GLOBAL HUMAN HEALTH – IN THE HANDS OF THE PESTICIDES INDUSTRY

Evidence to the Parliamentary Environmental Audit Committee

30/01/2013

Compiled by Rosemary Mason MB ChB FRCA on behalf of a global network of beekeepers, toxicologists, scientists, farmers and environmentalists. Within it, Georgina Downs, founder of the UK Pesticides Campaign, has given a summary her evidence

UK Sixth public evidence hearing: Insects and Insecticides 30/01/2013

Dr Julian Little of Bayer CropScience has been called back to account for discrepancies in his evidence to the Parliamentary Environmental Audit Committee on 28/11/2012. He said that the half-life of imidacloprid and clothianidin in soil was 16-200 days. The Footprint Database International Union of Pure and Applied Chemistry [IUPAC] data for clothianidin quotes 13-1386 days depending on the type of soil.
Dr Little also made untruthful statements about imidacloprid and clothianidin 2 years ago.
On 05/12/2010 he was asked the following (email) question with regard to the booklet, Bee Safe Bee Careful: "*What is the effect of seed dressing on the life in the soil, particularly earthworms?"*
Dr Little replied: "*For insecticides such as clothianidin or imidacloprid, both sub-chronic and long-term field studies are available which show that at normal field rates, there is no significant effect on the abundance or behaviour of earthworms in natural soil populations. Soil concentrations continue to decline to very low levels over time and such substances do not negatively influence soil microbial activity or other non-target flora and fauna. To be blunt about this, the single biggest farming activity to impact on earthworm populations is the plough; the use of selective seed treatments comes a long way down that list!!! It is important that farmers use such products responsibly such that they control the insect pests that they need to control to produce high quality affordable food, without impacting on non-target organisms*."
Yours sincerely, Julian

Dr Little's statements contradict the Australian Pesticides and Veterinary Medicines Authority (APVMA) Registration Document for clothianidin, on all counts: *"Effects on beneficial organisms may be also expected at the application rates…Toxic to soil invertebrates, earthworms and collembola... Degradation in soil is slow, with half-lives ranging from 1-2 years and in one case no dissipation of clothianidin being recorded.* There are clear warnings on the APVMA website for clothianidin. *"This product is highly toxic to aquatic invertebrates. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters. Do not apply directly to water or to areas where surface water is present or to intertidal areas below the mean high-water mark".*

Global human health and pesticides. The Silent Destroyers

Neonicotinoid insecticides
In 1991, Bayer CropScience introduced a new type of insecticide into the US; imidacloprid, the first member of a group now known as the neonicotinoids. Bayer Scientist Abbink certified that: *"imidacloprid is the first highly effective insecticide whose mode of action has been found to derive from almost complete and virtually irreversible blockage of post synaptic nicotinic acetylcholine receptors (nAChRs) in the central nervous system (CNS) of insects."* Imidacloprid differed from conventional spray pesticides in that it could be used as seed dressings or soil treatments. When used as a seed dressing the insecticide will migrate from the stem to the leaf tips, and eventually into the flowers and pollen. Bees, bumblebees, hoverflies and butterflies that collect contaminated pollen or nectar from the crop will ingest a small dose of the toxin, but **any** insect that feeds on the crop will eventually die. The five registered in Europe are: imidacloprid, thiamethoxam, clothianidin, acetamiprid and dinotefuran.

Neonicotinoid insecticides are not being monitored in surface or ground-water because they were on the US EPA list of "*reduced-risk pesticides*"

The systemic neonicotinoid insecticides were (and still are) "*beneath the radar"*, since they do not feature in the 2009 US Geological Survey (USGS) National Water-Quality Assessment Program (NAWQA) Report: *Pesticide Trends in Corn Belt Streams and Rivers (1996-2006).* The USGS authors of the Report said: *"The declines in pesticide concentrations closely followed the declines in their annual applications, indicating that reduced pesticide use is an effective and reliable strategy for reducing pesticides contamination in streams.*"

One of the first national studies on the presence of pesticides in ground-water had been published in 2008. Laura Bexfield who conducted the data analysis said: "*The results of this study are encouraging for the future state of the nation's ground-water quality with respect to pesticides. Despite sustained use of many popular pesticides and the introduction of new ones, results did not indicate increasing detection rates or concentrations in shallow drinking water resources over the 10 years studied."*

However, the chemicals that NAWQA were measuring were only those that they knew about. In fact, it has become apparent that no-one knew about them until recently.

Associations between pesticide use and human health; missing data

There have been an increasing number of reports in the US and Canadian literature in the last 12 years in which devastating effects of pesticides on human health have been documented. However, it is the older ones that are taking the blame. While organophosphates, atrazine and other toxic herbicides are still widely used in the US, the neonicotinoid insecticides and glyphosate (Roundup®) herbicide now occupy a dominant position in the global market. This accounts for the discrepancy in the US EPA figures in the Kid's Health Report. In the US EPA 2007 figures 857 million pounds was claimed for all usage; agricultural and domestic. This figure is at odds with the US EPA fact sheet published in January 2012 which says that: "*approximately 5.1 billion pounds of pesticides are used each year in the United States*"… (NB: The US billion has only nine 'noughts' whereas the UK billion has twelve).

Where are the majority of pesticides?

Where were all the other pesticides (and GMs to which insecticides are usually applied)? The US EPA has a second list on which the majority of pesticides appear; the allegedly "*reduced-risk pesticides*" whose concentrations in surface or ground-water water are not being monitored by any of the environmental protections agencies (with a few exceptions). These pesticides include the neonicotinoid insecticides; imidacloprid, thiamethoxam, clothianidin, acetamiprid, dinotefuran and the herbicides, glyphosate, glufosinate and aminopyralid. Was it by only calculating the weights applied for the older, so-called 'toxic' pesticides that were being monitored, that the corporations thought that they could escape the blame for effects on humans by the newer ones, particularly during fetal life, in infancy and in childhood when their organs are at their most vulnerable to toxins?

Widespread global use; agricultural and domestic

The 2002 distribution maps for imidacloprid and thiamethoxam show how widespread their annual use was in the US, even at that time. Clothianidin was conditionally registered in 2003 and now it has taken the place of imidacloprid (Bayer CropScience) in the US; clothianidin and thiamethoxam have rapidly taken over in the UK. Bayer is trying to further increase its domestic market in the UK. 'Consumer specialist appointed Head of Bayer Garden. Darren Brown, an individual with a strong track record in both consumer marketing and business growth, has been appointed Head of Bayer Garden. His appointment builds on the company's recent investment in the development of the Bayer Garden brand.' *"Last season Bayer Garden introduced new packaging*

designed to create a 'family' feel across its products. The aim was to make sure gardeners would know the product they were about to purchase was manufactured by a company they already knew and trusted through favourite products, including Provado Ultimate Bug Killer, Bio Slug & Snail Killer and Super Strength Glyphosate. The company also returned to the television, running a high profile advertising campaign that focused on its unique Simple Soluble Sachets." Speaking on his appointment, Darren said: *"The marketing team have already made great progress in building a strong Bayer Garden brand here in the UK. My aim is to advance this momentum and work hard on delivering excellent products for our customers:"…"I hope I can also bring some of the best practices from my Consumer Healthcare experience and am excited by the potential ahead for Bayer Garden in the UK."*

The withdrawal of garden products was suggested by MPs on 12/12/2012

This suggestion was dismissed by ACP and Defra scientists, on the grounds that the products were much weaker. However, this is not so. The RHS states that: "*Garden chemicals or pesticides, such as insecticides, fungicides and weed-killers, are perfectly safe, providing they are used in exactly the way described on the container or packaging*." Take for example, the Bayer Provado® Ultimate Bug Killer 400 ml aerosol spray. The main active substance in this product is the neonicotinoid imidacloprid. This chemical is highly toxic to bees (Defra, 1993). The can contains sufficient insecticide to kill 10 million bees (were that to be possible). On the aerosol is a warning label: HIGH RISK TO BEES. Do not apply when blooms are open. APPLY AWAY FROM BEES'. (The warning 'high risk' is worse than 'extremely dangerous.) Yearly applications of imidacloprid to an experimental lawn for three years decreased the soil invertebrates by 50%. The AVPMA states that clothianidin is toxic to soil invertebrates, earthworms and collembola (see Dr Julian Little's email above).

