



The PIPAH Study Newsletter

January 2016



Hello and welcome to our third newsletter! And welcome to our newest members who joined the PIPAH study during the last year. We have completed the main phase of recruiting professional pesticide users into the study, but we are still inviting people who join the National Register of Sprayer Operators (NRoSO) to take part in our study. So we hope that we will be welcoming new members into the study for some time to come. In this newsletter we report on some of our current research and other project activities.

Why are we interested in pesticides?

The PIPAH study is trying to better understand the health problems that may occur with regular pesticide use, and how to keep people who use these safe and healthy at work. The use of pesticides is very important to our lives in many ways, and we are really keen to make sure that when they are used, they are used safely.

Our third year.....

This was a year in which we began making the PIPAH study known further afield. Raising the profile of the study and ensuring that any findings are published will always be important activities for the study team. We also spent time working on the pesticide use questionnaire which we have tested for the past two years.

Ongoing recruitment

The main recruitment into the study was completed in 2013, but we are still inviting new members of NRoSO to join. This rolling recruitment is made possible by the continuing support that City & Guilds gives to the study. They send the PIPAH study pack, which includes an invitation to take part, to all new members of NRoSO. Recruiting new NRoSO members into the study is important. As the types of pesticide and working practices change over time, many new NRoSO members have no experience of some of the older practices and have not handled pesticides which are now withdrawn. We can use these types of differences in individual histories of working with pesticides to identify if there are any issues associated with particular pesticides.



HSL Building



Collecting information on pesticide use

For the past two years, in spring 2014 and 2015, we tested a questionnaire that collects information on which pesticides you have used during the previous year. This information is key to understanding whether there are any links between the use of pesticides and health. Each year we randomly selected a group of 400 study members, making sure that we did not select anyone twice, and invited them to complete the test questionnaire. They gave us feedback on the questionnaire which, together with discussions we had with study members at Cereals 2015, we used to further refine the questionnaire. We have selected another group of 400 study members this year, and invited them to complete the revised test questionnaire and to provide feedback.

The aim in testing this questionnaire is to develop a system of collecting the vital information on pesticide use in a way which makes it as simple as possible for the study members, but at the same time ensures that the information is still useful. In the questionnaire this year, we are asking for additional feedback on different ways of collecting this information, for example would it be more convenient to record the information on pesticides during the course of the year rather than recording everything at the end of the year. We are also asking if they would prefer to enter the information using a mobile 'app'. If study members who have not been sent a test questionnaire would like to send us their views on this, we will happily include them in our discussions on the test questionnaire.

Study members who are not in the group of 400 testing the main questionnaire on pesticide use have been invited to complete a short postcard questionnaire about the areas in which they carried out their work with pesticides. All the questions on the postcard are included in the main questionnaire so this information is being collected across the whole PIPAH study membership.

Cereals 2015

Anne-Helen Harding, David Fox and Gillian Frost, who are researchers working on the PIPAH study, went to Cereals 2015 at Boothby Graffoe. We enjoyed meeting our study members and had interesting discussions with them. We were also given some helpful suggestions on how we could make the pesticide use questionnaire which we tested last year, quicker and simpler to complete. Belinda Oakley and Claudia Tarr, who provide administrative support for the study, came on one of the event days. They wanted to meet study members and to develop a greater understanding of the machinery and other equipment used for pesticide application. We plan to go to Cereals 2016 at Chrishall Grange in Cambridgeshire, and will be based in the NRoSO tent. We are always pleased to answer any questions about the PIPAH study or to discuss the study in more detail with any of you attending the show.



IOHA 2015

David Fox and Anne-Helen Harding attended the International Occupational Hygiene Association 2015 Conference which was held in London (<http://www.ioha2015.org/>). This was an ideal opportunity to begin making the PIPAH study known to a wider audience. In this case, it was an international audience of scientists and professionals who were focused on worker health protection and the control of occupational exposures. David presented a poster describing the PIPAH study and you can see a copy of his poster on our study website (address given at the end of this newsletter).

Behind the scenes.....

