was monitored for one to two years.

The impact of NNIs observed could vary by country. For example, the number of bees exposed to clothianidin surviving the winter was lower in Hungary than in Germany.

Overall, however, it was negative. This is all the more evident when one considers the health of the hives instead of the quantity of bees (difficult to establish): 100% of the unexposed colonies survive, while this is not the case for those which are exhibited. In wildlife, "bumblebees produce fewer queens, and solitary bees produce fewer larvae when exposure to neonicotinoids is high."

In addition, the authors find "imidacloprid everywhere, even when cultures have not been treated with this molecule, confirming the recent work of the Ecobee team in France", confirmed by Dave Goulson.

The second study was conducted in Canada by researchers led by Nadejda Tsvektov. It involved 11 train apiaries close to cornfields treated with clothianidin, others several kilometers away. Note that corn is pollinated by wind and not by insects.

The authors would have found a cocktail of twenty-six pesticides, including four neonicotinoids, in the colonies near or far from the fields. The closest were the most affected.

They attempted to isolate the effect of clothianidin by placing bees exposed to contaminated pollen in an untreated experimental hive. They observed that their life expectancy was reduced by 25% and that "their behavior differed from that of unexposed individuals, to the point of endangering the survival of the colony. "

In light of this work, Dave Goulson concludes: "It has become untenable to continue to claim that agricultural use of neonicotinoids does not harm wild and honey bees."

### **34. October 5, 2017 : Les trois quarts des miels du monde sont contaminés par des néonicotinoïdes**

A study published by Science analyzed 198 honeys from Alaska, Australia, Madagascar, Europe or Asia and found traces of NNI in 75% of them. This rate would vary: 86% in North America, 80% in Asia, 79% in Europe and 57% in South America.

These figures would give a "good idea of the extent of the contamination of the landscapes", the bees foraging within a radius of 3 to 5 km around his hive.

The concentrations found "are deemed not to present a risk for consumers of honey.

»They are on average 1.8 µg / kg and a maximum of 50 µg / kg, which would be close to the maximum residue limit.

This would be an important problem, many studies highlighting the sublethal effects of NNIs, certain negative effects even appearing, in certain insects, "from a concentration of 0.1 µg / kg. These effects would be ignored by the regulations.

### **35. October 18, 2017 : En trente ans, près de 80 % des insectes auraient disparu en Europe**

Reminder of the study published by Plos One on the reduction in the mass of insects by 80% between 1989 and 2013 on a site in Germany (see article of May 27).

*"Our results document a dramatic decline in flying insects, from 76% on average and up to 82% in mid-summer, in German protected areas, in just twenty-seven years," writes Caspar Hallmann (Radboud University, The Netherlands) and its*

*co-authors. This considerably exceeds the quantitative decline, estimated at 58%, of wild vertebrates since 1970. "*

*The major factor explaining such a rapid collapse, the authors argue, is the intensification of agricultural practices (increased use of pesticides, synthetic fertilizers, etc.). "*

The authors would also have done a "big statistical job" to isolate the possible causes of this decline. They would conclude that, with 94% of the measured protected areas being in agricultural areas, agricultural intensification would be the most likely culprit.

Treatments, especially those with NNI, would also have, as the study on honey that we have already seen, have the ability to contaminate insects over large areas.

These measures would affect only Germany, but also, according to Dave Goulson (himself a co-author of the study) France and the United Kingdom with similar farming systems. More broadly, it could be "representative of a much larger situation", in which case we would "be facing an impending ecological disaster. "

In France, "such data have not been recently published". However, there is regular monitoring in a research area in Deux-Sèvres where comparable facts have been observed. Vincent Bretagnolle, working in this area, observed that the number of *Poecilus cupreus*, a ground beetle abundant in agricultural environments representing 70% of the individuals (ground beetles?) Captured in the area, would have been reduced by 85% in twenty-three years.

### **36. October 19, 2017 : Les apiculteurs dénoncent l'autorisation d'un nouveau néonicotinoïde en France**

The honey harvest would have been catastrophic, reaching a tonnage 3 times lower than in the 1990s. UNAF denounces the sulfoxaflor MAH. This insecticide would act like NNIs and would be an NNI not classified as such.

*"It is shameful, scandalous, pitiful and irresponsible towards future generations," says Gilles Lanio, the president of UNAF. I still can not believe it ! "*

This molecule was authorized in 2015, despite missing information and not excluding "a high risk for bees".

According to the spokesperson for the company marketing it, it is not an NNI and, "authorized in forty-three countries, is used on millions of hectares and no negative impact on bees or pollinators has been reported. "

ANSES authorized two sulfoxaflor products in September. The UNAF denounces authorizations made on the sly and translating a double discourse: "We authorize a product lightly and then procrastinate before withdrawing it, after fifteen years. Even N. Hulot's Ministry of Ecology would not have been notified.

NNIs would treat 6 of the 28 million hectares of arable land in France. However, they are extremely toxic to insects and can persist in soils for several years: 3 years for clothianidin and 10 years for imidacloprid.

Farmers would not even have a choice: "It has become very difficult for them to obtain seeds that are not coated with pesticides - the content of which they do not necessarily know. Today, the cooperatives, to which three quarters of them belong, sell 70% of the seeds presented as real "guarantees all risks" and dictate their way of proceeding. "Farmers depend on cooperatives and cooperatives depend on pesticides," said UNAF. "

The decline of the bees would only get worse.

Another threat would be beekeeping: the explosion of "honeys" from China containing a large share of sweet syrups. UNAF calls for labeling to indicate the origin of imported honeys.

### **37. November 18, 2017 : Pesticides : l'Italie a montré qu'il existe des alternatives**

A study conducted by Lorenzo Furlan created a mutual fund that fulfills the same crop insurance role as NNIs. It brought together farmers representing nearly 50,000 hectares, each contributing 3 to 5 € / hectare, ie 7 to 10 times less than the said pesticides.

This type of alternative is all the more urgent as a study has estimated that in "thirty years, nearly 80% of flying insects have disappeared from protected natural areas in Germany". The fact that they are not more frequent stems from the confusion between the sale of phytosanitary products and the advice to farmers:

*"In Italy, the companies that provide technical advice to farmers are also those that sell them pesticides," replies Lorenzo Furlan. And we constantly tell them that they will lose their harvest if they do not use these products..."The same observation holds true for France: all the parliamentary reports on the subject highlight this institutional conflict of interest which leads to mechanically upwards the use of phytosanitary products. "*

### **38. November 24, 2017: La justice suspend l'autorisation de nouveaux pesticides « tueurs d'abeilles »**

Seized in summary proceedings by Générations futures, the Nice Administrative Court suspended the MA for the two products (Closer and Transform) based on sulfoxaflor. Its decision is said to be based on the existence of new data that has not been taken into account by ANSES.

