Pesticides in the UK

The 2013 report on the impacts and sustainable use of pesticides

A report of the Pesticides Forum
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Introduction

Welcome to *Pesticides in the UK: The 2013 report on the impacts and sustainable use of pesticides*.

The Pesticides Forum was set up in 1996 to bring together a range of organisations with an interest in how pesticides are used and their impacts. Since 2013 it also has a key role under the UK National Action Plan for the Sustainable Use of Pesticides (Plant Protection Products) in providing stakeholder interaction and in producing an Annual Report on developments in the Plan. Further details on the background to the Pesticides Forum can be found on the [website](#).

The Forum represents stakeholders with differing views about pesticides and how the impacts of their use should be addressed. The content of this report has been compiled from a wide range of sources and no part of the text should be taken to represent the views of the member organisations either individually or collectively. Links to member organisations websites are provided on our [website](#).

Our Report pulls together a range of information that when viewed collectively can provide an indication of the extent to which pesticides are being used in a sustainable fashion. Indicators have been identified that are relevant to different aspects of sustainable pesticide use as set out in the Government’s *National Action Plan* (NAP). Our 2012 Report contained a description of the NAP’s key priorities, regulatory and non regulatory/industry incentives and relevant R&D activities.

Our [Downloads, Links and Resources](#) web page contains a PowerPoint presentation of the data presented in this report. Please feel free to use this information.

If you have any comments or views on this report please contact me:

**Tracey Ware**

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Chairman’s foreword

Welcome to the 2013 edition of the Pesticides Forum’s Annual Report

2013 was another interesting and challenging year for those of us considering how to promote and assess sustainable pesticide use.

The timetable and deadlines announced in the publication of the EU directive on sustainable pesticide use, which at the time seemed distant are now looming large.

During the year the UK Government published the National Action Plan for the sustainable use of pesticides. I am very pleased to note that, as a result of discussion in the Pesticides Forum and activity from other stakeholders, the level of training required of spray operators is to remain at previous high levels. The result is that all professional pesticide users must hold a specified training certificate from November 2015. This will require the significant numbers of users who operate under so-called ‘Grandfather Rights’ to be able to hold documentation demonstrating their competence. Whilst many have voluntarily already been trained, those who have not will need to be trained and certificated. I am very pleased to have heard during our meetings this year how training providers and those who represent professional pesticide users have responded to the challenge of developing proportionate training courses/certification arrangements for these users and also in how they have pro-actively worked with others to communicate those needs and solutions. This is an excellent start and the building blocks are in place for the significant challenge of ensuring the certification of potentially large numbers of users. The wide range of experience and knowledge amongst Forum members will be invaluable in both monitoring this process and considering how best we or others can contribute further to help achieve this task.

2013 also saw restrictions imposed on the use of some neonicotinoid pesticides, after lengthy negotiations in which EU Member States were unable to reach a common view. The rationale for these restrictions also divided opinion amongst Forum members. Much of this difference of opinion is due to interpretations of the validity of scientific studies and research. As is so often the case science cannot always deliver absolutely conclusive evidence one way or another and on many occasions an element of practical knowledge, judgement and/or assessment of an appropriate degree of precaution is also required. I know that Forum members share the view that pesticides should be regulated on the basis of sound evidence and that it is important to assess the effectiveness of these restrictions in terms of delivering the intended outcomes and determining their wider impact on pesticide use.

We continue to work closely with other organisations. For example, this year we established a joint working group on grassland farming, in conjunction with the Voluntary Initiative for Pesticides. This has the potential to play an important role in helping engage a group of farmers and pesticide users who, hitherto, may not have been sufficiently aware of the risks of impact from pesticides they use and how these can be mitigated.

Our meetings in 2013 focussed on the priority areas identified in the UK National Action Plan for Sustainable Pesticide Use. These included: protection of water; improving user practice in the non-agricultural sectors; and development and promotion of integrated approaches. References to the issues we considered can be found throughout the report and full details can be found on our website.
You will see from comments contained in this report that not all Forum members agree at all times with the conclusions that we draw. It is important that we have a healthy and robust debate on the issues associated with pesticide use. All organisations represented on the Forum and those who are co-opted for other specific activities have a vital role in our work and these assessments. Those who have been at our meetings have seen and been able to participate in a process which challenges all of those responsible for sustainable pesticide use to critically review their activities and deliver demonstrable change. It is at our regular meetings and in our indicators group, which plays an immense role in both compiling our annual report and also in challenging and understanding assessments made, that others have been able to raise their concerns. We try to enable all members to attend and to facilitate attendance at meetings we introduced the ability to join by conference call. The Pesticides Action Network took advantage of this until February 2013, and they also have an invitation to attend our indicators group, so it is very unfortunate that they have been unable to join our debate since then. I am therefore organising a meeting with them to discuss their concerns and importantly see if there is any more we can do to make it easier for them to attend meetings and join in the active discussions.

I would like to thank the Forum’s Secretariat, member organisations and guest speakers for their support for our activities. This ensures that our meetings and documents such as this report reflect full, careful and timely consideration of issues relating to pesticide use.