The newsletter usually mentions the main events for the PIPAH study, such as the Cereals show and the IOHA 2015 conference. But most of the work to keep the study on track goes on behind the scenes. With the help of our data management team we keep track of mountains of paper questionnaires, enter the data into the study database, carry out quality checks on data entry, and ensure that the questionnaires are stored securely. An overriding priority in our work is that confidentiality is maintained at all times. With this in mind, the whole study team took a refresher course on 'Research Data and Confidentiality', which is provided by the Medical Research Council. We also ensure that we comply with the conditions set out by the National Research Ethics Service Committee, by providing them with an annual report on the PIPAH study and informing them of any changes we make to the questionnaires.

The changes we made to the test questionnaire on the use of pesticides were partly based on the feedback from those of you who completed the questionnaire or spoke to us at Cereals 2015. But it was also based on a careful data checking exercise. We examined the responses given to each of the questions, looking for signs that the questions could be improved. In addition, we telephoned a small number of study members to ask for their views on the questionnaire. All of this enabled us to identify areas for change, and we feel that we have made significant improvements to the questionnaire. The feedback from this year's test questionnaire will show whether we were right!

Disseminating information about the study and any findings is another important activity for us. This includes attending conferences, speaking with stakeholders, and publication. We wrote two reports about the PIPAH study. The first one covers the establishment of the study, the background to why it was set up and the design of the study. The second report provides a descriptive summary of the demographic and lifestyle characteristics of the study membership, based on information collected in the general questionnaire which everyone completed when they joined the study. We hope that both reports will soon be freely available on our webpage and on the Health and Safety Executive's website.



What's next?

Our main focus for 2016 will be on looking at the information on health that you provided in the general questionnaire when you joined the study. We have already made a start on this by investigating whether there is any association between herbicide use and neurological conditions. We have included the findings from this analysis in this newsletter. We will develop the analysis further and draft an article to submit to a peer-reviewed journal for publication, as well as consider presenting our findings at an international conference.

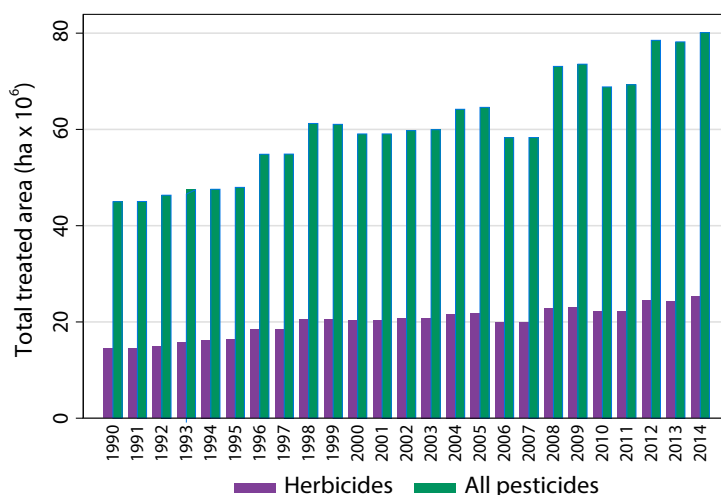
Work on the test pesticide use questionnaire will also continue, taking into account any feedback we receive and further checking of the responses to the questions. We have other major behind the scenes activities planned. For example, we plan to code all the jobs you reported in your work histories into Standard Industrial Codes (SIC) and Standard Occupational Codes (SOC). By standardising information in this way, we will be able to group individuals by code and make comparisons between the industrial or occupational groups. And our quality assurance activities are always on-going.

The general questionnaire you completed when you first joined the study asked whether you have had a diagnosis of any of the medical conditions listed in the questionnaire. But, as some of you pointed out to us, we did not include cancer in this list of possible conditions. This is because we can ask the Health and Social Care Information Centre (HSCIC) to provide us with this information. So, for those of you who consented to us contacting the HSCIC, we plan to send them personal information (such as your name and address) so that we are automatically notified of important health events.

Herbicides and Health

We have now analysed some of the data you provided in the general questionnaire which you completed when you joined the study. You may remember that this questionnaire asked about the sort of pesticides you used, the methods that you used to apply them and the health conditions that you have been diagnosed with by your doctor. For now, we have limited our analysis to the information you supplied about your use of herbicides. Herbicides are some of the most widely used pesticides, with 94 % of you reporting that you have either applied or mixed herbicides during your career. They also make up a large proportion of all the pesticides used.

