

## Open Letter to Bayer Crop Science Shareholders

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### **Glyphosate perturbs the gut microbiota of honey bees<sup>8</sup>**

Abstract: “Increased mortality of honey bee colonies has been attributed to several factors but is not fully understood. The herbicide glyphosate is expected to be innocuous to animals, including bees, because it targets an enzyme only found in plants and microorganisms. However, bees rely on a specialized gut microbiota that benefits growth and provides defense against pathogens. Most bee gut bacteria contain the enzyme targeted by glyphosate, but vary in whether they possess susceptible versions and, correspondingly, in tolerance to glyphosate. Exposing bees to glyphosate alters the bee gut community and increases susceptibility to infection by opportunistic pathogens. Understanding how glyphosate impacts bee gut symbionts and bee health will help elucidate a possible role of this chemical in colony decline.”

### **Sex-dependent impact of Roundup on the rat gut microbiome<sup>9</sup>**

Extracts of Abstract: A growing body of research suggests that dysbiosis of the gut microbiota induced by environmental pollutants, such as pesticides, could have a role in the development of metabolic disorders. We have examined the long-term effects of 3 doses of the Roundup (R) herbicide (made of glyphosate and formulants) on the gut microbiota in male and female Sprague-Dawley rats. In conclusion, we revealed that an environmental concentration of R (0.1 ppb) and other two concentrations (400ppm and 5,000 ppm) have a sex-dependent impact on rat gut microbiome composition and thus warrants further investigation.

### **Weedkiller found in US and UK cereals marketed for young children**

We read an article in the *Guardian* in August 2018 about the weedkiller Roundup being found in US oat-based cereals marketed for young children. But the *Guardian* said “There was no indication that the claims related to products sold outside the US.” In view of the reassurance by the *Guardian*, we bought four oat-based cereals from our local Co-op in South Wales and sent samples of them to the Health Research Institute in Fairfield, Iowa. In October, we had some alarming results. Dr John Fagan the Director wrote that they were “shockingly high levels”. He said, “to think they are being given to children.” He said: “These results are consistently concerning. The levels consumed in a single daily helping of any one of these cereals, even the one with the lowest level of contamination, is sufficient to put the person’s glyphosate levels above the levels that cause fatty liver disease in rats (and likely in people).”

Type of breakfast cereal marketed for children Product description	Glyphosate level ng/g	AMPA ng/g	Effective glyphosate level ng/g
Kelloggs No added sugar granola with Apricot & pumpkin seeds	499.90	ND	499.90
Quaker/Oat So simple/Original Microwaveable Oats	464.23	24.04	500.28
Weetibix Oatibix 100% wholegrain oats	318.85	16.96	344.28
Nestle Multigrain Cheerios Whole Grain Oat Flour 29.6% Whole Grain Wheat 29.6% Whole Grain Barley Flour 17.9% Whole Grain Corn Flour 2.1% Whole Grain Rice Flour 2.1%.	137.29	ND	137.29

The *Daily Mail* published the figures but the *Guardian* didn’t.<sup>10</sup>

<sup>8</sup> <http://www.pnas.org/content/early/2018/09/18/1803880115>

<sup>9</sup> [https://www.gmoseralini.org/wp-content/uploads/2018/01/Lozano-et-al.-Tox.Rep\\_.2018.pdf](https://www.gmoseralini.org/wp-content/uploads/2018/01/Lozano-et-al.-Tox.Rep_.2018.pdf)

<sup>10</sup> <https://www.dailymail.co.uk/health/article-6315209/Revealed-UK-cereals-contain-potentially-harmful-amounts-WEEDKILLER.html>

### Britain and America are in the midst of a barely reported public health crisis.<sup>11</sup>

They are experiencing not merely a *slowdown in life expectancy*, which in many other rich countries is *continuing to lengthen*, but the start of an alarming increase in death rates across all our populations, men and women alike. We are needlessly allowing our people to die early.

### Gradual onset of global extinctions of trees and crops from ‘diseases, pests and pollution’

#### Ash, elm and rowan among trees threatened by pests and pollution, says biodiversity report

More than half of native European trees face extinction, warns study on 27/09/2019<sup>12</sup> as invasive diseases, pests, pollution and urban development take a growing toll on the landscape, according to a study. Ash, elm and rowan trees are among those in decline, says the assessment of the continent’s biodiversity, which could complicate efforts to tackle the climate crisis through reforestation. “*It is a threat. It is not just the naturally occurring trees and woodlands, it is also some of the big commercial conifers that are threatened by invasive species,*” said one of the authors of the report, David Allen of the International Union for Conservation of Nature, who produced the study. He warned that countries such as the UK were keen to import more saplings to draw carbon out of the atmosphere, but said young trees needed to be carefully screened to avoid diseases and pests entering the country and depleting existing forests.

#### Glyphosate effects on diseases of plants: Johal and Huber: 2009<sup>13</sup>

However, this relatively simple, broad-spectrum, systemic herbicide can have extensive unintended effects on nutrient efficiency and disease severity, thereby threatening its agricultural sustainability. A significant increase in disease severity associated with the wide spread application of the glyphosate herbicide can be the result of direct glyphosate-induced weakening of plant defenses and increased pathogen population and virulence. “*Glyphosate is a strong mineral chelator to immobilize nutrients physiologically. This is how it works as an herbicide and why it kills most things eventually. The Shikimate pathway is a major route for disease defense in plants. By shutting it down by chelating Mn, Co, and a number of other essential minerals, the plant essentially has a severe case of AIDs and is very susceptible to many diseases. Then, as a powerful antibiotic against the beneficials needed for disease suppression and nutrient recovery, it provides a perfect environment for glyphosate resistant pathogens (the Roundup Ready genetics came from a plant pathogen that causes tumors in plants called crown gall). In non-sterile field soil, the plants treated with glyphosate succumb to heavy pathogen attack because their defenses are compromised. This is the herbicidal mode of action! The adjuvants etc. in the formulation don’t enter the plant, they just damage the cuticle etc. so the glyphosate is taken up more to do its job systemically by shutting down the defense physiology - especially in the roots. Glyphosate also stimulates the virulence factors (oxidation of Mn to non-available valence states) in the pathogens (Examples are Fusarium<sup>14</sup> and Xylella etc. diseases), and can increase virulence of several non-pathogens so they become serious disease organisms (examples are diseases caused by Corynesporium and Marasmius).*

#### Glyphosate associations with cereal diseases caused by *Fusarium* spp. in the Canadian Prairies: 2009<sup>15</sup>

These are the first studies that established a relationship between previous glyphosate use and increased *Fusarium* infection of spikes and subcrown *internodes* of wheat and barley,

<sup>11</sup> <https://www.theguardian.com/commentisfree/2018/aug/19/bad-news-is-were-dying-earlier-in-britain-down-to-shit-life-syndrome>

<sup>12</sup> <https://www.theguardian.com/environment/2019/sep/27/more-than-half-of-native-european-trees-face-extinction-warns-study>

<sup>13</sup> <https://www.sciencedirect.com/science/article/abs/pii/S1161030109000628>

<sup>14</sup> <https://www.sciencedirect.com/science/article/abs/pii/S1161030109000689>

<sup>15</sup> <https://www.sciencedirect.com/science/article/abs/pii/S1161030109000689>

or *Fusarium* colonization of [crop residues](#). However, because of the close association between noncereal crops, [reduced tillage](#) and glyphosate use, it was not possible to completely separate the effects of these factors on *Fusarium* infections. The consistent association between previous glyphosate use and *Fusarium* infections also warrants further research to elucidate the nature of this association and the underlying mechanisms determining these effects.

### **In 2014 reports of Olive trees destroyed by the insect-borne bacterium [xylella fastidiosa](#)**<sup>16</sup>

First drought, now blight. Widespread bacterial infection has already destroyed thousands of olive trees across Italy's Puglia region, with numbers only forecast to rise sharply, adding to the economic effects of droughts in Spain and California. The insect-borne bacterium [xylella fastidiosa](#) has infected trees across 74,000 acres in Puglia, which makes up Italy's "heel" in the south. 11 million metric tons of olives are produced each year in the region, accounting for 1/3 of the national crop, making it Italy's most important olive oil producing region.

Farmers have resorted to burning their trees — some of which are nearly 500 years old — in an attempt to stem the spread of infection. Many fear that [olive oil prices](#) in places like the United States, where Italian-produced oil has a 51 percent market share — will skyrocket in the wake of the crisis. "Prices will rise by 30 to 40 percent because there will be fewer olives and therefore less oil produced," Raffaele Piano, a Puglia olive farmer, told Agence France-Press.

The loss of trees alone has cost the region €250 million (\$330 million). As the economic effects of the blight continue to spiral, officials have drafted plans to manage the disease's spread.

"The disease is continuing to spread thanks to the summer temperatures and we have to take the right measures," Angelo Corsetti, a spokesman for the national agricultural organization, Coldiretti.

"There will be a genuine cordon sanitaire of 8,000 hectares where it will be obligatory to destroy the trees," he said. The mile-wide buffer zone will stretch from the Adriatic coast in the east to the Ionian coast in the west in an attempt to contain the blight, which causes trees to dry out stop bearing fruit.

Inside the area, grass will be trimmed down and [pesticides sprayed to control the insect population that carries the bacteria](#). 800,000 trees exist inside the area to be cordoned, with an estimated half infected at this point. An emergency decree providing €3.5 million (\$4.6 million) of funds and orders for farmers and officials to take action is set to come into place on August 27.

Some criticize the delay in action, pointing to the fact that the crisis emerged while many Italians were on traditional month-long vacations during August. "Xylella does not go on holiday," said Gianni Cantele of Coldiretti, the national agricultural organization.