In conclusion, I would highlight that assessing the sustainable use of pesticides is not an exact science. The data and information presented in this report ‘paints a picture’ of the way pesticide products are used and the impact they have. The knowledge of member organisations in aiding the interpretation and contextualisation of the data and information and conclusions we draw is essential in shaping our assessments. The more all parties understand the limits and wider factors, the greater chance we have of consensus. This is a key role of the Forum. However, it is inevitable that there will still be a range of views and emphasis. I am sure that you will find this Report an informative overview of how, why and where pesticides are used and the work being carried out to continually seek to reduce or balance any undesired impacts they have.

James Clarke
Chairman, Pesticides Forum
The Pesticides Forum –
Members’ forewords

The Crop Protection Association

The Crop Protection Association (CPA) is a key voice of the UK Plant Science Industry. We promote the role of modern plant science in safeguarding our food supply from seed to shelf.

Our members are involved in the development and manufacture of a wide range of plant science technologies, including the formulation and manufacture of synthetic and bio pesticides, which are of crucial importance to the cultivation and protection of food crops, protecting our gardens, woodlands, infrastructure and public places.

The Pesticides Forum is setting the standard within the EU in terms of stakeholder engagement as it provides a platform for a diverse range of organisations to debate issues openly, constructively and in a meaningful way.

The Crop Protection Association and its members have greatly valued the work of the Forum throughout 2013. We particularly appreciate the balanced oversight the Forum provides on the impacts from, and effects of, the use of pesticides.

As the crop protection industry continues to work with farmers and growers in ensuring pesticides are used carefully and responsibly, the openness and transparency provided by the Pesticides Forum is crucial in reassuring consumers about the safety of pesticides and their importance to modern productive agriculture.

Fresh Produce Consortium

The Fresh Produce Consortium is the UK’s trade association for fruit, vegetable and cut flower industry, with around 600 members involved in retail, food service, wholesale, processing, distributing, and growing fresh produce. Members are encouraged to follow the FPC Code of Practice for the Control of Pesticides which promotes the responsible use of pesticides.

FPC’s Technical Group provides members with the opportunity to discuss a wide range of technical issues affecting all sectors of the fresh produce industry. Regular contributions from regulatory bodies such as the Chemicals Regulation Directorate mean that delegates keep up-to-date with regulatory developments and food safety issues.

The responsible use of pesticides is critical and the Pesticides Forum provides an important role in sharing information on pesticide use and its impact across a wide range of stakeholders.

FPC believes that the availability of safe food of good quality at affordable prices can be achieved within a competitive and profitable horticultural industry by the application of scientifically proven good horticultural practices. In many cases, these focus on the reduction, whenever possible, of the use of chemical pesticides through the adoption of viable integrated crop management systems. However, the UK fresh produce industry faces an immense challenge in retaining an
effective suite of crop protection products for use on minor crops in the context of EU regulations designed to replace active substances which are identified as candidates for substitution.

The work of the Pesticides Forum is vital to ensure that growers continue to use pesticides responsibly and to support increased UK production of indigenous crops in a sustainable way.

**The National Farmers’ Union - England**

Pesticides are a vital component of sustainable farming systems and to gain approval all pesticides must get through a very rigorous registration system. However pesticides can evoke strong emotions in some people and this emphasises the importance of all pesticide users undertaking the safe and responsible use of pesticides across all sectors of agriculture. The NFU continues to actively support many campaigns to promote the responsible use of pesticides such as the Voluntary Initiative. The success of the Voluntary Initiative has been aided by the work of the Pesticide Forum on developing relevant indicators that can inform future direction for approaches to responsible pesticide use. The NFU believes the Pesticides Forum is an example of an effective partnership between Government and industry, in improving standards and meeting new challenges such as implementing the requirements of the Sustainable Use Directive.

**Pesticide Action Network UK (PAN UK)**

Pesticide Action Network UK has been a member of the Pesticide Forum for more than ten years. In the past, we have found it to be a useful place for sharing best practice and discussing UK pesticide policy. Indeed, as this report shows, the Forum continues to collect valuable data on patterns of use and impacts.

However, in recent years, we feel the Forum has lost its way. The Forum should be a “critical friend” of government, providing impartial and balanced advice to address pesticide issues. But instead of pushing for innovative ways to reduce the use and burden of pesticides on people and the environment, the Forum has become an unquestioning apologist for a failing pesticide policy and for maintaining the status quo of pesticide use in general.

As the report shows, the UK National Action Plan is way off course and integrated pest management is not being embraced. Meanwhile, the impact on the environment is significant: the key indicator on biodiversity - farmland bird populations - continues to decline and surface and groundwater contamination is still a problem. Yet in spite of these failures, this report exudes an air of complacency and suggests that everything is ‘rosy’ in the UK pesticide garden.

PAN UK urges the Forum to look at itself, and its role in general, and to move away from trying to simply plaster over the cracks regarding pesticide issues. The Forum should be leading a drive away from continued reliance on pesticides and become an innovative, forward thinking body that constructively explores how all sectors can cut the use of pesticides in the UK.
Wildlife and Countryside Link

Wildlife and Countryside Link (Link) brings together 42 voluntary organisations concerned with the conservation and protection of wildlife and the countryside. Our members practise and advocate environmentally sensitive land management, and encourage respect for and enjoyment of natural landscapes and features, the historic and marine environment and biodiversity. Taken together our members have the support of over 8 million people in the UK and manage over 750,000 hectares of land. Link has been a member of the Pesticides Forum since 1998.

