

PESTICIDE EXPOSURES FOR PEOPLE IN AGRICULTURAL AREAS

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Following the publication of reports from two UK Government Advisory Bodies which fundamentally disagree on the risks posed to people in the countryside from pesticide spraying, Georgina Downs of UK Pesticides Campaign assesses the reports and describes what the Government must now do to protect the public from pesticides

Keywords:

Pesticides, crop-spraying, residents, communities, bystanders, regulations, exposure, risk, children, acute, chronic, cancer, leukaemia, ME, asthma

Introduction

The risks to people in the countryside from pesticide spraying (commonly known as “residents” and “bystanders”), has been in the political and media spotlight since July 2001, when I first questioned the adequacy of the current regulatory system at the Advisory Committee on Pesticides (ACP) annual Open Meeting.

Since then there has been further consideration of the issue by the ACP and the Government regulators the Pesticides Safety Directorate (PSD); two Government Consultation’s on crop-spraying, followed by a year long investigation by the Royal Commission on Environmental Pollution (RCEP).

The ACP, the PSD and other UK Government agencies have continued to maintain that a robust system is in place to protect public health.

However, the RCEP report published in September 2005 entitled *Crop-Spraying and the Health of Residents and Bystanders*, concluded that crop-spraying is a potential health risk and that chronic illnesses and diseases reported by people in rural areas, including cancer, Parkinson’s and ME, could be associated with pesticide exposure. (RCEP, 2005).

The ACP has recently published its response to the RCEP report where the majority of ACP members remain of the view that pesticide spraying does not pose any significant health risks to those exposed and have continued to dismiss the problem as merely a social issue rather than a scientific one. (ACP, 2006).

With two of its main advisory bodies fundamentally disagreeing on the public health risks of pesticide spraying and with the Government response to the reports due out in a few months time, what action should the Government now take?

Background to the Bystander Issue

My family and I have lived next to crop fields that are regularly sprayed with pesticides for over 22 years. Since 2001, I have been presenting a case to the Government regarding pesticide exposures for people in agricultural areas and the inadequacy and serious fundamental flaws throughout the existing regulations and monitoring system for pesticides, particularly in relation to the so-called “bystander risk assessment.”



Georgina Downs and her father Ray regularly exposed to pesticides in their surrounding air and living environment. A worker is legally allowed to know what chemicals they are using, the potential health effects and are required to wear protective equipment, (similar to what Ray is wearing). Yet members of the public, breathing in the very same air, are not. Photo by Drew Gardener

The current method of assessing the risks to public health from crop-spraying is based on the predictive model of a “bystander.” Bystanders are not legally defined either in national regulations or under EU Directive 91/414/EEC, although the latter specifically refers to bystanders. A working definition of bystanders has been developed, which assumes that there will only be occasional, short-term exposure from the spray cloud at the time of the application only. It also assumes exposure will only be to one individual pesticide at any time.

I have continued to argue that this model is clearly inadequate to address the long-term exposure of residents actually living near sprayed fields, where they will be repeatedly and frequently exposed to mixtures of pesticides and other hazardous chemicals, throughout every year and in many cases, like mine, for decades. Therefore, residents and communities have a completely different type of exposure scenario to that set out for a bystander.

This was a point recognised in the EU by the Scientific Committee on Plants (SCP) when they questioned the comparison of bystanders and residents in their recommendations to the European Commission in October 2002. The SCP was of the opinion that there was no clear definition of bystander and that a difference should be made between a subject who is at risk of being exposed during a

pesticide application because they happened to occasionally be in the proximity of a field and someone who lives or works near a field being treated. (SCP, 2002).

Another fundamental point of the case that I have been presenting regarding the exposure for rural residents and communities, is that it is not simply about spray-drift at the time of the application, or just thereafter, and therefore misuse of pesticides or overspray.

Spray-drift is just one aspect of a much wider and more far reaching problem, as regardless whether there is immediate drift or not, a farmer/grower will not be able to prevent pesticides, once they are airborne contaminants, from being in the air, as the droplets, particles and vapours will be impossible to confine within the treated area.

However, the current assessment does not include all the potential exposure factors for rural residents and communities in the exposure calculations. These include, long-term exposure to pesticides in the air, exposure to vapours after application, reactivation, precipitation, pesticides transported from outdoor applications and redistributed into an indoor air environment, exposure to mixtures, and long-range transportation.