### **Don Huber's comments on Xylella**

*The olive decline in Italy is a classic example of glyphosate predisposition to Xylella. The plugging of the xylem plumbing by the bacterial biofilm is stimulated by glyphosate by chelating Zn that suppresses biofilm formation and stimulating the oxidation of Mn to form MnPO<sub>4</sub> or birnesite (CaMnPO<sub>4</sub>) precipitation in the polysaccharide matrix to plug things up." Glyphosate is systemic in the plant – moves in both the xylem and phloem. It is the phloem movement that takes it to the roots, but it concentrates in all growth points – stems, root tips, reproductive structures especially (that is where the minerals are also accumulating. The bottom 1-2 ft of a tree trunk is highly absorptive of glyphosate. It is just that conifers are more tolerant of it than hardwoods and brush, but it is still affected.*

### **Cryptococcus in human and horses following Roundup spraying in British Columbian Forests**<sup>17</sup>

*Spraying of glyphosate on conifer forests is almost a universal practice in the US. It definitely stresses the plants and changes the biology. British Columbia and adjacent areas are reported to be quite concerned with the outbreaks of Cryptococcus in hikers and others as well as horses visiting the*

<sup>16</sup> <https://www.oliveoiltimes.com/olive-oil-making-and-milling/blight-threatens-olive-crops-italy/40947>

<sup>17</sup> <https://academic.oup.com/mmy/article/49/7/734/951129>

areas because this respiratory fungus now can sporulate on tree trunks with the antibiotic effect of glyphosate killing the natural suppressing microflora.

In chelating (immobilizing) a number of essential mineral enzyme co-factors, the whole system is diminished so photosynthesis, amino acid synthesis, hormone production, etc. are all compromised

### **'A Round of Roundup' presenting the dangers of Roundup at a meeting of the Agroecology Group in the Houses of Parliament 02/07/2014**

Glyphosate is the most commonly used herbicide in the world and its use is increasing year by year. Dr Don Huber, Emeritus Senior Plant Pathologist at Purdue University, Indiana, one of four world experts on Roundup, states that glyphosate is an herbicide, an antibiotic, a growth regulator, a toxicant, a virulence enhancer, an organic phosphonate and a mineral chelator. It chelates (captures) and washes out the following minerals: boron, calcium, cobalt, copper, iron, potassium, magnesium, manganese, nickel and zinc.<sup>18</sup> UK Farmers increased their use of Roundup on crops from 226,762 kg in 1990 to 2,240,408 kg in 2016, a 10-fold increase in 16 years.

He says that Roundup and other glyphosate-based herbicides are responsible for pathogens attacking trees and destroying them.

### **A beetle and a fungus are killing off the trees that have become synonymous with the city, making way for trees that give more shade and use less water 2017**

Los Angeles' legendary palm trees are dying – and few will be replaced<sup>19</sup>

A beetle known as the South American palm weevil and a fungus called *Fusarium* are killing palm trees across southern California. Others are dying of old age. "It'll change the overall aesthetic because palm trees are so distinctive. It's the look and feel of Los Angeles," said Carol Bornstein, director of the nature gardens at the Natural History Museum of [Los Angeles](#).

### **Fusarium wilt in bananas 2019**<sup>20</sup>

Transcriptomic analysis of resistant and susceptible banana corms in response to infection by *Fusarium oxysporum* f. sp. *cubense* tropical race 4

Fusarium wilt disease, caused by *Fusarium oxysporum* f. sp. *cubense* (*Foc*), is a destructive soil-borne banana disease which is threatening the global banana industry. Transcriptome sequencing has been performed to understand the differential response to *Foc* TR4 between resistant and susceptible banana genotypes, but how the resistant banana genotypes avoided infection have not been conclusive.

### **The fungicidal action of Roundup is destroying the means by which trees communicate**

#### **Net transfer of carbon between ectomycorrhizal tree species in the field: the 'wood-wide-web'**

A professor of forest ecology at the University of British Columbia's Department of Forest and Conservation Sciences in Vancouver, Suzanne Simard studies the surprising and delicate complexity in nature. Her main focus is on the below-ground fungal networks that connect trees and facilitate underground inter-tree communication and interaction. Her team's analysis revealed that the fungi networks move water, carbon and nutrients such as nitrogen between and among trees as well as across species. The research has demonstrated that these complex, symbiotic networks in our forests -- at the hub of which stand what she calls the "mother trees" -- mimic our own neural and social networks.<sup>21</sup> This ground-breaking work on symbiotic plant communication has far-reaching implications in both the forestry and agricultural industries, in particular concerning sustainable

<sup>18</sup> <https://sustainablepulse.com/2014/07/02/uk-parliamentary-meeting-brings-dangers-roundup-public-focus/#.XZtU0y17Fp8>

<sup>19</sup> <https://nypost.com/2017/10/02/las-palm-trees-are-dying-and-they-wont-be-replaced/>

<sup>20</sup> <https://www.nature.com/articles/s41598-019-44637-x>

<sup>21</sup> <https://www.nature.com/articles/41557>

stewardship of forests and the plant's resistance to pathogens. She works primarily in forests, but also grasslands, wetlands, tundra and alpine ecosystems.

### **Toxic blue-green algae in lakes in the US and UK are killing pets and wildlife**

#### **Toxic algae in the US is killing pets and wildlife**

Erin Brockovich is an American legal clerk and activist and who, despite her lack of formal education in the law, was instrumental in building a case against the Pacific Gas and Electric Company (PG&E) of California in 1993. She has regularly won lawsuits against Corporations that are poisoning communities. She wrote in the US *Guardian* on 06/12/2018: **The weedkiller in our food is killing us**<sup>22</sup> *"On a recent Saturday afternoon, in an estuary near Tampa Bay, Florida, I watched airboats move up and down the river banks, spraying massive plumes of weedkiller on to the vegetation. The state of Florida was trying to control and kill off scores of plant species. Nearby, children were lying out in the sun, though they knew better than to swim in the water, which has recently been blooming with toxic algae. Mists of weedkiller drifted downwind toward them.*

*The main active ingredient in that mist, and in the weedkiller being sprayed throughout Tampa Bay, is glyphosate, one of the most widely used herbicides in the US. First registered for use here in 1974, it is now an ingredient in more than 750 products, including the most widely deployed herbicide in the world, Monsanto's Roundup. For more than a generation, Americans have been using Roundup and other glyphosate-based chemicals to improve agricultural yields, manage forests, ripen fruit and kill the dandelions sprouting from our front lawns.*

*There is also evidence that glyphosate is an important driver of Florida's toxic algae bloom and of similar algal efflorescences across the country. According to research conducted on Lake Erie, the algae thrive off the phosphorus released when the compound is sprayed on certain soils. In turn, human exposure to the toxic algae, which regularly kills pets and wildlife, has been linked to neurodegenerative disorders such as Parkinson's, Alzheimer's and Amyotrophic Lateral Sclerosis.*

#### **Glyphosate, the controversial main ingredient in Monsanto's Roundup and other herbicides, is being connected to Lake Erie's troubling algae blooms, which has fouled drinking water and suffocated and killed marine life in recent years.**

The herbicide Roundup may be contributing to the growth of harmful algal blooms in Lake Erie, according to Ohio Sea Grant researchers. Drs. R. Michael McKay and George Bullerjahn of Bowling Green State University are studying the impact of glyphosate, a phosphonate and the main ingredient in the commonly used herbicide, on the strains of blue-green algae found in Lake Erie.<sup>23</sup> Phosphorus has long been known to act as fuel to blue-green algae, and efforts in the 1970s reduced harmful algal blooms and nuisance algae by limited phosphorus loading in the Lake Erie watershed. However, the last 15 years have seen an increase in the growth of the toxic blooms, contributing to an ever bigger Dead Zone in the lake's Central Basin and massive fish kills each summer. Scientists have believed phosphonates to be inaccessible to plankton, but McKay and Bullerjahn have begun to look to glyphosate as a potential phosphorus source with funding from Ohio Sea Grant. *"Our research is finding that Roundup is getting into the watershed at peak farming application times, particularly in the spring,"* McKay explains. Their work has shown that glyphosate cannot be detected in the lake in April but can be found from mid-May through July, after crops are planted, which corresponds to the forming of the Dead Zone. They have also discovered that the blue-green algae, also known as cyanobacteria, are capable of using phosphonates.

#### **Significant correlation between the increased use of glyphosate to the percentage of dissolved reactive phosphorus (DRP) in the runoff**

<sup>22</sup> <https://www.theguardian.com/commentisfree/2018/dec/06/the-weedkiller-in-our-food-is-killing-us>

<sup>23</sup> <https://ohioseagrant.osu.edu/news/2009/fe052/researchers-study-roundup-as-possible-cause-harmful-algal>

**Phosphorus**—attributed to farm runoff carried by the Maumee River—has long been identified as a leading culprit feeding the excessive blooms in the western Lake Erie basin. Now, according to a new study from chemistry professor Christopher Spiese, a significant correlation has been established between the increased use of glyphosate to the percentage of dissolved reactive phosphorus (DRP) in the runoff. As No-Till Farmer observed from the study, DRP loads in Lake Erie increased in the mid-1990s at the same time that farmers began the widespread cultivation of crops genetically engineered to withstand multiple applications of Roundup.<sup>24</sup>

*"For every acre of Roundup Ready soybeans and corn that you plant, it works out to be about one-third of a pound of P [phosphorus] coming down the Maumee,"* Spiese told the agricultural publication. Here's how the team came to the conclusion, as No-Till Farmer reported:

Through his own and others' research, Spiese found that depending on the types of metal in the soil, glyphosate does release P. For example, when glyphosate is applied to soil containing iron oxide-hydroxide, P is immediately released. But almost nothing is removed when it's an iron oxide material. Finally, Spiese took soil samples all over the Maumee watershed, applied P to them and then sprayed glyphosate to see how much P was released vs. soil that wasn't sprayed with glyphosate after 24 hours. He saw desorption occurred all over the watershed, but certain areas were higher than others, specifically in the south-eastern corner.