Many independent scientists have demonstrated that the neonicotinoid insecticides have effects on the mammalian brain, immune system and reproductive organs

Duzguner,V., Edogaan, S. Acute oxidant and inflammatory effects of imidacloprid on the mammalian central nervous system and liver in rats. *Pest. Biochem. Physiol.* 97, 13-18 (2010) *Imidacloprid has acute oxidant and inflammatory effects on the mammalian CNS and liver*.
Tennekes, H.A. The significance of the Druckrey-Küpfmuller equation for risk assessment – The toxicity of neonicotinoid insecticides to arthropods is reinforced by exposure time. *Toxicology* 276, 1-4 (2010) *Tennekes was the first to prove that neonicotinoids can produce effects at any concentration level, provided the exposure time is sufficiently long.*
Tennekes, H.A., Sánchez-Bayo, F. Time-Dependent Toxicity of Neonicotinoids and Other Toxicants: Implications for a New Approach to Risk Assessment. *J. Environment. Analytic. Toxicol.* S4:001. doi:10.4172/2161-0525.S4-001 (2011). *Tennekes and Sánchez-Bayo demonstrated that chemicals that bind irreversibly to specific receptors (neonicotinoids, genotoxic carcinogens and some metals) will produce toxic effects in a time-dependent manner, no matter how low the level of exposure.*
Kimura-Kuroda J., Hayashi, M., Kawano, H. Nicotine-like effects of neonicotinoids on rat cerebellar neurons. *Neuroscience Research*, 71, suppl, (2011). This is a study to determine to what extent the neonicotinoids imidacloprid and acetamiprid affected the nAChRs of rat cerebellar neurons and to compare their effects with nicotine by using in vitro excitatory Ca-influx assay. Although nicotine excited rather higher proportions of neurons and produced a higher peak of Ca-influx compared with the two neonicotinoids, both had higher binding to the neurons and were significantly inhibited with nAChR antagonists. The authors suggested that the neonicotinoids could have adverse effects on human health, especially in the developing foetus.

Bal, R. *et al.* Insecticide imidacloprid induces morphological and DNA damage through oxidative toxicity on the reproductive organs of developing male rats. *Cell. Biochem. Funct.* (2012) DOI: 10.1002/cbf.2826. *The weights of the epididymis, vesicula seminalis, epididymal sperm concentration, body weight gain, testosterone and reduced glutathione values were lower in the imidacloprid-treated groups than that in the controls. All treated groups had increased lipid peroxidation, fatty acid concentrations and higher rates of abnormal sperm. Apoptosis and fragmentation of seminal DNA were higher in rats treated at the two higher doses of imidacloprid. These results show that imidacloprid has a negative effect on sperm and testis of rats.*
Bal, R. *et al*. Effects of clothianidin exposure on sperm quality, testicular apoptosis and fatty acid composition in developing male rats. *Cell. Biol. Toxicol.* DOI 10.1007/s10565-012-9215-0. *It is concluded that low doses of clothianidin exposure during critical stages of sexual maturation had moderate detrimental effects on reproductive organ system and more severe effects are likely to be observed at higher dose levels. In addition, the reproductive system may be more sensitive to exposure of clothianidin even earlier in development*.
Abou-Donia, M.B. *et al*. Imidacloprid induces neurobehavioral deficits and increases expression of glial fibrillary acidic protein in the motor cortex and hippocampus in offspring rats following in utero exposure. *J. Toxicol. Environ. Health A. 71 (2), 119-130 (2008) Gestational exposure to a single large, non-lethal, dose of imidacloprid produces significant neurobehavioral deficits an and increased expression of glial fibrillary acidic protein in several brain regions of the offspring on postnatal day 30, corresponding to human early adolescent age. These changes may have long-term adverse effects in the offspring.*
Li, P., Ann, J., Akk, G. Activation and Modulation of Human α4β2 Nicotinic Acetylcholine Receptors by the Neonicotinoids Clothianidin and Imidacloprid. *J. Neuroscience Research DOI:10.1002/jnr.22644 (2011). Since the clinical manifestations of neonicotinoid poisoning clearly involved the nicotinic receptors, studies of the effects of clothianidin and imidacloprid on human neuronal-type α4β2 nAChRs were undertaken. Both chemicals had effects on human receptors, but imidacloprid more so than clothianidin.*
Mondal, S., Ghosh, R.C., Mate, M.S., Karmakar, D.P. Effects of Acetamiprid on Immune System in Female Wistar Rats. *Proc. Zool. Soc. 62 (2), 109-117 (2009)*
A subacute toxicity study of acetamiprid was undertaken in 72 female Wistar rats in four groups (18 each). Three different concentrations of acetamiprid (25, 100 and 200 mg/kg of body weight) were administered orally to rats. The results indicated that acetamiprid suppressed both CMI and antibody forming ability of lymphocytes.

The following paper acknowledged the action on mammalian receptors, but considered that they were safe for human exposure. They were very effective against pests so soon their use became widespread. But they were highly persistent in the soil; they were applied blindly, year on year; they accumulated, leached into water and were taken up by wild flowers.
Tomizawa, M, Lee, D.L., Casida, J.E. Neonicotinoid insecticides: Molecular Features Conferring Selectivity for Insect versus Mammalian Nicotinic Receptors. *J. Agric. Food Chem*. 48 (12), 6016-6024 (2000) *These authors showed that neonicotinoids acted on mammalian nicotinic acetylcholine receptors as well, but considered that the selective nature of its binding (i.e. less affinity than in insects) made it safe for human exposure.*

Cancers, birth defects and reproductive problems in farming communities globally

2001
Daniels, J.L. *et al*. Neuroblastoma linked to homes treated with pesticides. *Epidemiology*; 12, 20-26 (2001) *"One of the largest studies to date has that pesticides around the home can*

more than double the chance of a child developing a neuroblastoma." Seven Universities and medical facilities studied 390 children with neuroblastoma and 460 non-cancer controls. "*As statistics show that neuroblastoma rates have increased over the past 50 years, it is reasonable to assume environmental factors may be involved…Results show that using pesticides in an around the home resulted in a 60% (Odds Ratio=1.6) likelihood of children developing the disease. Looking at pesticide use for lawn and garden only resulted in an increased risk of 120% (Odds Ratio=2.2) when the mother (as opposed to the father) had applied pesticides in the yard."*

2003

Schreinemachers, D.M. Birth Malformations and Other Adverse Perinatal Outcomes in Four U.S. Wheat-Producing States. *Environmental Health Perspectives* 111 (9), 1259-1264 (2003) Rates of adverse birth outcomes in rural, agricultural counties of these states during 1995–1997 were studied by comparing counties with a high proportion of wheat acreage and those with a lower proportion. Infants conceived during April–June, the time of herbicide application, had an increased chance of being diagnosed with circulatory/ respiratory (excluding heart) malformations compared with births conceived during other months of the year.