Agriculture shapes the UK countryside and is a major driver determining the fortunes of our wildlife. The intensification of farming over the last few generations, in which pesticides have played a key role, has proved challenging for farm wildlife. Thanks to tighter regulation and innovation within the sector, the direct impacts of pesticides on wildlife are far less than in the past. However, pesticides still exert significant effects on wildlife by removing the insects and weed seeds that are at the base of many food chains. As this report shows, unwanted outcomes including the poisoning of non-target organisms can still occur. We must build on the advances made over recent years to further reduce the environmental impacts of pesticide use and build more sustainable farming systems.

The Pesticides Forum performs a vital role in collating and reporting data on pesticide impacts. This report showcases the work that is being done across the sector to ensure best practice in pesticide use. It also shows that further change is still needed: for example biodiversity indicators continue to decline (albeit at a slower rate) and a proportion of water bodies are still failing to meet Water Framework Directive targets. Link believes that the UK’s National Action Plan is severely lacking in ambition and fails to set clear targets or propose new measures to achieve them. Key challenges still to be addressed include the need to embed the principles of Integrated Pest Management (IPM) across the whole sector, to monitor its implementation, and support growers to attain ever higher IPM standards. This must go hand-in-hand with targeted action to reduce pesticide impacts on waterways and biodiversity, and the phasing out of pesticides of particular concern.

This foreword is supported by the following 7 organisations: Amphibian and Reptile Conservation; Buglife – The Invertebrate Conservation Trust; Butterfly Conservation; Plantlife; Royal Society for the Protection of Birds; Wildfowl & Wetlands Trust; and The Wildlife Trusts.
Executive summary

The Directive on the Sustainable Use of Pesticides establishes a framework to achieve the sustainable use of these chemicals by: reducing the risks and impacts of pesticide use on human health and the environment; and promoting the use of integrated pest management and of alternative approaches or techniques such as non-chemical alternatives to pesticides.

Article 4 of the Directive requires Member States to develop National Action Plans (NAPs) to achieve these aims. The UK NAP sets up objectives, targets and measures necessary to achieve the aims of the Directive. The Plan also describes how the UK will implement measures in the Directive relating to: training and certification of users, distributors and advisors; controlling sales of products; provision of information, monitoring impacts and identifying issues; regular testing and certification of application equipment; controlling aerial spraying; the protection of water, public spaces and conservation areas; the handling, storage and disposal of products, their remnants and packaging; and promotion of low pesticide-input pest management (in particular integrated pest management).

The information and data presented in this report indicate that, overall, pesticides are being used in a more sustainable fashion than in the past. Improvements are being made to the arrangements for training pesticide users and distributors and there is increasing awareness of the need to use an appropriate range of techniques for controlling pests, weeds and diseases in an integrated fashion, and the benefits from doing so. Pesticide users, distributors and advisors are engaging with continuing professional development training programmes in increasing numbers and a significant proportion of application equipment continues to be tested on an annual basis.

There is a need to reduce the number of waterbodies which contain residues of pesticides to meet the requirements of water quality legislation. It should be noted, however, that the levels which are found do not pose a threat to human health or the wider well being of the environment, although some pollution incidents can cause significant localised and often short-term impacts.

The data/information suggest that pesticide use could be having an indirect impact on biodiversity. However, the extent of this impact and the way pesticide use interacts with other land-management practices in affecting biodiversity is not clear. Monitoring and research to provide further evidence/information in this area would be welcome.

Whilst progress has been made in improving practice in the non-agricultural sectors, more needs to be done. This report summarises key findings from recent Government studies into practices within the amateur and amenity sectors; it is clear that those who use pesticides in these sectors require additional guidance, particularly on handling, storage and disposal practice. These three issues are all covered in the NAP.

A combination of laws, incentive schemes, Government- and industry-led initiatives and R&D continues to ensure that pesticides are used in increasingly more sustainable ways in the UK.
Section A: Review of activities supporting the UK National Action Plan

Part 1: Training

Key Priorities

- That pesticide users, distributors and advisors (and those who cause or permit the use of pesticides) have access to high quality initial and on-going training in sustainable pesticide use.
- That there is a particular emphasis on improving the training available to those in the non-agricultural sectors.

Overview

Effective training is fundamental to delivering sustainable pesticide use. It helps those who store, use, distribute and/or advise upon the professional use of pesticides by making them aware of hazards and risks and the importance of: maintaining equipment; protecting more sensitive environments; adopting good handling and storage practice; and controlling pests, weeds and diseases in an integrated way. Effective training helps society to maximise the benefits of pesticide use, whilst minimising the risks associated with the use of these chemicals.

Our meetings this year have heard about improvements to training/standards programmes, particularly in the amenity sector. These are to be welcomed, as are figures showing an encouraging level of engagement with, particularly, the Amenity Assured Standard. A potentially substantial number of users, currently operating under grandfather rights will need to undergo training and/or be certificated by November 2015. The Forum will monitor how this important development is managed and implemented.

This part of the Report contains indicators on the number of individuals engaging with initial and on-going training courses. A number of case studies are also included which provide personal perspectives on the value of such training. The indicators suggest that engagement with these training courses is high (though not in all sectors of use) and that, overall, pesticides are being applied by a professional, highly-trained workforce.
Indicators

Figure 1. National Register of Sprayer Operators (NRoSO): membership and sprayed area

This figure indicates the number of members of the National Register of Sprayer Operators (NRoSO) and the percentage of the sprayed area treated by those members. NRoSO is part of the Voluntary Initiative (VI).

