

HOUSE OF COMMONS
ORAL EVIDENCE
TAKEN BEFORE THE
ENVIRONMENTAL AUDIT COMMITTEE

INSECTS AND INSECTICIDES

WEDNESDAY 21 NOVEMBER 2012 (MORNING)

NICK MOLE and MATT SHARDLOW

DR CHRIS HARTFIELD, PETER MELCHETT and EMMA HOCKRIDGE

Evidence heard in Public

Questions 1 - 90

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Oral Evidence

Taken before the Environmental Audit Committee

on Wednesday 21 November 2012

Members present:

Joan Walley (Chair)
Martin Caton
Zac Goldsmith
Caroline Lucas
Mr Mark Spencer
Dr Alan Whitehead
Simon Wright

Examination of Witnesses

Witnesses: **Nick Mole**, Policy Officer, Pesticide Action Network UK, and **Matt Shardlow**, Chief Executive, Buglife, gave evidence.

Q1 Chair: A very warm welcome to our first two witnesses, for what is the first session in our inquiry into insects and insecticides. Thank you both for coming along. We feel that this is an important inquiry that the Environmental Audit Select Committee is carrying out. We are particularly mindful that we are doing this 50 years after the publication of Rachel Carson's seminal work *Silent Spring*, which I know has influenced a lot of thinking on this whole agenda. It might be helpful for me to say to you that we are looking to close this session around 10.30am. We have quite a few detailed questions, but I think it might be helpful if you would both introduce yourselves very briefly to the Committee in the first instance.

Matt Shardlow: Hi. I am Matt Shardlow. I am the Chief Executive of Buglife - The Invertebrate Conservation Trust. We are the charity that is there to represent the needs of all the little things out there that make the world go round, including the bees, including the pollinators. We have been very much involved with the question of neonicotinoids and their potential impact on the environment since 2009, when we produced a seminal report that reviewed all the existing science at that time. We had no prior involvement in the issue. We have no general position with regard to pesticides. We treat it on an evidence-based case-by-case basis, but there had been concern about neonicotinoids and we looked into that. We found that those concerns were substantiated with science and we made recommendations that, in the light of the absence of evidence that they were safe, the chemicals should be suspended. Since then we have maintained a watching brief on this issue and we are still involved, and no doubt we will come on to some of the other things we are doing in due course.

Q2 Chair: Thank you. Mr Mole?

Nick Mole: I am Nick Mole from the Pesticide Action Network. I am a policy officer there. Pesticide Action Network has been operating for 25 years. We are the only UK charity that works on all issues of global pesticide-related concerns. We have been concerned about neonicotinoids for over 10 years, and the effects that they have on bees, other pollinators and other insects. Of course, since we have had all these studies showing all the un-thought about

effects that we are seeing on bees, we have launched into it. Our main concern is that in this case—as in many other pesticide-related issues—Defra is acting complacently and is not taking the weight of independent evidence of harmful effects into account and, therefore, is not taking an adequately precautionary approach to what is a very serious issue.

Q3 Chair: That is very helpful to start our inquiry. Much of the concern there has been in the press—possibly because of the campaigning that there has been—has been about the decline of honeybees, but what we are also interested in as well, from the point of view of the Committee, is whether or not we should be just as concerned about other insect pollinators, and whether or not the UK is facing a general insect-pollination crisis or whether it is specifically an issue to do with honeybees.

Matt Shardlow: I will pick up that point. We should certainly be very concerned about what happens with our wild pollinator populations, because they do 90% of the pollination service. The apples that we eat, the flowers in the countryside, are pollinated largely by wild pollinators. That is bumblebees, solitary bees, hoverflies, moths and beetles. There are various other things as well, but those are the main groups of pollinators out there.

How well are they doing in the countryside? As a rule of thumb, two-thirds of the species of pollinator are declining. Where we have the data, that is the situation: two thirds declining. So, 66% of larger moth species in the countryside, including things like the Hedge Rustic, are declining. Most of the bumblebees are declining and six species have declined by at least 80% in recent years. Where change is detectable in the data, 66% of hoverflies are declining, 71% of butterfly species are declining. In addition to pollinators, aquatic ecosystems are also in trouble with 66% decline in the abundance of mayflies, for instance, in recent years.

Across Europe there is a similar picture. The moth data in Europe is very similar to the moth data here: 67% of Dutch species declining. Also grassland butterflies—one of the most shocking statistics—a 70% decline in abundance in grassland butterflies since 1990, so that is a very recent and massive decline in grassland butterflies, an important pollinator group. A study called ALARM looked at bees and hoverflies across Europe and found 38% of the species were declining and 12% of the species were increasing. What does this lead to? You start to get into the area where the evidence is very sketchy but that ALARM study showed that 62% of wild flowers in Europe were pollen-transmission limited. That means that if they were getting more pollination there would be more seeds and there would be more flowers. It seems that there is already an impact in terms of the reduction in pollination services causing a reduction in the abundance of wildlife.

Q4 Chair: Do you wish to add to that?

Nick Mole: I think that is fairly comprehensive.

Q5 Chair: You have just mentioned different statistics. We were wondering about the extent of the research that there is and whether or not, in your view, Defra particularly has undertaken sufficient research in relation to wild insect pollinators generally.

Matt Shardlow: The answer that question is, no. We think that at a basic level there should be monitoring, not just of the populations of the pollinators but also of pollination rates, so that we can start to get a better grip on the relationship between the insect pollinators and crops and wild flowers. There is no national monitoring programme around that. In terms of individual bits of science, in 2009 we flagged up the potential impact on the environment, on these wild pollinators. There has been very little government-funded research looking at those issues since then. There is a bit on bumblebees now but there is very little going on.

Certainly it is taking a long time for them to step outside the honeybee mentality to look at the wild bees, the solitary bees, and the moths as well.

Q6 Chair: Can I follow that up? We have seen what has happened with ash, and we have seen other catastrophes. What channels of communication do you have with Defra, and what do you think needs to happen to make the case for further research from Defra, and what is your understanding of how Defra go about the process of determining where further research is needed.

Matt Shardlow: There was a recent answer to a parliamentary question that stated that there are 70 Government scientists researching the health and populations of honeybees, which is a domestic species, and there is part of one person looking at the health of wild bees.

Q7 Chair: Part of one person?

Matt Shardlow: Part of one person looking at the health of wild bee populations. That gives you some idea of the level of priority that Government has put on this issue. Frankly we found it very difficult to engage with Government on this issue. We had a meeting with Richard Benyon, a year or two ago, about this and other pollinator-related issues, but they certainly have not come proactively to talk to us. Indeed, one thing we are concerned about is how this whole area of decision-making relates to the Aarhus Convention. The Aarhus Convention sets out that, around environmental decisions—which this clearly must be, because this is all on an environmental basis—there must be openness, there must be access to information and there must be clear decision-making and consultation, and we have not been consulted.

Q8 Chair: You mentioned the meetings that you had with the Defra Minister. Did you make any specific requests at that meeting that you would have expected to be followed up?

Matt Shardlow: As I mentioned earlier, we did ask for a national programme of monitoring to be put in place, so that we could understand what was happening with our pollinator populations much better and relate that to what is happening in terms of crop, economic and wildlife impacts.

Q9 Caroline Lucas: I want to follow up on looking at the issue of food production in particular. Given that the research is not going into the wild bee population, which seems to be so critical when it comes to pollinating our crops, do you think there is a potential catastrophe in the making when it comes to food production and, if so, is that an area where you think Defra should be doing more work?

Matt Shardlow: Absolutely. The difficulty here is that pollination is a common good, isn't it? It operates on a broader scale than a field scale; it operates on a landscape scale with populations pollinating lots of people's crops and wild resources as well. It is very difficult to look at a single field and try to make a determination about the contribution of that pollinator population to that field. There is a risk that, by focusing as we are at the moment on plant-protection products to increase output, we are not focusing enough on the ecosystem services and their contribution. We do know that, in the UK alone, they are worth £510 million a year.

For instance, if you compare that with what Syngenta claim is the benefit across Europe of the use of clothianidin, of Cruiser OSR, they claim that that is worth £800 million across Europe. Well, pollination services are worth £17 billion across Europe. If that chemical is reducing pollination services by just 4% or 5%, then the impact of using that chemical on farmers who are not using that chemical is economically negative. We do not believe that this economic issue has been properly assessed or looked at by Government as part of the process

of determining this. It is a critical point, because it is part of the European legislation that they must first show that the plant-protection products have an economic benefit. If they are not accounting for the environmental impacts and the economic impacts of the environmental impacts, they should not be licensing these products for use.

Q10 Chair: On that point, is there a modelling that currently exists that could show how the economic benefits of that could be taken into account in policy formulation?

Matt Shardlow: I do not think we are at the point where we have enough science about the impacts in the field to make that determination. We will no doubt come back to this point that if you want perfect science, that may take 20 or 30 years, by which point these chemicals will be gone, because the industry will have found the next generation so the research will be redundant. We will come back to this and Nick may add to this, but this is why we have a precautionary principle. It is a wise thing to have, because if you do not have a precautionary principle then you never get those sorts of absolute levels of proof.

Q11 Chair: You mentioned the Aarhus Convention. In view of what you said relating to that, do you think there is a case for extending the EU legislation or, if not extending it, re-assessing how adequately it is operating and how fit-for-purpose it is, so as to include risk assessments covering all wild insect pollinators?