This decision would raise the question, in the background, of the legality of the authorizations issued at European level. According to F. Veillerette:

*"This file reveals a scandalous situation on the management of European approvals of active ingredients of pesticides which are granted in the absence of essential data on product safety, called confirmatory data, which will not be transmitted until two years later".*

Similarly, the European mediator, contacted by Pesticide Action Network, accused the European Commission of being "too light in its practices and not taking sufficient account of the precautionary principle".

### **39. February 10, 2018 : « Toutes les procédures d'évaluation des risques des pesticides sur les abeilles sont, au minimum, très discutables »**

Foucart echoes the criticism of the risk assessment procedure for AMM made by EFSA in 2012. He presents the problem as a "hoax" that an elementary school child could understand in a matter of minutes.

The reason is that "these protocols were designed by groups of experts infiltrated by the agrochemical industry." A report from Future Generations and PAN would suggest that this example is not in fact isolated: "in 92% of the cases examined, the techniques in question were co-developed by the manufacturers concerned, directly or indirectly. "

For David Demortain, sociologist at INRA, this report would show "that industry, through its own scientists, has invested, or even encouraged the creation of forums to discuss risk assessment methods" . He takes the example of the ILSI1 forum founded in the 1970s by the industrial giants of the agrochemicals. They would have "sort of created the very scientific framework within which to evaluate their products." "

#### **40. March 1, 2018 : Les insecticides néonicotinoïdes, des molécules à l'utilité contestable**

A study published on February 25 in Environmental Science and Pollution Research reportedly observed that NNIs "have little or no use" through the review of 200 publications. (Furlan et al. 2018)

According to Jean-Marc Bonmatin, co-author of the work, the conclusion is that NNIs would not increase agricultural yields. This is consistent with a Center for Food Safety study published in March 2014.

This would be due to the systemic and preventive dimension of NNIs. The targeted pests would be present on only a small part (4% in the example he takes) of the areas. In addition, their diffusion in the environment would encourage the emergence of resistance.

There would be, in addition, alternatives "such as crop rotation, the use of biological control (recourse to natural predators of pests, etc.)". An experiment carried out over 3 years and 50,000 hectares in Veneto would have proved the effectiveness of a solution:

"The operators have come together, have built a common insurance fund that they provide to the tune of around 3.50 euros per hectare and per year," explains Mr. Bonmatin. They thus save the cost of seed treatments, which amounts to around 40 euros per hectare, and are compensated if their harvest is destroyed by pests. "

Only half of the sums collected would have been redistributed in this way. The reason why farmers would buy unnecessary chemicals would be structural:

"The reason is a structural conflict of interest: technical advice to farmers is provided by those who sell them the pesticide treatments," Mr. Bonmatin summarizes. If this advice were provided by independent agronomists, the situation would be very different. "

#### **41. March 1, 2018 : Les experts européens confirment les risques des néonicotinoïdes pour les abeilles**

EFSA reported on February 28 that the 3 NNIs subject to the 2013 moratorium (imidacloprid, thiamethoxam, clothianidin) do indeed pose a risk to bees, domestic and wild.

For J-M Bonmatin, it would not be a surprise, these risks having already been demonstrated. NNIs are believed to reach bees not only through pollen, but also seedling dust and guttation.

The moratorium would not have reduced the use of NNIs. Thus, the UNAF noted an increase of more than 30% in the tonnages sold in 2014 compared to 2013: other NNIs have replaced the 3 banned.

The European Commission is reportedly considering a total ban on the 3 NNIs, which would be discussed on March 22.

This would raise the question of their replacement by other molecules with a comparable neurotoxic effect, such as sulfoxaflor. According to J-M Bonmatin, "It doesn't make sense any more to evaluate substances in this way, molecule by molecule." The October 2017 study published by PloS One would observe that, "in Germany, 75% to 80% of the biomass of flying insects have disappeared in less than thirty years. "

#### **42. March 20, 2018 : Les oiseaux, victimes directes des insecticides néonicotinoïdes**

As part of a phyto-pharmacovigilance program piloted by ANSES, researchers led by Florian Millot and Elisabeth Bro have "reviewed 101 outbreaks of wild bird mortality, totaling more than 730 dead animals" between 1995 and 2014. The analyzes would have observed the implication of imidacloprid and, in 70% of the cases, the researchers "consider probable the causal link with the death of the animals. "

This would mainly affect grain-eating insects, which would poison themselves by eating seeds coated with NNI. However, as the surveillance network is not systematic, "the extent of this poisoning remains an open question. "

#### **43. March 20, 2018 : Les oiseaux disparaissent des campagnes françaises à une « vitesse vertigineuse »**

The MNHN and the CNRS published on March 20 the results of 2 bird monitoring networks. They evoke a phenomenon of "massive disappearance", "close to ecological disaster":

*"The birds of the French countryside are disappearing at breakneck speed [...]. On average, their populations have shrunk by a third in fifteen years. "*

The two surveillance networks have different methodologies:

- The MNHN network (STOC1 program) brings together the observations of ornithologists.

- The CNRS network has mobilized 160 measuring points of 10 hectares monitored since 1994 in the “CNRS Plaine et val de Sèvre” zone in 450 km<sup>2</sup> of agricultural land.

In the latter, Vincent Bretagnolle explains that the partridge, having declined from 80 to 90% and the last specimens encountered being "from the autumn releases, organized by the hunters", it was "now virtually extinct".

This decline would accelerate in the late 2000s, but the link to the increased use of certain NNIs is only correlative.

Foucart recalls the study conducted by Caspar Hallman and published in PloS One in 2017 observing that, since the early 1990s, "the number of flying insects has declined from 75% to 80% in Germany. This disappearance would obviously impact the birds, even grain-eaters, which would be insectivores at the beginning of their life, as Christian Pachteau of the LPO2 emphasizes.

The coordinator of the STOC network, Frédéric Jiguet, adds:

*“That birds are doing badly indicates that the entire food chain [food chain] is in bad shape. And this includes the microfauna of soils, that is, what makes them alive and enables agricultural activities. ”*

To change this, it would be necessary to change the agricultural model according to Vincent Bretagnolle.

#### **44. March 29, 2018 : Pourquoi les pesticides sont bien l’une des causes du déclin des oiseaux**

In this article, he defends the responsibility of pesticides, and especially NNIs, in the decline of birds announced by the CNRS and MNHN studies in the previous article. This thesis would indeed have been criticized, in particular in a Europe 1 column of March 28. He takes up and disputes several allegations.