NRoSO is a central register of sprayer operators using Continuing Professional Development (CPD) as a means of ensuring ongoing training. The scheme is open to anybody who holds an appropriate City & Guilds NPTC PA certificate of competence, or is applying pesticides under “Grandfather Rights”. Members are required to collect 30 or more CPD points in each three-year period to qualify for membership renewal. A wide range of CPD events and courses are approved for NRoSO members. Events and courses are publicised in the agricultural press, by colleges, in local training providers’ newsletters and under the events section of the NRoSO website. Members must: ensure that any equipment is being used in accordance with current legislation; have due regard to any environmental impact; give priority to the health and safety of bystanders and those that purchase/use/consume crops being treated; and use equipment that affords relevant protection to operators under current health and safety legislation.

At the end of 2013 there were 20,929 active members of NRoSO. 1343 new members joined during the year, 231 of those were members rejoining the scheme. Approximately 86% of members are based in England; 11% in Scotland; 3% in Wales and a negligible number (less than 160 members) in Northern Ireland. These figures accord very approximately to overall pesticide usage patterns.
Membership of the BASIS Professional Register is an indicator of a commitment to best practice in the crop protection industries. The Register encourages training of professional users and advisors through a commitment to continuing professional development (CPD). The case study on page 17 describes how good training and CPD has influenced users and advisors to change their behaviours and helped them to advance their knowledge and career.

**BASIS Amenity Register**

The BASIS Amenity Register (BAR) is a purpose-designed CPD scheme for Managers, Contract Supervisors, Contract Specifiers and others responsible for pesticide use in the Amenity sector. At the end of 2013, there were 359 BAR members.

**Amenity Assured Standard**

The Amenity Assured Standard sets a benchmark of best practice methods for the control of weeds, pests and diseases in Amenity situations; members are subject to regular audit. This is a relatively new initiative, launched at the end of 2012. However, engagement with the Scheme is encouraging as the figures below demonstrate. Amenity Assured covers:

- Local Authorities – 344
- Utility companies – 20,126 sites
- Football clubs – 71
- Sports pitches/sites – 527
- Water treatment – 1917 sites
- Telecoms sites – 1020
- Building sites – 457
- Parks – 9
- Airfields – 1
- Golf courses – 223
- Railways – 23,000 hectares
- Sports Centres – 31
- Highways – 11 contracts
- Industrial sites – 912
- Facilities management areas – 564
- Housing complexes – 29
- Forestry areas – 29
- Others – 165
The Amenity Forum

The Amenity Forum is the voluntary initiative for the amenity sector.

The primary objective of the Forum is to promote and encourage proper and responsible use of pesticides and integrated methods for the control of pests, weeds and diseases. It produces best practice guides, issues publications and newsletters, provides a regular email update service for its members, organises events, and is in dialogue with government, media, stakeholders and all relevant bodies. In recent years, much progress has been made and engagement increased significantly with now almost 45 organisations as direct members representing manufacturers, distributors, contractors, local authorities and a range of other bodies.

In 2013, the Amenity Forum supported an initiative when the Chemicals Regulation Directorate (CRD) wrote to all local authority Chief Executives advising them of the new regulations relating to the use of pesticides. CRD’s letter emphasised the requirement for local authorities to comply with the legal requirements and ensure safe use of pesticides, whether or not their own staff directly use pesticides or they appoint contractors to manage vegetation or control pests, weeds and diseases on their behalf. The 2013 annual Amenity Forum conference attracted a record number of delegates demonstrating the increasing impact and awareness of issues and the commitment to best practice across the sector. At this event, the Forum received direct support from Defra’s Parliamentary Under Secretary, Lord de Mauley, and launched a new document entitled “The Ten Golden Rules for pesticide use”. This is intended to help those who are new to professional pesticides spraying understand the need for best practice. These Rules are complemented by the Best Practice Guidance Notes, all of which are available on the Amenity Forum website.

Following its launch in November 2012, the uptake of the new Amenity Assured Standard has been very encouraging. The aim is that all involved with weed, pest and disease control, in whatever capacity, strive to operate at amenity assured standards and ideally meet the requirements for this award. Shortly to be launched is a new amenity management information service and the Forum is further improving its guidance on integrated control measures. It is also working closely with the Environment Agency and water companies and fully contributing to activities related to water quality and other such initiatives. These are just a few examples of the Forum’s wide ranging activity and more can be found on the website at www.amenityforum.co.uk.

The Amenity Forum’s strength derives from it being a voluntary initiative led by the sector for the benefit of the sector. Clearly there is still much to do in engaging everyone in this complex and diverse sector, especially against a backdrop of financial constraints. The Forum is committed to continuing to lift standards, encourage integrated approaches and training and promote amenity assured standards. The amenity sector is a very important one. It promotes an integrated approach – but it is important to recognise the vital role pesticides play in maintaining amenity areas to the standards required and in a sustainable manner.

Professor John Moverley OBE, Independent Chairman, Amenity Forum.
Case study

How Wakefield Council supports the Amenity Forum campaign for best practice

Wakefield Council has several hundred kilometres of roads and pavements, which it needs to keep free of weeds, in order to protect the surfaces and give the district a clean and well kempt appearance.