Based on the average two glyphosate applications growers make every year, Spiese estimates that overall, 20-25 percent of the DRP runoff is caused by glyphosate. But depending on the location within the watershed, that percentage could be much lower or much greater. *"Some of those sites, it's less than a percent. Other sites it's almost 100 percent,"* he says.<sup>25</sup>

**Dog owners in the UK have been warned to take extra precautions while walking their pets amid a rise in reports of potentially toxic blue-green algae.**<sup>26</sup>

The British Veterinary Association (BVA) said it had seen an increase in reports including in Southampton, Edinburgh, Cornwall and Lincolnshire. Contact with the algae can be fatal for animals if left untreated and can cause rashes and illness to humans. The BVA urged owners to keep dogs on a lead around affected lakes and rivers. It follows a number of reports of dogs becoming ill or even dying after swimming in water suspected to be contaminated with blue-green algae.

**Roundup and clothianidin are largely responsible for the destruction of the Great Barrier Reef because the APVMA did not read the instructions**

**The coral on the Great Barrier Reef has been destroyed because the Australian Regulators did not read the instructions: Roundup and the systemic neonicotinoid pesticides are highly toxic to aquatic life. Instructions for use state that all water bodies should be protected**

Instructions for using Roundup Advance AG Herbicide by Monsanto include: *"Protection of Wildlife, Fish, Crustacea and Environment. Do not contaminate dam, river or stream with the product."*<sup>27</sup>

Clothianidin (Sumitomo Shield a systemic neonicotinoid insecticide) has been granted registration by the Australian Pesticides and Veterinary Medicines Authority (AVMA) for use on very low-lying sugar cane plantations draining into the Great Barrier Reef. In addition to global warming that is why there has been progressive destruction and bleaching of coral.

Instructions: PROTECTION OF WILDLIFE, FISH, CRUSTACEANS AND ENVIRONMENT<sup>28</sup>

*DO NOT apply under weather conditions, or from spraying equipment, that may cause spray drift onto nearby or adjacent areas, particularly wetlands, water-bodies or watercourses. **This product is***

<sup>24</sup> <https://www.no-tillfarmer.com/articles/5793-scientists-glyphosate-contributes-to-phosphorus-runoff-in-lake-erie?v=preview>

<sup>25</sup> <https://www.ecowatch.com/lake-eries-toxic-algae-bloom-forecast-for-summer-2016-1891172391.html>

<sup>26</sup> <https://www.bbc.co.uk/news/uk-49344232>

<sup>27</sup> <http://websvr.infopest.com.au/LabelRouter?LabelType=L&ProductCode=70096>

<sup>28</sup> [http://www.sumitomo-chem.com.au/sites/default/files/pdf/labels/shield\\_label.pdf](http://www.sumitomo-chem.com.au/sites/default/files/pdf/labels/shield_label.pdf)

**highly toxic to aquatic invertebrates.** *DO NOT contaminate streams, rivers or waterways with the chemical or used containers. DO NOT apply when there are aquatic and wetland areas including aquacultural ponds or surface streams and rivers downwind from the application area and within the mandatory no-spray zone shown in table 1.*

### **The 27-year decline of coral cover on the Great Barrier Reef and its causes<sup>29</sup>**

Extracts: Based on the world's most extensive time series data on reef condition (2,258 surveys of 214 reefs over 1985–2012), we show a major decline in coral cover from 28.0% to 13.8% (0.53% y<sup>-1</sup>), a loss of 50.7% of initial coral cover. Tropical cyclones, coral predation by crown-of-thorns starfish (COTS), and coral bleaching accounted for 48%, 42%, and 10% of the respective estimated losses amounting to 3.38% y<sup>-1</sup> mortality rate. Importantly, the relatively pristine northern region showed no overall decline. Thus, reducing COTS populations, by improving water quality and developing alternative control measures, could prevent further coral decline and improve the outlook for the Great Barrier Reef. **Such strategies can, however, only be successful if climatic conditions are stabilized, as losses due to bleaching and cyclones will otherwise increase.**

### **Glyphosate persistence in samples of seawater<sup>30</sup> taken from the Great Barrier Reef; this biocide has probably been responsible for the gradual poisoning of the GBF's aquatic vertebrates and invertebrates over 40 years of use.**

Extracts: Glyphosate is one of the most widely applied herbicides globally but its persistence in seawater has not been reported. Here we quantify the biodegradation of glyphosate using standard "simulation" flask tests with native bacterial populations and coastal seawater from the Great Barrier Reef. The half-life for glyphosate at 25 °C in low light was 47 days, extending to 267 days in the dark at 25 °C and 315 days in the dark at 31 °C, which is the longest persistence reported for this herbicide. AMPA, the microbial transformation product of glyphosate, was detected under all conditions, confirming that degradation was mediated by the native microbial community. This study demonstrates glyphosate is moderately persistent in the marine water under low light conditions and **is highly persistent in the dark.** Little degradation would be expected during flood plumes in the tropics, which could **potentially deliver dissolved and sediment-bound glyphosate far from shore.** *'A wide spectrum of pesticides has been detected in waters of the GBR, but herbicides are often more water soluble and mobile than contemporary insecticides and fungicides, and as a consequence, are more frequently detected in the river mouths and GBR lagoon. The photosystem II herbicides have been the primary group detected in GBR waters; however, glyphosate (CAS number 1071- 83-6) is the most widely used herbicide in Australia, in the GBR catchments and elsewhere, with approximately 15,000 tonnes applied annually to control agricultural, urban and roadside weeds.'*

### **Massive kills of wildlife during flooding now make sense with glyphosate and clothianidin having been found to be toxic to aquatic invertebrates, biocides and immune suppressants**

In 2011, Australia (New South Wales and Queensland) had disastrous floods.<sup>31</sup> The Darling River area had suffered prolonged drought followed by heavy rain and flooding. On March 11 Bourke Township experienced a massive fish kill. An eye-witness said: *"It was phenomenal; you couldn't see the water, there were carp gasping for breath and crayfish crawling onto the bank."* Counting the dead fish passing Bourke Weir at 100/sec. Geoff Wise estimated 8 million per day and the event continued for 5 days; 40 million dead fish was said to be an underestimate. It was described as a 'Black Water' event and attributed to lack of oxygen from organic material being washed down the

<sup>29</sup> <http://www.pnas.org/content/109/44/17995.full>

<sup>30</sup> <http://www.sciencedirect.com/science/article/pii/S0025326X14000228>

<sup>31</sup>

[http://www.water.nsw.gov.au/\\_data/assets/pdf\\_file/0003/549282/menindee\\_lakes\\_management\\_community\\_summary.pdf](http://www.water.nsw.gov.au/_data/assets/pdf_file/0003/549282/menindee_lakes_management_community_summary.pdf)

river following flooding of a plain. But beekeepers suspected otherwise: “*why were the crayfish trying to escape the water if it was only due to lack of oxygen?*”<sup>32</sup> Agricultural land borders 2,500 km of the Darling River. Cotton is grown in the area; at the time, more than 95% was seed-treated GMO and 96% was imidacloprid treated. BUT, OF COURSE, GLYPHOSATE WOULD HAVE BEEN PRESENT IN THE WATER TOO. Two further ecological disasters have occurred down the Queensland Coast after the floods in December 2010 and January 2011. In July 2011 “*the northern coast of Queensland has become littered with sick and dying turtles and dugongs (sea cows).*” It was attributed to run-off of nutrients into the ocean “*potentially killing the sea grass that both turtles and dugongs feed on.*”<sup>33</sup> On September 19 2011 in Gladstone Harbour many sick fish were discovered; barramundi and bream were found with sores, skin rashes and infected eyes.<sup>34</sup> Capricorn Conservation Council suspected industrial pollution, so fishing was prohibited.

According to beekeeping sources, the entire Queensland Coast above Gladstone are the biggest areas for sugar cane in Australia and clothianidin (Sumitomo Shield Systemic insecticide) and Roundup have been granted registration by APVMA for use on these very low-lying sugar cane farms. “*A sudden mass starvation of turtles and dugongs, a rare sea mammal, off the coast of Queensland has prompted warnings of a long-term natural disaster in the normally sheltered waters just inshore of Australia's Great Barrier Reef.*”

**Two pieces of vital evidence that the devastating deterioration in the Great Barrier Reef is man-made and not due to natural disasters came from two papers:**

- “*Importantly, the relatively pristine northern region showed no overall decline.*”<sup>35</sup>
- “*Glyphosate has not often been included in regular monitoring programs as the stand-alone analytical methods are often cost-prohibitive, resulting in a long-term deficiency in global datasets.*”<sup>36</sup>

### **Report by the Queensland Government in 2003 on water quality<sup>37</sup>**

“*Regional assessments of coastal water quality condition found that sites in the Burdekin, Mackay/Whitsunday and south-east Queensland regions most commonly experienced poor water quality. Phosphorus and nitrogen were the two indicators contributing to this rating. Metals bioaccumulated in prawns, shellfish and other marine fauna were greatest in south-east Queensland waterways, particularly canals, and occasionally exceeded Australian food quality standards. In central and north Queensland, the persistence of pesticides and herbicides, including a number of banned substances, in sediment, seagrass and some marine mammals is an issue.*”

### **Herbicides: A new threat to the Great Barrier Reef<sup>38</sup>**

In 2009, researchers showed runoff of herbicides particularly associated with sugar cane cultivation in the adjacent catchment.