Nick Mole: I think there is a case for that. It is covered within the text of it. Pesticides being the emissions of the environment are covered by the Aarhus Convention. We should have access to all the industry risk assessments.

Q12 Chair: Are you saying it is there already?

Nick Mole: Within the Aarhus Convention there is the provision that information should be supplied, because this is an emission to the environment. Pesticides are an emission to the environment, the same as from chimneys and that sort of thing. In theory, we should be able to access the information about risk assessments that have been done by industry.

Q13 Chair: So that I am absolutely clear, are you saying that the Aarhus Convention as it exists gives provision for this?

Nick Mole: In theory. However, they are covered by commercial confidentiality, which seems to trump that, certainly in the UK. There is no independent access to be able to peer-review or look at the industry studies that they use for their approvals of pesticides.

Q14 Chair: Are you talking about the UK now or are you talking about the application of the—

Nick Mole: The UK, but also more widely in the EU as well. It is all covered by commercial confidentiality, so independent access is at best extremely limited.

Q15 Martin Caton: Can I just clarify? I think the Chair's question was: should the EU be undertaking risk assessments or, at least, requiring the manufacturers to undertake risk assessments on wild pollinators? You seemed to say that they probably are doing that but they are keeping it secret. I think we need to clarify that.

Matt Shardlow: That may be the case. We have two bit of legislation: the Aarhus Convention, which is about access to environmental information, and the Plant Protection Products Directive, which is about that regulation happens. That regulation on plant protection products is very clear that it is about protecting the environment. In fact, it says that protecting human health and protecting the environment are higher priorities in that legislation than supporting plant protection products. We have to put those things in context.

We have to look after people and the environment first—that is all there—including impacts on non-pollinators, so if there are significant, unacceptable impacts on those wild pollinators that is not acceptable. How that is implemented is then how those tests are carried out and what is required of the pesticide manufacturers, what tests do the products need to go through before licensing for use.

The European Food Standards Authority has recently produced a report saying that it is insufficient at the moment and it should at least be extended to include solitary bees and bumblebees, as a standard for the industry. We would go further. We think we need to include things like moths but also the predators that live in these fields as well. Those predators are contributing to a sustainable agricultural system and they should be part of that study as well. The answer is, yes, the legislation is all okay, but the way it is being implemented is restricted at the moment and they need to broaden the approach to include in the assessment process and a wider range of invertebrate groups.

Chair: Thank you for clearing the record about the relationship between the Aarhus Convention and the different legislation that exists in relation to regulation.

Q16 Caroline Lucas: I want to drill down on the issue of transparency. Can you just say how damaging is it—or is it damaging—that more of this research is not properly in the public domain? I want to clarify that bit, if that is what you are saying. Perhaps I misunderstood you.

Matt Shardlow: It is very damaging because it is secret. No one knows what the data is saying unless it is published. In some ways, when you get to the point we have now, where there is so much research that it is starting to look conclusive, it starts to count against the pesticide manufacturers, that they are keeping information that they think might support their case secret. Up until this point the information has been very difficult to access. I have had Bob Watson, chief scientist of Defra, telling me that, unless the pesticide industry starts to reveal their data to him, he is going to have to take action with regard to the pesticides. If the Government's own chief scientist is struggling to get hold of this information, how is the public going to have access to this important information about how these chemicals might be impacting their environment? It is just impossible.

Nick Mole: Also, the point of that is that the decisions on whether to approve a pesticide are based on these, basically, secret documents that we do not have access to.

Chair: We will be returning to this issue on transparency in just a short while.

Q17 Zac Goldsmith: Can I just clarify that there is approval at the EU level?

Nick Mole: It is approval at EU level, but for products in the UK manufacturers have to produce a risk assessment for their product that contains an EU-approved active.

Q18 Zac Goldsmith: Can I follow up on that point? Is it not also the case that the composition of the delegated committees, whose job is to assess these chemicals and approve them, is also confidential? I know that ClientEarth is running a campaign to reveal the names. It is perfectly possible that on these committees you have companies, effectively, policing, regulating and judging chemicals produced by another division of the same firm. Is that the case?

Nick Mole: I believe that is the case, yes. It certainly can be the case.

Q19 Zac Goldsmith: The information is confidential, the manner in which they are decided is confidential, and the identity of the people who are making the decisions is also confidential or secret?

Nick Mole: Ultimately, yes. There is a massive lack of transparency and no redress for it, unless you want to pursue a lengthy court case.

Q20 Zac Goldsmith: Is this an area where the British Government has made any representation? It is hard to defend, the status quo, but has Defra made any public representations on this issue of transparency?

Nick Mole: Not to my knowledge. All I have ever had is, “No. It is covered by commercial confidentiality”. I have never heard them say, “Well, yes, this would be better if it was in the public domain”.

Q21 Zac Goldsmith: I am going to go on to neonicotinoids in a second, but I think this issue of confidentiality is a really crucial area. It is very hard to argue against a precautionary principle, when we are not allowed access to the information that would enable us to make an informed decision. It is an extraordinary situation. I am assuming there is total unanimity, among all the NGOs with an interest in this area, on this issue of transparency. There are no arguments against it as far as I can see.

Nick Mole: No.

Q22 Zac Goldsmith: Before I go on to neonicotinoids, can I ask you: does Defra accept the data that you provided us with earlier on the decline of insects?

Matt Shardlow: As far as I am aware, yes.

Q23 Zac Goldsmith: There is no argument there?

Matt Shardlow: No. The Rothamsted work on moths is Government funded, as is the butterfly work. This is all fairly standard data.

Q24 Zac Goldsmith: The 70 people and the half-person in these jobs, are they there to monitor or are they also engaging in research to understand what is causing the decline? Is there a distinction in terms of the tasks they have been set?

Matt Shardlow: As I understand it—and I am reading slightly between the lines—70 people work at Fera, and they are interested in the health of domestic honeybees and the full range of the things that are affecting them. One person, who I believe is at Natural England, is overseeing the conservation of the remaining 500 species of bees and wasps across the whole of England.

Q25 Zac Goldsmith: That means looking for cause as well monitoring the decline?

Matt Shardlow: Potentially, yes.

Q26 Zac Goldsmith: You have already stated that you think neonicotinoids are a factor. Can you explain why? You mentioned there was a lot of science. You have made that point a couple of times. Can you explain why you think it is a key factor in the decline, not just in bees but in pollinators in general?

Matt Shardlow: Okay. I will refer to a bit of research that I did on the train on the way down.

Zac Goldsmith: Very Peter Schofield, isn't it? Three minutes on the internet.

Matt Shardlow: We have been keeping abreast of the scientific research since we produced our report. We have a list. The list is one that is not just things we have become aware of, this is a list that we circulated around a lot of independent scientists and asked them to put forward studies on things off the list. We sent it to Bayer and they suggested studies that we do not have on the list, which we have added to the list. We talked to CRD about what

studies they are relying on, and we have added those to the list. I am not saying it is absolutely comprehensive, but this is as good a list as we can get of all the science that has happened since our report was produced in 2009.

In this science, basically 31 of the studies show a much bigger or more concerning impact of neonicotinoids on insects, and on other environmental issues, than was previously known to be the case. If you look at it overall, there are 41 studies but eight of them we think are suspect, because of the dose rates being wrong or various experimental errors or foibles. If you take those out of the equation that means that, since we produced our report, 94% of the studies are showing impacts on bees, other insects and on the environment. This includes fatalities from dust, for instance. This includes increased disease susceptibility and death. This includes reduced foraging and activity within bees and reduced reproduction, particularly in bumblebees.

Q27 Zac Goldsmith: Are you talking about neonicotinoids as a single entity or are you distinguishing between the five different products that are available?

Matt Shardlow: I am talking about all the neonicotinoid research, and it is an important point. The older chemicals—clothianidin and imidacloprid—are the ones where research has now come to fruition and we have evidence about. There is a lot less research on the newer ones.

Chair: It would be very helpful for the Committee to have that list that you have just referred to.

Q28 Mr Spencer: Could you clarify what sort of concentration levels are those tests conducted at? Are they at field-scale concentrations?

Matt Shardlow: Yes. As I said, there is one study where the levels were clearly too high. I have taken that out. There are a couple of studies where they only applied them for a single day. That is completely unrealistic. There is one field study where they only treated 0.05% of the area that was being foraged on in some of the tests. So I have taken out the ones that I think are completely unrealistic. That has reduced it down to 31 studies that show bigger impacts and two studies that show either no effect or less worrying trends. We all know science is imperfect, and some science is always going to find no effect in a complex ecosystem analysis, so I think it is really worrying that 94% of the studies—which is almost at the level of statistical viability—are showing bigger impacts than we feared.

Q29 Mr Spencer: I am sorry to come back again, but I think this is an important point. Are the insects that are being tested being exposed to the type and levels of the chemical that they would naturally be exposed to in the commercial world or are those concentration levels greater than they would be exposed to in the commercial world?

Matt Shardlow: It would be wrong of me to say that they are exactly the same, because we do not know what “exactly” is and it is going to vary from one place to another. So there is no absolute, “This is what it is like everywhere”. There is going to be variation in the environment. There is variation in the studies as well but they are all in the right ballpark.