*“Researchers have not shown a causal link with pesticides.*

The studies in question were not intended "to look for causal links." To say that pesticides are not responsible for the decline of birds would therefore be a "logical error".

On the other hand, other studies would establish a strong link between pesticides, such as

- the study published in 2014 in Nature showing that the "fall in populations of insectivorous birds was indeed linked to the concentration of neonicotinoid insecticides in the environment (in the Netherlands in this case)", even at concentrations very low (20 ng / l surface water).
- ONCFS researchers have reportedly documented poisoning of grain-eating birds with seeds coated with NNI.

*"Low doses of pesticides have little impact and these inputs weigh three to four times less in bird decline than habitat modification. "*

The study on which this statement is based would only have monitored plots between 2009 and 2011 and the proportion mentioned would be calculated by comparing farms with each other, which would be "relative data which does not allow us to measure the shared responsibilities of the decline in birds observed for several decades. "

On the contrary, several hundred studies show the deleterious effects on non-target invertebrates. The author takes the example of two meta-studies, one of which concludes that NNIs "are therefore likely to have negative biological and ecological impacts on a large scale and this on a wide range of non-target invertebrates, in terrestrial, aquatic, marine and benthic habitats. "

"It should be noted that in the city, bird populations have also fallen by a third. " If this implies that the role of pesticides would not be decisive, similar decreases having been recorded in the city, that would not prove anything: this decrease could be related to other factors.

*"The cause of the disappearance of insects remains a mystery, the authors of this finding have not integrated or studied the effect of pesticides, climate change or other factors. "*

The study published in October 2017 by PloS One, observing a 76% decline in flying insects in Germany, would "rule out the main possible causes unrelated to agriculture." "

#### **45. April 28, 2018 : Néonicotinoïdes : « L'interdiction intervient alors que les dégâts sont immenses et en partie irréversibles »**

The European Commission reportedly announced on April 27 that the three NNIs that were subject to the moratorium in 2013 (imidacloprid, clothianidin and thiamethoxam) would be banned in all their outdoor uses.

Foucart nevertheless criticizes the lateness of this decision, which would signal a "serious regulatory disaster". Indeed, as the apidologist Gérard Arnold recalls, beekeepers reported serious disorders as early as 1994, of which imidacloprid was already suspected. However, it was not until 7 years that the then Minister of Agriculture (Jean Glavany) formed a group of experts: the Scientific and Technical Committee for the Multifactorial Study of Bee Disorders (CST). The latter issued its conclusions in 2003, accusing the same NNI and pointing to shortcomings in the risk assessment for Mas.

This could have marked "the beginning of the end of the controversy", however the "agrochemical companies" would have used "the toolbox of the tobacco companies to turn science against itself and sow doubt".

It was only 8 years later that the European Commission asked EFSA to look into the matter further. Its report, published in 2012, would be consistent with that of the CST and would also identify deficiencies in the risk assessment for the AMM. However, the moratorium decided in 2013 only targeted 3 NNIs, for a limited duration and uses. It was not until 2018, 24 years after the first alerts, that EFSA reportedly banned the 3 NNIs "for good". In the meantime, all the entomofauna have plummeted, as a German study published in October 2017 noted that "populations of flying insects may have declined in Europe by nearly 80% over the past three decades."

#### **46. June 1, 2018 : « Haro scientifique mondial sur les néonicotinoïdes »**

A text published on June 1 by the journal Science and endorsed by 233 scientists, including Dave Goulson, argues that the use of NNIs must be drastically and urgently restricted. Indeed, the available facts strongly suggest that these products contribute to the current massive loss of biodiversity.

An expert report commissioned in 2001 by the French Minister of Agriculture, Jean Glavany, already suggested the involvement of the most commonly used NNI in "bee disorders denounced by beekeepers since the mid-1990s" .

France would be, to date, the only country to have registered in the law (the biodiversity law of 2016) the exit of NNI. ANSES was then contacted to examine the possible alternatives to their use.

It also submitted its report on June 1. The health agency has identified 130 agricultural uses for these molecules and found in 78% of cases at least one non-chemical alternative solution and in 89% of cases alternative pesticides. J-M. Bonmatin welcomes

the ANSES report, but regrets that the hypothesis of a common insurance fund, which has been successfully implemented in north-eastern Italy, has not been considered.

The SNPN calls on the French government to be vigilant, this law being able to be "emptied of its meaning and its effectiveness compromised by complacent derogations". Foucart concludes:

*“For the SNPN, the urgency is in one number:“ Recent research in Germany, adds the learned society, has shown a collapse of the total biomass of flying insects, of nearly 80% in three decades. ””*

#### **47. June 7, 2018 : « En hiver, les taux de pertes des abeilles ne devraient pas excéder 5 % »**

Gérald Arnold, director of research emeritus at the CNRS, would have been "one of the first groups of experts to study the causes of the decline of bees. For him, it would be necessary to "put everything back together" and "correctly retest the toxicity on bees of each pesticide present in the environment today". "

Beekeepers have reportedly suffered "catastrophic" winter losses this year, possibly as high as 70% of colonies. They have been around 30% for many years. In a "normal" situation, the losses should be "5% to 10%".

This excessive mortality is largely due to pesticides and, above all, to NNIs, which weaken or poison bees and hives by the cocktail effect. To combat this problem, it would be necessary "to re-examine everything, and to correctly retest the toxicity on the bee of each pesticide present today in the environment, taken in isolation, or in mixture. "

#### **48. December 19, 2018: Entre les abeilles et l'agrochimie, l'Europe tarde à choisir**

It is "to a technical committee unknown to the public," SCOPAFF1, "that the difficult choice to choose the new authorization rules for pesticides falls. "This choice would have to be made between" bees and pollinating insects on the one hand, and the agrochemical industry on the other ".

Discussions between Member States and the Commission to change the risk assessment of pesticides "are stalling behind the closed doors of the expert committee. "

The Pollinis association disputes the refusal of the European Commission to provide it with "a series of documents detailing the debates between Member States around the adoption of these new regulatory tests. "According to the association's delegate

general," The opacity of such a system is simply undemocratic. It's a lobbyist's dream. " Foucart then recalls the shortcomings of the assessment procedures, which had been identified by EFSA in 2013. The NNIs could thus have passed the certification tests and would be the main suspects in the erosion of pollinators. This laxity in regulatory testing would be measured by the annual loss of 30% of bee colonies and the rapid collapse of the entomofauna.