2004

Sanborn, M. *et al*. Systematic Review of Pesticides: Human health effects. Ontario College of Family Physicians (2004) The six project team members peer-reviewed all studies published between 1992 and 2003 that investigated the human health effects of pesticides. The cohort studies all found significant positive associations between pesticide exposure and cancers of the brain cancer, prostate, kidney, leukaemia and Non-Hodgkin's lymphoma (NHL), the incidence of which is increasing in Canada. In summary, there are many studies showing positive associations between solid tumours and pesticide exposure. Positive associations between pesticide exposure and chromosome aberrations were found in the majority of studies. In addition, the presence of increased susceptibility to pesticide health effects in about 40% of Canadians, as suggested by the Montreal leukaemia study, make a strong argument for a general reduction of pesticide use and human exposure.

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Knopper, L.D., Lean, D.R.S. Carcinogenic and genotoxic potential of turf pesticides commonly used on golf courses *Journal of Toxicology and Environmental Health, Part B: Critical Reviews.* 7 (4), 267-279 (2004)

Abstract: *"As a result of the controversy surrounding pesticide use and animal and human health concerns, many municipalities in Canada have restricted, or are in the midst of restricting, the use of pesticides for cosmetic purposes. In some cases, pesticide use on golf courses is also being phased out at the municipal level. One of the dominant health effects of concern in relation to pesticide exposure is the occurrence of cancer. With over 1600 golf courses in Canada and between 400 and 600 new courses created each year in Canada and the United States, there appears to be increasing potential for unintentional human and animal exposure to turf pesticides. In light of the debate around pesticide exposure and the onset of cancer that has lead to controversial Canadian municipal bylaws regulating pesticide use, and due to recent results of a biomonitoring study that has shown genotoxicity in a rodent species living in golf-courses, it seems timely to review the carcinogenic and genotoxic potential of commonly used golf-course pesticides. The purpose of this review is to present some debated epidemiological research that deals with the relationship between pesticide exposure and cancer, and to review and update the literature on the in vivo and in vitro mammalian carcinogenic and genotoxic potential of these pesticides. It is our intention*

to unite information from various sources so those interested specifically in the carcinogenicity and genotoxicity of pesticides commonly used on golf courses can refer to one comprehensive and updated resource"

2005

Walter A. Alarcon *et al*. Acute Illnesses Associated With Pesticide Exposure at Schools. *JAMA* 294(4), 455-465(2005) doi:10.1001/jama.294.4.455 The rate of illnesses in children linked to pesticides and similar chemicals rose sharply between 1998 and 2002. Illness of high severity was found in 3 cases (0.1%), moderate severity in 275 cases (11%), and low severity in 2315 cases (89%). Most illnesses were associated with insecticides (n = 895, 35%), disinfectants (n = 830, 32%), repellents (n = 335, 13%), or herbicides (n = 279, 11%). Among 406 cases with detailed information on the source of pesticide exposure, 281 (69%) were associated with pesticides used at schools and 125 (31%) were associated with pesticide drift exposure from farmland.

France: In France, 90% of the soil is treated with chemicals. In France as a whole and in villages in the region of Gard in particular, high incidences of cancers and other serious illnesses in children and adults who have been exposed to chemical pesticides in the air, the ground water and in food have been highlighted.
http://www.idph-videos.com/nos-enfants-nous-accuseront.htm 'Our children will accuse us'. Watch this devastating video clip from Barjac in the Gard District of Cévennes. Illnesses in the farming communities started in 2005. The local hospital is full of children with leukaemia and other neoplastic disorders. Many children have died. The mayor has introduced an organic revolution whereby children in schools only eat organic produce. One organic farmer showed the difference between the structure of his soil, a rich humus-clay with worm holes, and that of chemically-treated soil. The latter was stratified, there were no worm holes for water and oxygen to penetrate and the surface soils were continuously being eroded by wind and water. In the US, John Peterson Myers, one of the authors of "Our Stolen Future" showed the documentary: "*Food Beware: the French organic revolution*", directed by Jean-Paul Jaud, to American audience. He started by asking three questions. "*How many of you have family members with cancers? How many with diabetes? How many with infertility?*" Many members of the audience raised their hands to all three.

2006

Landrigan, P.J, Benbrook, C.M. Symposium on Opportunities and Initiatives to Pesticides. AAAS, 2006 Annual Meeting: In the US, prenatal and childhood exposure to pesticides have emerged as a significant risk factor for neurodevelopmental disorders, including learning disabilities, dyslexia, mental retardation, attention deficit disorder and autism, which are now affecting 5-10% of 4 million children.

2007

Bassil, K.L., Vakil, C., Sanborn, M., Cole, D.C., Kaur, J.S., Kerr, K.J. Cancer health effects of pesticides: Systematic review. Canadian Family Physician 53, 1704-1711 (2007) This reported: "*a positive relationship between exposure to pesticides and development of some cancers, particularly brain, prostate, and kidney cancers, as well as NHL and leukemia. A number of the studies on children found increased risk of cancer associated with critical periods of exposure, both prenatal and postnatal, and with parental exposure at work"*

2007 Cancer Trends Progress Report from the US National Cancer Institute showed that people with higher exposure to pesticides have high rates of certain types of cancer. Farmers,

pesticide applicators, manufacturers and crop dusters have high rates of blood and lymphatic system cancers, cancers of the lip, stomach, lung, brain and prostate, as well as melanoma and other skin cancers.

2008

In 2008 from the US by Jacobs and Clapp reported: Agriculture and Cancer; a need for action. (Boston School of Public Health and Lowell Center for Sustainable Production, Massachusetts) *"Studies of farming populations routinely reveal elevated risk for several specific types of cancer, including leukemia, non-Hodgkin's lymphomas, multiple myeloma, soft-tissue sarcoma, and cancers of the skin, brain, prostate, stomach and lip".*

UK Office of National Statistics: Incidence of major cancers in 2008. One in four adults would develop cancer in their lifetime. The four most common cancers, breast, prostate, lung and colorectal cancer, accounted for 53% of the new cases of malignant cancers registered in England in 2008.

2009

The US President's Cancer Panel

'The usually cautious US President's Cancer Panel has reported that synthetic chemicals can cause grievous harm and that the number of cancers for which they are responsible had been grossly underestimated. The Standing Committee of European Doctors, including the BMA, added': *"Chemical Pollution represents a serious threat to children, and to Man's survival."* Geoffrey Lean in: *The (London) Telegraph*. In January 2012 I wrote to the Coordinator of the Report. She replied: *"The Panel reports directly to the White House and does not have any specific authority over any federal or non-federal agency. In addition, it does not have the authority to implement or enforce the recommendations it makes to the President".*

March 2009: Brain tumour UK reported that 40,000 brain tumour patients missing from the official statistics because of poor hospital data input. www.braintumouruk.org
In South East England, 5,930 brain tumour patients were missing from the statistics.