Q30 Zac Goldsmith: Finally on that point, given the research that you have identified, and given the 94% alarm that that reveals, why do you think Defra has not taken that evidence to justify adoption of the precautionary principle, at the very least? To your mind, what is their argument? Why are they resisting that?

Matt Shardlow: I will probably leave this to Nick to some degree, but I will point out that in their report, which they produced in September, they talk about there being

unequivocal evidence. The reason that they are not taking action at a simple level is because they are not finding absolute proof, unequivocal evidence.

Q31 Zac Goldsmith: Is it even possible to find the kind of evidence they are looking for?

Matt Shardlow: Possibly not.

Nick Mole: Defra's position on this, pointing out they like unequivocal scientific evidence: they base their decisions largely on the industry's research—which we have already covered—so we do not know what they are saying, but obviously the tests that the industry run show that they are acceptable, within a flawed risk-assessment process.

It is also worth pointing out that CRD, who ultimately make the decisions, is 60% funded by the work it does on approving pesticides. I am not in any way suggesting there is any kind of corruption going on, but to our mind there is a clear conflict of interest. Their closeness and their relationship with the work they do for the agrochemical industry is very, very clear. That the same people that approve pesticides also regulate and enforce pesticide rules—there is no separation—we think that is one reason why precautionary decisions are not made. They are too closely embedded together.

Q32 Zac Goldsmith: You are saying that Defra's reluctance to act on this issue is not in any way based on the science. It is based on the closeness of the regulators to the industry?

Nick Mole: In part. I cannot believe, given the body of evidence that we have from all these studies that Matt has just shown, that Defra could interpret it any other way than going down the precautionary route, so there must be some other reason for it. They rely in their positions on industry-generated data and studies.

Q33 Zac Goldsmith: Because of that closeness do you think the regulatory system, when it comes to chemicals in this country, therefore is not fit-for-purpose? It is not a system in which people can justify having any faith at all?

Nick Mole: I would agree with that completely. I do not think it is fit-for-purpose, either in this instance or when it comes to human health or other areas of the environment.

Q34 Dr Whitehead: Could we widen this slightly, in terms of looking at the context of this discussion? We have heard that there is no dispute about the figures on decline, but what other factors might be driving those declines, if we exclude the issue of pesticides for a moment? Are there a number of other factors that can be identified, which should be added to the list, as far as decline is concerned?

Matt Shardlow: We are talking about thousands of species. Each species is unique, each species is different and each species is responding to different factors. There are going to be lots of factors involved here. One of the big factors—at least historically—has been the loss of wild flowers. Since the Second World War we have lost vast areas, huge percentages of our wild flowers from the countryside, due to agricultural intensification. Ploughing, use of herbicides, use of fertilisers, has reduced the area that is available to pollinators in the countryside and, no doubt, has had a massive impact on pollinator populations.

Whether, since 1995 until now—where I think hopefully we have slowed at least, if not halted, the loss of wild flowers in the countryside, the destruction of meadows and SSSIs—the loss of wild flowers is the big factor, or the use of these chemicals and other pesticides, I could not tell you. The science is not there to give absolute conclusive evidence as to what is the biggest factor across all these issues, but certainly it fits the pattern. A lot of the species we are seeing declining are wider-countryside species, that are potentially going to be in areas that are affected by the neonicotinoids chemicals.

Q35 Dr Whitehead: The mentions of mites and other chemical factors, are those significant in your view?

Matt Shardlow: It is probably worth making a point about honeybees and other pollinators. Most of the research is on honeybees. All of the evidence that suggests there are other issues, like Varroa mites, and field studies that indicate there may not be an effect, are about honeybees. The legislation is about wild pollination. It is about the environment. In that context there is no evidence that they are safe. When it comes to things like the Varroa mite—which is often claimed to be the problem—that can only apply to the honeybee, which is only about 10% of pollination. So, 90% of pollination, all those declines I listed earlier, must be down to something other than the Varroa mite.

Q36 Dr Whitehead: Is that your view?

Nick Mole: Yes. When you look at honeybees, there are a whole range of problems affecting them. Neonicotinoids are just one. The increase in things such as Varroa mite could be attributable in part to the effects that pesticides are having on honeybees, so making them more vulnerable to other pests and diseases that were already in existence. The point is that we know—it is a fact—that these pesticides are toxic to bees. That is not in dispute at all. We cannot legislate against Varroa mites or other pests and diseases but we can, at the very least, take out something that we know is toxic to bees while we look at the other problems. I think that would be the sensible approach; take one part of the puzzle away and look at the other things. But it is not the entire reason that honeybees are facing difficulties.

Q37 Dr Whitehead: Regarding these other factors, the question in my mind—and you have mentioned this—is the extent to which you might say that the use of pesticides advances and exacerbates those other factors, or whether they ought to be considered discretely, and what evidence there may be of combination factors at work in terms of decline.

Nick Mole: There are two parts to that. Some studies have looked at how pesticides weaken bees' immune systems and make them more vulnerable to pests and diseases. The thing that is not looked at, and certainly is not covered in any risk assessment at the moment, is the combinatory effect of different pesticides. One study has shown that the effect of a neonicotinoid with a pyrethroid, which is a different class, working together, greatly increases the effect. That is not covered in any kind of risk assessment whatsoever. In the real world, bees, and all the other pollinator species, are coming into contact with cocktails of pesticides every day, and there is simply nothing done on how these interact with each other and make things potentially worse. That is a hole in the research that needs addressing as a matter of priority.

Matt Shardlow: On bumblebees specifically—which is a good illustrative case—there have been two recent studies, both at field-level application rates and both showing big declines in reproduction: one of 33% reproduction-rate decline and one of an 85% reduction in the queens produced. If those sorts of impacts are happening on bumblebees and other pollinators in the countryside, it is very difficult indeed to see how that will not impact very significantly at a population level.

Q38 Dr Whitehead: In terms of location-specific studies, to your knowledge, what has been done about areas, such as islands, where a number of these factors are not present? For example, across the UK there are a number of islands where pesticides and combinations of pesticides are generally not used, and there appears to be anecdotal evidence that populations have a very different trajectory.

Nick Mole: I am afraid I am not aware of that.

Matt Shardlow: “Anecdotal”, I think, is the word. There is also anecdotal evidence, for instance in Italy, where they have restricted the use of these chemicals, that the decline in the bees there has reversed, but it is all anecdotal. We do not have the monitoring in place, of what is happening at a national level or at a local level, so we are not getting the answers to those questions.

Nick Mole: Sorry, Matt. I will just pick you up on that. The evidence in Italy is not anecdotal. It has been shown, by Government monitoring in Italy, that stopping the use of neonicotinoid seed-treated maize has resulted in far, far fewer bee die-offs.

Matt Shardlow: For honeybees?

Nick Mole: For honeybees, yes. Not for other—

Matt Shardlow: Anecdotal for wild pollinators.

Nick Mole: Yes.

Q39 Mr Spencer: Two questions, if that is all right. I think this issue of concentration on these tests is absolutely crucial, and I hope you both accept that field-scale tests are really the best source of information, because obviously salt and alcohol at high concentrations are toxic to bees and you would not suggest that they should be banned.

Just go back to habitat. Can you give us an idea of the percentage of drop in that habitat that you were talking about, about wildflower meadows since the Second World War? Is that comparative to the decline in honeybees, or have we lost more habitat than we have lost bees, or have we lost more bees than habitat?

Matt Shardlow: I have to come back on the first point, because I not sure I agree with that. It is misrepresenting the science to suggest that they are giving these chemicals to the invertebrates at levels higher than they would be likely to be encountering in the field. It is not that the laboratory studies are heavily dosing things and then looking for an impact, because of course they are going to get one. That is not what is happening. Nor is it the case that some categories of science are inherently more important and trustworthy than other categories. There are field studies that are full of errors. One of the biggest ones that is relied on, for instance, when the Canadian Government looked at it they found that the treated and the untreated colonies were both contaminated with the pesticides. The study showed no effect. The no-effect was there because both were contaminated. One has to look at the science and each bit of scientific study on its own merits, and not say, “This is in a field study so therefore it is better than this other bit of science”.

In terms of the loss of wild flowers, yes, enormous loss, 97% loss of wildflower meadows, for instance, in the countryside. As I said earlier, that loss has slowed in recent years so I think we are looking in recent years for other causes for the declines in the populations of wild insects.

Q40 Caroline Lucas: I want to come back to the precautionary principle just for one moment. I note that there was a Defra statement in September on the state of the science, and it did not even mention the words “precautionary principle” anywhere in that paper. To the contrary, it went on and said it justified its position of not taking any action because none of the recent studies provided what it called unequivocal evidence. Do you think that Defra has a robust understanding of the precautionary principle?

Nick Mole: Defra and other organisations have publicly stated that when it comes to plant protection products, pesticides, they do not follow the precautionary approach.

Q41 Caroline Lucas: Where have they said that?

Nick Mole: To me in a meeting in this building a few years ago and, Matt, I believe you—

Q42 Chair: Do you have precise details of this meeting?

Nick Mole: I can get you the precise details, the dates and so on, but it was about the effects of pesticides on bees, and the Crop Protection Association were there.

Q43 Caroline Lucas: It will be on the record somewhere?

Nick Mole: It will be on the record somewhere, yes.

Matt Shardlow: I think the NFU's evidence to this Committee says, quite clearly, that they do not think a precautionary principle should be applied to this area of regulation.