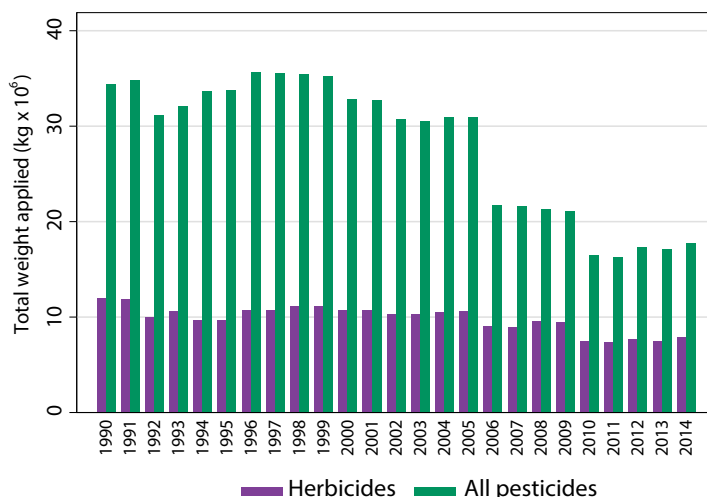
In the agricultural sector, data from Fera's Pesticide Usage Surveys show that the total area treated with any pesticide and the total area treated with herbicide have increased by a similar percentage in recent times. Over the same time period, the total weight of herbicides and pesticides overall applied decreased. Compared with pesticides overall, the reduction in the amount used was smaller for herbicides: they represented 35 % by weight of all pesticides used in 1990 and represented 45 % in 2014. This is likely to be a reflection of the fact that herbicides are applied at relatively higher rates than fungicides, insecticides and growth regulators. In the amenity sector, 95 % by weight of all pesticides applied in 2012 were herbicides.



Total area treated with herbicides and all pesticides in Great Britain, 1990-2014

(Data from Fera Pesticide Usage Surveys:

<https://secure.fera.defra.gov.uk/pusstats/index.cfm>)



Total weight of herbicides and all pesticides applied in Great Britain 1990-2014

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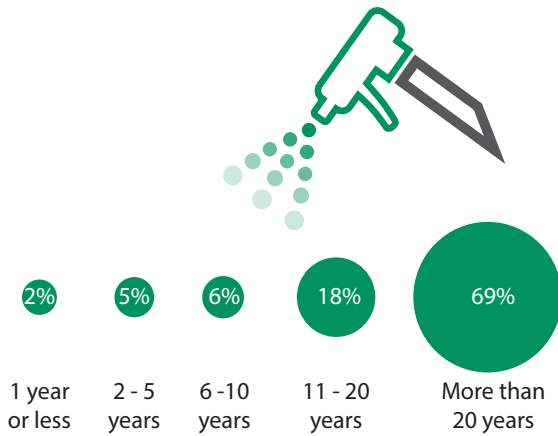


Your use of herbicides

Our first step in the analysis was to look at the context in which you applied herbicides. We found that about 55 % of you first used herbicides in the 1970s and 1980s, with a small percentage first using herbicides before 1960. The majority (69 %) reported using herbicides for more than 20 years, and nearly 50 % of you applied herbicides on 10-39 days in an average year. Many of you have often handled herbicide concentrate (74 %) and carried out repairs to your own application equipment (90 %). Using a boom sprayer was the most widely used method of applying herbicides, with just over 80 % of you having used this application method. Knapsack spraying was the next most used application method, with around 67 % of you reporting that you have applied herbicides using this method. Other herbicide application methods, such as granule spreaders, other handheld spraying methods and weed wipers, were used less frequently.



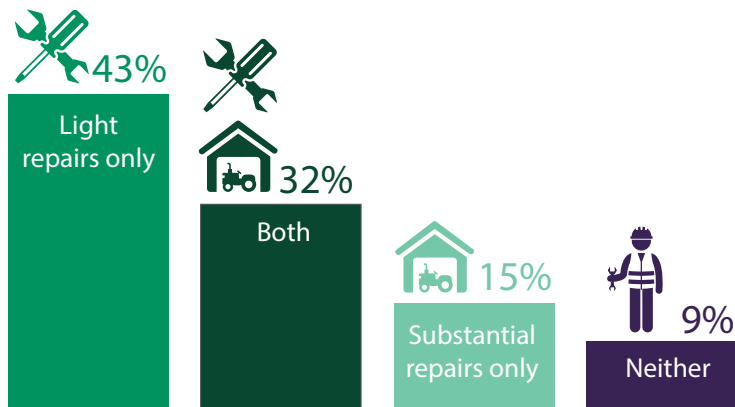
How many years did you apply herbicides?