2010

Watts, C. Brain Cancer: An Unrecognised Clinical Problem. *Oncology News*, 5 (2) May/June (2010) www.oncologynews.biz *Office of National Statistics figures for the UK showed that the number of children dying from brain tumour in 2007 was 33% higher than in 2001**;** in contrast, child deaths from leukaemia were 39% lower than in 2001. In fact, brain tumours have now replaced leukaemia as the commonest cause of childhood death.*

CHEMTrust Report: Gwynne Lyons and Professor Andrew Watterson. July 2010. A review of the role pesticides play in some cancers: children, farmers and pesticide users at risk? www.chemtrust.org.uk *In a UK study in 2010 pesticide exposure of the foetus was linked to later childhood cancer. In the last 35 years the following have increased; non-Hodgkin's lymphoma has more than doubled; testicular cancer has doubled; breast cancer in women has increased by two thirds and in men has quadrupled; prostate cancer has tripled.*

2011

Lee, S-J *et al.* Acute Pesticide Illnesses Associated with Off-Target Pesticide Drift from Agricultural Applications — 11 States, 1998–2006. *Environmental Health Perspectives* 119 (8), 1162-1169 (2011)The study identifies 2,945 cases of pesticide poisoning associated with 643 events of agricultural pesticide drift in eleven states: Arizona, California, Florida, Iowa,

Louisiana, Michigan, New Mexico, New York, Oregon, Texas and Washington. While the study focuses on top agriculture producing states, it provides only a snapshot of the poisoning of farmworkers and other rural residents nationally and around the world. Study findings show that the risk of illness resulting from drift exposure is largely borne by agricultural workers, and the incidence (114.3/million worker-years) was 145 times greater than that for all other workers.

Report 2011: Dangerous Exposure: Farmworkers' children and pesticides. *Association of Farmworkers' Program* Children of farmworkers bear a disproportionate burden of health effects from pesticide use in our country. An increasing body of research suggests relationships between pesticides and serious illnesses, particularly among children. Birth defects include neural tube defects and male genitourinary malformations from endocrine disrupting herbicides, limb defects, neurobehavioral disorders, ADH and autism spectrum, chronic respiratory problems and atopic asthma and cancers. These have all been linked by peer-reviewed research to pesticide exposure in children. The childhood cancers include leukemia, lymphoma, brain tumour and Ewing's sarcoma. These can be due to pre- or postnatal, take-home or direct exposure.

A link to neurological degenerative disorders in France; a prospective study
Baldi, I. *et al*. Neurobehavioral effects of long-term exposure to pesticides: results from the 4-year follow-up of the PHYTONER Study. *Occup. Environ. Med* 68, 108-115 (2011)
This was the first study to provide prospective data on farmer workers in the Bordeaux area of France (1997-98 and 2001-03). It showed long-term cognitive effects of chronic exposure to pesticides and raised the issue of evolution towards dementia

MacMillan Cancer Report 2011: *"Cancer rates are increasing at such a rate that 42% of people who die in this country will have had a cancer diagnosis. And for most of them it will be cancer that causes their death".*

Antoniou, M. *et al*. Roundup and birth defects. Is the public being kept in the dark? (June 2011) *Earth Open Source*.
Extracts: "*The European Commission has previously ignored or dismissed many other findings from the independent scientific literature showing that Roundup® and glyphosate cause endocrine disruption, damage to DNA, reproductive and developmental toxicity, neurotoxicity, and cancer, as well as birth defects. Many of these effects are found at very low doses, comparable to levels of pesticide residues found in food and the environment*."... "*This issue is of particular concern now that Monsanto and other producers of genetically modified seed are trying to get their glyphosate-tolerant crops approved for cultivation in Europe. If the EU Commission gives its approval, this will lead to a massive increase in the amount of glyphosate sprayed in the fields of EU member states, as has already happened in North and South America. Consequently, people's exposure to glyphosate will increase*."
All these concerns could be addressed by an objective review of Roundup® and glyphosate in line with the more stringent new EU pesticide regulation due to come into force in June 2011. Just such a review was due to take place in 2012. However, shortly after the European Commission was notified of the latest research showing that glyphosate and Roundup® causes birth defects, the EC quietly passed a directive delaying the review of glyphosate and 38 other dangerous pesticides until 2015.

Brändli, D, Reinacher, S. Herbicides found in human urine. *Ithaka Journal* 1/2012, 270-272 (2012) Abstract: *Glyphosate is the main active substance used in most commercial*

herbicides. It poisons not only plants, but also animals and humans. When testing for glyphosate contamination in an urban population, a German University found significant contamination in all urine samples with 5 to 20 times above the legal limit for drinking water. The authors concluded that since the contamination was present in urban populations it must be coming via glyphosate residue on the crop, which then enters the food chain of animals and humans. They revealed and condemned the practice of desiccation (Spraying crops to death) before harvest.

2012

Brain Tumour Research UK Statistics in 2012

"The statistics speak for themselves. Something has to be done. Too many people are being faced with the devastating diagnosis each year: brain tumours kill more children and adults under the age of forty than any other cancer and five year survival remains the same as it did thirty years ago. We need to raise significant amounts to fund research into this dreadful disease if we are to identify the causes, advance treatments and ultimately find a cure for brain tumours".

- Brain tumours kill more children and adults under the age of forty than any other cancer and five year survival remains the same as it did thirty years ago.
- Brain tumours are the biggest cancer killer of UK children
- More people under 40 die of a brain tumour than from any other cancer
- Only 12% of males diagnosed with a brain tumour and 15% of females survive beyond 5 years (compared with 50% for all cancers)
- Brain tumours are a particularly devastating form of cancer with one of the lowest survival rates

US Kids' Health Report October 2012: A Generation in Jeopardy: How pesticides are undermining our children's health & intelligence. This report draws from academic and government research, focusing on studies published within the past five years, to chronicle the emerging threat of – with over 1 billion pounds applied on farms and homes annually– to children's health. Children and other sensitive sub-populations are exposed to a "toxic soup" of chemicals whose health impacts are not properly understood and clouded in uncertainties which are not captured in current risk assessments. Knowing this, the take home message from this report is the need to shift from systems that depend of toxic pesticides to systems that incorporate organic principles of pest management**.**

Extract: "*Children today are sicker than they were a generation ago. From childhood cancers to autism, birth defects and asthma, a wide range of childhood diseases and disorders are on the rise. Our assessment of the latest science leaves little room for doubt: pesticides are one key driver of this sobering trend.*

- **Compelling evidence now links pesticide exposures with harms to the structure and functioning of the brain and nervous system.** Neurotoxic pesticides are clearly implicated as contributors to the rising rates of attention deficit/hyperactivity disorder, autism, widespread declines in IQ and other measures of cognitive function.
- **Pesticide exposure contributes to a number of increasingly common health outcomes for children, including cancer, birth defects and early puberty.** Evidence of links to certain childhood cancers is particularly strong.
- **Emerging science suggests that pesticides may be important contributors to the current epidemic of childhood asthma, obesity and diabetes.**
- **Extremely low levels of pesticide exposure can cause significant health harms, particularly during pregnancy and early childhood.**

Appendix B page 38 Top pesticides used in agriculture and at home (from US EPA 2007).
Table B-1 *"Most commonly used pesticide active ingredient in agriculture"* and
Table B-2 *"Most commonly used active ingredient at home"*; listed by volume of use.
"Our current system of industrial agriculture and pest control relies on chemical inputs sold by a handful of corporations. These multinational corporations wield tremendous control over the system, from setting research agendas to financing, crop selection and inputs throughout the production and distribution chain. Not surprisingly, these same corporations also hold significant sway in the policy arena, investing millions of dollars every year to influence voters, lawmakers and regulators at both the state and federal level to protect the market for pesticides. The result is agriculture, food and pest control systems that serve the interests of these corporations well. It does not, however, serve farmers, who have lost day-to-day control of their operations and are putting themselves and their families in harm's way. Farmworker interests are not served, as workers are continuously exposed to chemicals known to harm human health. And the health of children across the country is compromised by exposure to pesticides used to control pests in agriculture and where they live, learn and play. In short, the system is broken."