Q44 Caroline Lucas: The NFU says it does not believe that or NFU says Defra does not say it? There is quite a big difference.

Matt Shardlow: Certainly, in the past, NFU have said that Defra is in the same position as the NFU. That may just be NFU's view, from my experience. I do not know.

Q45 Caroline Lucas: There is quite a big difference between Defra saying it and the NFU.

Matt Shardlow: There is.

Q46 Caroline Lucas: Anyway, four studies recently—two from the US, one from France and one a British study—all of which look as if they should be raising concerns, and yet the Chief Scientist at Defra, as advised by the advisory Committee on Pesticides and the Chemicals Regulation Directorate, has not acted. Can you give a sense of why that might be?

Nick Mole: We met the Chief Scientist, Professor Ian Boyd, to outline our concerns about the Defra response to it. We left him with a detailed critique, which is in part what our written submission here was. We have left it with him and are waiting to hear back from him. He seemed concerned at the issues we raised and he was going to ask Defra for some answers about their position. I have not had any follow-up from that meeting.

Matt Shardlow: It is very clear indeed, in the plant protection products regulations, that the precautionary principle applies in this situation, “underpinned by the precautionary principle in order to ensure that active substances or products placed on the market do not adversely affect human or animal health or the environment”. It is also very clear that the member states must be satisfied that the active substances used in the product have been approved “in the light of current scientific knowledge”. When new knowledge becomes available, it is quite appropriate—and they have every right and every right in law—to review that product in the light of the new science. This is what they have done but we believe they have applied the wrong test. They have applied a test of looking for unequivocal proof. We believe there should be a precautionary principle. So we are concerned that this is wrong in law and we are looking at whether we should be judicially reviewing their decision, in the light of not just the precautionary principle but also the range of factors that we are concerned they may not have considered.

For instance, they have a duty to conserve biodiversity under the NERC Act. We have seen no evidence of them considering the impacts of this on various aspects of biodiversity. We have not seen any assessment on the impacts on the Water Framework Directive; the impacts on protected sites, SSSIs and SACs. Also, we think they have not considered the full range of environmental issues that they should be considering in making such an important environmental decision. We also believe they have not carried out a proper open process with proper consultation, so we think this decision is probably wrong in law.

Q47 Caroline Lucas: Just to have it clearly on the record—I think you have said this already—if Defra were to be guided by the precautionary principle, is it overwhelmingly clear to you that they should be banning neonicotinoids, even if they are waiting now for unequivocal evidence?

Matt Shardlow: No question about it.

Nick Mole: No question or, at the very least, instituting a moratorium on their use.

Q48 Caroline Lucas: Can I just put one argument to you that has been raised in some of the evidence we have looked at, which has suggested that a ban might do more harm than good to insect pollinators because it is argued that it would lead the agricultural industry to spray larger quantities of potentially more harmful pesticides more frequently?

Nick Mole: This is a typical and regular line used by the agrochemical industry when there is any hint that one of their profitable pesticides might be looking at a suspension or a withdrawal. There is no evidence to suggest that if neonicotinoids were not used they would be replaced by potentially worse older chemistries, or there would be any need to spray in greater quantities. Oilseed rape is an example of one thing that is not looked at. It is impossible for a farmer to buy non-seed-treated oilseed rape seed, so 100% of the oilseed rape in this country is grown with a systemic pesticide in it. There is no indication whether any of that is dealing with any kind of real-life pest threat whatsoever. It is simply an insurance policy, and there is a real need to look at whether we need this amount of seed dressing—is it really dealing with a problem—because if it is purely for insurance, it completely undermines basic principles of integrated pest management and it is leading to overuse of pesticides. So, number one, are they really necessary? We do not believe that they are, so there would be no increase in spraying.

If you look at the example of Italy, where they have banned certain seed dressings on maize crops, not using them has not led to any increase in pest or disease problems. It has also not resulted in any kind of loss of yield or profitability to the people growing the maize. I am sure you will hear more in the second session about what can be used. We think it is a fallacious statement and it is alarmist scaremongering from the people who are profiting from selling treated seeds.

Matt Shardlow: Can I just say that it is very attractive to think that new things are better than old things and it is not always the case. While the older chemicals tended to be used in larger volumes, they were a lot less toxic. In addition, the old chemicals would—as Nick said—be used to treat a problem on an occasional basis, whereas the new chemicals are used prophylactically. They are used whether there is a problem or not. You get this highly toxic chemical applied to the seed, put in the soil. It then stays in the soil and in the plant and potentially washes out into aquatic systems. The aquatic ecosystem as well as pollinators, is something you should bear in mind. I know this is about pollinators but in 89% of Californian water bodies they found neonicotinoid pollution, so there is a potential issue here with the chemicals getting washed out of the soil as well. There is no evidence that what went before was worse for pollinators than what is happening now. Even if that was the case, surely the answer is then that those chemicals as well should not be being used, if they are destroying the environment as well.

Q49 Mr Spencer: This is really important as well. Are you suggesting, then, that the whole of the UK agricultural industry has been mis-sold a product that has no commercial benefit whatsoever, and the agricultural industry is spending millions and millions of pounds on a product that is completely a waste of investment?

Nick Mole: That is not what I am saying at all. These products obviously work when there is a pest present—they do—otherwise they would not be approved, so they are

efficacious. My point is: do we need 100% of oilseed rape, in this case, treated with these pesticides? From what I have seen my conclusion is, no, we do not. It is not targeting specific pest problems. It is an insurance policy just in case. There is no evidence to point that these things would be damaged by pests if they had not had the seed treatment on them.

Q50 Mr Spencer: Given that viral diseases in plants are spread by aphids who go between plants, surely you would recognise that a seed treatment that prevents that from happening, and is applied when there are no pollinators in and around that crop, that applying a chemical to a crop when it is in flower is much more likely to come in contact with pollinators as they are going in and around that crop?

Nick Mole: Again, that would be basing it on the chemical-first approach when there are other non-chemical approaches that could deal far more effectively, or as effectively, with pest and disease problems. I would again draw your attention to the Italian study, which did not just look at insect problems but at the whole range of pests and diseases related to that and saw no increase, whatsoever, by not using seed treatments.

Matt Shardlow: I think the evidence should be gathered and there should be more work looking at the economic benefits. That should be part of the regulation process and part of what the UK Government looks at. We do not have all the answers. I would draw attention to one product called Biscaya, which is marketed against pollen beetles that are a pollinator. With pollen beetles, all the evidence I have seen shows that the damage caused by these beetles is replaced by the plant. Pollen beetles do not cause a reduction in production, yet there is a chemical being marketed with the purpose of destroying that pollinator, so there are some questions to be answered here as to how efficacious and how useful some of these products really are.

Q51 Martin Caton: I come back to the point you made about the Californian research about water pollution by neonicotinoids. Has there been any research done in the UK about pollution to our waters?

Matt Shardlow: I am not aware of any. We have asked Defra in our pre-action letter that we sent to them—and which we submitted as evidence—to provide us with details about how many sites are being monitored, what chemicals are being monitored and what the results are, but we are not aware of any research in the UK looking at how these pesticides are impacting on water bodies. As we have to get water bodies in good ecological condition by 2015, I think that is a really pertinent question for us to try to answer.

Martin Caton: Thank you.

Q52 Caroline Lucas: Just the last bit, you talked a moment ago about issues around a weight of pesticides and again, in some of the evidence we have seen, they talk about the fact that the weight of pesticides is now reduced and so we live in a happy, much less toxic world. Would you comment on the importance of concentrating on the weight of pesticides versus the concentration? Is not concentration a rather more useful measure of level of toxicity rather than weight?

Nick Mole: Yes, it is. Monitoring the improvements or reductions in pesticide used by the amount of kilograms applied is completely spurious and does not take into account the greater toxicity of neurochemistries. A more appropriate approach would be to look at treatment frequency: how much area is being treated; how regularly they are being treated, which is what several other European member states do.

Chair: We turn now to regulation.

Q53 Mr Spencer: Clearly there has been a different response in different member states of the EU. I wonder if you want to comment on why you think different states have responded in a different way, and whether that is indicative that the EU regulation of those chemicals is failing somehow.

Matt Shardlow: I think it looks very haphazard, doesn't it? Some of the haphazardness of this comes about through the setups in each individual country and the opportunities that arise. If you look at each one, each one of those instances has a different cause and a different route in. In Germany it was a mass movement of beekeepers that created political change. In France it was a Government funded bit of research; it was their research so they reacted on that research. In Italy their legal system has enabled people, in a way that we cannot do, to stand up for their environment and to protect their rights as beekeepers. In each different case you find there have been chinks in the armour around these plant protection products. In the UK we have yet to find that chink, which enables the science to be properly considered in a way that could result in the Directive—and the perfectly logical and legitimate principles and morality around that of protecting the environment and protecting people—being applied in the UK.

Nick Mole: I also think it is a result of different approaches to scientific uncertainties, so France, Italy and Germany have taken a more precautionary approach than we have in the UK. They are basing it essentially on the same evidence but it is how they interpret that evidence. There is no killer document in France that they have acted on. It is just their interpretation of that and their response to the scientific uncertainties.