Following presentations I made in 2002 to the ACP and to Ministers on the inadequacy of the bystander risk assessment in protecting rural residents, DEFRA launched 2 Consultations on crop-spraying in July 2003. As part of the evidence I submitted, I produced a video that featured people from all over the country reporting acute and chronic long-term illnesses and diseases in rural areas.

Some of the acute effects reported to me include sore throats, burning eyes, nose, skin, blisters, headaches, dizziness, nausea and flu-type illnesses. The chronic long-term illnesses reported include various cancers, leukaemia, non-Hodgkins lymphoma, neurological problems, including Parkinson's disease and ME, asthma, amongst many other



Currently farmers are legally allowed to spray right up to the open window of any occupied premises, whether it be a house, a school, a home for the elderly or any office or workplace. The RCEP report estimated the number of properties adjoining farmland at approximately half a million. Considering the distances pesticides are known to travel this figure will be far higher if including all the homes, schools and other properties that might not be directly adjoining fields, but could still be contaminated by pesticide spray.

Photo by Vincent Fallon

medical conditions. Reports of this nature have gone on for decades and many are related to young children. Yet, in relation to the UK, there does not appear to have been any monitoring for chronic effects and acute effects are commonly dismissed by Government agencies and advisors as being unrelated to pesticides. Therefore, the Government's official figures do not give a true representation of the real scope of the problem relating to the adverse effects of pesticide exposure.

The result of the Consultations was announced by the former DEFRA Minister for Rural Affairs, Alun Michael, on 16th June 2004. He stated that on the basis of the scientific advice he had received from the PSD, the ACP and DEFRA's Chief Scientific Advisor, he was confident that the existing system provided full reassurance. However, he requested the Royal Commission study to examine the scientific evidence on which the current regulatory system is based and the reasons for people's concerns. (Michael A, 2004)

The Royal Commission's Report

The Royal Commission identified grounds for concern in respect of all the areas they addressed, including health, exposure and risk.

The RCEP were highly critical of both the ACP and the PSD and concluded that the level of confidence and assurance that had been given by the ACP to Ministers, as well as the public, regarding the safety of residents and bystanders exposed to agricultural pesticides, "*represented too sanguine a view of the robustness of the scientific evidence.*"

The RCEP concluded that they did not agree that the evidence could lead to unequivocal conclusions, previously given by the ACP, that the system provides adequate protection and that there are no scientific concerns or that it provides full reassurance to the Minister.

The RCEP recommended that the reported ill-health effects need to be taken more seriously; direct access to information and prior notification; concluded that legal redress is virtually impossible and clearly acknowledged that residents and bystanders are 2 different exposure scenarios. Obviously, these findings are all to be welcomed.

However, some of the RCEP's conclusions are disappointingly weak in view of the existing evidence.

For example, there is no question that both residents and bystanders have suffered acute effects following exposure to crop sprays and the Government's own monitoring system, the Pesticides Incidents Appraisal Panel (PIAP) has confirmed cases from just one single exposure. Therefore, pesticides being able to cause acute effects was never in doubt, but the Royal Commission did not make this clear enough in the report or in subsequent comments in the media. This left it open to criticisms from some quarters that the RCEP had not found any evidence that pesticides do cause ill-health, which is not correct. On closer examination of their wording where the RCEP refer to the plausibility of a link between resident and bystander exposure and ill-health, it actually states that it is in relation to chronic ill health.

There is no doubt about the rise in chronic illness, particularly in young children. The Office of National

Statistics released figures in 2004 that showed that record numbers of children and young adults are suffering from long-term illnesses and conditions and that 1 in 6 children under 5 now suffer from a long-standing illness, compared with 4 per cent in 1972. (Office of National Statistics, 2004)

Many pesticides have neurotoxic, carcinogenic and hormone-disrupting capabilities. Studies have shown that very low doses of pesticides can disrupt hormone systems at levels significantly lower than previous research stated was safe. (Hayes *et al.*, 2002, Hayes *et al.*, 2003)

Substantive evidence already exists linking pesticides to various forms of cancer, neurological diseases and birth defects, among other chronic conditions.

The total cost to the UK with regard to cancer, ME and asthma alone, is in excess of £6 billion per year. It is not known what proportion of the overall costs from damage to health and the environment could be attributable to pesticides. However, even if only partly then the cost to the economy and society, as a whole, is clearly substantial.

Obviously the personal and human costs to individuals suffering pesticide related ill-health cannot be calculated in financial terms. The significance of these consequences requires the adoption of a preventative approach, especially in relation to the protection of children and other vulnerable groups.