*Abstract: The runoff of pesticides (insecticides, herbicides and fungicides) from agricultural lands is a key concern for the health of the iconic Great Barrier Reef, Australia. Relatively low levels of herbicide residues can reduce the productivity of marine plants and corals. However, the risk of these residues to Great Barrier Reef ecosystems has been poorly quantified due to a lack of large-scale datasets. Here we present results of a study tracing pesticide residues from rivers and creeks in three catchment regions to the adjacent marine environment. Several pesticides (mainly herbicides) were*

<sup>32</sup> <http://www.theabk.com.au/article/neonicotinoids-australia>

<sup>33</sup> <http://www.telegraph.co.uk/news/worldnews/australiaandthepacific/australia/8753630/Mass-starvation-of-dugongs-and-turtles-on-Great-Barrier-Reef.html>

<sup>34</sup> <http://www.abc.net.au/news/2011-11-09/gladstone-harbour-in-pictures-and-quotes/3650296>

<sup>35</sup> <http://www.pnas.org/content/109/44/17995.full>

<sup>36</sup> <http://www.sciencedirect.com/science/article/pii/S0025326X14000228>

<sup>37</sup> <https://web.archive.org/web/20070614223713/http://www.epa.qld.gov.au/register/p01258bs.pdf>

<sup>38</sup> <https://www.sciencedirect.com/science/article/pii/S0269749109001304>

*detected in both freshwater and coastal marine waters and were attributed to specific land uses in the catchment. Elevated herbicide concentrations were particularly associated with sugar cane cultivation in the adjacent catchment. We demonstrate that herbicides reach the Great Barrier Reef lagoon and may disturb sensitive marine ecosystems already affected by other pressures such as climate change.*

**Advice for Cane Sugar farmers (sugarresearch.com.au) is the first organisation that has admitted that herbicides are being detected in the Great Barrier Reef Lagoon (GBR)**<sup>39</sup>

They state that: *“Products of major concern are atrazine, ametryn, hexazinone and diuron (all Group C or PSII herbicides). These products and others are being detected in waterways and in the Great Barrier Reef Lagoon (GBR)”* Page 108. Even though glyphosate is one of the most widely applied herbicides globally, it is evident that very few studies had been done because it is expensive. Herbicides such as glyphosate, atrazine and dicamba were recommended by [sugarresearch.com.au](http://sugarresearch.com.au) (2013) for weed control: pre-emergent or post-emergent, sometimes by aerial spraying. Aerial spraying is commonly used for the control of vines at the out-of-hand stage or in the mature crop, particularly in the areas when extreme crop lodging occurs. *“These products and others are being detected in waterways and in the Great Barrier Reef Lagoon (GBR). Control of weed growth in tidal drains should be carried out in accordance with the guidelines in the SmartCane Riparian and Wetlands Area practice booklet or with an individual permit. All other watercourses in Queensland are protected under the Water Resources Act 1989.”*

**Sugarcane industry managers are promoting lectures by a controversial scientist who argues farm runoff is no threat to the reef**

Former James Cook University Professor of Geophysics, Peter Ridd is on a speaking tour of Queensland arguing against regulations that would set restrictions for sediment and chemical runoff from cane farms into the Great Barrier Reef catchments. Earlier this year Canegrowers was handed one of the first grants awarded by the Great Barrier Reef Foundation’s partnership with the federal government, for a behavioural management program called “Cane Changer”. The \$1.4m grant aims to help promote best management practice and to improve uptake.

The Queensland environment minister, Leeanne Enoch, told Guardian Australia: *“There is a clear expectation that the organisation uses that taxpayer funding for its stated purpose.”*

Enoch said science had *“come under attack for political purposes”* and pointed to a Liberal National party [suggestion that the state establish a scientific review office](#), prompted partly by unhappiness about the scientific consensus that agriculture is harming the reef.

*“This office of ‘alternative facts’ would be used to undermine science in this state,”* Enoch said.

*“For the last decade, the Queensland government has supported agricultural industries to voluntarily improve their practices. However, uptake has not been fast enough, so water quality has continued to decline.”* On Wednesday, the Australian Coral Reef Society released a statement saying it was “deeply concerned” about Ridd’s lecture tour, and provided a [detailed scientific response to claims he has made](#) *“They’re not supported by any other scientist we can think of. On one side we have hundreds of scientists from dozens of institutions in Australia and overseas, lots of universities involved in this work publishing thousands of peer-reviewed papers, brought together in the consensus statement [in 2017],”* Brodie said.

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<http://www.sugarresearch.com.au/content/FlippingBooks/Sugarcane%20Advisors%20Information%20Kit/files/assets/common/downloads/Sugarcane%20Advisor%20Information%20Kit%20FINAL.pdf>

## **Emerging pathogens wipe out wildlife species across the globe secondary to immune suppression by glyphosate and neonicotinoid insecticides**

### **Emerging pathogens as threats to animal and plant health**

Outbreaks of infectious diseases amongst species of wildlife around the world (such as amphibians, honey bees and wild bees, fish, birds and bats) have occurred over the last 25 years. Kiesecker (2002) found that atrazine (herbicide) and malathion (pesticide) made frogs more susceptible to a parasite, a burrowing trematode worm, which caused limb deformities in tadpoles.<sup>40</sup> Field experiments conclusively demonstrated that exposure to trematode infection was required for the development of limb deformities in wood frogs, *Rana sylvatica*. Even very low levels of exposure (“at concentrations considered safe for drinking water by the US Environmental Protection Agency”) could produce “dramatic effects on the immune response of the animals”. Field studies showed “considerably higher rates of limb deformities where there was pesticide exposure... Amphibian deformities, in particular those related to limb development, have now been reported in 43 states in the U.S. and in five Canadian Provinces, as well as in several other countries around the world.”<sup>41</sup>

Since the late 1990’s scientists have written in increasingly desperate tones. In 2012 there were two papers in *Nature*: “Biodiversity loss and the impact on humanity”<sup>42</sup> and “Emerging fungal threats to animal, plant and ecosystem health”.<sup>43</sup> Authors of this last review had appealed to scientists urgently to find ‘*the elusive magic bullet*.’ Only one other (in addition to Kiesecker’s) paper from California dared to mention pesticides. Davidson *et al.*<sup>44</sup> reported in 2002 spatial patterns of decline for four California ranid frogs and matched the declines with the distribution of agricultural lands (based on USGS land use maps and key predominant wind directions based on California Air Resources streamline wind maps). The authors stated that “*In California, the transport and deposition of pesticides from the agriculturally intensive Central Valley to the adjacent Sierra Nevada is well documented, and pesticides have been found in the bodies of Sierra frogs.*” The widespread use on agricultural crops of the systemic neonicotinoid insecticides<sup>45</sup> and the herbicide glyphosate,<sup>46</sup> both of which cause immune suppression, make species vulnerable to emerging infectious pathogens, driving large-scale amphibian extinctions.

### **Chytrid fungus has wiped out amphibian populations over five continents.**

Chytrid fungus, *Batrachochytrium dendrobatidis* has wiped out amphibian populations over five continents. A spokesman for IUCN said: “*The IUCN Red List currently considers 31% of the earth’s amphibians are threatened with extinction...it’s thought that 159 species have vanished forever in recent years.*” Amphibians, particularly tadpoles, are considered to be environmental indicators of indirect ecosystem effects because of their unique niche at the boundary of the aquatic-terrestrial ecosystems as well as their sensitivity to pollutants. While tadpoles feed on periphyton, adult amphibians are strictly insectivorous. Amphibians were the first group of vertebrates to be affected by the epidemics of diseases caused by uncommon pathogens. Joseph Mendelson an amphibian taxonomist wrote in 2011.<sup>47</sup> “*The reality of amphibian declines and extinctions has shifted the ecological baseline in so many ecosystems, that an entire generation of biologists is conducting their research in a framework that has been very recently remodelled. I am a taxonomist and I have seen*

<sup>40</sup> <http://www.pnas.org/content/99/15/9900.full.pdf>

<sup>41</sup> [http://onlinelibrary.wiley.com/doi/10.1002/1096-9926\(200009\)62:3%3C147::AID-TERA2%3E3.0.CO;2-2/full](http://onlinelibrary.wiley.com/doi/10.1002/1096-9926(200009)62:3%3C147::AID-TERA2%3E3.0.CO;2-2/full)

<sup>42</sup> [http://www.nature.com/nature/journal/v486/n7401/full/nature11148.html?WT.ec\\_id=NATURE-20120607](http://www.nature.com/nature/journal/v486/n7401/full/nature11148.html?WT.ec_id=NATURE-20120607)

<sup>43</sup> <http://www.ncbi.nlm.nih.gov/pubmed/22498624>

<sup>44</sup> <http://onlinelibrary.wiley.com/doi/10.1046/j.1523-1739.2002.01030.x/abstract>

<sup>45</sup> [http://www.boerenlandvogels.nl/sites/default/files/JEIT%20Immune%20Suppression%20pdf\\_6.pdf](http://www.boerenlandvogels.nl/sites/default/files/JEIT%20Immune%20Suppression%20pdf_6.pdf)

<sup>46</sup> [http://www.fs.fed.us/foresthealth/pesticide/pdfs/seratr01\\_43\\_08\\_04.pdf](http://www.fs.fed.us/foresthealth/pesticide/pdfs/seratr01_43_08_04.pdf)

<sup>47</sup> [http://nationalzoo.si.edu/support/volunteer/documents/HR\\_Mar2011\\_JoeM\\_proofs.pdf](http://nationalzoo.si.edu/support/volunteer/documents/HR_Mar2011_JoeM_proofs.pdf)

*my career vacillate between the thrill of discovering new species and the chill of tracking extinction events—including species that I described.”*

### **The science behind GMOs is fraudulent**

#### **US Attorney Steven Druker says: Governments and leading scientific institutions have systematically misrepresented the facts about GMOs**

On 4 March 2015 the Organisation Beyond GM facilitated the Press Release of American public interest attorney Steven Druker’s acclaimed new book, Altered Genes, Twisted Truth How the Venture to Genetically Engineer Our Food Has Subverted Science, Corrupted Government and Systematically Deceived the Public.<sup>48</sup>

#### **Steven Druker initiated a lawsuit against the US Food and Drug Administration (FDA) that forced it to open its files on GM foods**

*Those files revealed that GM foods first achieved commercialisation in 1992 only because the FDA:*