A study published in 2017 by Plos One would indeed show that "the quantity of flying insects fell by more than 75% between 1989 and 2016, in about sixty rural areas of Germany, representative of most of the landscapes of Europe. Western dominated by human activities. "

These figures would hardly impress SCOPAFF. Indeed (?) Member States' reactions to the guidelines proposed by EFSA would be disparate.

France's position, if it asserts itself as being in favor of the new tests, would be ambiguous, the pesticides based on sulfoxaflor having been authorized by ANSES "on the basis of obsolete tests".

An "impact analysis conducted by manufacturers and published in July on a sample of a few dozen molecules," 79% of uses of all herbicides, 75% of uses of fungicides and all uses of 92% of insecticides "does not do not pass the chronic toxicity tests prescribed by the EFSA guidelines. "

#### **49. January 5, 2019 « Sur les 36 députés signataires de l'appel à sauver les abeilles, 30 ont soutenu au moins un amendement contestant l'interdiction des néonicotinoïdes »**

Le Monde had published at the end of December a column entitled "Bees are essential" signed by 36 deputies The Republicans or related. However,

- 30 of them reportedly supported at least one amendment challenging the ban on NNIs in the Egalim law passed in 20181.
- around ten have co-signed "one or more amendments authorizing the return of aerial spraying of pesticides, using drones"
- around twenty have co-signed "amendments aimed at relaxing the constraints weighing on the aforementioned aerial spraying"

- about twenty have "proposed or supported the elimination or weakening of a flagship measure of the bill: the separation of the activities of sale of pesticides and technical advice to farmers", which would however be "one of the causes major overuse of agrottoxics"

In addition, then

- that in their forum they implicate the Minister of Agriculture at the time, Didier Guillaume, who would have "aroused strong reactions from NGOs, in the investigation of babies known as "born without arms", by declaring that scientists had to prove that pesticides had consequences on health",
- that "there is no evidence to date that pesticides are involved in these malformations",
- 29 of them co-signed at least one amendment "aimed at striking out from the bill a provision restricting the possibility of spraying pesticides in the vicinity of dwellings".

Thus, with two exceptions, they would all have tried to "curb the ambition of the" Egalim "bill to limit the use of pesticides".

## **50. April 13, 2019 : « L'affaire du Levothyrox illustre une confusion entre "consensus scientifique" et "consensus réglementaire" »**

On April 4, a study appeared in the journal Clinical Pharmacokinetics giving a "pharmacological explanation for the disorders declared by thyroid patients after their switch to the new formula of Levothyrox. "

The Merck laboratory had indeed changed the formulation of a drug against thyroid disorders, Levothyrox. "Tens of thousands" of patients using it have reported new side effects.

However, "a part of the medical profession, the learned societies involved and the authorities nevertheless argue that no adverse effects can be attributed to the new formula, since a scientific consensus certifies its equivalence to the old one. " However, this would not be a scientific consensus, but a regulatory consensus. S. Foucart defines it in these terms:

*"A regulatory consensus is based on the opinions of expert agencies which judge the compliance of a product with the regulations in force. These are often anonymous opinions, not subject to peer review, based on data generally*

*confidential and inaccessible to criticism, produced and interpreted by the manufacturers themselves. "*

This "science" would often be called upon, in health or environmental controversies, to "silence the protesters":

*"" It is allowed, so Science guarantees us that it is safe "is a convenient slogan, but one that ignores a huge body of work by historians and sociologists of science. "*

Indeed the health scandals, for example with chlordecone, DDT, PCB, NNI or chlorpyrifos show that a substance considered safe by the regulatory authorities can in fact be very toxic. Likewise, a report from the European Parliament would show that "the bulk of European regulations do not incorporate scientific knowledge on endocrine disruptors, which has been acquired over more than twenty years. " This misuse of the authority of science would fuel relativism:

*"Because if you have been persuaded that regulation is science, why, when it is obvious that the former is so often wrong, would you still trust the latter? "*

## **51. 25 May 2019 : « L'Europe et les abeilles »**

Despite repeated warnings about declining biodiversity, reiterated in an IPBES report on 6 May, EU member states are still struggling to agree on new registration procedures for pesticides. However, the flaws in current methods have been known since the early 2000s and EFSA details them in a 250-page long report published in 2013.

Foucart recalls some of the said flaws.

EFSA has produced a "guidance document" outlining new accreditation procedures. However, despite 27 changes, the text was not accepted. On May 8, the Commission asked EFSA to "take back the sensitive parts" of the document. The agency is expected to return its copy in 2021.

Blocking Member States would be all the more incomprehensible as the catastrophe was not yet to come, but already there. This is evidenced by the study published in 2017 observing that "the biomass of flying insects has fallen by more than 75% across the Rhine and probably in all European landscapes dominated by human activities".

It would be all the more difficult to understand if the European rules do not allow to know the details of the discussions or the identity of the states responsible for the blockage. S. Foucart concludes:

*"In the end, all the stigma is transferred to the institutions of the Union, and is part of a lack of love that could be seen, this Sunday, at the polls. "*

## **52. June 27, 2019 : Pourquoi l'agriculture bio est favorable aux abeilles**

A French study carried out in particular by Vincent Bretagnole on the "Zone-Atelier Plaine & Val de Sèvre" and published on June 26 in the Journal of Applied Ecology would be "the first to suggest and quantify the beneficial effect on *Apis mellifera*, agricultural systems deprived of synthetic inputs. The difficulty was in the extent of the range of honey bees: 2 to 10 km!

The study area covers 450 km<sup>2</sup>, 10 apiaries of 5 hives each were placed in different places. The researchers observed that, when the hives had organic plots in their environment, the size of the brood (all the larvae) could "increase by up to 37%, compared to hives located at the heart of only conventional farms. This effect would be all the more noticeable as the proportion of organic plots would remain limited, representing 10-30% of crops within 300 meters and 5-15% within 1,500 meters. The amount of honey "during the scarcity period" would be much higher, increasing to 53% in colonies exposed to organic.

This positive effect would be obtained even in the absence of organic rapeseed cultivation in the area. The authors "explain these positive effects by the absence of synthetic insecticides on these plots, which could prevent the destruction of foragers. In addition, the greater presence of organic weeds<sup>1</sup> would benefit them.

## **53. August 27, 2019 : Pesticides: les ravages de l'agriculture américaine**

*[Editor's note: As part of the promotion of his book "Et le monde became silent", co-edited by Seuil and Le Monde and published on August 29, S. Foucart published 3 articles.]*

A study published in early August (2019) in PLOS ONE looked at the "toxic load" of American agriculture for insects between 1992 and 2014. It would have, over this period been multiplied by 48, almost exclusively because of NNIs, which would represent 92% of the toxic load over this period.