Therefore, despite many positive aspects of the RCEP report, the biggest weakness, is that having accepted that there is a potential health risk and that various illnesses and diseases could be associated with pesticides, the report then completely contradicts its own findings by making recommendations that will not actually prevent exposure for people in the countryside from crop-spraying.

The RCEP report recommends the introduction of 5 metre buffer zones alongside residential property and other buildings such as schools, hospitals and retirement homes in an attempt to decrease the likelihood of spray drift affecting residents and bystanders.

This recommendation has been widely criticised and has created a spurious argument that could ultimately undermine the overall effectiveness of the RCEP report.

There is an extensive body of scientific evidence, which was submitted to the RCEP, to show that pesticides can travel in the air and spread over vast distances.

For example, a reputable study in California found pesticides located up to 3 miles away from the treated areas and calculated health risks for rural residents and communities living within those distances. (Lee *et al.*, 2002). Many pesticides commonly used in California have been detected far from the site of application, some as far as 25 to 50 miles. Studies in California consistently find pesticides in the air, rain and even fog as a result of the repeated and frequent use and release of pesticides on a large scale in agricultural areas. (CALPIRG Charitable Trust, 1998)

One study involving nearly 700 Californian women showed that living within a mile of farms where certain pesticides are sprayed, during critical weeks in pregnancy, increased by up to 120% the chance of losing the baby through birth defects. (Bell *et al.*, 2001)

Another study found high brain cancer rates in people

living near cranberry agricultural fields in Cape Cod, Massachusetts. Results showed that living within 2600 feet of the cranberry growing area resulted in twice the risk for all brain cancers and nearly a 7-fold increased risk for a type of brain cancer known as astrocytoma. (Aschengrau *et al.*, 1996)

A study published last year that confirmed acute illnesses in children and employees from pesticides sprayed on farmland near schools pointed out that 7 US states now require no-spray buffer zones of up to 2.5 miles around schools in an attempt to protect children from exposure. (Alarcon *et al.*, 2005)

Therefore, international scientific evidence supports buffer zones of miles not metres.

So why did the RCEP recommend a buffer zone of only 5 metres? A member of the RCEP Secretariat informed me that it came from Silsoe, a research institute previously funded by DEFRA, but that has now been closed down. Silsoe's work was predominantly related to spray-drift in the form of droplet drift and application technology issues, such as nozzle design. The RCEP relied heavily on their expertise for the modelling and exposure sections of the report. However, Silsoe's work did not address the long-term exposure factors that I have been raising regarding rural residents and communities. For example, considering volatilisation can occur days, weeks, even months after application then it is immaterial how good the nozzles of the sprayer may be at the time of the application.

Many people who contact me have been affected by the inhalation of chemical fumes after application, which again is not something that would have fallen into Silsoe's area of work and was not sufficiently addressed in the RCEP report. Yet the safety data sheet for each pesticide product shows how hazardous these chemicals are via inhalation with warnings such as, "Very toxic by inhalation," "Do not breathe spray"; "Do not breathe fumes," "Do not breathe vapour," "Harmful, possible risk of irreversible effects through inhalation," "May cause cancer by inhalation."



Aerial photo of Georgina's home (marked with a red circle) surrounded by fields that run for miles in all directions, which is obviously a common feature of many rural communities. These fields could all be regularly and sequentially sprayed with mixtures of pesticides throughout every year. The yellow line shows where a 5 metre buffer zone would be in the field adjoining Georgina's home. Photo scale approximately 1 mile left to right. Photo courtesy of Getmapping plc

It is impossible to avoid inhaling chemicals when living near fields that are regularly sprayed.

Therefore, the recommendation of 5 metre buffer strips is wholly inadequate and will not be able to protect rural residents and communities from the overall and complex exposures they will be receiving as a result of pesticide spraying in the complete sense rather than exposure related solely to that of immediate spray-drift. It would be a travesty if Silsoe's 5 metre recommendation turns out to be the undoing of the RCEP report.

The ACP's Response to the RCEP Report

On February 6th 2006, the ACP hit back at the RCEP's criticisms of the ACP's approach in one of the most extraordinary documents to be published by a Government advisory committee charged with advising ministers on the protection of public health.

The ACP report contains numerous factually inaccurate and grossly misleading statements and demonstrates the ACP's continued complacency in relation to the impact of pesticides on human health. The ACP relies on highly selective literature in an attempt to support its view that pesticide spraying is more of a social issue than a scientific one and that any ill-health reported is likely to be predominantly of a psychological origin following an awareness of exposure.