Q54 Mr Spencer: How damaging do you see it? Potentially, if you were in charge of the research and development budget of one of these chemical companies, and you see the different interpretation across member states, there is no real incentive for you to go out there and find a new product? You would not have the confidence to invest in a new product, in that you are not sure if you are going to be able to apply that product in all member states. We are almost making the problem worse, in that we are pulling out the confidence of those companies to go and find products that are less damaging to the environment.

Nick Mole: I am not really sure what the question was, but I do not think it is going to stop people developing new pesticides. Approval is given at the EU level for particular actives. It is then up to individual member states to approve the products that contain those, although it is done on a slightly different basis. We now have a zonal authorisation, so one member state can accept a product and it would be used throughout that zone, which we do not think is correct. If it is restrictive, then I have to say I am all for that. That is just the way it is. What we would rather see is, instead of the millions and millions of pounds that have been put into developing new chemicals, that money would be better spent on researching non-chemical approaches to dealing with pests and diseases.

Mr Spencer: I think we covered the regulatory regime fairly well with Zac earlier on.

Chair: All right.

Matt Shardlow: Mark, can I just add to that? I come back to the point that there cannot be no risk in this for the chemical manufacturers. They are producing products. Some of those products are going to work, some of them may have unexpected impacts. Those should be discovered as early as possible and action taken as quickly as possible. We cannot take risk out of there if we are going to deliver on what the directive says, which is, "The objective of protecting human and animal health and the environment should take priority over the objective of improving plant protection".

Q55 Mr Spencer: The point I am making is that clearly it costs a lot of money to develop these products. If we do not have a regime across the whole of Europe, which those

companies understand, and a framework that they can work to, then they are not going to put that money into research and development, and they will concentrate their activities in other parts of the globe and that will commercially disadvantage—

Matt Shardlow: That is a fair point. There has to be clarity about what is expected of those products, what tests they have to get through and, hence, how safe they have to be. I think that is something we all have to strive to achieve.

Q56 Martin Caton: I have a question, but I would like to join this debate, if I may, because I think the thing we have to balance against what the chemical companies have to put into their research is the profits that they get out of very successful products. Off the top of your heads—and I know it is a big call—do you have an idea of how much, say, Bayer or Syngenta actually make from the profits every year from what they sell in this country?

Matt Shardlow: No, but I had a figure—

Martin Caton: If you could provide it in writing.

Nick Mole: We can do that. Yes, we can provide that in writing.

Martin Caton: I think that would balance it.

Nick Mole: In the UK, EU and globally, imidacloprid is their best selling product and we are talking hundreds of millions.

Q57 Chair: Just before we move on from this—I am particularly asking Mr Shardlow to respond to this—in your evidence you refer to the proposed judicial review. I am very mindful that there are certain rules that relate to Select Committees about discussing anything to do with judicial review so, having regard to that, can I just ask you if you are in a position to say what the likely implications of the Prime Minister's speech to the CBI are in relation to, I understand, a policy change to look at removing red tape and to removing judicial review, in respect of environmental decisions? What impact might that have, and how might that relate to the discussion we are having here, in relation to regulation and Defra's decision not to change the regulations earlier in the year?

Matt Shardlow: My understanding is that statement was concerned primarily with judicial reviews in the context of the planning system. However, I cannot understand how one could introduce a filter for judicial reviews that would only apply to one set of decisions and not another. If there was an attempt to introduce that, I would think that would potentially fall foul, again, of the Aarhus Convention, because the Aarhus Convention is pushing things towards more access for the people to make sure that the environment and their needs are represented in the courts and represented through the legal system. As has been pointed out in relation to the system, there are very few judicial reviews taken on behalf of the environment and most of them with very good cause. It is certainly not a vexatious issue, with lots and lots of cases coming forward on environmental grounds but really for other reasons. People are genuinely concerned about looking after their environment and should have access to justice to enable them to do that.

Q58 Martin Caton: Do you have any information about what mitigation strategies work to support, particularly, wild insect pollinators, and is there evidence of where they have been shown? I am thinking of things, such as sowing wild flowers around the edges of crop fields and that sort of thing.

Matt Shardlow: Yes. Certainly one can give a boost to pollinator populations by putting in wild flower mixes around the edges of fields. It is not a perfect solution for a number of reasons. One reason is that it does not provide very good nesting habitat for the bees. It provides foraging habitat but, because the ground is still ploughed and turned over, it does not provide very good nesting habitat. You need to find that elsewhere.

The other point is that, as these chemicals are used more and they persist in the soil for a number of years, there is an increasing chance that in fact those verges and margins will produce wild plants that also contain neonicotinoids, and that impact has not been looked at yet either. We know from one study where dandelions grew on an area that had been treated with neonicotinoids, those dandelions had high levels. We also know, from work that has been done on rhododendrons in gardens by Bayer that, three or four years after the use of neonicotinoids in a garden environment, the levels in the nectar and pollen in the rhododendrons are at potentially fatal levels, so there are issues with that.

In terms of what does work, we believe that one has to look at reverting areas of whole fields back into a lower input, less pesticides, less nitrates production system, to try to get back that network of wild flower habitats in the countryside. We have a project called B-Lines, which is attempting to do that at the moment, and working with Yorkshire councils and others to put in place the lines where farmers can work to reintroduce wild flower networks into the countryside. That provides both forage and nesting habitats, which would help our beleaguered wild pollinator populations.

Q59 Martin Caton: Basically, there is no mitigation that would work properly if the continued use of these particular pesticides carries on?

Matt Shardlow: At the moment all agri-environment schemes, put together in the last 20 years, have created just 6,500 hectares of pollinator habitat, which might sound like a bit but when that is spread over the whole of the UK that is not much at all.

Chair: Thank you both very much indeed for the written evidence and also for coming today to share your expertise on this. Thank you very much indeed.

Examination of Witnesses

Witnesses: **Dr Chris Hartfield**, National Farmers Union, **Peter Melchett**, Soil Association, and **Emma Hockridge**, Soil Association, gave evidence.

Q60 Chair: I would like to give a very warm welcome to each of you. I think you sat in on the previous session, so you are aware of the direction of our concerns. Would you briefly introduce yourselves to the Committee and then we can go straight into the questioning?

Peter Melchett: I am Peter Melchett. I am the Policy Director at the Soil Association, which is 60-plus years old. Organic farmers farm some 720,000 hectares just about. It is an interesting contrast to the 6,000 hectares Matt just mentioned that are in stewardship schemes. The 718,000 hectares that organic farmers farm are all farmed without the use of neonicotinoids, or indeed any other field-scale pesticide treatments, pretty much. We called for a ban on neonicotinoids three years ago and, as you have heard, the science since then is 94% of the studies show that the science is even more unfavourable to those chemicals than it was.

In our evidence we have picked up a number of the points you touched on this morning, about the pesticide regulation system not being fit-for-purpose. It relies on industry studies that are secretive and may be very selective. We do not know. It does not have any mechanism for looking at the very low doses of active ingredient that a seed treatment like neonicotinoids delivers. These are doses that are well below observable effect level and not covered by pesticide regulation, but it is the repeated low doses that are a problem. There are a number of other problems in the regulations as we see it.

Q61 Chair: Thank you for that from the Soil Association. Perhaps just briefly, Dr Chris Hartfield, if you would like to do the same and then we will go straight into the questions.

Dr Chris Hartfield: I am Chris Hartfield. I am Horticulture Policy Adviser for the National Farmers' Union. I am also the National Farmers' Union lead on bee health issues. I am representing our farmer and grower members who have an interest, of course, in the value of agricultural pollination but also in the pollination of wild habitats as well, as they are responsible for managing the majority of these habitats in the wider countryside. We also have an interest in representing commercial bee farmers as well, who are our members also.

Q62 Mr Spencer: Can I clarify from Peter, the acreage that you are farming, could you give us a ballpark figure, a breakdown as to how much of that was in cereal production, how much was in grass and how much oilseed rape you were growing organically?

Peter Melchett: The oilseed rape is easy to answer. There is no organic oilseed rape because there is no market for organic oilseeds. The breakdown between—

Emma Hockridge: I think it is around 40% grassland and the rest arable production, and obviously a small percentage within that would be in vegetable production as well.

Q63 Chair: What we want to try to get an understanding of, in the course of our inquiry, is to what extent the future of the agricultural sector of the UK—which both of you have real interests in—depends upon a healthy population of both managed and wild insect pollinators? Perhaps starting with you, Mr Hartfield?

Dr Chris Hartfield: The importance of insect pollinators varies by crop. I would make that point to start with. Indeed, there are crops that do not require insect pollination at all: your wind-pollinated crops, your cereals like wheat, and also crops like maize. Different crops have different levels of dependence upon insect pollination, and it varies from 100% for things like apples to perhaps less than 10% for something like oilseed rape. When you combine that need for insect pollination, by crop, with the current area grown for that crop and then the market value for that crop, that is when you can calculate the economic value of agricultural pollination, and obviously those figures can be updated year on year. That is why you would have seen figures for a value of £200 million or now £400 million or in excess of £500 million. Interestingly, those figures all hinge on one piece of 20-year-old research, looking at the dependence of crops on insect pollination, done by Ingrid Williams over 20 years ago.

Whichever figure you use, there is no doubting the economic value of healthy populations of pollinators. It is substantial, and it is clear that a healthy pollinator population will currently be one factor that is underpinning the future success of agriculture and horticulture. The fact is we would not be able to grow many crops successfully in the UK without pollinators, which is why it simply would not be in the interests of UK agriculture or horticulture to undertake practices that are known to result in the widespread destruction of those pollinator populations.