- \* Covered up the extensive warnings of its own scientists about their dangers*
- \* Lied about the facts*
- \* And then violated federal food safety law by permitting these foods to be marketed without having been proven safe through standard testing*

#### **Druker challenges UK Royal Society over misleading statements made about GM foods**

Open Letter to the UK Royal Society can be read here.<sup>49</sup>

*Extracts: “Because clarifying the facts about GM foods is crucial for developing an intelligent, science-based policy on the future of agriculture, and because the Royal Society has significantly contributed to the confusion that currently surrounds this issue, it is imperative that remedial action be promptly initiated. This is especially so considering that:*

- The European Commission is about to approve substantial regulatory changes in regard to GM crops.*
- The UK is seriously considering allowing them to be commercially planted.*
- The Society and other proponents of GM foods have inculcated the widespread illusion that there is an overwhelming scientific consensus that the safety of these products has been established through rigorous testing...”*

#### **Pandora’s Potatoes: The Worst GMOs<sup>50</sup>**

Defra allowed a trial of GM Potatoes at farms in Suffolk and Cambridge to proceed despite the book by Caius Rommens, ex-Director at Monsanto. Considering the huge number of scientists employed by Defra and Rothamsted Research, not one of them has read the new book by Caius Rommens, former team leader at Monsanto, the creator of GM potatoes, who has retracted his research on GM Potatoes. It shows an ignorance beyond belief! It just demonstrates how narrow the scientists’ reading is and how arrogant and brainwashed they have become.

The Ex-Director of J.R. Simplot and team leader at Monsanto, Caius Rommens, has revealed the hidden dangers of the GMO potatoes he created, in a wide ranging interview for Sustainable Pulse, on the same day that his book ‘Pandora’s Potatoes: The Worst GMOs’ was released [on Amazon](#). Here are some extracts from the interview.

<sup>48</sup> <http://beyond-gm.org/new-book-exposes-systematic-government-and-scientific-fraud-over-gm-food/>

<sup>49</sup> [http://beyond-gm.org/wp-content/uploads/2015/03/DRUKER\\_OPEN-LETTER-TO-THE-ROYAL-SOCIETY\\_Final.pdf](http://beyond-gm.org/wp-content/uploads/2015/03/DRUKER_OPEN-LETTER-TO-THE-ROYAL-SOCIETY_Final.pdf)

<sup>50</sup> [https://sustainablepulse.com/2018/10/09/the-creator-of-gmo-potatoes-reveals-the-dangerous-truth-exclusive-interview/#.W70H-i97E\\_V](https://sustainablepulse.com/2018/10/09/the-creator-of-gmo-potatoes-reveals-the-dangerous-truth-exclusive-interview/#.W70H-i97E_V)

**How many years did you spend working on creating GM potatoes? Was this all lab-based work or did you get out to see the farms that were growing the potatoes?**

*“During my 26 years as a genetic engineer, I created hundreds of thousands of different GM potatoes at a direct cost of about \$50 million. I started my work at universities in Amsterdam and Berkeley, continued at Monsanto, and then worked for many years at J. R. Simplot Company, which is one of the largest potato processors in the world. I had my potatoes tested in greenhouses or the field, but I rarely left the laboratory to visit the farms or experimental stations. Indeed, I believed that my theoretical knowledge about potatoes was sufficient to improve potatoes. This was one of my biggest mistakes.”*

**Why have you decided to reveal information about the failings of GM potatoes after spending many years creating them?**

*“I dedicated many years of my life to the creation of GMO potatoes, and I initially believed that my potatoes were perfect but then I began to doubt. It again took me many years to take a step back from my work, reconsider it, and discover the mistakes. Looking back at myself and my colleagues, I believe now that we were all brainwashed; that we all brainwashed ourselves. We believed that the essence of life was a dead molecule, DNA, and that we could improve life by changing this molecule in the lab. We also assumed that theoretical knowledge was all we needed to succeed, and that a single genetic change would always have one intentional effect only.*

*We were supposed to understand DNA and to make valuable modifications, but the fact of the matter was that we knew as little about DNA as the average American knows about the Sanskrit version of the Bhagavad Gita. We just knew enough to be dangerous, especially when combined with our bias and narrowmindedness. We focused on short-term benefits (in the laboratory) without considering the long-term deficits (in the field). It was the same kind of thinking that produced DDT, PCBs, Agent Orange, recombinant bovine growth hormone, and so on. I believe that it is important for people to understand how little genetic engineers know, how biased they are, and how wrong they can be. My story is just an example.”*

**Have the GM potatoes you helped create been approved by the FDA and EPA in the U.S. or indeed elsewhere in the world?**

*“It is amazing that the USDA and FDA approved the GM potatoes by only evaluating our own data. How can the regulatory agencies assume there is no bias? When I was at J.R. Simplot, I truly believed that my GM potatoes were perfect, just like a parent believes his or her children are perfect. I was biased and all genetic engineers are biased. It is not just an emotional bias. We need the GM crops to be approved. There is a tremendous amount of pressure to succeed, to justify our existence by developing modifications that create hundreds of millions of dollars in value. We test our GM crops to confirm their safety, not to question their safety.*

*The regulatory petitions for deregulation are full with meaningless data but hardly include any attempts to reveal the unintended effects. For instance, the petitions describe the insertion site of the transgene, but they don’t mention the numerous random mutations that occurred during the tissue culture manipulations. And the petitions provide data on compounds that are safe and don’t matter, such as the regular amino acids and sugars, but hardly give any measurements on the levels of potential toxins or allergens.*

*The Canadian and Japanese agencies approved our GMO potatoes as well, and approvals are currently considered in China, South Korea, Taiwan, Malaysia, Singapore, Mexico, and the Philippines.”*

**Is it possible for GM potatoes to cause gene-silencing in other potatoes or pollinating insects such as bees?**

*“The problem with certain insects, including bees, is that they cannot degrade the small double-stranded RNAs that cause gene silencing. These double-stranded RNAs were intended to silence several potato genes in tubers, but they are likely to be expressed in pollen as well. So, when the pollen is consumed by bees, the double stranded RNAs in this pollen may silence bee genes that share inadvertent homology.”*

**Your new book Pandora’s Potatoes, which is available to the public for the first time this week, includes many points as to why the GM potatoes you helped create should not be grown by farmers or eaten by the public. What would you like to say to the FDA and EPA?**

*“The main problem about the current process for deregulation of GMO crops is that it is based on an evaluation of data provided by the developers of GMO crops. There is a conflict of interest. I propose that the safety of GMO crops is assessed by an independent group of scientists trained at identifying unintended effects.”*

### **Release of Genetically Engineered Trees would be a massive and irreversible experiment**

The Genetically engineered American Chestnut (GE AC) is specifically intended to be released into forests, and to spread its GE pollen and seeds. Locating and monitoring all GE AC trees and their progeny will be nearly impossible, especially over a long period of time.<sup>51</sup>

The release of GE AC into forests would be a massive and irreversible experiment. The introduction of GE AC could not only fail, but also create new problems and exacerbate existing pressures on forest ecosystems. Forests are already threatened by unsustainable logging practices, invasive species and introduced pests and pathogens, urban sprawl, and the escalating impacts of climate change. Without solving these underlying causes of forest demise, the restoration of the American chestnut through any technology is highly improbable.

Page 16: In a 2016 article, Beckers *et al.* state: *“The interactions between a plant and its microbiome are highly complex and dynamic, involving multiple reciprocal signaling mechanisms and an intricate interplay between the bacteria and the plant’s innate immune system. Therefore, even small changes in the host genome (ecotypes, cultivars, genetically modified genotypes, etc.) may influence the plant microbiome and may even feed-back to modulate the behavior and the productivity of the host plant.”* Very little is known about the impact of genetic engineering on tree microbiomes, nor has it been a focus of environmental impact studies. However, one study of genetically engineered poplars did report changes in endosphere microbiome as a result of altered lignin biosynthesis.

Page 21: A 2018 review of GE trees sums up the commercial focus of current research: *“Genetic engineering of trees to improve productivity, wood quality, and resistance to biotic and abiotic stresses has been the primary goal of the forest biotechnology community for decades. ... Examples include novel methods for lignin modification, solutions for long-standing problems related to pathogen resistance, modifications to flowering onset and fertility, and drought and freeze tolerance.”*

### **Evidence that glyphosate/Roundup damages human health**

**There are more than 18,000 plaintiffs in the US who are suing Monsanto/Bayer for Roundup causing Non-Hodgkin Lymphoma but concealing it from the general public**

The British Government and the UK media are, at present, supporting Bayer Crop Science but the figures from Cancer Research UK (CRUK) for NHL are ominously high. In the UK there were 13,605 new cases of Non-Hodgkin Lymphoma in 2015 (and 4,920 deaths in 2016).

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<sup>51</sup> <https://stopgetrees.org/wp-content/uploads/2019/04/biotechnology-for-forest-health-test-case-american-chestnut-report-WEB-1.pdf>

The statistics are equally disastrous for many other cancers.

**In the UK, each year there are steady increases in the numbers of new cancers and increases in deaths from the same cancers, with no treatments making any difference to the numbers.**

In the UK there were 41,804 new cases of bowel cancer in 2015 (and 16,384 deaths in 2016); 12,547 new cases of kidney cancer in 2015 (and 4,619 deaths in 2016); 5,736 new cases of liver cancer in 2015 (5,417 deaths in 2016); 15,906 new cases of melanoma in 2015 (2,285 deaths in 2016); 3,528 new cases of thyroid cancer in 2015 (382 deaths in 2016); 10,171 new cases of bladder cancer in 2015 (5,383 deaths in 2016); 8,984 new cases of uterine cancer in 2015 (2,360 deaths in 2016); 7,270 cases of ovarian cancer in 2015 (4,227 deaths in 2016); 9,900 new cases of leukaemia in 2015 (4,712 deaths in 2016); 55,122 new cases of invasive breast cancer in 2015 (11,563 deaths in 2016); 47,151 new cases of prostate cancer in 2015 (11,631 deaths in 2016); 9,211 new cases of oesophageal cancer in 2015 (8,004 deaths in 2016); and 5,540 new cases of myeloma in 2015 (3,079 deaths in 2016); 2,288 new cases of testicular cancer in 2015 (57 deaths in 2016); 9,921 new cases of pancreatic cancer in 2015 (9,263 deaths in 2016); 11,432 new cases of brain cancer in 2015 (5,250 deaths in 2016); 46,388 new cases of lung cancer in 2015 (and 35,620 deaths in 2016). In the US in 2014 there were 24,050 new cases of myeloma.