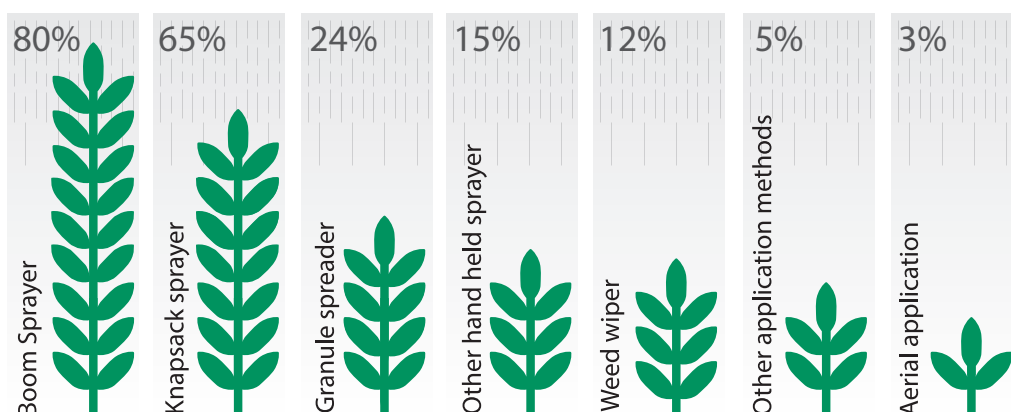
In an average year when you used herbicides how many days did you use them?



Do you usually repair or maintain your own pesticide application equipment?



What application method did you usually use when you applied herbicides?



Use of herbicides and neurological health

Previous research has suggested a potential link between pesticide exposure and conditions related to the nervous system. But the full picture is not clear. In the general questionnaire, we asked whether you had ever been diagnosed with anxiety, depression, epilepsy, multiple sclerosis, Parkinson's disease, motor neurone disease or any other neurological problems. We analysed the data you provided, to investigate if your use of herbicides was associated with reporting a diagnosis of these neurological conditions.

Our analysis suggested that a diagnosis of anxiety, depression or both was not associated with when you first started to use herbicides, the number of days you used them in an average year, the number of years that you had used herbicides or whether you repaired or maintained your spraying equipment. However, our analysis did detect an association between the methods that you used to apply herbicides and being diagnosed with depression or anxiety. Applying herbicides using a knapsack sprayer was associated with a higher likelihood of reporting a diagnosis of depression or anxiety. In contrast, we found that study members who applied herbicides using a boom sprayer were less likely to report a diagnosis of depression or anxiety. Those of you using only dilute herbicides (rather than concentrate) were also less likely to report a diagnosis of anxiety. See the 'Key Results' box for more details. A meaningful analysis of the data relating to epilepsy, multiple sclerosis, Parkinson's disease and motor neurone disease was not possible because of the small number of cases reported.

Key Results

About **8 in 100** of you reported being **diagnosed with depression**, and



4 in 100 reported being **diagnosed with anxiety** at some stage in your lives.

Note that a national survey in England* found that the prevalence of these conditions 'in the past week' for all adults was

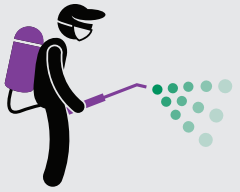
2 in 100 people experienced **depressive disorder**

4 in 100 people experienced **generalised anxiety disorder**

9 in 100 people experienced **mixed anxiety and depressive disorder**

* <http://www.hscic.gov.uk/catalogue/PUB02931/adul-psyc-morb-res-hou-sur-eng-2007-rep.pdf>

The possibility of reporting a diagnosis of depression was



60% higher if you used a knapsack sprayer to apply herbicide compared to those who did not



43% lower if you used a boom sprayer to apply herbicide compared to those who did not.