This study would deconstruct "the idea that the general decline of insects is mainly due to climate change, natural pathogens, invasive species, etc. "

The toxic load indicator would have been built "on the tonnages of each family of insecticides used, on its acute toxicity to insects (with the honey bee as a reference) but also on its average persistence in the environment".

[Foucart takes up a graph showing the increase in the acute toxic load of insecticides in American agriculture, almost exclusively linked to NNI, taken from a 2019 Plos One study, and that on the reduction in the mass of insects by 75% observed by the 2017 PLOS ONE study by Hallman et al.]

According to Pierre Mineau, reports from the EPA anticipated "dramatic effects on the ecology of the terrestrial or aquatic systems in which these products would be used". He concludes :

*"Everything that happened was predictable, if not expected."*

[NdA: S. Foucart ends with a presentation of his book "And the world became silent"]

#### **54. August 27, 2019 : Disparition des abeilles : comment l'Europe a renoncé à enrayer leur déclin**

The "Updated Principles for Evaluating the Effects of Pesticides on Bees" was issued on July 17th. This text would ignore the gist of the EFSA recommendations. Most of the measures would be deferred for further consideration.

The move would come after a study published in 2017 in PloS One observing that "the biomass of flying insects fell by more than 75% between 1989 and 2016 in around 60 protected areas in Germany. The authors of the latter would suspect that this decline is representative of the "low-lying landscapes of Western Europe dominated by human activities", which would be supported by "the" clean windshield syndrome "observed by motorists older than 40 years old. This steep decline would coincide with the introduction of NNIs and fipronil. The alerts of beekeepers following the use of these products date back to 1994 according to Mr Dermine of the NGO PAN-Europe1.

As early as 2001, work from INRA showed that doses of imidacloprid "several thousand times lower than the acute toxicity dose, administered each day, could kill a honey bee in eight days. The study of acute toxicity alone would have greatly underestimated the impact of this pesticide. Already in 2003, the CST "had shown that the regulatory tests in force" were "unsuitable for assessing the risks of new generations of phytosanitary products on bees. This report resulted in the ban on certain uses of imidacloprid.

It took almost 10 years for the EU to take an interest in this issue. The report issued by EFSA in 2012 concludes that the risk assessment methods are very insufficient. In 2013, EFSA published a "guidance document" describing "a set of potential deleterious effects that should be tested before a molecule is allowed to enter the market. In particular, he recommends taking into account the different routes of exposure, as well as the sublethal effects. This document was put on the agenda of a European technical committee, SCOPAFF, but no agreement has been found between member states to adopt it.

On July 17, none of the proposed advances would have been adopted, renewing "a risk assessment based on acute toxicity." The Commission would then have asked EFSA to further review its proposals. For Mr Dermine, this request would not be "scientific expertise, but rather an exercise in political acrobatics aimed at reducing ambitions in order to satisfy reluctant member states".

The Pollinis association, participating in a committee set up on the subject by EFSA, would denounce "the intense lobbying of agrochemical manufacturers. They sent at least a dozen letters to EU executive officials vigorously protesting against the EFSA guidance document. Their stakes are indeed considerable: the vast majority of uses of herbicides, fungicides and insecticides would not pass the tests offered by EFSA.

According to ECPA2, the proposed tests would not be feasible, as some recommended tests do not even have internationally recognized methodologies. [Foucart takes up a graph showing the increase in the acute toxic load of insecticides in American agriculture, almost exclusively linked to NNI, taken from a 2019 Plos One study, and that on the reduction in the mass of insects by 75% observed by the 2017 PLOS ONE study by Hallman et al.]

A report published in 2015 by EASAC3 also observed that "very low levels of neonicotinoids have long-lasting sublethal effects on beneficial organisms." Report coordinator Michael Norton further points out that wild pollinators are more sensitive than honey bees, so their decline would result in even greater damage to other pollinators. We should therefore study the risks of pesticides on "other wild insects that have a beneficial role in human activities. "

[NdA: S. Foucart ends with a presentation of his book "And the world became silent"]

## **55. August 27, 2019: Neonicotinoids are here to stay**

Researchers led by Ségolène Humann-Guilleminot and Fabrice Helfenstein analyzed more than 700 plant and soil samples on 169 plots of 62 Swiss farms.

Are contaminated with NNI:

- All conventional plots
- 93% of ORGANIC plots (which have been organic for more than 10 years)
- 80% of "areas of ecological interest"

This overall presence is believed to be due to "the widespread use of neonicotinoids, the presence of these products in the dust clouds generated during sowing, their solubility in water and their stability in soils". They would therefore represent an "environmental risk for adjacent untreated lands, over distances hitherto unknown, with consequences for non-target species." "

*[Foucart takes up a graph showing the increase in the acute toxic load of insecticides in American agriculture, almost exclusively linked to NNI, taken from a 2019 Plos One study, and that on the reduction in the mass of insects by 75% observed in Germany by the 2017 PLOS ONE study by Hallman et al.]*

The only exposure to one of the investigated NNI, clothianidin, would represent a lethal risk for 5.3 to 8.6% of the 84 species studied and a sublethal risk for 31.6 to 41.2% of these organisms. The concentrations would be lower in untreated fields, which would present a sublethal risk for only 1.3 to 6.8% of the species considered.

This, without even taking into account the potential cocktail effects.

*[NdA : S. Foucart finit par une présentation de son livre « Et le monde devint silencieux »]*

## **56. August 29, 2019 : « De nombreux éléments de preuves pointent vers les néonicotinoïdes comme cause majeure » du déclin des abeilles**

*[Date du jour de publication de son livre]*

In the "middle of summer", the EU is said to have "quietly postponed" the introduction of new risk assessment tests against advice from EFSA and the scientific community. "According to a study, published in October 2017 in the journal PloS One, the biomass of flying insects fell by more than 75% between 1989 and 2016 in around 60 protected areas in Germany. "

Foucart answers a series of questions. The subject is often too dense to be synthesized, I invite you to consult the article.

## **57. August 29, 2019 : Disparition des abeilles : « Le rôle des pratiques apicoles a été monté en épingle par les milieux de l'agrochimie »**

This article transcribes the online event that prompted the Q&A from the previous article. Likewise, the content is too dense to be synthesized, I invite you to consult the article.

## **58. 23 October 2019 : Abeilles et pesticides : le Parlement européen recadre la Commission**

The author recalls the opinion of EFSA of 2012, the development of the guide document in 2013, then its study by SCOPAFF and resistance from member states. In the end, the Commission adopted a text (already mentioned) ignoring most of the recommendations made by EFSA in 2013.