Emma Hockridge: To add to that, there have been some calculations done on the cost if it was necessary to use alternative means of pollination. That has been estimated at £1.8 billion. Within that obviously there would be huge impracticalities, particularly for some of the major crops in the UK. You can imagine people walking through these crops damaging them and causing other problems. Of course pollinators do carry out many other vital services within the balance of ecosystems. They are not just there as pollinators but have beneficial effects, for example in terms of pest control within the broader system, so are hugely important.

Q64 Caroline Lucas: Just off the back of that, since we were talking about the precautionary principle earlier, Mr Hartfield, I want to give you the opportunity to give your view of the NFU's position on the precautionary principle. I notice that in your evidence you say there is no compelling weight of evidence showing conclusively that neonicotinoids are responsible for declines in bee population. We have already discussed whether or not the precautionary principle requires compelling weight and conclusiveness, but perhaps you would like to say whether you think the precautionary principle does come to bear on this and how you define it?

Dr Chris Hartfield: To clarify, yes, we accept the precautionary principle. It is there. It is embedded within EU law. What we are saying in our submission is that we do not think it is appropriate for the precautionary principle to be brought to bear in this particular circumstance, with respect to banning the use of neonicotinoids—as is being called for currently—for a number of factors, which all hinge around how particular organisations define the precautionary principle. We do not agree with its use in this context, because we do not see that there is a compelling weight of evidence that is demonstrating that neonicotinoids are responsible for the widespread decline in pollinator populations.

Q65 Caroline Lucas: Do you not seem to be defining the precautionary principle yourself, in a rather different way from the understood way of defining it? I have never heard it being described as “a compelling weight of evidence showing conclusively”. If it is conclusive, by definition it does not need to be precautionary.

Dr Chris Hartfield: One of the problems with the precautionary principle is that the definition of it is not clear. If you look at what is written in the EU, there is massive room for interpretation. This is probably why we are having this debate. One of the key things with precautionary principle, and why you would bring it into force, is to ensure that there is a higher level of environmental protection as a result. There is a problem, you bring the precautionary principle to bear and, as a result, there is a high level of environmental protection. We believe that in this circumstance that cannot be demonstrated, because of the high risk that the alternatives to neonicotinoids—that would be used if neonicotinoids were banned—would pose to bees, to other pollinating insects and indeed to all beneficial insects.

It was referred to in the first session that there is also a cost consideration within the precautionary principle, and I would like to bring the Committee's attention to a statement made under the Rio Declaration—

Chair: Sorry, I am having difficulty hearing. You would like to draw the Committee's attention to?

Dr Chris Hartfield: To statements made under the Rio Declaration of 1992 that said the definition of the precautionary principle based just on lack of certainty is not enough of a reason for postponing or halting measures which are cost effective, and the NFU believes that banning neonicotinoids would not be cost-effective.

Q66 Caroline Lucas: How can you know that? In your own evidence you talk about the science being inconclusive, so if you do not know what the impact is of neonicotinoids how can you then decide what the relevant trade-off is going to be, in terms of whether or not there are going to be less damaging ways of dealing with pests that do not require use of neonicotinoids?

Dr Chris Hartfield: We have looked at the trade-off for various crop scenarios. What would happen in the absence—

Q67 Caroline Lucas: If you accept that the science on neonicotinoids is inconclusive, then how can you have made that decision because you do not know? You have said in your evidence that the science is inconclusive. How can you then—

Dr Chris Hartfield: Sorry, I am not following the point you are trying to get to.

Caroline Lucas: I am trying to get to the point of: how can you say, with such certainty, that if you were not to use neonicotinoids the impact would be worse because you would be using insecticides that are more damaging? How can you say that, when you know that there is a degree of uncertainty about the toxicity of neonicotinoids, which you acknowledge yourself? How can you say whether one is going to be more damaging than the other, when you do not know how damaging one of those things is?

Dr Chris Hartfield: You have to look at the evidence that is available to you. You have to look at what the alternative scenarios would be for various crop pest situations. If neonicotinoids are removed, what would be used instead of those neonicotinoids? We know that for various crops those neonicotinoids would be replaced—you would have a single seed treatment of neonicotinoids, a very targeted low dose of an insecticide—with at least two or more multiple sprays of broad-spectrum insecticides, and this is not just saying that. This is because those are the only options available.

What is very clear is if you remove neonicotinoids from the situation, the pest problems are not going to go away. Farmers are still going to feel the need to react to pest pressures and to apply insecticides, and so they will use the next best thing. The reality is that growers and farmers use neonicotinoids because they are the most effective products available to them. It is not because they are the cheapest. They are very expensive to buy and apply so, almost by definition, if you remove those then you are relying on—

Q68 Caroline Lucas: I am deeply concerned about the kind of trade-offs that you seem to be implying here. On the one hand we have plant protection, on the other hand we have protection of bees, and somehow we are going to trade-off protection of bees because we think that being able to continue with the kind of plant protection that we have done in this country for many years is more important.

Dr Chris Hartfield: The European Food Safety Authority themselves, in a scientific opinion they published earlier this year on this whole area, looking at the assessments around bees and insecticides, said quite clearly that there is a balance that must be considered between food production and environmental protection. So, yes, there is a trade-off that needs to be considered, between food production and environmental protection. Yes, there is a trade-off to be considered.

Q69 Zac Goldsmith: Just on this point, because I think this is an important point. In order to make the judgment that you have made—that you outlined earlier, in relation to that trade-off—you must have a view, therefore, on how toxic neonicotinoids are. My question to you is what science have you been looking at that has enabled you to reach that position? You say it is not conclusive. We heard from the previous session, from both our panellists, that there are endless examples of scientific research that have testified that neonicotinoids are hugely toxic and are a big part of the problem that we are talking about today. My question to you is: in the evidence that they provided, what do you disagree with? What science do you endorse? Which reports have enabled you to reach this position that you have reached?

Dr Chris Hartfield: I do not think we disagree with any of the scientists. This is not about disputing the science. It is about—

Q70 Zac Goldsmith: Sorry, I am going to have to interrupt you. It has to be about disputing the science because, according to the evidence that we received, 94% of the papers

in existence on this issue—barring the ones that were removed because they were not realistic—suggest that there is a very profound problem, so it is a question of whether or not you believe in that science and endorse it or not.

Dr Chris Hartfield: With respect, that is about interpretation of that science. That 94% figure, and the view that was given by the previous panel, is about interpretation of the science. That is not questioning the science or interrogating the science, it is about how you, as a particular organisation, interpret the science.

Q71 Zac Goldsmith: How do you interpret that science? What is it that has enabled you to reach your view that the precautionary principle would be inappropriate at this stage? Can you tell us that?

Dr Chris Hartfield: Our view is that there is no compelling weight of evidence that shows that neonicotinoids are causing the widespread decline of bees and other pollinating insects that we are seeing. The fact is one thing—

Q72 Zac Goldsmith: What are the things that you are looking for then? What is the threshold that you are looking for as an organisation that might encourage you to change your position on that? What is it that needs to be delivered, in terms of science and research? Is it a statement by agribusiness? Increasingly, NFU seems to be national agribusiness union and not National Farmers Union. It is quite extraordinary. Is there a particular thing that your organisation is looking for that might encourage you to push for the precautionary principle. Is it a statement from Defra? Is it internal industry research that you might endorse? What specifically is it?

Dr Chris Hartfield: We are looking, quite simply, for a balanced and proportionate appraisal of the situation. That is fundamentally what we are looking for.

Caroline Lucas: So why were those 94%—

Dr Chris Hartfield: We are looking for that to be done at an EU level, because we do not believe that member states should be taking unilateral approaches on this issue, that the position should be clear at an EU level. Also one of the things from this morning—

Chair: I think Caroline wanted to come back.

Caroline Lucas: Sorry, there is just so much to try and unpack. Yes, go on.

Chair: I will bring you in at the end, Peter. I just want to get Caroline in and then Martin, because this was originally a question that was directed to the NFU.

Q73 Caroline Lucas: It is going back to the fact that we have 94% of these studies suggesting that there are problems. We have Mr Hartfield saying he wants something that is balanced. We have already shifted from something that was supposed to be compelling and absolutely conclusive, to now Mr Hartfield saying he will settle for something that is balanced. If you have 94% of studies saying that there is a problem here, I fail to see why that is not balanced enough for you to be prepared to see some action.

Dr Chris Hartfield: I am afraid I did not do the research coming down in the train to come up with a 94% figure, so I would be happy to look at that and look at that research after this session.

Caroline Lucas: It would be very interesting to have your views on that.

Q74 Martin Caton: You are not assured that there is compelling and categorical evidence that says neonicotinoids are a large part of the problem. Do you believe there is compelling and convincing evidence that they are not part of the problem?

Dr Chris Hartfield: We are not denying that pesticides are one of the factors. One of the problems with this debate—and it has been very clear from the session this morning—is

that we talk about declines in pollinators and that is immediately juxtaposed with this weight of evidence, concerns around pesticides and the impacts on insects. It is automatically taken that that one problem is due to that second thing.