The Council uses two applications of glyphosate per year, keeping our use of herbicides to a minimum. This is applied from quad mounted sprayers that allow us to target weeds and keep overall spraying to an absolute minimum. In order to keep weed growth to an acceptable amount with this small amount of herbicide use, we integrate street sweeping into the weed control programme. We then make use of the dedicated spraying team during the winter season (late October to mid March) to clear all islands, chicanes, roundabouts and other such street features of built up detritus. This cleaning operation makes a big difference to the amount of weed growth we get on such features during the growing season.

Wakefield Council finds that this integrated method of control – using targeted herbicide application, sweeping and manual detritus removal – gives a very decent level of weed control throughout the year.

Gary Harland
Lead Supervisor for Weedspraying, StreetScene Services
Case study

How training leads to behaviour changes
Andrew Gough – independent agronomist

What was the main reason you took the BASIS Diploma in Agronomy?

I have always been someone who values qualifications and the practice of going as far as possible regarding training is ingrained in me. Very soon after doing my first few courses under BASIS Registration, when I had arrived in the UK and begun to work here as an advisor and agronomist, I took a great interest in trying to achieve the requirements of the BASIS Diploma in Agronomy. I knew if I could get it this would complement the agricultural qualifications and experience that I already had in the UK and other parts of the world. I was sure that if I could achieve the desired qualification then it would greatly assist my operation in my chosen field of work from the point of understanding wider issues as well as giving me a very credible standpoint within the industry of Agriculture. Having achieved the Diploma I was encouraged to pursue the relatively new Harper Adams University Graduate Diploma in Agronomy with Environmental Management which I have now also achieved.

How has taking the Diploma enhanced your ability to do your job?

Qualifying with both the Diplomas has put me firmly in a position where I have a considerably better understanding of the crucial issues that our industry is wrangling with on a number of fronts. I feel very well placed now to represent the industry in the wider world and at the very least hold my own in any forum. Most importantly I am able to give sound advice to people that takes into consideration all of the vital issues and implementation so that compliance is always achieved. I feel that my farmer clients and colleagues can rest assured that our combined input is keeping them at the forefront of current knowledge and thinking in our industry.

How has training (in general) helped you meet the requirements of new legislation: “The Plant Protection Products (Sustainable Use) Regulations 2012”?

The so called ‘new’ legislation that has resulted from the Sustainable Use Directive (2009/128/EC) effectively builds on and strengthens that which is already in place under the pre-existing framework of regimes. The training that I have done under BASIS has positioned me very well for both now and the future regarding assistance of those within agriculture from an advisory point of view, which is the mainstay of my daily work. The role of an advisor is a highly specialised and responsible profession and one where it is essential to be appropriately qualified. As a result of my training, I became a member of the BASIS Professional Register. Its requirement of membership of an industry recognised and supported CPD scheme is important in ensuring that my knowledge is kept up to date with current legislation, technology and methodology. It also helps to evidence that I can meet the requirement that users need to take into account the appropriate level of pest, weed or disease control necessary, in particular situations, when deciding their control strategies.
Has the training helped you to implement or enhance Integrated Pest Management (IPM) on your farm/farms you manage (or advise)?

The principles and importance of IPM are well taught through various modules of BASIS training. I most definitely have an enhanced understanding and now implement every aspect of the IPM principles into the advice that I give to my farmer clients, colleagues and others. I would suggest that it is vital for all those involved in agriculture in the UK to give careful consideration to IPM in their operations particularly as it is heavily promoted and required under the EU’s Sustainable Use Directive, which will have a massive effect on all of us, now and into the future.

Has the training led you to modify your use of/advice on use of pesticides?

Yes, absolutely. The use of pesticides is always carried out as the last resort now after all non-pesticide options have been considered and the relevant ones implemented. Only pesticides with the lowest possible effect on non-target organisms, the wider environment, and operators are utilised for necessary treatments wherever possible. Pesticides are only utilised in the approved way and careful consideration is always given to effective dose rates and the sequence of active substances applied so that anti-resistance strategies are well implemented and strictly adhered to.

Specifically, has the training led to reduced use or reduced impact (through more targeted application, or using different products for example) of pesticides on your farm/farms you manage (or advise)?

I do believe that through the training that I have done and what I am now able to deliver in an advisory capacity, I have been able to positively influence the reduced use and impact of pesticides; particularly certain types that are under heavy scrutiny and pressure for various reasons, ie several residual herbicides, molluscicides and a number of insecticides.
Part 2: Sales

Key Priorities

- That distributors have sufficient appropriately-trained staff available at the time of sale to advise on managing the risks from use of pesticide products.
- That non-professional products are sold with information enabling users to store, apply and dispose of products safely.

Overview

This part of the Report contains indicators on the number of individuals engaging with training courses and information from a survey of non-professional users on the clarity of product labels (the main mechanism for ensuring users store, apply and dispose of products safely). The indicators suggest that engagement with these training courses is high or increasing and that work to improve the clarity of advice on pesticide labels for non-professional products is having a positive impact.