In this Kids Report, the pesticides identified are only the old ones (prior to 1991)
The majority of crops now sown in the US have systemic neonicotinoid insecticides applied to them, or are GMO herbicide-tolerant seeds which also have insecticides applied. The neonicotinoid insecticides; imidacloprid, thiamethoxam, clothianidin, dinotefuran, thiacloprid, acetamiprid and all the GMO seeds are absent from the list.

The US EPA pesticide figures don't add up; the neonicotinoid insecticides, glyphosate and GM have been hidden away to protect the Agrochemical Corporations
On Table 4 page 27, Pesticide usage (in the US) in all market sectors in 2007 is stated to have been 857 million pounds of active ingredient.
This figure is at odds with the US EPA fact sheet published in January 2012 which says that: "*approximately 5.1 billion pounds of pesticides are used each year in the United States*"…
(The US billion has only nine 'noughts' whereas the UK billion has twelve). Even so, there is a huge difference between the 5.1 (US billion) pounds in 2012 and the 857 million pounds that the EPA claimed were used in the 2007 figures for the Kids Health Report. Presumably by only putting in the weights applied for the older pesticides, they could be exonerated from blame for effects on humans, particularly during fetal life, in infancy and in childhood when their organs are at their most vulnerable to toxins. In that case, where were all the other pesticides (and GMOs)? The US EPA has a second list on which all these pesticides appear; the allegedly "*reduced-risk pesticides*" whose concentrations in surface or ground-water water are not being monitored by any of the environmental protections agencies. This is where the neonicotinoid insecticides are hiding.
US EPA Fact sheet Jan 2012 goes on to state: *"A challenge for EPA is to ensure that pest control and pesticide use become increasingly safer each year. To meet this challenge, EPA is promoting safer pesticides and reducing risks through the re-registration process. EPA is also expediting approval of safer, reduced-risk pesticides, and assessing more completely the potential risks of pesticide products, with special protections for infants and children.*"

American Academy of Pediatrics POLICY STATEMENT (2012) Lead Authors: James R. Roberts, MD, MPH Catherine J. Karr, MD, PhD Pesticide Exposure in Children *Pediatrics* 2012;130:e1757–e1763
Extract: *"Chronic toxicity end points identified in epidemiologic studies include adverse birth outcomes including preterm birth, low birth weight, and congenital anomalies, pediatric*

cancers, neurobehavioral and cognitive deficits, and asthma. These are reviewed in the accompanying technical report. The evidence base is most robust for associations to pediatric cancer and adverse neurodevelopment. Multiple case-control studies and evidence reviews support a role for insecticides in risk of brain tumors and acute lymphocytic leukemia. Prospective contemporary birth cohort studies in the United States link early-life exposure to organophosphate insecticides with reductions in IQ and abnormal behaviors associated with attention-deficit/hyperactivity disorder and autism".

Calderon-Segura, M.E. *et al.* Evaluation of Genotoxic and Cytotoxic Effects in Human Peripheral Blood Lymphocytes Exposed *in Vitro* to Neonicotinoid Insecticides *Journal of Toxicology* 2012 Article ID 612647, doi:10.1155/2012/612647
Abstract: *Calypso (thiacloprid), Poncho (clothianidin), Gaucho (imidacloprid), and Jade (imidacloprid) are commercial neonicotinoid insecticides, a new class of agrochemicals in Mexico. However, genotoxic and cytotoxic studies have not been performed. In the present study, human peripheral blood lymphocytes (PBL) were exposed in vitro to different concentrations of the four insecticides. The genotoxic and cytotoxic effects were evaluated using the alkaline comet and trypan blue dye exclusion assays. DNA damage was evaluated using two genotoxicity parameters: tail length and comet frequency. Exposure to 9.5 × 10-6 to 5.7 × 10-5 M Jade; 2.8×10-4 to 1.7×10-3 M Gaucho; 0.6×10 -1 to 1.4×10-1 M Calypso; 1.2×10-1 to 9.5×10 -1M Poncho for 2 h induced a significant increase DNA damage with a concentration-dependent relationship. Jade was the most genotoxic of the four insecticides studied. Cytotoxicity was observed in cells exposed to 18 × 10-3 M Jade, 2.0 × 10 -3 M Gaucho, 2.0 × 10 -1 M Calypso, 1.07M Poncho, and cell death occurred at 30 × 10-1 M Jade, 3.3 × 10-3 M Gaucho, 2.8 × 10-3 M Calypso, and 1.42M Poncho. This study provides the first report of genotoxic and cytotoxic effects in peripheral blood lymphocytes following in vitro exposure to commercial neonicotinoid insecticides.*

Disastrous effects of GMO-based agriculture in Argentina and Paraguay
Genetically-Engineered Corn and Roundup®-Ready Soya were introduced into the rural towns of Argentina and Paraguay in 1996. The devastation of human and animal health and biodiversity is described in: Advances in Molecular Toxicology, Vol. 6, published by Elsevier: ISSN 1872-0854 (2012). Chapter Title: GMO Pesticides Used in South American GMO-Based Agriculture: A Review of Their Effects on Humans and Animal Models
Abstract: *In South America, the incorporation of genetically modified organisms (GMO) engineered to be resistant to pesticides changed the agricultural model into one dependent on the massive use of agrochemicals. Different pesticides are used in response to the demands of the global consuming market to control weeds, herbivorous arthropods, and crop diseases. Here, we review their effects on humans and animal models, in terms of genotoxicity, teratogenicity, and cell damage. We also stress the importance of biomarkers for medical surveillance of populations at risk and propose the use of biosensors as sensitive resources to detect undesirable effects of new molecules and environmental pollutants. The compatibility of glyphosate, the most intensively used herbicide associated to GMO crops, with an integrated pest management for soybean crops, is also discussed.*
Séralini, G-E *et al.* Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize. *Food and Chemical Toxicology* 2012 http://dx.doi.org/10.1016/j.fct.2012.08.005 Séralini's controversial feeding study showing tumours in rats was dismissed by EFSA and other GM scientists. It has, in fact, been confirmed by human "trials" in Argentina and Paraguay (see page 13). These photographs, by kind permission of Argentinian lawyer Dr Graciela Gomez, show the severity of some of the

neural tube deformities from Monsanto's formulated glyphosate Roundup®. Monsanto is in denial. See: Mission statement on Latin America. "*Monsanto is committed to helping improve lives – especially the lives of farmers in small rural communities around the world*." …there you will find a list of the very towns in which these birth defects, cancers and reproductive problems have occurred.