Apart from being grossly insulting and disrespectful to all those suffering ill-health whether it be acute or chronic, it is simply not the reality.

As I have informed the ACP many times, the majority of people who contact me did not know anything about being exposed to pesticides until long after they became ill and, therefore, they cannot be imagining or perceiving the ill-effects as being related to pesticides if they have no knowledge of any exposure.

It is interesting to note that the US study published last year and supported by the US Environmental Protection Agency (EPA) that confirmed acute illnesses in children and employees from pesticides sprayed on farmland near schools did not suggest anywhere that the ill-health effects reported could be due to perception, imagination, hysteria or of any other psychological origin. (Aларcon *et al.*, 2005).

However, seemingly in an attempt to try and support the psychological argument, the ACP have mainly focussed on the two most controversial conditions, Myalgic Encephalomyelitis (ME) or Chronic Fatigue Syndrome (CFS) and Multiple Chemical Sensitivity (MCS), even though the RCEP were calling for changes to the current system in relation to any acute or chronic illnesses and diseases that could be related to pesticide spraying.

The ACP's comments regarding ME (CFS) and MCS portray a biased, one-sided view of the existing literature and evidence relating to both conditions. ME (CFS) has actually been formally classified by the World Health Organisation (WHO) in the International Classification of Diseases (ICD) as a neurological disorder since 1969, with CFS listed as an alternative term for ME. (WHO 1969-current)

In relation to MCS, other countries have acknowledged it

as a physical condition in its own right. For example, Germany was the first country to recognise MCS officially and it is now included in its edition of the WHO's International Classification of Diseases. (ICD-10-GM current)

There have been a number of studies that have linked exposure to pesticides, as well as other chemicals with both ME (CFS) and MCS (Fernandez-Sola *et al.*, 2005)

Even in the UK, there has been previous acknowledgement of MCS that the ACP did not refer to. A 1999 report commissioned by the Health and Safety Executive concluded that MCS did exist and could be caused by chemicals affecting part of the brain. (IOM, 1999)

Considering the RCEP made firm statements that people reporting ill-health are genuinely ill and that this was definitely not psychological, then the ACP's continued reliance on this argument, although probably predictable, only takes the issue backwards and will continue to fuel the adversarial relationship between farmers, regulators and the general public.

It also misses the fundamental point. The principle aim of pesticide regulation is supposed to be the protection of public health, which is obviously based on the risk of harm and not that harm has to have already occurred. Therefore, individuals should not have to prove they are ill. The Government should not be exposing people to any risks. This is the fundamental point that tends to get overlooked with all the arguments regarding proof of causation.

For example, in written evidence to the EFRA inquiry in February 2005, DEFRA and HM Treasury clearly stated that, "*If there is scientific evidence that use of a pesticide may harm human health, that is considered an unacceptable level of risk.*" (DEFRA and HM Treasury, 2004)

This calls into question the lawfulness of the ACP's current approach. The EU Directive 91/414/EEC and the UK equivalent legislation (the Plant Protection Products (PPP) Regulations 2005) state that a pesticide shall not be approved unless it has been satisfied that it will not have any harmful effect on humans or animals.

The former ACP Chairman Professor Coggon has stated that approvals have been given to some products knowing that they pose a danger to people's health and that there may be adverse effects following exposure. (Coggon, ACP, 2005). However, the ACP has confirmed that it accepts these effects as they are deemed to be relatively minor health effects and ACP and PSD have both stated that the aim is to protect against any "*serious*" illness from the use of pesticides.

This would appear incompatible with the precise and definite language used in both the EU Directive 91/414/EEC and the UK PPP Regulations 2005. The regulatory system is supposed to protect against any adverse health effects occurring from exposure to pesticides, not simply those that the regulators and scientific advisors deem to be "*serious*" adverse effects.

Decades of Government Inaction

There has now been over 50 years of documented scientific and medical evidence in relation to the dangers of pesticides, the risks inherent in their use and the acute and chronic long-term ill-health effects that can result following exposure.

Prior to the RCEP report, a number of previous official reports had also warned of the dangers of pesticides and heavily criticised the existing regulations and monitoring system for being wholly inadequate. These included the highly regarded British Medical Association's (BMA) 1990 report "*Pesticides, Chemicals and Health*" and the Commons Agriculture Select Committee report in 1987.