The possibility of reporting a diagnosis of anxiety was

82% higher if you used 'other' hand held spraying equipment to apply herbicide compared to those who did not



55% lower if you used a boom sprayer to apply herbicide compared to those who did not

81% lower if you only used dilute herbicides compared to those who mixed herbicide concentrate.



One possible explanation for these differences between application methods is due to the sprayer operator's proximity to the herbicide during spraying. Operators applying herbicides using knapsacks or other hand held spraying equipment are, compared to boom spraying methods, operating much closer to the substance being sprayed. Being closer to the herbicide during spraying would increase the chances of the individual getting the herbicide on their skin or breathing in small quantities of droplets. Individuals applying herbicides using boom spraying methods, in particular using tractors with cabs that have integral filtration systems, removes the sprayer from direct contact with the herbicide during the spraying process. We would like to emphasise that this analysis is at an early stage and does not prove that herbicide exposure increases the likelihood of a diagnosis of anxiety, depression or both. The study is collecting more detailed information on your pesticide use through its yearly pesticide use questionnaire, and we will be updating our information on your health status. This will, in future, allow us to reach more robust conclusions about how pesticides impact on health.



PIPAH study members

Who are we?

We come from every part of Great Britain -

1 % from London

2 % from Wales

7 % from the north of England

10 % from Scotland

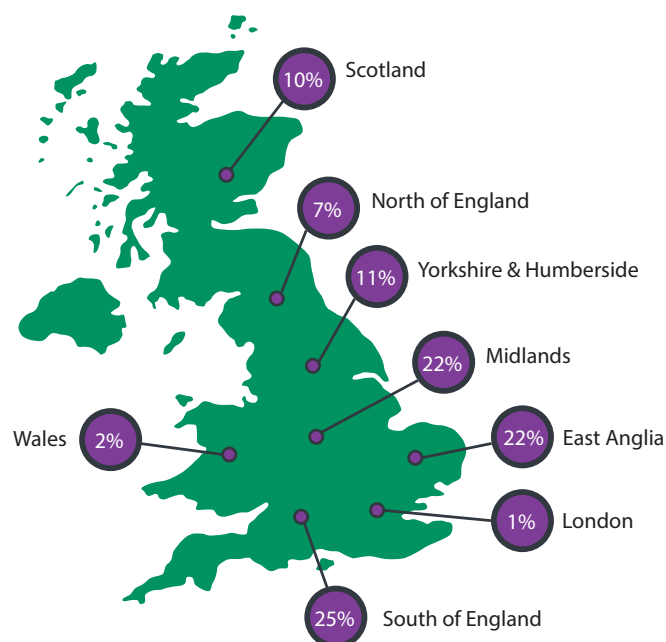
11 % from Yorkshire & Humberside

22 % from the Midlands

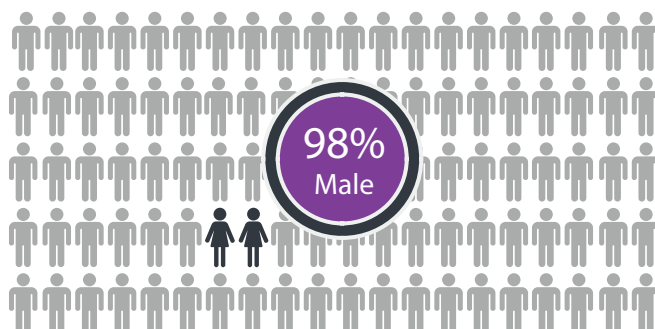