Denial about super-weeds. The EU Regulatory bodies are in denial about super-weeds arising from GM herbicide-tolerant crops, yet the evidence from the US is clear. GM scientists and Monsanto also claim that GE crops will reduce the amount of pesticides used and increase the yield in order to feed the world. However, since 1996, the year in which GE crops were first planted in US and Latin America independent analyses have shown that both of these claims are false. The residues of these toxic chemicals appear in humans from food and via animal feed. Farmers have reported side effects with feeding animals GM soya. In the previous 2 years, a Danish Pig Farmer had experienced piglet diarrhoea and 35 sows had died of stomach problems. In the previous 9 months he had had 13 malformed, but live-born, piglets. Now two other farmers have joined him (cattle and chicken). They have done an observational changeover study in their animals, from GM to non-GM feed. Their lecture is in the form of a PowerPoint presentation which was first shown in Copenhagen (December 2012). Glyphosate kills beneficial organisms and leaves clostridia to spread. Whilst the non-GM soya was more expensive, the reduced veterinary bills and increase numbers of piglets in the litter more than made up for it. In their conclusion the farmers admit that it is only an observational study; but they question the present farming methods. All three farmers believe that they are seeing the beginning of a major collapse in animal, plant and human health. Dr Don Huber from Purdue University has shown that glyphosate (which their lab has found in feed and in animals/ human's urine and faeces) is a strong chelator of manganese, copper, iron, zinc and cobalt. He is now seeing almost a universal deficiency of manganese in livers as well as B_{12}. However, it is possible that the Danish animals could be exposed to additional glyphosate from other sources, arising from a new farming practice, that of desiccation prior to harvest. Monsanto requested an increase in MRLs in lentils in Jan 2012: "*in order to accommodate the authorised desiccation use of glyphosate in lentils in the US and Canada."* from 0.1 mg/kg to 10 mg/kg (i.e. 100 times). These were granted by EFSA. Desiccation has crept in, unobserved by the public. It was only when we read about the practice of desiccation of crops did we realise that the glyphosate could be accumulating in animals from more than one source of feed. This ties in with serious diseases in entire herds of animals in northern Germany, in which glyphosate has repeatedly detected in urine, faeces, milk and animal feed.

http://www.youtube.com/watch?feature=player_embedded&v=8KF0eXC-0Bk
In this YouTube presentation by Dr Charles Benbrook, who has been studying the effects of GM crops in the US since 1996, he estimates the costs of introducing GM crops to Europe. He calculates it in terms of weed resistance, increased herbicide use and monetary costs to farmers. GMO crops cause super-weeds and super-pests necessitating application of larger doses of the same pesticide, or re-registration of older ones.
In his report he says that Glyphosate-Resistant weeds were practically unknown before the introduction of Roundup® Ready crops in 1996 into the US. Today, nine or more GR weeds collectively infest millions of acres of U.S. cropland. GR horseweed, giant ragweed, common waterhemp, and six other weeds are not only driving substantial increases in the use of glyphosate, but also of more toxic herbicides, including paraquat, glufosinate and 2,4-D.

GM food isn't as harmless as manufacturers and GM scientists claim it to be
Aris, A., Leblanc, S. Maternal and fetal exposure to pesticides associated with genetically modified foods in Eastern Townships of Quebec, Canada. *Reproductive Toxicology* 31, 528-33 (2011) This study found Bt toxin in 80% of women and their unborn children tested in Canada. Long-term toxicology and health risk assessments on Bt in GM crops had not been done.

New GM research from EFSA scientists shows an unidentified viral gene
Podevin, N. and du Jardin, P. Possible consequences of the overlap between the CaMV 35S promoter regions in plant transformation vectors used and the viral gene VI in transgenic plants. *GM Crops and Food* 3, 296-300 (2012)

A baby with a neural tube defect; this is a meningo-myelocoele. More extensive defects can occur. Hospital de Posadas, Misiones, Argentina. Photograph by kind permission of Dr Graciela Gomez.

Julieta, who died aged 7 months from multiple abnormalities in 2010 Bandera Santiago del Estero Photograph by kind permission of Dr Graciela Gomez

Georgina Downs' (Founder of the UK Pesticides Campaign) summary of her written evidence to the EAC and a link to the full document

- All chemical pesticides are deliberately designed to be toxic, that is their purpose, and therefore all chemical pesticides have inherent hazards for human health.

- The dangers of pesticides can clearly be seen on the data sheet for each pesticide product that can carry various warnings such as "*Very toxic by inhalation*," "*Do not breathe spray; fumes; vapour*," "*Risk of serious damage to eyes*," "*Harmful, possible risk of irreversible effects through inhalation*," and even "*May be fatal if inhaled*."

- It is now beyond dispute that pesticides can cause a wide range of both acute, and chronic, adverse effects on human health, including on the health of residents exposed to them. This includes irreversible and permanent chronic effects, illnesses and diseases.

- Approx. 80% of pesticides used in the UK each year are related to agricultural use.

- The majority of poisoning incidents and acute adverse health effects recorded annually in the Government's own monitoring system are from agricultural pesticides used on crops.

- The Government has **repeatedly failed to take action** when faced with, including in its own monitoring system, evidence of actual harm, as well as the risk of harm, to human health from crop-spraying under the current policy and approvals regimen.

- Yet **EU law requires** that pesticides can only be authorised for use if it has been established that there will be **no harmful effect on human health**. It also requires a proactive approach to reviewing authorisations *after* approval, including that authorisations shall be cancelled and pesticides prohibited where there is a risk of harm.

- The Government's monitoring system currently only considers the acute effects of individual pesticides and therefore does not, in general, monitor or deal with either (i) chronic ill-health effects caused by pesticides or (ii) the effects of mixtures of pesticides.

- The fact that there has been, to date, no specific monitoring or collection of data in the Government's monitoring system in relation to the chronic effects, illnesses and diseases reported by people is a situation that has previously been criticized in a number of official reports dating back to 1987 and Government has *still* not changed its policy to rectify this.

- The **reality of crop spraying in the countryside** is not merely related to exposure to one individual pesticide or to one single group of pesticides, as agricultural pesticides are rarely used individually but commonly sprayed in mixtures (cocktails) -- quite often a mixture will consist of 4 or 5 different products. Each product formulation in itself can contain a number of different active ingredients, as well as other chemicals, such as solvents, surfactants and co-formulants (some of which can have adverse

effects in their own right, *before* considering any potential synergistic effects in a mixture(s)). Studies have shown mixtures of pesticides (and/or other chemicals) can have synergistic effects.

- Scientific papers have concluded that "*the total emissions of pesticides may range from several per cent up to almost all the applied quantities*" and in relation to vapour that, "*Volatilization may represent a major dissipation pathway for pesticides applied to soils or crops, accounting for up to 90% of the application dose in some cases*", and that "*Volatilization may last for a period of several days to a few weeks (or sometimes even longer), and sometimes exhibits a diurnal cycle".*

- Scientific studies have found pesticides **miles** away from where they were applied and have calculated health risks for residents and communities living within those distances.

- **The existing UK Government policy and approvals system fundamentally fails to protect people in the countryside from pesticides, particularly rural residents**.

- There are serious flaws in the approach to exposure and risk assessment for public health.

- The fact that, to date, there has never been ***any*** assessment in the UK of the risks to health for the long term exposure for those who live in the locality of pesticide sprayed fields, and/or who go to school in the locality of sprayed fields, means that under EU law **pesticides should never have been approved for use in the first place for spraying in the locality of residents' homes, schools, children's playgrounds, among other areas.**

- Children are particularly vulnerable to the effects of pesticide exposure because their bodies cannot efficiently detoxify chemicals, as their organs are still growing and developing. Also when children are exposed at such a young age they will obviously have a longer lifetime to develop long-term chronic effects after any exposure.

- The Government previously **failed to act** on its *own findings* of 82 exceedances of the EU limits set for exposure (the AOEL), in some cases the AOEL **was exceeded up to 20 to 30 times over**, which is *an order of magnitude higher*, when **any** exceedance, on the Government's *own previously stated case*, and most importantly **under EU law, would lead to immediate action of authorizations being refused (or trigger prohibition/revocation if the AOEL exceedance is discovered *after* approval).**

- The Government's previous estimated exceedances of the AOEL clearly demonstrated that products have been in use in the UK which resulted in residents (and others in the countryside) being exposed to levels greatly in excess of the AOEL, year after year.