Indicators

Figure 3. BASIS Nominated Storekeepers qualification: number of passes

Source: BASIS

There are 652 stores registered under the BASIS inspection scheme. The Nominated Storekeepers (NSK) course equips storekeepers to meet the standards of pesticide storage laid down in the ‘Code of Practice for Suppliers of Pesticides to Agriculture, Horticulture and Forestry’ (the ‘Yellow Code’). Subject to course availability, nominated storekeepers in the amenity sector may opt for a more tailored course which leads to an Amenity NSK qualification. As shown in the chart above, the Amenity NSK course has been taught every few years depending on demand. A revised Amenity NSK course will be available from BASIS for 2014. At the end of 2013 there were 6531 qualified storekeepers, 1311 of whom held the Amenity NSK qualification.
This two day high level training course for managerial and senior technical garden centre staff provides up to date advice on: growing media and plant nutrition; how to control weeds, pests and diseases in the garden; the legislation and safety requirements for using and selling garden chemical products; and the promotion of wildlife and protection of the garden environment. By the end of 2013, 147 people held the BASIS Guardian certificate.

A more basic e-learning course was launched by the Crop Protection Association (CPA) and Horticultural Trades Association (HTA) on 26 March 2014. ‘Using Garden Plant Protection Products Safely’ aims to train garden pesticides sales staff to provide good quality advice to their customers.
Clarity of non-professional product labels

Fuller details of the findings of the Government’s 2013 survey into the practice of users of non-professional products (PS2817) can be found later on pages 54 and 55 of this Report. However at this point it is relevant to report the findings of the survey in regard to the clarity of product labels.

Between the previous survey in 2010 and that in 2013, new requirements were set for the labelling of non-professional products. These included a requirement, from 2012 onwards, to include the phrase ‘Use Pesticides Safely. Read the Label.’

The 2013 survey results indicated an increase in reading product instructions before using: for the first time (27% in 2007, 29% in 2010 and 38% in 2013); and every time (13% in 2007 and 2010 and 29% in 2013). 86% of respondents considered that the instructions on how to use pesticides were clear. In percentage terms this represents a drop from the high of 94% recorded in 2007. 95% of respondents said that they followed instructions ‘very’ or ‘fairly’ closely.

Details on the handling, storage and disposal practices of non-professional users can be found in Part 8 of this report.
Part 3: Information and awareness raising

Key Priorities

- That the public have access to accurate and balanced information on pesticide use and its impact.
- That there are systems for gathering and reporting information on pesticide poisoning incidents and that information gathered in this way is acted upon as appropriate.

Overview

The Pesticides Forum annual report itself plays a role in helping everyone understand the implications of pesticide use. In order to judge the extent to which pesticides are being used sustainably, it is important to read the overall messages that emerge from the full suite of indicators which are available, and not look at any single piece of information/data in isolation. The indicators presented in this section form only part of the full assessment, with those included in this section being those which represent a particular interest for the general public. The three are: pesticide residues in foodstuffs, the impact of pesticides on animals and wildlife and potential human health poisoning incidents.

Indicators

Figure 5. Maximum Residue Levels (MRL) compliance: % of fruit and vegetable samples tested and found with one or more residues above the MRL

Source: Data extracted from PRC and PRiF reports

This indicator shows the percentage of samples of fresh fruit and vegetables tested in the UK that contained detectable residues above the Maximum Residue Level (MRL) as reported by the Defra Expert Committee on Pesticide Residues in Food (PRIF) (and its predecessor, the Pesticide Residues Committee (PRC)).
MRLs are the maximum amount of pesticide residue that will be found in foodstuffs when pesticides have been used properly. This figure, therefore, provides an indication of practice amongst pesticide users. It should be noted that MRLs are a mechanism for regulating trade in produce. They are generally set many times lower than levels which would be expected to have an adverse effect on human health. Consuming foodstuffs with residues in excess of an MRL does not, therefore, necessarily constitute a risk to consumer health.

In 2012, 607 samples of UK fruit and vegetables were tested. Five (0.82%) of the samples contained residues above the MRL. 1007 samples of non-UK fresh fruit and vegetables were tested. 50 (5%) contained residues above the MRL.

However, it should be noted that the monitoring programme is directed towards foods where residues are expected. The same food products are not tested each year, the range of pesticides being tested for has increased from year to year and limits of detection are being lowered as the technology improves. Therefore, comparing data year-on-year is not straightforward. It should also be noted that, when comparing UK samples with non-UK samples, some foods and some survey categories contain a higher proportion of foods of UK origin than others.

Figure 6. The Wildlife Incident Investigation Scheme (WIIS): UK pesticide poisoning incidents investigated

The WIIS investigates deaths or threats to the health of animals and wildlife if there is evidence to suggest that they may have been caused by pesticides. The scheme relies on members of the public volunteering information and is operated independently in all four countries of the United Kingdom, using the same free phone number to report incidents. The scheme’s objectives are to: provide information to the regulator on hazards to wildlife and companion animals and beneficial invertebrates from pesticides; and enforce the correct use of pesticides, identifying and penalising those who deliberately or recklessly misuse and abuse pesticides.
If evidence of pesticide poisoning is found, further enquiries may be made by enforcing authorities. A description of the categories used to classify cases and a regional breakdown of the results of investigations can be found online in WIIIS Quarterly Reports. Individual case data can be searched by country in the ‘Latest results’ spreadsheet.