On October 23, the European Parliament "adopted by an overwhelming majority (533 for, 67 against and 100 abstentions) an objection to the reform of the principles of environmental risk assessment of plant protection products. "

Lithuanian Vytenis Andriukaitis, "European Commissioner responsible for health and food safety issues," said the vote would be "not good news for bees", as the reform did not lower the level of protection. They would be returned "to square one".

NGOs, on the contrary, would welcome the parliamentarians' resolution:

*"MEPs have taken the measure of the scandal that is playing out around the approval of pesticides," says Nicolas Laarman, general delegate of the Pollinis association. Agrochemicals, with the complicity of Member States and the European Commission, tries to deprive us of the only scientific tool that would make it possible to halt the decline of pollinators in Europe. The French national beekeeping union (UNAF) also welcomes the motion, citing "immense relief".*

According to a representative of Greenpeace, this would show that the Parliament "takes seriously the protection of endangered European pollinators".

## **59. October 31, 2019 : Les poissons sont aussi victimes des insecticides « tueurs d'abeilles »**

A study by Japanese researchers led by Masumi Yamamuro published on October 31 by Science studies the effect of NNIs on fishing. The introduction of imidacloprid to the rice fields of Shimane in 1993 is said to have collapsed the capture of two important commercial species: Japanese eel and wakasagi.

Catches of wakasagi increased from 240 tonnes before 1993 to 22 tonnes in the following years. Those of eels fell from 42 tonnes to less than 11. The researchers would have followed the concentrations of imidacloprid over 20 years and followed the evolution of the abundance of small aquatic organisms. They observed that populations of aquatic arthropods collapsed in the same year as the 1993 introduction of imidacloprid.

This fall would have caused the fall of the eel and wakasabi populations, which feed on these organisms. This link would be validated by the fact that another species feeding not on invertebrates, but on microalgae, would not have been affected during the period studied.

Foucart recalls two studies conducted by Caspar Hallman, which in 2014 would have shown an association "between the concentrations of imidacloprid in surface water throughout the Dutch territory with, on the one hand, the abundance of aquatic invertebrates (larvae insects, etc.) and on the other hand the rate of decline of exclusively or partially insectivorous passerines. »Concentrations of more than 20 µg / l would be correlated with an average decline in populations of these birds of 3.5% per year, ie a reduction of half in two decades.

## **60. November 27, 2019 : Les pesticides néonicotinoïdes continuent à menacer les abeilles, même lorsqu'ils ne sont plus utilisés**

This article concerns a study published on November 28, 2019 in the journal Science of the Total Environment by researchers led by Dimitry Wintermantel and Vincent Bretagnolle, both researchers at the Center for Biological Studies in Chizé.

The latter analyzed nectar and pollen taken from 300 rapeseed plots spread over the Plaine and Val de Sèvre workshop area. Samples were taken from these fields between 2014 and 2018, i.e. after the 2013 moratorium.

Despite the latter, there would be "no downward trend." The researchers found traces of NNI in 43% of the rapeseed samples analyzed. We would find imidacloprid in 70% of plots in 2014, 5% in 2015, 90% in 2016, 30% in 2017, to rise to 55% in 2018. The vast majority of traces would be less than 1 part per billion . However, on 2 occasions in 2016, researchers reportedly found 45 parts per trillion of imidacloprid in the samples tested, which would be "five times the expected concentration of product in the nectar or pollen of treated oilseed rape. "

The researchers estimated, from a "conservative" model, that of the EFSA, that 12% of the plots were contaminated enough to kill 50% of the honeybees venturing there, this

rate rising to 20% for bumblebees, and 10% for solitary bees. According to them, it could be related to the rains, the contaminations being more important in the rainy years and the NNI being soluble in water.

Foucart recalls a study published in the Journal of Applied Ecology in March studying the contamination of NNIs in Switzerland and finding NNIs in 93% of samples taken from organic farms and 80% in areas of ecological interest. It also recalls the estimated impact on the 72 species of invertebrates studied.

## **61. July 9, 2020 : Sauvegarde des pollinisateurs : l'échec de la Commission européenne**

The European Court of Auditors reportedly issued a report on July 9, ruling that the European Commission's measures to protect wild pollinators have "not borne fruit". In its report, the Court would recall the importance (estimated at € 15 billion) of wild pollinators for agricultural production and that their decline is due to "the growing threat posed by human activity [...], in particular the conversion to intensive agriculture, as well as the use of pesticides and fertilizers. "

A study published by Nature in October 2019 would observe a drop of 67% between 2008 and 2017 in the weight of arthropods captured on a sample of 150 German meadows, of 78% of their number and of 34% of their diversity. The Court criticized the "European Strategy for Biodiversity 2011-2020 and the European Initiative for Pollinators, adopted in June 2018." The first would have had very incomplete or non-existent indicators and the second would have had no convincing results. lack of resources and follow-up.

She also criticized the inadequacy of the ban on the 3 main NNIs in 2013 and 2018. On the one hand "farmers have resorted more to thiacloprid" and on the other hand many Member States have provided for exemptions. She also echoed criticism of the flaws in the risk assessment of pesticides.

A preliminary EFSA report on the subject, dated June 22, would consider 4 approaches to reforming risk assessment, three of which consist of "scaling back levels of protection." The subject would be put on the agenda of a committee of European experts to meet on July 16 and 17.

Mr Dermine from PAN-Europe reacted by noting that thirty years after the "neonicotinoids affair", "Member States continue to be reluctant to improve the authorization criteria for pesticides and, once again in a secret meeting, will consult each other. to render the protection of pollinators obsolete. "

## **62. July 9, 2020 : La médiatrice de l'Union européenne met en cause le processus d'autorisation des pesticides**

The European mediator, Emily O'Reilly, was seized by the NGO PAN-Europe on the subject of the authorization procedures (MA) of pesticides. She sent a letter on June 22 to the President of the European Commission, which S. Foucart comments on in this article. Marketing Authorizations are issued after a risk assessment by EFSA, which is based on data provided by the company seeking approval. If the data is incomplete, the Commission can still grant MA using a 'confirmatory data request' procedure. The product is approved, but the company will have to provide additional information at a later date. PAN-Europe criticizes the abusive use of this procedure:

*“since 2015, the Commission has used it in half of the authorizations issued. The mediator studied 5 cases of such procedures. In the majority, EFSA would not be consulted. In addition, the commission would not give reasons for its decisions to issue these authorizations. Finally, for "pesticides approved under this procedure since 2015," confirmatory data "on how they respond to water treatment has still not been provided. ”*

## **63. August 6, 2020 : Le gouvernement va réintroduire les insecticides « tueurs d'abeilles »**

Following the beet yellows epidemic transmitted by an infestation of aphids (*Myzus persicae*), the Ministry of Agriculture announced on August 6 a support plan for the sector providing in particular exemptions allowing the use of NNI. The latter, also called "bee killers", had however been banned by the 2016 biodiversity law.