- Yet the UK Government has **not, to date, taken any action** to prevent the exposure and risk of harm for residents in these circumstances, and has violated its obligation under EU law to prohibit the use of pesticides where the AOEL is known to be exceeded.

- The UK Government has continued to refuse to introduce **<u>any</u>** statutory conditions of use to protect residents and others from exposure. Such conditions of use would include, most importantly, the prohibition of the use of pesticides in the locality of residents' homes, as well as schools, children's playgrounds, nurseries, hospitals, amongst other areas. Yet such a measure is absolutely crucial for public health protection, especially those of vulnerable groups, including babies, children, pregnant women, and those already ill.

- Therefore, in relation to the health of rural residents and communities, the UK Government has, to date, knowingly failed to act, has continued to shift the goalposts, cherry picked the science to suit the desired outcome and has misled the public, especially residents, over the safety of agricultural pesticides sprayed on crop fields throughout the country. The Government's continued line that there is no evidence of harm from pesticides, as well as no risk of harm, is just untenable and inexcusable. The evidence is there and has been there for a considerable time, the Government is just determined not to act on it. The Government's response to this issue has been of the utmost complacency, is completely irresponsible and is definitely not "*evidence-based policy-making.*"

- The failings in the UK Government's policy and approach to exposure and risk assessment regarding human health, and related and repeated inaction, is also comparable to the serious concerns that have been raised regarding the UK Government's policy and approach to exposure and risk assessment in relation to other species, such as bees.

- Bees and other species, just like residents and other humans, could be exposed to innumerable *mixtures* of pesticides, repeatedly, throughout every year, and for years.

- In relation to the risk of harm to bees from pesticide mixtures, a US study in 2010 highlighted the potential synergistic effects on bee health from mixtures and combinations of different pesticides as the researchers found 121 **different** pesticides and metabolites within 887 wax, pollen, bee and associated hive samples. Therefore aside from the individual products that carry warnings of a risk to bees on the product label and safety data sheet information (such as '*harmful*', '*dangerous*', '*extremely dangerous*' or '*high risk*' to bees), there will also be the risk of adverse impacts on bee health from the cumulative effects of multiple exposures to mixtures of different pesticides.

- The **reality of pesticide spraying in the countryside** is **<u>not</u>** reflected in any of the risk assessments under the UK Government's existing approach, whether for humans or bees.

- The principal aim of pesticide policy and regulation is supposed to be the protection of public health and the environment. Yet the Government, DEFRA, PSD (now CRD), and ACP, have all continued to base decisions in relation to pesticides on the protection of industry and business interests as opposed to what is absolutely required as the number one priority of pesticide policy and regulation - **to protect public health**.

- Sales of pesticides in the UK alone for 2011/12 were £ 627 million, and reports have put the value of the world pesticides industry at around a staggering $52 billion.

- There are clear conflicts of interests in relation to those advising DEFRA Ministers over the pesticides policy agenda, especially regarding the Chemicals Regulation Directorate (CRD) that receives approx. 60% of its funding from the agrochemical industry. This is broken down into the fees charged to companies for applications, and a charge on the UK turnover of pesticides companies. For a number of years now this has resulted in the CRD receiving around £7 million or more per year from the agro-chemical industry.

- A number of ACP members have links to the pesticides industry. For e.g., some members may undertake consultancy work, have shares in and/or receive funding for research support. This has always been an inappropriate structure, as so-called "*independent*" advisors cannot possibly be classified as independent if they have financial or other links with the very industries they are overseeing in relation to the hazards to human health.

- Ministers have also been receiving advice from the Pesticides Forum for many years, and yet year after year the Forum has wrongly asserted in its annual reports that, "*the use of pesticides is **not** adversely impacting on the health of UK citizens or the environment.*" Considering the grossly inaccurate statements that the Pesticides Forum has continued to make, effectively denying the adverse health and environmental impacts of pesticide use, then it is also of serious concern that it is intended that the Forum be responsible for the monitoring and review of the UK's Action Plan on pesticides after it has been adopted.

- The UK's policy and approvals regimen is based on a wholly inappropriate structure and it goes some way to explaining why the pesticide industry has, for many years, had such control over successive Governments' policy decisions on pesticides, particularly in relation to the use of pesticides in agriculture. Successive Governments' have continued to reflect the position of the pesticides industry in **all policy decisions taken to date on pesticides**, (at least since the UK Pesticides Campaign has been in existence since 2001).

- The only real solution to **eliminate** the adverse health and environmental impacts of pesticides is to take a **preventative approach** and avoid exposure altogether with the widespread adoption of truly sustainable **non-chemical farming methods**. This would obviously be more in line with the objectives for sustainable crop production, as the reliance on complex chemicals designed to kill plants, insects or other forms of life, cannot be classified as sustainable. **Therefore it is a complete paradigm shift that is needed, as no toxic chemicals that have related risks and adverse effects for any species (whether humans, bees or other) should be used to grow food.**

Link to Georgina Downsfull evidence, see number 28:
http://www.publications.parliament.uk/pa/cm201213/cmselect/cmenvaud/writev/668/contents.htm

Some other controversial chemicals

Organophosphates: Mackenzie Ross, S.J. *et al.* Neurobehavioural problems following low level exposure to organophosphate pesticides: A systematic & meta-analytic review. *Clinical*

Reviews in Toxicology (2012) A review of 14 studies (looking at 1600 participants) has shown a relationship between low level exposure to organophosphates and impaired neurobehavioural functioning. It targets memory, information processing speed, the ability to plan and have abstract thoughts. Defra had always denied that there was a link.

Aminopyralid: (Dow Agrosciences Ltd) was approved in 2006. Complaints to Gardeners' Question Time about amateur gardeners' crop failures led to the link between use of this herbicide and manure from animals that had been fed on hay from fields where aminopyralid had been used. This discovery led to its suspension in July 2008. Dow then applied to the ACP to have it reintroduced. The ACP advised Ministers that it could be re-introduced in 2009 with label changes. In 2010 there were still problems with the manure. Dow gave advice to farmers and gardeners to check the provenance of the manure and sales were restricted to Scotland, SW England and Ireland.

Atrazine: In Northfleet in Kent, nine babies within 12 years were born in the same street, with the same condition, gastroschisis. Gastroschisis is a congenital defect in the abdominal wall, almost always to the right of the navel, through which the abdominal contents freely protrude. The condition normally affects one-in-seven thousand babies. Southern Water acknowledged that atrazine had been found in tap water in 2008. It was banned in the EU in 2004, but in the UK the ban did not come into force until 2007 to allow companies to use up their stockpiles. The conclusions of the Public Health Report from Kent on 05/03/2012 were that there was '*no evidence that this cluster around Waterdales Road is any more concentrated than we can explain by the normal pattern of occurrence of rare diseases.*' Syngenta said: "*There is no proven link between atrazine and these defects. Atrazine does not cause developmental abnormalities*" A Water Frame Directive Update presented by Dr Jo Kennedy of the Environment Agency to the Pesticides Forum in 2008 on groundwater status in the UK showed that atrazine and/or its two breakdown products were found at more than 25% of monitoring sites and were present in quantities in excess of 0.1µg/l. Jo Kennedy Pesticides_Forum_Oct_2008_WFD.pdf
Waller SA, Paul K, Peterson SE, *et al*. Agricultural-related chemical exposures, season of conception, and risk of gastroschisis in Washington State. *Am J Obstet Gynecol* 202:241.e1-6 (2010). The paper concluded that maternal exposure to surface water atrazine is associated with foetal gastroschisis, particularly in spring conceptions. The researchers found that the closer a mother lived to a site of high surface water contamination with atrazine the more likely she was to deliver an infant with gastroschisis. The birth defect occurs more often among infants who live less than 15 miles from one of these sites and it occurs more often among babies conceived between March and May, when agricultural pesticide use is common.
In the US, in a settlement between plaintiffs and the manufacturer of the endocrine disrupting herbicide atrazine, Syngenta will pay $105 million to settle a nearly 8-year-old lawsuit and could help reimburse community water systems (CWS) in 45 states that have had to filter the toxic chemical from its drinking water, according to news reports. It will provide financial recoveries for costs that have been borne for decades by more than 1,887 CWSs that provide drinking water more than one in six Americans across at least 45 states.
http://www.atrazinesettlement.com/utility/GetFile/c3e918bf-742a-41fa-8af6-0637bcf0b253