Cases are classified as:

- approved use (the pesticide is used in accordance with its conditions of authorisation);
- abuse (a deliberate attempt is made to poison animals illegally);
- misuse (a product has been used incorrectly, carelessly, or accidentally with no intention to cause harm); or
- unspecified (the source of the pesticide remains uncertain so cannot be classified as one of the above).

This indicator includes a breakdown of the 96 cases of actual, attempted or accidental poisoning of wildlife by pesticides which were investigated under the scheme in 2012. Of these, 45 abuse cases were confirmed (which continues the reduction in the number of abuse cases since 2010).

24 of the 96 incidents involved bees. The cause of death from pesticide poisoning was confirmed in 11 cases. Bees reported under the WIIIS are routinely screened for the presence of neonicotinoid insecticides and fipronil. Eight cases identified neonicotinoids and two identified the presence of fipronil.

Two cases of approved use were noted, involving a dog and two pigs; both cases involved rodenticide bait, which is a biocide as opposed to being classed as a pesticide.

In an additional 80 cases, background residues were found but pesticide poisoning was not the primary cause of death.
Figure 7. Pesticides Incidents Appraisal Panel (PIAP) investigations

![Graph showing Pesticides Incidents Appraisal Panel (PIAP) investigations]

Source: Health and Safety Executive Pesticide Incidents Reports

This indicator shows the number of incidents in Great Britain investigated by the Health and Safety Executive’s (HSE’s) Field Operations Directorate (FOD) and reviewed by HSE’s Pesticides Incidents Appraisal Panel (PIAP). PIAP’s main purpose is to provide an overview of alleged ill-health attributed to pesticide exposure (as reported to and investigated by HSE) so that new issues and trends can be identified, and to inform the pesticide authorisation process.

**Great Britain**

Between 1 April 2012 and 31 March 2013, FOD investigated 45 reported pesticide incidents. Fifteen cases involved allegations of ill-health, all of which were considered by PIAP. The panel assessed two cases as ‘likely’ to be linked to pesticide usage and one case as confirmed.

HSE Inspectors issued 14 enforcement notices: one under the Control of Pesticides Regulations 1986; two under the Biocidal Products Regulations 2001; three under the Plant Protection Products (Basic Conditions) Regulations 1997; one under the Plant Protection Products Regulations 2011; and seven under the Plant Protection Products (Sustainable Use) Regulations 2012 during the year, compared with 9 notices in 2011/12. Further details of enforcement and prosecution actions can be found on HSE’s register of prosecutions and notices database. The full Pesticides Incidents Report 2012/13 is available on the HSE website.

**Northern Ireland**

During 2013, two cases of potential misuse of pesticides were reported in relation to HSE Northern Ireland enforced premises. One related to poor spraying practice by a farmer and the other alleged that a farmer had failed to apply a suitable buffer zone when applying pesticide near to a watercourse. Both cases were investigated and neither was upheld.
Case study

Northern Ireland’s Water Catchment Partnership tackles the River Derg

The Northern Ireland Environment Agency (NIEA) established a ‘Pesticide Working Group’ in 2012 and selected the River Derg, which is a Drinking Water Catchment, to use as a ‘focus catchment’ to develop controls to further reduce the presence of pesticides entering the water environment in this catchment. Following this a subgroup ‘The Water Catchment Partnership’ has developed, which is a working partnership with representatives from NIEA, Ulster Farmers’ Union, Northern Ireland Water and DARD’s College of Agriculture, Food and Rural Enterprise.

The Partnership has been proactively working to promote and raise awareness of best practice when using pesticides in the garden or on the farm, through a voluntary approach to improve water quality.

Representatives from the Water Catchment Partnership have attended a number of local shows and hosted a pesticide awareness event at the Derg Waste Water Treatment Works. A large mail drop has been carried to all addresses (both domestic and business) throughout the whole Derg catchment and there have been articles in the local press to highlight both pesticide issues and the Partnership. A series of one to one farm visits is also planned to provide best practice guidance on grassland pesticide use.

If the Derg project is successful the Partnership aims to embark upon other drinking water catchments.

Representatives from the Water Catchment Partnership
**Part 4: Inspection of application equipment**

**Key Priorities**

- That pesticide application equipment is formally tested on a regular basis.
- That regular testing of application equipment is undertaken as widely as possible ahead of legal requirements coming into force in November 2016.

**Overview**

Regular testing and certification of pesticide application equipment helps to reduce the risk of pollution from, for example, worn or incorrectly attached pipes and hoses, partially-blocked nozzles or poorly calibrated systems. From November 2016 lawful use of certain types of application equipment will only be permitted if it has passed an inspection.

The indicators we have selected here show that substantial numbers of tests have been conducted on application equipment, representing a significant proportion of the sprayed area. The indicator on crop assurance schemes, showing widespread coverage, has been selected as membership of these includes annual testing of application equipment as a key requirement.

One issue the Forum will be monitoring is the accessibility of testing for farmers in remote locations such as upland areas. This is of particular interest to governments in Wales and Scotland who will be working with the National Sprayer Testing Scheme (NSTS) to ensure this is not a problem.

**Indicators**

**Figure 8. National Sprayer Testing Scheme (NSTS): number of tests and % sprayed area**

Source: NSTS/AEA
The number of tests completed by the NSTS in 2012/13 was slightly down on the previous year, due mainly to farmers and growers postponing their tests because of the extended winter weather. The NSTS, however, tested 14,123 sprayers, 291 granular applicators and 36 foggers during the period, these machines accounting for 85.6% of the sprayed area of the UK. In 2013 the NSTS was designated by Government as an authority competent to test and certificate application machinery.