Both reports concluded that none of the Government agencies involved with pesticides had made any serious attempt to gather data on the chronic effects of pesticides on human health.

Despite the recommendations that both of these reports made, the situation has not changed, as successive Governments have just continued to deny the evidence. In fact in light of the reluctance of the ACP's recent publication to even acknowledge this as a serious public health issue then the situation now appears worse than ever.

We cannot continue to have the same arguments for the next 50 years. Many of the conditions that are reported in rural areas including cancer and leukaemia are devastating diseases that are on the increase, especially in children and even though there could be a number of different causes for any chronic illness or disease, all the causes must be identified in an attempt to try and prevent them from occurring.

Pesticides that were approved for use for decades and declared safe have since been banned, as they were subsequently recognised as having damaging effects on human health and the environment.

There have been many parallel examples where the UK Government and its advisors continued to deny the existence of a problem only to have to issue subsequent retractions, along with a ban on the substance, at a later date. One of the most significant of these is in relation to asbestos related diseases.

A report published in 2004 stated that 3,500 people die each year as a result of exposure to asbestos and that this figure is expected to rise to over 10,000 people a year in the next decade. (Asbestos Working Party, 2004). These deaths and those yet to come could have been avoided if the early warning signs, going back many decades, had been adhered to and the immediate and appropriate action taken.

Another example is the Government's approach to smoking, as despite the fact that the medical evidence on passive smoking had been around for decades, it is only now that the Government have finally made the proactive decision to introduce preventative measures to protect people from second hand exposure to cigarette smoke. However, the tobacco industry, like the pesticides industry, continues to maintain that the evidence is only circumstantial, that there is no definite proven link and simply calls for further research. David Michaels, a professor at the George Washington University School of Public Health, has called this approach "*the art of manufacturing uncertainty*." In an article last year for the Los Angeles Times he stated "*Every polluter and manufacturer of toxic chemicals understands that by fostering a debate on uncertainties in the underlying science and by harping on the need for more research – always*

more research – it can avoid debating the actual policy or regulation in question." (Michaels D, 2005)

A recent US study that highlighted the neurodevelopmental effects of pesticides concluded that a new regulatory approach for pesticides is needed and that the uncertainty that accompanies scientific research cannot be allowed to serve as an impediment to protective actions. (Colburn, 2006)

Conclusion

The Government's recent decision to ban smoking in public places has now created a clear mismatch and inconsistency with its failure to protect people from passive exposure to pesticides.

The use of pesticides and other hazardous chemicals has resulted in devastating consequences for public health, animals, wildlife, air, water, soil, food and the wider environment. This has massive economic and financial implications for all parties (with the exception of the pesticide industry) that are impossible to quantify.

The UK Government and the EU must take immediate action, which is very long overdue, especially in relation to the protection of children and other vulnerable groups.

The only way to protect public health and prevent any illnesses and diseases that could be associated with pesticides, for now and for future generations, is to avoid exposure altogether through the widespread adoption of truly sustainable non-chemical and natural methods, as an alternative to chemical pest control.

This would obviously be more in line with the Government's commitment to sustainable development, sustainable food and farming and sustainable communities, as the reliance on pesticides and other chemicals for food production cannot be classified as sustainable.

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Georgina Downs runs the UK Pesticides Campaign to highlight the adverse health and environmental effects of pesticides. She has lived next to regularly sprayed fields for 22 years and has long-standing health problems. Georgina was the first to identify serious fundamental flaws regarding the bystander risk assessment and for the last 5 years has presented a case to the Government for a change in the regulations and legislation governing crop spraying.

She has produced 2 videos "Pesticide Exposures for People in Agricultural Areas – Part 1 Pesticides in the Air; Part 2 The Hidden Costs" to illustrate chemical exposure and the effects on people in rural areas

She has called for an immediate ban on crop-spraying and the use of pesticides near to people's homes, schools, workplaces and any other places of human habitation and for direct public access to the information on the chemicals sprayed on crops.

Georgina has recently won the prestigious Andrew Lees Memorial Award at the British Environment and Media Awards and is also a nominee for Campaigner of the Year in the Observer Ethical Awards 2006.

The Farmers Weekly included Georgina in their list of the Top 20 power players in UK farming following the impact of her campaign.

Similar articles that featured in *Outlooks on Pest Management (Pesticide Outlook)* include: 2002 **13(6)** 233; 2003 **14(5)** 205; 2003 **14(5)** 210; 2004 **15(3)** 108; 2005 **16(2)** 75; 2005 **16(6)** 244

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