The Industry secret meeting to get GM into the UK 26/06/2012
Monsanto, Syngenta, Bayer and BASF and their industry body, the Agricultural Biotechnology Council (ABC) are setting the agenda for UK agricultural research with a view to bringing GM crops into the UK and exporting them overseas. Two Ministers and two

MPs met with scientists from Defra, the John Innes Centre, Rothampsted Research and the NFU. They had a round table discussion including how to overcome the barriers that currently prevent the UK achieving these outcomes and a strategy to attain them. The Summary was written by Dr Julian Little of Bayer CropScience. This is the same Dr Little that lied to MPs at the Select Committee on 28/11/2012 in Parliament on at least three occasions and in an email reply in December 2010.

[1] Going for Growth roundtable discussion, Tuesday, 26 June 2012, BIS Conference Centre:

- Attendees on: http://tinyurl.com/9jbce4g (pdf 16kb)
- Agenda on: http://tinyurl.com/8ahylza (pdf 64kb)
- Summary on: http://tinyurl.com/92rrajn (pdf 88kb

Shift in pest management on crops worldwide; an apocalyptic threat

Over the last 20 years, the shift in worldwide pest management has moved away from reactive to prophylactic. Now many fungicides, pesticides and herbicides are applied to the seeds before sowing. Application of the chemical **before** pest damage has occurred often involves routine, calendar-based spraying and pre-emptive treatments. It is like humans taking permanent antibiotics. Last week (Jan 2013) the Chief Medical Officer for England Professor Sally Davies gave a press release about the apocalyptic threat posed by antibiotic resistance. This is nothing compared with that posed by herbicide-tolerant weed-killers and pesticides. In the US where GM, herbicide-tolerant crops are widespread, the phenomena of insect and herbicide resistance have locked US farmers into a pesticide treadmill. Target pests and weeds are capable of becoming resistant to the repeated use of a single insecticide or herbicide such that successively larger doses have to be applied. Farmers and weed scientists across the US heartland and cotton belt are now struggling to devise affordable and effective strategies to deal with the resistant weeds emerging in the wake of herbicide-tolerant crops.

Humans cannot develop resistance like plants and pests

More and more genotoxic, neurotoxic and teratogenic chemicals are being poured into the environment. Dow has recently applied for a GMO corn tolerant to both 2,4-D (they have resurrected an old pesticide related to Agent Orange, the dioxin used by the US for defoliation in the Vietnam War) and glyphosate. It has not yet obtained approval because of massive protests by US farmers and concerned scientists.
http://www.reuters.com/article/2013/01/18/dow-biotech-idUSL1E9CIBN320130118

Who is governing Britain?

Why is the government determined to force GMOs upon an unwilling public?
The US farmers have warned UK farmers about Monsanto's tactics and super-weeds.
Latin American scientists have reported devastating effects on human and animal health.
France tried Monsanto Roundup® Ready corn for a short time. They decided to ban its sale in France, although under current EU legislation it is illegal so to do.
The Agrochemical Corporations have concealed the truth. Some UK politicians believe them.

Rachel Carson's Silent Spring

Last year was the 50th Anniversary of the publication of Rachel Carson's Silent Spring.
Yet if DDT is equivalent to one, in terms of its toxicity to bees, thiamethoxam and clothianidin are, respectively, 5,400 and 6,750 times more toxic (Bonmatin 2009).
It is Syngenta and Monsanto who, in relation to agrochemicals, are '*manipulating the strings'* of the British government. They have gained control of the Pesticide Regulatory Agencies.

A massive environmental chemical disaster. Not from outside; but from within

Look to the cancers and birth defects in the US, Latin America and Canada.
City dwellers, are you blind to what's happening in the countryside? Defra seem to be.
The Government's failure to respond to complaints by Pesticide UK is outrageous.
Where-ever chemicals have been used, biological deserts have been created.
Last August, on a warm summer evening in a Hampshire garden, no moths fluttered to the candles. There wasn't a single insect.
Pollinators, frogs, bats and birds have disappeared from epidemics of pathogenic diseases.
Cancers and birth defects are increasing in rural communities as a result of these genotoxic (gene changing), neurotoxic (brain changing) and teratogenic (causing birth defects like thalidomide) chemicals. Soon these chemicals will contaminate the cities.
Our farm-workers and rural communities are sick. Farm animals are sick. The land is dying. Soon it will be irreversible. The public is unaware because the media are silent.
How can we leave a world like this for our children?

Can a collapse of global civilization be avoided?
In 2005 Professor Jared Diamond wrote an influential book: Collapse: How Societies Choose to Fail or Survive**.** His close friend Professor Paul Ehrlich, the eminent population ecologist from the Department of Biology at Stanford University, has posed this question in a paper published in: *Proceedings of the Royal Society* [Proc. R. Soc. B 2013 **280**, 20122845, published online 8 January 2013]. Prof Ehrlich has harsh words to say about the pole-to-pole spread of toxic compounds, the accelerating extinction of animal and plant populations and species, which could lead to a loss of ecosystem services essential for human survival, and "*the trade-off for immediate corporate profits*".

Dr Don M. Huber, Emeritus Professor of Plant Pathology, Purdue University US
On the topic of GMO crops and glyphosate, he said: "*Future historians may well look back upon our time and write, not about how many pounds of pesticide we did or didn't apply, but by how willing we are to sacrifice our children and future generations for this massive genetic engineering experiment that is based on flawed science and failed promises just to benefit the bottom line of a commercial enterprise.*"

Professor EO Wilson, the eminent field entomologist, who in his autobiographical book The Naturalist, has described massive global declines of ant colonies at the hand of man said: "*If all mankind were to disappear, the world would regenerate back to the rich state of equilibrium that existed ten thousand years ago. If insects were to vanish, the environment would collapse into chaos."*

Dr Graciela Gomez is a Lawyer and Campaigner for the people of the crop-sprayed agricultural areas in Argentina. This quotation by José Martí is taken from her website:
"*Quien sabe que se comete un crimen y no lo denuncia es un CÓMPLICE*."
"*Whosoever knows that a crime was committed and denounces it not is an accomplice"*.

In fact, Dr Gomez has had small victories against glyphosate on behalf rural communities in Argentina. On 21/08/2012, judgement was announced in a court case in Argentina against GM soy producers and glyphosate. Sofica Gatica, who initiated her complaints in 2001, had two children with birth defects (one of whom died at birth without kidneys) and she made the first health survey in the neighbourhood of Ituzaingo, near Cordoba.

That same afternoon, the Argentinian Minister of Agriculture was congratulating Monsanto on its new transgenic soy seed.