**Roundup/glyphosate causes birth defects at low doses**

The late Professor Andrés Carrasco was lead embryologist at the University Buenos Aires Medical School and the Argentinean National Research Council. Reports of neural defects and craniofacial malformations from regions where glyphosate-based herbicides (GBH) were used led him to undertake an embryological approach to explore the effects of low doses of glyphosate in development. His research showed that glyphosate, an agrochemical used on genetically modified soy and rice in Argentina, caused teratogenic effects (neural tube defects) in frog and chick embryos exposed to low dose glyphosate at levels far below those frequently used in agricultural spraying.<sup>52</sup> *“Treated embryos were highly abnormal with marked alterations in cephalic and neural crest development and shortening of the anterior-posterior (A-P) axis. It was shown that the effects were due to the glyphosate itself, rather than the additive.”* This confirmed that the birth defects that were occurring in rural communities in the crop-sprayed towns of Argentina were due to glyphosate/Roundup. Monsanto went to great lengths to try to suppress this research.

**Séralini’s 2-year feeding study provoked chronic hormone and sex dependent pathologies in rats; males developed tumours at 4 months and females at 7 months**

- A Roundup®-tolerant maize and Roundup® provoked chronic hormone and sex dependent pathologies.
- Female mortality was 2–3 times increased mostly due to large mammary tumours and disabled pituitary.
- Males had liver congestions, necrosis, severe kidney nephropathies and large palpable tumours.
- This may be due to an endocrine disruption linked to Roundup® and a new metabolism due to the transgene.
- GMOs and formulated pesticides must be evaluated by long term studies to measure toxic effects.

**Monsanto and their lobbyists got it retracted from the *Journal of Food and Chemical Toxicology*<sup>53</sup> after more than a year but it was republished in 2014 in *Environmental Sciences Europe*<sup>54</sup>**

<sup>52</sup> Paganelli, A. *et al.* Glyphosate-Based Herbicides Produce Teratogenic Effects on Vertebrates by Impairing Retinoic Acid Signaling *Chem. Res. Toxicol.*, 2010, 23 (10), 1586–1595. DOI: 10.1021/tx1001749

<sup>53</sup> <http://pubs.acs.org/doi/abs/10.1021/tx1001749>

<sup>53</sup> <http://dx.doi.org/10.1016/j.fct.2012.08.005>

<sup>54</sup> <https://enveurope.springeropen.com/articles/10.1186/s12302-014-0014-5>

### Breast cancer and glyphosate

A study in 2013 showed that breast cancer cell proliferation is accelerated by glyphosate in extremely low concentrations: *"The present study used pure glyphosate substance at log intervals from  $10^{-12}$  to  $10^{-6}$  M. These concentrations are in a crucial range which correlated to the potential biological levels at part per trillion (ppt) to part per billion (ppb) which have been reported in epidemiological studies."* A new study (2019) shows that a very low concentration of glyphosate (in the parts per trillion range and thus environmentally relevant for everyone) can trigger an aggressive form of breast cancer when combined with another risk factor.<sup>55</sup> In the UK, there were 55,122 new cases of invasive breast cancer in 2015 (11,563 deaths in 2016).

### Jess Rowlands US EPA allegedly bragged he could kill off the cancer risk

It included emails in which an [Environmental Protection Agency](#) official Jess Rowlands who was in charge of evaluating the cancer risk of [Monsanto Co.](#)'s Roundup allegedly bragged to a company executive that he deserved a medal if he could kill another agency's investigation into the herbicide's key chemical.

### A letter written by the late Marion Copley US EPA toxicologist to her colleague Jess Rowland<sup>56</sup>

It's been four years since Marion Copley, a toxicologist who had worked for 30 years for the EPA, wrote this letter to her then-colleague, Jess Rowland, accusing him of conniving with Monsanto to bury the agency's own hard scientific evidence that it is *"essentially certain"* that glyphosate, the key ingredient in Monsanto's Roundup weed killer, causes cancer. The date of the letter comes after Copley left the EPA in 2012 and shortly before she died from breast cancer at the age of 66 in January 2014. She accuses Rowland of having *"intimidated staff"* to change reports to favor industry, and writes that research on glyphosate, the key ingredient in Monsanto's Roundup, shows the pesticide should be categorized as a *"probable human carcinogen."*

"Jess,

*Since I left the agency with cancer [breast] I have studied the tumor process extensively and I have some mechanism comments which may be very valuable to CARC based on my decades of pathology experience. Glyphosate was originally designed as a chelating agent and I strongly believe that is the identical process involved in tumor formation."*

In a 1-page letter Dr Copley makes 14 observations about chelators and/or glyphosate, including that they are endocrine disruptors, suppress the immune system, damage the kidneys or pancreas which can lead to clinical chemistry changes that favor tumor growth; glyphosate kills bacteria in the gut, the gastrointestinal system is 80% of the immune system making the body susceptible to tumors.

She goes on to say: ***"It is essentially certain that glyphosate causes cancer."***

Dr Copley ends with the statement: *"I have cancer, and I don't want these serious issues in HED [EPA's Health Effects Division] to go unaddressed before I go to my grave. I have done my duty."*

### Many young workers in the sugar cane and tea industries have developed Chronic Kidney Disease of unknown origin (CKDu) and died from renal failure following GBH spraying to ripen the crop

Professor Channa Sudath Jayasumana from Rajarata University [announced](#) earlier this week that a group of farmer organizations, researchers, patients and the families of deceased farmers are set to take Bayer/Monsanto and other glyphosate herbicide manufacturers to the Supreme Court of Sri Lanka over the link between glyphosate-based herbicides and fatal chronic kidney disease of unknown etiology (CKDu), which has killed an estimated 25,000 people in the country.<sup>57</sup> In Sri Lanka

<sup>55</sup> <https://www.frontiersin.org/articles/10.3389/fgene.2019.00885/full>

<sup>56</sup> <https://www.organicconsumers.org/sites/default/files/marioncopleyletter.pdf>

<sup>57</sup> <https://sustainablepulse.com/2018/08/18/glyphosate-set-for-legal-battle-in-sri-lanka-over-kidney-disease-deaths/#.W46ZiS3Mx0t>

alone CKDu now afflicts over 15% of people of working age in the Northern part of the country; a total of 400,000 patients with an estimated death toll of around 25,000. CKDu affects workers in eleven countries on three continents: Sri Lanka, India, the Pacific coast of Central America, Louisiana, Africa and Vietnam.

**Chronic kidney Disease** Over a ten-year period from 2005 to 2015, the number of people dying from chronic kidney disease across the world rose by 31.7%. Kidney Research UK estimates that, in the UK alone, some three million lives are at risk from CKD with one million of these cases undiagnosed. This correlates with Séralini's team finding heavy metals contaminating glyphosate-based herbicides. It is also confirmed by his initial study which reported liver and kidney damage. It was republished because of retraction by *Food and Chemical Toxicology*, "After 24 months feeding studies, Males (rats) had liver congestions, necrosis, severe kidney nephropathies and large palpable tumours." <sup>58</sup>

### **Neurotransmitter changes in the brain from exposure to Glyphosate-based herbicides**

Many papers come from Latin American countries where they grow almost exclusively GM Roundup Ready Crops that Monsanto forced on them in 1996. Here are just three papers.

Behavioral impairments following repeated intranasal glyphosate-based herbicide administration in mice. <sup>59</sup>

*Taken together, our findings demonstrate that intranasal (IN) exposure to commercial Gly-BH produces alterations in locomotor activity, anxiety and memory in adult mice. These observations could be a consequence of alterations in neurotransmission systems comprising the GABAergic, dopaminergic, serotonergic and/or cholinergic systems.*" In this research paper there are references to many papers from around the world that confirm the glyphosate-based herbicides are damaging to the development of the foetal brain and that repeated exposure is toxic to the adult human brain and may result in alterations in locomotor activity, feelings of anxiety and memory impairment.

Martínez, M. A., Ares, I., Rodríguez, J. L., Martínez, M., Martínez-Larrañaga, M. R., & Anadón, A. (2018). Neurotransmitter changes in rat brain regions following glyphosate exposure. *Environmental Research*, 161, 212-219. <sup>60</sup>

Highlights:

- Glyphosate oral exposure caused neurotoxicity in rats.
- Brain regions were susceptible to changes in CNS monoamine levels.
- Glyphosate reduced 5-HT, DA, NE levels in a brain regional- and dose-related manner.
- Glyphosate altered the serotonergic, dopaminergic and noradrenergic systems.