This was "one of the main demands of beet growers, especially as other European countries are also waiving the ban. Franck Sander, president of CGB1 is said to have estimated the loss for the planters at 150 to 200 million euros. François Veillerette, director of Future Generations denounces "an unacceptable setback which shows that this government easily bends under the weight of agrochemical and industrial agriculture lobbies, and has given up being the leader in the fight against insecticides that kill 'bees in Europe'.

The ministry says there would be no alternative. According to ITB, there are alternatives, but they are either too toxic for the auxiliaries or substances that do not persist enough and therefore require more frequent passages.

The ministry justifies its decision also on the grounds that the beets would not produce flowers before harvest, limiting their impact on pollinators. However, "a large number of studies carried out in recent years have shown that the impact of neonicotinoids used

in seed coating could be indirect", in particular by lasting soil contamination. Surprisingly, organic beets would have been "little or not affected by jaundice":

- Loïc Tridon, researcher at the regional organization of organic agriculture (Hauts de France) observes that the organic beet plots in the region "are hardly affected by this problem". "We do not know why, it may be related to the size of the plots."
- Victor Charlot, technical advisor to the Organic Farmers Group of Île-de-France, estimates that the damage linked to beet yellows is, in organic farms, "very limited" in his region.

#### **64. August 12, 2020 : Avec ou sans floraison, les néonicotinoïdes représentent des risques pour les pollinisateurs**

Maize growers would also like to be able to derogate from the NNI ban. The success of beet growers in obtaining this derogation would be based on the argument that sugar beet would be harvested before flowering. "Put into circulation by agro-industry circles and taken up by the Ministry of Agriculture in its communication, this argument has been widely echoed on social media by elected officials and political leaders. »

Yet much scientific work, taken up by EFSA in its 2018 expertise, has reportedly shown that NNIs pose a high risk to pollinators, even without pollination. They would be affected

- through guttation (Girolami et al. 20091);
- by dust released during sowing (Greatti et al. 20032);
- by NNIs that would remain in the soil, which may account for 80–98% of the dose (Sur and Stork, 20033).

S. Foucart also recalls the study object of the article of November 27, 2019, observing that "untreated rapeseed, growing on plots free of neonics for five years, could be impregnated with these products.

And this at levels that pose a risk to pollinators. He also recalled the study of 169 plots in Switzerland, which was the subject of the August 27, 2019 article. Finally, he recalls that NNIs are toxic at tiny doses: 60 g of imidacloprid per hectare out of 423,000 hectares of beets would be 25 tonnes of produce, enough to kill 3 billion bees.

## **65. September 2, 2020 : Néonicotinoïdes : la réautorisation annoncée de ces insecticides neurotoxiques sur la betterave ravive la polémique**

*[Cet article est assez difficile à synthétiser, l'auteur utilisant beaucoup sa technique de juxtaposition de phrases, que nous étudierons plus en détail, consistant globalement à ne pas faire de connexions logiques explicites entre ses phrases.]*

The bill allowing exemptions from the NNI ban is expected to be introduced the day after the article, on September 3. Released on September 1, the text would arouse “strong opposition from non-governmental organizations (NGOs) and environmental circles. There would be doubt that the text, not referring to beet, could benefit other crops, such as corn. According to the Ministry of Agriculture, this would not be justified on legal grounds. He also stresses that the ban endangers not only beet growers, but also downstream sectors, which represents a total of 40,000 jobs. He also pledged to allocate 5 million euros to the search for alternatives.

Opposite, Sandrine Bélier, director of the NGO Humanity and Biodiversity, questions why these sums had not been allocated before and asks that there be an obligation of result. According to Delphine Batho:

*“The sugar beet sector has had several years to adapt and find alternatives, but it has done nothing, because it has always lived with the prospect of succeeding in getting around the ban on neonics: since 2016, it has systematically been the same arguments that are put forward to reintroduce these substances”.*

According to EFSA (according to S. Foucart), all uses of NNI would pose a risk to pollinators. In the case of beet, it would be soil contamination, which would affect subsequent crops, potentially honey-bearing. Beyond the effect on bees, hundreds of studies published in recent years have shown, beyond reasonable doubt, that NNIs have negative effects on many types of organisms: arthropods, birds, aquatic organisms. , etc.

D.Batho concludes:

*"This bill is based on a form of obscurantism," Judge Batho. It ignores the scientific data available and in particular ignores the phenomenon of the disappearance of insects that we are witnessing. "*

The article ends with an insert featuring a study published in Nature Sustainability (Li, Miao and Khanna 2020) showing a strong link between the use of NNIs and the collapse of nesting birds.

**66. September 12, 2020 : « Les néonicotinoïdes sont des substances trop efficaces et trop persistantes pour que leur usage puisse être contrôlé »**

B. Pompili warned in 2016 that "scientific studies are piling up" to show the dangers of NNI to not only bees, but also our health and the environment in general. "Promoted by agribusiness circles, taken up by the Minister of Agriculture, echoed by journalists and multiplied endlessly on social networks by thousands of little hands, a single element of language has swept away all of this. No one is unaware of it any more: "A bee, that will not go foraging in the fields of beetroot. "" Nonetheless, NNIs would be too dangerous and too persistent to be controlled, especially because of their solubility in water. This is what Japanese researchers would have shown in 2019.

Foucart recalls the results of the study by Yamamuro et al. (2019), which he previously presented in his article of October 31, 2019. He strongly supports the low amount of imidacloprid to which the aquatic populations studied were exposed and the magnitude of the effects. This study would have 3 lessons:

- "The first is that a negligible amount of neonics applied over a large area can have a catastrophic effect [...]. ";
- "The second lesson is an immediate corollary of the first: no confidence can be placed in regulatory environmental risk assessment systems. Bankruptcy of this magnitude is simply unforgivable. "
- Finally, "the collapse of Lake Shinji shows that technical innovations - neonics in this case - can have negative effects which, while enormous, can go under the radar for a long time without being documented. The absence of proof, the difficulty or the impossibility of administering the proof are, implicitly, interpreted as as much proof of the absence of deleterious effects. "

The journalist concludes:

*“Thus, during all this time, if the Shinji fishermen had complained to their caretaker minister about the practices of their rice-growing neighbors, they would no doubt have been answered with assurance that their concerns were unfounded. It’s well known: “Fish, it’s not going to loot in rice paddies. »»*

## **67. September 26, 2020 : Abeilles et pesticides : les ONG s'alarment d'un affaiblissement de la réglementation européenne**

On 23 September, EFSA reportedly presented to "associations representing civil society" the progress of the reform of "the risk assessment of pesticides for foragers." These NGOs would be alarmed, with future generations going so far as to call the changes "catastrophic." Barbara Berardi of the Pollinis association would denounce that "Member States and the European Commission are in the process of lowering the levels of protection provided for in the 'guide document' prepared by EFSA in 2013".