I heard very little mention this morning that the challenges facing bees and other pollinating insects are multi-factorial. If you look at the evidence that has come out of the scientific community that is very much the consensus, with respect to the challenges facing bees and other pollinators. The consensus is that the key challenges facing honeybees are pests and disease, principally the parasitic mite *Varroa*. The key challenge facing wild pollinators is the loss of habitat and the problem that causes with respect to finding forage. The United Nations Environmental Programme identified around 12 different challenges facing pollinators. This is not about denying that pesticides is one of those factors but it is about keeping it in context. Otherwise you trivialise all the other factors, and you do not do justice to investigating the impact of pesticides on insects in a robust and scientifically proportionate way.

Q75 Martin Caton: Would you accept that there is a growing body of evidence that shows that the new neonicotinoids are contributing to those other factors?

Dr Chris Hartfield: There is a growing body of evidence that shows concern around neonicotinoids and insect pollinators, yes. As I say, I would not deny any of the evidence but it is about looking at that evidence in detail. It is not just about taking it on face value that another piece of evidence is equally as valid as the piece of evidence that went before it. You have to look at that in detail. As Mr Spencer was saying in the previous session, you have to look at the doses involved. You have to see whether they are realistic, in terms of what the pollinators would be exposed to under field situations. You have to look at the whole range of factors. It is not just about stacking up the pile and saying, “Well, that is enough to ban neonicotinoids”.

Q76 Chair: This was a question that was originally asked of the NFU in respect of the precautionary principle. Peter Melchett, you have been very constrained. We are constrained for time, but I will give you an opportunity now to place on record a very brief response to the issue about the precautionary principle.

Peter Melchett: Could I just make two quick points before that, on the question of habitat loss and its impact compared to pesticides? The habitat loss that we know has affected all insect populations in the UK on farmland largely occurred during the 1960s, 1970s and 1980s. And—according to the NFU and the Government—has now largely stopped, and indeed has been reversed, because of the introduction of stewardship schemes and wild flower margins, so you would have expected pollinator numbers to start to recover. In fact it is in the period when we have not been losing habitat that we have started to lose pollinators and honeybees in huge numbers. The idea that there is a link with the new class of pesticides, which were introduced at that time, is entirely rational.

Secondly, this trade-off argument is really disingenuous. There is no science, no facts, on which to base a claim that if you did not use neonicotinoids things would be worse. Nobody has done any published work to show that. The only published science is from Italy, which shows that when neonicotinoid use was suspended for three years there was a 50% recovery in winter survival rates. That is the one bit of clear evidence, and the farmers were no worse off.

On the precautionary principle, one of the most disturbing and upsetting things about this saga, which has been going on for many years, is the way I think the goalposts have been quite deliberately moved as the scientific evidence against neonicotinoids has built. You see now in the National Farmers Union’s evidence phrases like, “compelling weight” and “not

being conclusive”. As has already been pointed out, if something has to be conclusive you would not need a precautionary principle. You would not need any principle at all. If the evidence is conclusive you act on it. The point of the precautionary principle is to accept that, particularly in an area like this, there will always be some element of uncertainty if the science is good. The level of uncertainty that is acceptable to the Government and other interests protecting neonicotinoids has simply gone up and up, so we now have Defra using—as Caroline Lucas pointed out—the phrase “unequivocal”. That removes any element of uncertainty at all and is scientifically impossible. Good scientists will never say “unequivocally” something is the case. In fact what has happened is that, as the scientific evidence about neonicotinoids has increased, the bar has been raised until now, if you accept the Government’s position, it is at an impossible level, which dooms pollinators to continued death and destruction.

Q77 Zac Goldsmith: Just very quickly, why? Why do you think the Government is raising the bar to an impossible level? Where does that resistance come from?

Peter Melchett: I think the key problem that systemic chemicals generally pose to pesticide regulation, is that they introduce a whole new category of risk. We saw that a few years ago with the cocktail effect. People were quite rightly concerned that the regulatory system was not looking at possible interactions, and perhaps additive or even synergistic impacts with different chemicals, and the regulatory system took some steps to address some parts of that.

These chemicals give rise to a whole new class of problem because they appear to be active at doses below what is accepted as an active level of dose, so a neonicotinoid seed dressing delivers minuscule doses of the pesticide to bees but of course it does it repeatedly, hour after hour after hour. Every time a bee or another pollinator revisits pollen on a plant it gets a tiny dose of this chemical, and it is that that would be very difficult to regulate and the regulatory system simply does not cover it all, so to admit there is a problem is to admit that the whole regulatory system needs review, which it certainly does. It is not fit-for-purpose.

Q78 Chair: Worst case scenario—and everyone is concerned about food security and food supply—were pollinator numbers to decline so dramatically, is the large-scale manual pollination of crops feasible in the UK? A very quick answer.

Peter Melchett: I farm organically. We grow peas and vetch for seed and they both need pollinating by insects. I can tell you, if you have a gang of people walking across my pea crop they may pollinate them but there would not be any crop left. It is completely, economically and physically, a ridiculous impossible idea.

Emma Hockridge: As someone worked out, that calculation of the annual £1.8 billion cost equates to the average salary of 60,000 teachers so a huge economic impact.

Dr Chris Hartfield: No, is the short answer. Large-scale manual pollination would not be feasible.

Q79 Mr Spencer: To go back and explore this, let us imagine that we are going to stop using this chemical and we are going to use foliar applied chemicals. Can we establish whether you think that would be worse or better than the current situation? If we reached the stage where we removed those foliar-based insecticides, what would be the impact on food prices and crop yields?

Peter Melchett: I would say that this catastrophic decline in honeybees and wild pollinators appears to coincide with the introduction of systemic chemicals, and in particular the neonicotinoids in the seed dressings, which—as you heard in the previous session—are now ubiquitous, so they are not used on a need-to-use basis, they are used as a precautionary

application on all, for example, the rape seed. Going back to more selective use of sprayed insecticides would certainly be better. If you look at the historical evidence when those chemicals were in use, bees and wild pollinators were not disappearing at the rate they are now, which is why I dispute this idea that there is some trade-off, which would make things worse. It is unsupported by any evidence, or any peer-reviewed science at all. It is simply a slogan.

Q80 Mr Spencer: That is anecdotal. There is no scientific evidence to prove that.

Peter Melchett: Nobody has done any control field trials over a period of years looking at the impact of previously used insecticides and neonicotinoids—no, that is true—but we know that we were using those sprays. They were only used when farmers needed to use them against identified pests. They were not in every crop, all the year round, the whole time the crop is growing, in all of the pollen. We know that spraying insecticides is pretty inefficient. When I last saw it demonstrated, about 90% of the spray either did not hit the crop at all or bounced off and hit the ground—it may have improved a bit since then—so it was not a terribly efficient method. Of course, very often the insecticide only stayed on the crop for a short period of time.

Emma Hockridge: There does seem to be the assumption that anything that was used in the past is automatically worse than the newer products that are made now, which is not automatically true.

Just going back to that Italian example, after the restrictions on neonicotinoids came in they did some detailed studies on the yield and found that overall there was no negative effect. Even in terms of the affected maize plants, they found that only 10% were affected by any of the major soil dwelling pests. There was no overall impact on production levels and less than 3% of sample fields were affected. With regard to the insurance principle, a lot of the seed dressing is used as insurance, not necessarily directly if the crop is being attacked.

Peter Melchett: That is published science based on the Italian three-year experience.

Q81 Mr Spencer: If we remove the foliar-based chemicals as well, what impact do you anticipate there would be on yields and food prices?

Peter Melchett: If you remove insecticides you have to change your farming system, to use rotations to combat insect pests, as you would in agri-ecological or organic systems, so you are looking at a different system.

Emma Hockridge: I think we also have to look at the particular crops that, particularly in the UK, these are being used on, so maize and oilseed rape in the large majority, and they are not necessarily automatically going into the human food supply chain. They are used for animal feed, biofuels and so on, and so not an automatic impact.

Q82 Mr Spencer: Is that a realistic prospect of completely changing the agricultural system that you identify?

Peter Melchett: If you look in Europe as a whole the organic market is growing in double figures—and has done through the recession—of somewhere between 10% and 11% and 15%. The land area is steadily increasing in Europe as a whole and also in countries, like the US, places in Latin America, and in China and India. It is not going to happen overnight but there is definitely a global trend, even through the global recession, in that direction.

Q83 Mr Spencer: Chris, do you want to respond as well?

Dr Chris Hartfield: I would just say clearly the NFU has members that grow both organically and conventionally, and we do not see that it is a black and white, one or the other, situation. It is basically about getting the best resource you can to produce the best

outcome, and pesticide inputs have a place to play within that, a place to play in ensuring safe, reliable and sufficient supply of affordable food. This has been no better emphasised than this year in the wake of a brutally harsh season—like the one we have just had—pesticides have been one input that have helped mitigate the impacts of that for what otherwise would have been a disaster. If you look at production this year within the organic sector, unfortunately that has meant many organic producers this year have suffered extremely low yields and some of their crops have been completely wiped out and unharvestable: brassica crops, for example, and potato crops.

Q84 Martin Caton: Peter, you have already answered this, but perhaps I could ask you to expand on it, giving your reasons why you think the UK safety standards and practices for applying systemic pesticides are not sufficient to protect insect pollinators. Could I also ask your opinion, Chris, of the present rules?