Mechanisms underlying the neurotoxicity induced by glyphosate-based herbicide in immature rat hippocampus: Involvement of glutamate excitotoxicity. <sup>61</sup>

**This is why there are so many mental health and psychiatric disorders, depression, suicides, anxiety and violence among children and adults (politicians included).**

### **Neurobehavioural effects of developmental toxicity** <sup>62</sup>

"*Neurodevelopmental disabilities, including autism, attention-deficit hyperactivity disorder, dyslexia, and other cognitive impairments, affect millions of children worldwide, and some diagnoses seem to be increasing in frequency. Industrial chemicals that injure the developing brain are among the known causes for this rise in prevalence. Since 2006, epidemiological studies have documented six additional developmental neurotoxicants—manganese, fluoride, **chlorpyrifos**, dichlorodiphenyl-trichloroethane, tetrachloroethylene, and the polybrominated diphenyl ethers. Pesticides mentioned, each with supporting references, were: **Acetamiprid**, amitraz, avermectin, emamectin, fipronil*

<sup>58</sup> <https://enveurope.springeropen.com/articles/10.1186/s12302-014-0014-5>

<sup>59</sup> <https://www.sciencedirect.com/science/article/pii/S0892036217301526>

<sup>60</sup> <https://www.sciencedirect.com/science/article/pii/S0013935117316730>

<sup>61</sup> <https://www.sciencedirect.com/science/article/pii/S0300483X14000493>

<sup>62</sup> [http://www.thelancet.com/pdfs/journals/laneur/PIIS1474-4422\(13\)70278-3.pdf](http://www.thelancet.com/pdfs/journals/laneur/PIIS1474-4422(13)70278-3.pdf)

(Termidor), **glyphosate**, hexaconazole, **imidacloprid**, tetramethylenedisulfotetramine. *We postulate that even more neurotoxicants remain undiscovered. Untested chemicals should not be presumed to be safe to brain development, and chemicals in existing use and all new chemicals must therefore be tested for developmental neurotoxicity. To coordinate these efforts and to accelerate translation of science into prevention, we propose the urgent formation of a new international clearinghouse.”* The ones in bold are still registered by Defra/Fera in the UK.

### **Glyphosate-induced cell death: associations with neurodegenerative disorders in humans**<sup>63</sup>

Ya-xing Gui et al. [Glyphosate induced cell death through apoptotic and autophagic mechanisms.](#) *Neurotoxicology and Teratology* 2012, **34 (3)**: 344–349

*Herbicides have been recognized as the main environmental factor associated with human neurodegenerative disorders such as Parkinson's disease (PD). Previous studies indicated that the exposure to glyphosate, a widely used herbicide, is possibly linked to Parkinsonism, however the underlying mechanism remains unclear. We investigated the neurotoxic effects of glyphosate in differentiated PC12 cells and discovered that it inhibited viability of differentiated PC12 cells in dose- and time-dependent manners. Furthermore, the results showed that glyphosate induced cell death via autophagy pathways in addition to activating apoptotic pathways. Interestingly, deactivation of Beclin-1 gene attenuated both apoptosis and autophagy in glyphosate treated differentiated PC12 cells, suggesting that Beclin-1 gene is involved in the crosstalk between the two mechanisms.*

### **Differential impact of pure glyphosate and glyphosate-based herbicide in a model of peripheral nervous system myelination**<sup>64</sup>

In 2018 a scientific paper from two neurologists in Germany showed that Glyphosate-based herbicides cause demyelination.

### **ECHA's Committee for Risk Assessment (RAC) agrees to maintain the current harmonised classification of glyphosate as a substance causing serious eye damage and being toxic to aquatic life with long-lasting effects.**

RAC concluded that the available scientific evidence did not meet the criteria to classify glyphosate as a carcinogen, as a mutagen or as toxic for reproduction.<sup>65</sup>

**Helsinki, 15 March 2017** – RAC assessed glyphosate’s hazardousness against the criteria in the Classification, Labelling and Packaging Regulation. They considered extensive scientific data in coming to their opinion.

The committee concluded that the scientific evidence available at the moment warrants the following classifications for glyphosate according to the CLP Regulation:

- Eye Damage 1; H318 (Causes serious eye damage)
- Aquatic Chronic 2; H411 (Toxic to aquatic life with long lasting effects)

RAC concluded that the available scientific evidence did not meet the criteria in the CLP Regulation to classify glyphosate for specific target organ toxicity, or as a carcinogen, as a mutagen or for reproductive toxicity.

### **An increase in cataracts has been confirmed by epidemiological studies in England and by a 2016 WHO Report**

Annual rates of admission for cataract surgery in England rose 10-fold from 1968 to 2004: from 62 episodes per 100,000 population in 1968 to 637 in 2004.<sup>66</sup> A 2016 study by the WHO also confirmed that the incidence of cataracts had greatly increased:<sup>67</sup> ‘A global assessment of the burden of disease from environmental risks’ it says that cataracts are the leading cause of blindness

<sup>63</sup> <http://www.sciencedirect.com/science/journal/08920362>

<sup>64</sup> <http://link-springer-com-443.webvpn.jxutcm.edu.cn/article/10.1007%2Fs00401-018-1938-4>

<sup>65</sup> <https://echa.europa.eu/-/glyphosate-not-classified-as-a-carcinogen-by-echa>

<sup>66</sup> <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1955650/>

<sup>67</sup> [http://apps.who.int/iris/bitstream/10665/204585/1/9789241565196\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/204585/1/9789241565196_eng.pdf)

worldwide. Globally, cataracts are responsible for 51% of blindness – an estimated 20 million individuals suffer from this degenerative eye disease. In Wales, 35,000 patients are at risk of going blind from macular degeneration and glaucoma while on the waiting list.<sup>68</sup>

### **Multimomics reveal non-alcoholic fatty liver disease in rats following chronic exposure to an ultra-low dose of Roundup herbicide.**<sup>69</sup>

Overall, metabolome and proteome disturbances showed a substantial overlap with biomarkers of non-alcoholic fatty liver disease and its progression to steatohepatosis and thus confirm liver functional dysfunction resulting from chronic ultra-low dose Glyphosate-Based Herbicide (GBH) exposure. The study is the first ever to show a causative link between consumption of Roundup at a real-world environmentally relevant dose and a serious disease. NAFLD currently affects **25% of the US population** and **similar numbers of Europeans**. Risk factors include being overweight or obese, having diabetes, or having high cholesterol or high triglycerides (a constituent of body fat) in the blood. However, some people develop NAFLD even if they do not have any of these known risk factors.

### **Roundup caused a 50% decrease in sperm count in males between 1973 and 2011**

Researchers from Brazil where babies who are lactose intolerant drink GM soy milk found that in rats fed soy milk it elicits endocrine-disrupting effects, by decreasing serum testosterone levels, decreased Sertoli cell numbers and increased percentage of degenerated Sertoli and Leydig cells.<sup>70</sup> Prof Hagai Levine from the Hebrew University of Jerusalem undertook a rigorous and comprehensive meta-analysis of data collected between 1973 and 2011 finds that among men from Western countries, sperm concentration declined by more than 50 percent, with no evidence of a 'leveling off' in recent years.<sup>71</sup> Prof Levine suggested endocrine disruption from chemical exposures “*during critical windows of male reproductive development may play a role in prenatal life*” and “*exposure to pesticides may play a role in adult life. Thus, a decline in sperm count might be considered as a ‘canary in the coal mine’ for male health across the lifespan.*”

## **Some research papers on animals fed with GM Soy and Corn**

### **The first study to measure glyphosate residues in Danish dairy cattle and its impact on blood parameters. Field Investigations of Glyphosate in Urine of Danish Dairy Cows<sup>72</sup>**

*Abstract: In the present study, thirty dairy cows from each of eight Danish dairy farms were investigated for excretion of glyphosate in urine. Blood serum parameters indicative of cytotoxicity as alkaline phosphatase (AP), glutamate dehydrogenase (GLDH), glutamate oxaloacetate transaminase (GOT), creatinine kinase CK), nephrotoxicity, (urea, creatine), cholesterol and the trace elements as manganese (Mn), cobalt (Co), selenium (Se), copper (Cu) and zinc (Zn) were investigated. All cows excreted glyphosate in their urine but in varying concentrations. Increased levels of GLDH, GOT and CK in cows from all farms demonstrate a possible effect of glyphosate on liver and muscle cells. High urea levels in some farms could be due to nephrotoxicity of glyphosate. Also, the unexpected very low levels of Mn and Co were observed in all animals which could be explained due to a strong mineral chelating effect of glyphosate. In contrast the mean levels of Cu, Zn and Se were within the normal reference range. In conclusion, this study gives the first documentation to which extent Danish dairy cattle are exposed to Glyphosate and its impact on blood parameters.*

<sup>68</sup> <https://www.bbc.co.uk/news/uk-wales-48585767>

<sup>69</sup> <http://www.nature.com/articles/srep39328>

<sup>70</sup> <http://www.sciencedirect.com/science/article/pii/S0278691516304896>

<sup>71</sup> <https://academic.oup.com/humupd/article/doi/10.1093/humupd/dmx022/4035689/Temporal-trends-in-sperm-count-a-systematic-review>

<sup>72</sup> <http://dx.doi.org/10.4172/2161-0525.1000186>

### Glyphosate in human urine<sup>73</sup>

A study conducted by the Heinrich Böll Foundation discovered that 99.6% of German people has glyphosate residues in urine. Most of them are those who eat meat, because of animal feed containing GM soy and corn. Glyphosate entered the humans' food chain, studies demonstrate. According to the Italian Organic Agriculture Association (AIAB), in order to prove the presence of the controversial weed killer in our daily life, bread was analysed in the United Kingdom, water in France and breast milk as well as tampons in the United States. Germany chose to analyse glyphosate residues in 2,009 German people's urine. The study reveals that 75% of the target group displayed levels that were five times higher than the legal limit of drinking water. One third of the people contaminated with glyphosate even showed levels that were between 10 and 42 times higher than what is generally admissible. Only 0.4% of the 2,009 samples was completely free from glyphosate residues, so almost all Germans (99.6%) have residues of the weed killer in their body. The most significant levels were found in children aged 0 to 9, teenagers aged 10 to 19, and farmers. "The investigation confirmed the findings of the Federal Environment Agency, in regards to the majority of the population having glyphosate residue in their urine. The investigation was the largest of its kind ever carried out and volunteers from all over Germany participated in it. The findings exemplify that further research must be conducted in order to grasp the link between glyphosate exposure through food, drinking water or air and serious diseases", said veterinarian Professor Monika Krüger, author of the study.