With agrochemicals manufacturers estimating that these specifications would lead to the exclusion of "nearly 80% of substances already on the market", the European executive asked EFSA in July 2019 to revise its guide document.

The scheme adopted by Member States is said to be one of the least protective of those presented by EFSA. It would "consider as acceptable a reduction in the size of a bee colony exposed to a pesticide, if this reduction remains within a" range of natural variability ". This would be calculated using an algorithm, "Beehave", co-developed by Syngenta. However, since "background" pollution is already affecting beehive mortality, this would underestimate the toxicity of pesticides.

Barbara Berardi also points out that this logic would not be applicable to wild pollinators, for which risk assessment methods would remain unclear. The opacity of the process would also be a problem. Thus, according to MEP Pascal Canfin:

*"It is unacceptable that this type of decision is still taken in the greatest secrecy of a committee where we do not even know the positions defended by the states"*

## **68. September 5, 2020: La majorité sous pression avant l'examen du projet de loi sur les néonicotinoïdes**

The NNI bill is expected to begin consideration on October 5 under "heavy pressure from civil society." Thus, called not to vote on this bill N. Hulot, about thirty environmental organizations (WWF, Greenpeace, LPO), the peasant confederation and about sixty researchers specializing in NNI. The latter denounce "a serious error, under the pretext of minor or inaccurate reasons, this in view of the immense stakes". The magnitude of such criticism is said to be "worrying majority MPs", many recalling the unexpected virulence of criticism following the "backpedaling" of the glyphosate ban.

Thus, the LREM deputy from Isère would have "taken the lead" and announced that he would vote against the bill.

The presidential party being aware of the risks, an argument of 7 pages would have been addressed to the deputies of the majority "to provide them the elements of language of the government".

The Confédération paysanne contradicts the argument in a letter addressed to the deputies assuring that "the pressure which weighs the most on the sector" would be "that of the market much more than the jaundice". It would thus refer to the abolition of quotas in 2017, which would have exposed the sector to three structural problems: "end of quotas, market deregulation and competition from world sugar".

### **69. October 29, 2020 : Des niveaux alarmants de pesticides mesurés dans les sols et les vers de terre**

The Senate would have adopted, on October 27, the NNI for sugar beets. At the same time, published online at the end of September in Agriculture, Ecosystems & Environment<sup>1</sup>, a study carried out on the Plaine and Val de Sèvre workshop area would show the impact of pesticides on soils and earthworms. The researchers, including Vincent Bretagnolle, took samples from various areas (agricultural, conventional or organic plots, meadows and hedges that had never been treated, etc.) to study the presence of 31 pesticides.

They would have found

- at least one pesticide in all the samples analyzed;
- a mixture of at least one insecticide, fungicide and herbicide in 90% of the samples;
- more than ten different pesticides in 40% of cases.

This study would be very original, such data on contamination being "surprisingly rare".

*"The four most commonly found substances are diflufenican (a herbicide), imidacloprid (a neonicotinoid insecticide) and two fungicides, boscalid and epoxiconazole. At least one of these four substances is detected in more than 80% of the soils analyzed. "*

The researchers also reportedly studied the earthworms present in the soils. They would have found it in 155 samples out of 180. They would have found imidacloprid in 80% of the earthworms, sometimes in astronomical concentrations of imidacloprid:

*"The concentrations found are spectacular: 43% of earthworms have an imidacloprid level of more than 100 ppb [parts per billion] and 8% have more than 500 ppb", specifies Mr. Bretagnolle. The maximum recorded is close to 780*

*ppb. That is, for example, a concentration almost 400 times higher than what is measured in rapeseed nectar, when the latter is treated with imidacloprid. "*

This is believed to be a sign of bioaccumulation, which may have been overlooked by EFSA, which considered imidacloprid to be "at low risk of bioaccumulation". Researchers have also reportedly found other pesticides in earthworms, all of which pose "a high risk of chronic toxicity." It would also be worrying on a larger scale, in particular, for example, for birds feeding on said earthworms.

## **70. February 19, 2021 : L'arrêté encadrant le retour des néonicotinoïdes s'appuie sur des données erronées**

One of the issues of NNI's beet authorization would be the issue of post-treated beet crops. It would therefore be necessary to wait one to three years before sowing crops that are attractive to bees.

Farmers demanded the right to be able to replant corn without delay. During a meeting of the supervisory board on January 22, representatives of the beet industry allegedly argued that a study would show that 80% of the bees present in a corn plot were in a strip of 8 meters on the periphery of the plots. . Not treating this area would then make it possible to plant corn over the entire field.

This mitigation would have been adopted by the decree of February 5. The ITAB reportedly consulted the study in question and observed that, in fact, if 80% of the bees surveyed were in the periphery, this area had been the most sampled. On recalculation, the ITAB would have found that to protect 80% of the bees on 50 hectares of maize would require an untreated strip of 189 meters.

## **71. March 26, 2021 : A Bruxelles, débat crucial autour des nouveaux tests pour évaluer les effets des pesticides sur les abeilles**

On March 24 and 25, SCOPAFF met to study the risk assessment tests of pesticides on bees. According to MEP Pascal Canfin, the discussion focused on the mortality considered acceptable in a colony following exposure to a pesticide:

*"The mortality threshold considered acceptable should be placed between 7%, a position defended by France, Slovakia or Sweden, and 25% which is defended in particular by Spain and Hungary".*

According to the NGO Pollinis, it is likely that more permissive criteria than those established in 2013 are retained. "This would irreparably precipitate the ongoing disappearance of these insects essential to European cultures instead of remedying it. "

Foucart recalls that Pollinis had asked for more transparency in these debates and the positions of the different countries.

*"This is all the more important as the ambition of the new bee tests has, since 2013, been considerably reduced. A large part of EFSA's recommendations have been abandoned (tests on bumblebees and wild bees, chronic toxicity tests, etc.) and the chosen approach is now based on a model simulating the response of a colony to stress. - the model used by EFSA having been co-developed by the agrochemical firm Syngenta, one of the largest producers of pesticides in Europe."*

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