22 % from East Anglia

25 % from the south of England

32 % of us reside in urban areas



98 % of us are male



49 % grew up and still live on a farm

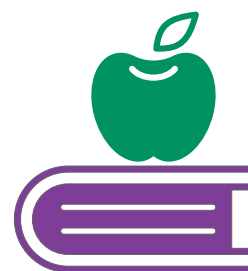
28 % have lived on a farm at some time

23 % have never lived on a farm

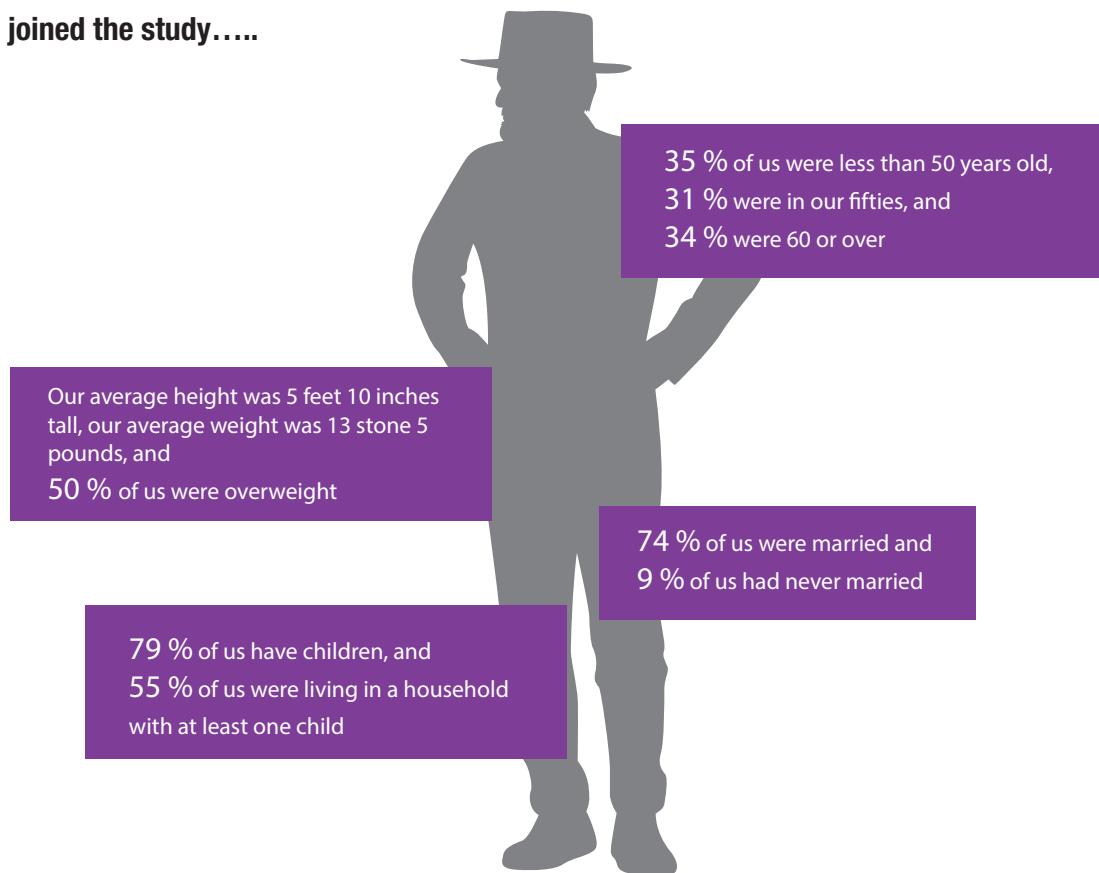
50 % of us spent more than 11 years in full-time education

25 % of us have taken vocational training

18 % have a university degree.



When we joined the study.....



What do we eat?

Analysis of the responses to the general questionnaire shows that we fall into two equal sized groups with regard to dietary preferences. Around half of us prefer a more healthy diet that includes plenty of:



fresh fruit



fresh and
cooked
vegetables



Salad



Wholemeal
bread



fish



some meat

The other half of us tend to eat less of these more healthy foods and eat more meat, in particular processed meat. There was little difference between the groups in terms of the amount of tea, coffee and milk we consumed.



Once again, we would like to thank you for taking part in the PIPAH study and hope you continue to remain members of it. We certainly can't do without you and we look forward to sending you another update. In the meantime, please don't hesitate to contact us either by email PIPAH@hsl.gsi.gov.uk or by freephone 0800 093 4809 if you have any queries, want to discuss any aspect of the PIPAH study with us, or if you would like to update your current contact information.

The PIPAH study team:

Anne-Helen Harding
(Principal investigator)

Claire Collins
(Data Management Team Lead)

Bronwen Ley
(Project manager)

David Fox
(Researcher)

Anne Andrew
(Study coordinator)

Gillian Frost
(Researcher)

Yiqun Chen
(Researcher)

David Fishwick
(Study medical officer)



Visit our webpage <http://www.hsl.gov.uk/resources/major-projects/pipah>