Those who eat meat showed higher levels of glyphosate than vegetarians and vegans. Also, those who consume organic products are less intoxicated than people who eat non-organic food.

### Analysis of glyphosate residues in malformed piglets

Glyphosate residues in different organs and tissues as lungs, liver, kidney, brain, gut wall and heart of malformed euthanized one-day-old Danish piglets (N= 38) were tested using ELISA. All organs or tissues had glyphosate in different concentrations. The highest concentrations were seen in the lungs (Range 0.4-80 µg/ml) and hearts (Range 0.15-80 µg/ml).<sup>74</sup> The authors gave an overview of reports of malformations in children of families living few meters from where this herbicide was sprayed. The risk of malformation in human embryos is very high when their mothers are contaminated at 2 to 8 weeks of pregnancy.

### The effects of glyphosate on pathogens in farm animals

Several papers have demonstrated the effects of glyphosate on pathogens in farm animals: it destroys beneficial bacteria and allows harmful ones, such as *salmonella*, and *clostridium*, to flourish. The action of glyphosate as a biocide on normal gut flora could be a significant predisposing factor to the increases in *Clostridium botulinum*-associated diseases<sup>75</sup> in cattle which have occurred in Germany over the last 10-15 years.<sup>76</sup> Similar effects have been shown gut bacteria in poultry<sup>77</sup> and on microorganisms in milk.<sup>78</sup>

<sup>73</sup> <https://www.lifegate.com/people/lifestyle/glyphosate-almost-all-germans-intoxicated>

<sup>74</sup> <http://www.omicsonline.org/open-access/detection-of-glyphosate-in-malformed-piglets-2161-0525.1000230.pdf>

<sup>75</sup> <http://www.sciencedirect.com/science/article/pii/S1075996411002344>

<sup>76</sup> <https://www.ncbi.nlm.nih.gov/m/pubmed/23396248/?i=4&from=/15071029/related> Krüger, M. *et al.*

Glyphosate suppresses the antagonistic effect of *Enterococcus* spp. on *Clostridium botulinum*. *Anaerobe* 2013, Feb 6

<sup>77</sup> <http://link.springer.com/article/10.1007/s00284-012-0277-2> Shehata, A.A. *et al.* The Effect of Glyphosate on Potential Pathogens and Beneficial Members of Poultry Microbiota *In Vitro*. *Current Microbiology* 2013, 66 (4): 350- 58

<sup>78</sup> <http://link.springer.com/article/10.1007/s00284-012-0098-3> Clair, E. *et al.* Effects of Roundup® and Glyphosate on Three Food Microorganisms: *Geotrichum candidum*, *Lactococcus lactis* subsp. *cremoris* and *Lactobacillus delbrueckii* subsp. *bulgaricus*. *Curr Microbiol*. Epub 2012 Feb 24.

### **Birth defects in animals in Montana correlates with glyphosate usage on crops and with birth defects in humans**

A recent study by Hoy *et al.* found alarming increases in congenital malformations in wildlife in Montana that Hoy has been documenting for the past 19 years.<sup>79</sup> Similar birth defects have occurred in humans in the USA. Their graphs illustrating human disease patterns over the twelve-year period correlate remarkably well with the rate of glyphosate usage on corn, soy and wheat crops, which has increased due to “Roundup® Ready” crops. While the animals’ exposure to the herbicide is through food, water and air, the authors believe that human exposure is predominantly through food, as the majority of the population does not reside near agricultural fields and forests. They conclude: *“Our over-reliance on chemicals in agriculture is causing irreparable harm to all beings on this planet, including the planet herself. Most of these chemicals are known to cause illness, and they have likely been causing illnesses for many years. But until recently, the herbicides have never been sprayed directly on food crops, and never in this massive quantity. We must find another way”*.

### **The global legacy of aspartame, Monsanto’s neurotoxic sweetener**

#### **Why Monsanto chose Britain to be the Rapporteur Member State with backup from EFSA**

Aspartame was first synthesised in 1965 in the US. It is an addictive, excite-neurotoxic, carcinogenic, genetically engineered drug and adjuvant that damages the mitochondria and interacts with drugs and vaccines. For the first 16 years the FDA banned it. Aspartame was shown by FDA scientists to cause brain tumours, epilepsy and neurotoxic effects. However, the CEO of Searle that manufactured aspartame was a man called Donald Rumsfeld. He and President Ronald Reagan (a man famed for his deregulation of the US EPA) between them managed to get it passed for use in a wide number of fizzy diet drinks in 1982. It has been approved for use in Britain since then. In 1985 (when Monsanto purchased Searle, that held the patent to aspartame) the late FDA toxicologist, Dr Adrian Gross, confirmed to congress that it was highly neurotoxic (1985, Senate) and that aspartame violated the Delaney Amendment because it caused brain tumors and brain cancer.<sup>80</sup> Many independent researchers have confirmed its dangers but industry studies say it is safe. In 2007 a Review was published in *Nature*: Direct and indirect cellular effects of aspartame on the brain.<sup>81</sup> *“Aspartame is composed of phenylalanine (50%), aspartic acid (40%) and methanol (10%). Phenylalanine plays an important role in neurotransmitter regulation, whereas aspartic acid is also thought to play a role as an excitatory neurotransmitter in the central nervous system. Glutamate, asparagines and glutamine are formed from their precursor, aspartic acid. Methanol, which forms 10% of the broken-down product, is converted in the body to formate, which can either be excreted or can give rise to formaldehyde, diketopiperazine (a carcinogen) and a number of other highly toxic derivatives.”*

The UK is the Rapporteur Member State for aspartame Monsanto’s controversial sweetener. EC rules specify that the RMS be chosen by Industry.<sup>82</sup> It appears that the Committee on Toxicity of Chemicals in Foods (CoT) had only consulted industry literature, since they have allowed aspartame to be approved since 1982. Professor David Coggon was Chairman at the time of the latest reassessment of aspartame (2013).

*“At its meeting on 29 October 2013, the Committee on Toxicity of Chemicals in foods (CoT) discussed a paper, describing results from a study led by scientists at Hull York Medical School.” ... CoT POSITION PAPER ON A DOUBLE-BLIND RANDOMIZED CROSSOVER STUDY OF ASPARTAME.<sup>83</sup>*

<sup>79</sup> <http://www.esciencecentral.org/journals/the-high-cost-of-pesticides-human-and-animal-diseases-2375-446X-1000132.php?aid=56471>

<sup>80</sup> <http://www.mpwhi.com/main.htm>

<sup>81</sup> <http://www.nature.com/ejcn/journal/v62/n4/full/1602866a.html>

<sup>82</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009R1107>

<sup>83</sup> <http://cot.food.gov.uk/pdfs/cotposponaspar.pdf>

No one is allowed to see this study until it has been accepted for publication in a peer-reviewed journal. *“The Committee judged the delay acceptable since the results presented did not indicate any need for action to protect the health of the public.”* EFSA has also re-evaluated the safety of aspartame.<sup>84</sup> As a result, it concluded in December 2013 that *'aspartame and its breakdown products are safe for human consumption at current levels of exposure'*.

Independent scientist Erik Millstone<sup>85</sup> Professor in Science & Technology Policy, Sussex University sent a 67-page detailed response to the Head of EFSA 'Food Ingredients and Packaging' Unit and the Senior Scientific Officer.<sup>86</sup> He strongly disputed their re-assessment. EFSA ignored his response, just as the US EPA ignored evidence from Dr Betty Martini and Dr John Olney.<sup>87</sup>

**EFSA's toxicological assessment of aspartame: was it even-handedly trying to identify possible unreliable positives and unreliable negatives?<sup>88</sup> Erik Millstone and Elisabeth Dawson**

*A detailed appraisal is provided of the most recent (December 2013) assessment of the safety and/or toxicity of the artificial sweetener aspartame by the European Food Safety Authority's Panel on Food Additives and Nutrient Sources Added to Food. That appraisal is prefaced with a contextualising chronological account drawn from a documentary archive of the key highlights of the antecedent scientific and policy debates concerning this sweetener from the early 1970s onwards.*

*Eighty-one studies were identified that prima facie did not indicate any possible harm, and of those the panel deemed 62 to be reliable and 19 as unreliable. Seventy-three studies were identified that prima facie did indicate possible harm; of those the panel deemed all 73 to be unreliable; none were deemed reliable. A qualitative comparative review of the criteria of appraisal invoked by the panel to judge the reliability of putative negative and positive studies is also provided.*

*The quantitative result indicate that the panel's appraisal of the available studies was asymmetrically more alert to putative false positives than to possible false negatives. The qualitative analysis shows that very demanding criteria were used to judge putative positive studies, while far more lax and forgiving criteria were applied to putative negative studies.*

Erik Millstone and Elisabeth Dawson demonstrated that the European Food Safety Authority's Panel on Food Additives and Nutrient Sources Added to Food showed bias towards the industry studies that said aspartame caused no harm.

Rosemary Mason 09/10/2019

<sup>84</sup> <http://www.food.gov.uk/news-updates/news/2013/dec/efsa-aspartame#.UuAtV3xFDcs>

<sup>85</sup> Professor of Science Policy at the University of Sussex

<sup>86</sup> [http://sro.sussex.ac.uk/43821/1/EM\\_Letter\\_to\\_EFSA\\_on\\_Aspartame\\_22Feb2013.pdf](http://sro.sussex.ac.uk/43821/1/EM_Letter_to_EFSA_on_Aspartame_22Feb2013.pdf)

<sup>87</sup> <http://www.scribd.com/doc/6669992/Dr-John-Olney-Statement-Aspartame-1987> Dr. John Olney's letter to the Senate in 1987.

<sup>88</sup> <https://archpublichealth.biomedcentral.com/articles/10.1186/s13690-019-0355-z>