Peter Melchett: This would apply to European standards not just to the UK and indeed globally. Pesticide regulation was designed after the Second World War to allow pesticides to be used. The regulatory system was not set up to decide whether or not pesticides should be used as a general principle, but to ensure that, when they were used, they would be used as safely as possible. There were two key things that needed to be incorporated in a regulatory system to make it workable. One was you had to look at it chemical by chemical. If you looked at combinations, the possible combinations that occur in the real world, on the farm, the system becomes impossibly complicated, expensive and unworkable, and the answer would be you would not authorise any pesticides for use because you would not be able to test every possible combination, and that was what led to the concerns about the cocktail effect over many decades.

The second thing that was a requirement to make the system work was you had to assume that, at some level or another, these things stopped having any impact because otherwise you would have to test down to incredibly low levels. As technology and science has improved in the last 30 or 40 years, the levels at which you can detect pesticides have become smaller and smaller, and that would have meant a regulatory system looking at tinier and tinier doses, which again would have made it impossibly expensive and, therefore, you would not have authorised any pesticides at all.

What the neonicotinoids do, as a systemic chemical, in every part of the plant is deliver very small doses, but continually over a long period of time, and very often. As Matt Shardlow told you in the earlier session, what you find is you need to look at the impact over a period of weeks or even months not—as some of the research that he rejected did—over a single day. On the whole, all the safety testing of pesticides and other things in farming rely on pretty short-term testing, 90 days tends to be the very longest for feeding trials for example. This is a real problem for the regulatory system as a whole. If you accept that minuscule doses repeated regularly can have an active effect on insects, of course the next question is can they have an active effect on you and I, and we do not know that.

Q85 Martin Caton: Before Chris comes in, the recent recognition of the inadequacy of the present regime, as it applies to systemics, seems to be a step forward but do you think that is going to produce changes that will tackle the problem?

Peter Melchett: After the number of years that organisations, like Buglife, ourselves and many others now, have been complaining about neonicotinoids, I see every move, I am afraid—and perhaps too cynically—as a move simply to delay action, including calls for more research. We are convinced by the arguments. The scientific evidence is overwhelming and the evidence of the good impacts of bans, for example in Italy and other countries, is clear, and what Defra should do is ban them immediately.

Emma Hockridge: Looking back further through history there are a huge number of examples within pesticides and pesticide regulation where it has taken many years to ban certain pesticides, and the Chair mentioned *Silent Spring* at the beginning. As a result of the anniversary we did some work looking back through each decade looking at how long it had taken for pesticides—for example, DDT, but a range of others since then—to be banned, and how long that evidence had taken to build up, and it has been between 20, 30, 40 years in some cases, and that is just really unacceptable.

Dr Chris Hartfield: The NFU believes that the current UK standards and legislation are sufficient to protect pollinators. That is not to say that there are not gaps, and those gaps have been identified and are well known. There is work coming out of Europe by EFSA that has identified those gaps, and it is totally right and proper that, as the science and the knowledge base moves on, you review the way that you assess pesticides. That is totally right and proper. If you find that there are gaps then you adjust those assessment processes accordingly.

The NFU does not sign up to the kind of conspiracy theories, which you might see in the popular press, about collusion between Government and chemical companies in the areas of pesticide legislation or regulation. One thing that I would also like to say is that it is remarkable and worth putting on the record that most organisations that are calling for precautionary bans, more restrictions on the use of neonicotinoids, are organisations that have quite public pre-existing anti-pesticide agendas. It is remarkable that none of the beekeeping organisations are calling for bans on the use of neonicotinoids.

I would like to quote you something from the September edition of *The Scottish Beekeeper*, and these figures relate to honeybee colonies run by one of the biggest commercial beekeepers in the UK, a guy called Murray McGregor. In the 2011-12 season he had 2,000 bee colonies in Tayside and Lothian. He is very proactive in controlling his pests and disease, particularly Varroa, and he does that very effectively. In the 2011-12 season all 2,000 of his beehives, of his colonies, were actively taken to flowering oilseed rape crops that, as we have heard, are more likely than not to have been seed treated with neonicotinoids. His losses in that season were just 5%. The lowest he had seen for several years. Lower than his losses with colonies that he had in areas where there was no oilseed rape, and also in other years where he had colonies placed where there was no oilseed rape. As someone at the coalface of this issue, his experienced view as a beekeeper is there is no negative association with oilseed rape and, accordingly, he actively seeks out oilseed rape—like many beekeepers I speak to—for all his bee colonies, to boost colony vigour and honey production, and the forage that that crop provides.

Beekeepers, in my experience—and I talk to a lot of beekeeping groups—are not concerned about neonicotinoids and insecticides. They are concerned about pests and disease and principally the control of Varroa.

Emma Hockridge: Can I just clarify Chris' answer. It is not true that all beekeeping associations are not calling for answers. The British Beekeepers Association has quite famously not called for a ban, and many of its local groups have in the past years been quite outraged that they have been taking money from at least one of the chemical companies. A number of their own local groups have been very much against their position. There are also a range of other beekeeping organisations, BioBees, Natural Beekeepers, associations in general who have been very keen.

Chair: Okay, we are now up against the clock. I know that Zac Goldsmith wants to come in, but I do remind colleagues that we are up against the time and schedule.

Q86 Zac Goldsmith: I was going to make that point, and say that all the chapters that I know are outraged by the behaviour of the central organisation and believe that it is linked to the money that they have been taking from industry. I think that should be on the record.

My question is to the NFU. You have taken a very strong position against the science that already exists, at least the interpretation of the science that already exists as you put it. It would be very useful—we cannot do it now—if you would agree to submit in writing your organisation’s analysis of the reports that we heard identified earlier, and why you think these do not provide sufficient evidence to justify the precautionary principle. It would be useful to have that on the record in an authoritative manner, and we would hopefully be able to incorporate that into our process because a blanket dismissal is not good enough at this point.

Dr Chris Hartfield: No, as I said before, I am not dismissing the science. It is about interpretation of that science. As an organisation I could not commit to that now because you are talking about an extremely labour intensive and resource heavy process to review, paper by paper, all of the science and evidence in this area. As an organisation we do not necessarily see that that is our responsibility to do. I think the responsibility—

Q87 Zac Goldsmith: In that case I just make the point that to have taken the line that you have taken it would be reasonable to expect that your organisation had already reviewed that science, because you have put up a very robust opposition to the idea of introducing a precautionary principle. You seem now to be admitting that you have done so without having reviewed the scientific papers that were outlined earlier, which seems to me to be a very irresponsible position for an organisation like the NFU.

Dr Chris Hartfield: We are following the consensus of the scientific opinion. I have stated that today. We are also following the lead of what is coming out from the regulatory authorities at EU level, and at UK level as well.

Zac Goldsmith: Science never allows an absolute consensus but, in as much as consensus is possible in science, the evidence we have heard today suggests the consensus is calling for a precautionary approach. Again, it seems odd that the NFU has—I have made the point.

Q88 Caroline Lucas: In your own evidence you have said that the science is inconclusive.

Dr Chris Hartfield: Indeed.

Peter Melchett: But conclusive enough to do a detailed cost-benefit analysis on whether continuing to use neonicotinoids is better or worse for farming in the environment. You are knocking earlier use of insecticides, which, as I say, is not based on any rational process but is just a slogan.

Q89 Mr Spencer: It would be worth exploring whether the market could deliver a solution. If we can cost out how much certain bodies think this costs the environment, could farmers be paid to not use these chemicals and to introduce more habitats and practices that increase the amount of pollinators. Could the market deliver a solution?

Peter Melchett: Farmers are paid by the public not the market—if we are looking at the money we get from the Common Agricultural Policy—I suppose it is possible under pillar 1. To qualify for your pillar 1 payment you might be asked not to destroy pollinators—and remember the majority are wild not honeybees—on your land, because if you are expected to keep it in good environmental condition that surely means having a healthy population of pollinators. That would not involve farmers being paid. It would involve farmers who are destroying pollinators not being paid, and it is a very interesting thought that had not occurred

to me, but may be one we should pursue with the Commission if we cannot get regulation at a European level to ban these dangerous chemicals more quickly.

Emma Hockridge: Of course there are mechanisms within that system already to support farming systems that are beneficial to pollinators, for example, organic farming systems. Even through the entry level scheme, as was mentioned before, there are specific ways that farmers can be supported, but there is not a very high uptake so I think there is some tweaking. We can look at that in more detail.

Q90 Mr Spencer: How would you measure that because there is no ability for farmers to access local data on the numbers of pollinators, and how you would even begin to measure it or make it work?

Peter Melchett: There are a number of publicly funded operations on farms that are based on general science, so we know that providing winter food and nesting cover is important for the survival of some of our most endangered farmland birds, like Grey Partridge or Skylarks or Corn Buntings, and there is good science to support that. There is now really very good science to show which elements of the agri-environment schemes will help those rare birds.

As Emma says, the parts of the schemes that are likely to be the most helpful are not being taken up enough yet. Defra have made some changes to encourage that, so there are mechanisms to encourage farmers, either not to do something bad or to do something good. The idea that you have to keep pollinators healthy populations by following certain practices, which might include avoiding systemic seed dressings, I think, is a really interesting one. Perhaps we can get the Agricultural Commissioner to pursue it.

Chair: I will bring our session this morning to a close. I do not think we were ever going to cover all the issues. Can I remind our witnesses this morning that if you do have any further written evidence arising out of our discussion, which you wish to submit to us, please do let us have that. Thank you very much indeed for your time.