58% of sprayers required repair or rectification as a result of the test. This has been fairly consistent since the NSTS started in 2003. Leaks and drips have been the greatest cause of failure over the years. There has been a decrease in failures relating to PTO (power take-off) guards and nozzle set replacement.

Preparing for the expected increase in testing requirements to meet the new legal requirements which will apply from 2016, the NSTS’s coverage of the UK has further increased with the appointments of test centres in mixed and livestock areas and examiners testing machines currently used on the Channel Islands and Isle of Man. There are now some 240 test centres throughout the UK with 632 active and qualified examiners. The scheme continues to be commercial at the point of use, giving machine owners a choice as to by whom and where they get their machine examined.

Figure 9. Membership of crop assurance schemes on holdings sampled in the United Kingdom by Pesticide Usage Survey

Notes:
- n = number of farms surveyed
- 1 = Surveys of GB only
- 2 = England and Wales only
- 3 = Orchards include apples grown for dessert and cider production.
- The level of crop assurance is normally higher for dessert apples.

Source: Fera Pesticide Usage Surveys

This indicator shows the percentage of agricultural and horticultural farms in assurance schemes. Farm assurance schemes are industry-led initiatives which
producers can join to assure customers that certain standards have been maintained in the production process. There are a number of schemes, which cover a range of standards including safety, welfare and environmental. Together the schemes aim to demonstrate assurance along the whole chain, from farm through to the consumer’s shopping basket, including hauliers, abattoirs and suppliers. The standards for individual crops and livestock vary to reflect the differences in production and legislation.

Practices which are consistent with sustainable use of pesticides (for example annual testing of application equipment, participation in continuing professional development training and careful planning of the application of chemicals) feature prominently in the schemes. This indicator demonstrates the key role industry-led approaches have in helping to deliver sustainable pesticide use in the UK.

Farmers are encouraged to join to build consumer confidence in UK food. Over 78 000 farmers and growers in the UK are farm assured, accounting for between 63 per cent and 95 per cent of output in the main commodity sectors. Reaching the required standards offers marketing opportunities for produce. Scheme members have to undertake regular, independent checks to ensure that production systems follow the rules. There are normally annual membership and inspection fees.
Part 5: Aerial Application

Key Priorities

- That applications for aerial spraying operations are assessed appropriately and permitted or denied in accordance with the relevant legislation.
- That there are sufficient products available to ensure treatments can be delivered where aerial pesticide application is the only effective way of controlling pests, weeds and diseases.

Overview

CRD is the UK authority designated to establish the conditions in which aerial spraying may be carried out and the competent authority for assessing and permitting applications to undertake aerial spraying. There are only a handful of companies which undertake aerial spraying in the UK - they notify CRD of proposed operations. CRD permits operations provided that certain conditions are met. Where spraying takes place in, or close to a protected area, additional checks are conducted.

Aerial spraying companies are diligent in adhering to these requirements. There was, however, one reported case of aerial spraying having taken place without the necessary permit having been obtained. Enquiries undertaken by the Scottish Government established that there were no adverse effects as a result of this operation and further investigation is underway to establish the facts.

The vast majority of aerial spraying takes place to control bracken. Only one product was authorised for this use in 2013, and that was granted on an emergency basis. There is a need, therefore, to develop alternative methods of control and we are aware of experimental work to test the suitability of other products for bracken control; we will be following this up.

2013 also saw a relatively high-profile aerial spraying operation to control a colony of oak processionary moth caterpillars in a Site of Special Scientific Interest (SSSI). Careful consideration was given to permitting this operation and specific conditions were imposed to assess medium to longer term impacts.

Indicators

352 aerial spraying jobs were permitted in 2013. The majority of these were to apply asulam from aircraft to control bracken. Three other active substances were permitted for specific aerial application jobs: amidosulfuron in an experimental trial to control bracken; *Bacillus thuringiensis* var. *Kurstaki* to control oak processionary moth; and copper oxychloride to control dothistroma needle blight.

115 of the permitted jobs were in nature conservation areas and 18 were within 150m of such areas. The remaining 219 applications took place well away from conservation areas. Nature conservation legislation requires an assessment to be made of the implications of any operation adjacent to a protected area which has the potential to adversely impact a protected feature. More information on Protected Areas, Areas/Sites of Special Scientific Interest (ASSIs/SSSIs) and Natura sites appears in Part 7 of this report.
214 of the jobs permitted in 2013 related to land in Scotland; 106 to land in England, 24 in Wales and the remaining eight relating to land in Northern Ireland.

Applications for control of bracken took place between late May and the early part of September. They tend to be done early each day to minimise the risk that members of the public may be in, or close to, areas due to be treated.
Part 6: Measures to protect the aquatic environment and drinking water

Key Priorities

- That we understand which pesticides are identified as polluting water and the routes by which this pollution occurs.
- That pesticides detected in surface water, groundwater and drinking water do not pose a risk to human health or the environment, or cause the UK to fail to comply with the requirements of relevant EU legislation.
- That effective action is taken to prevent or reduce the pollution problems identified, working with relevant stakeholders to ensure positive socio-economic impacts.
- That accidental spillages, which can result in substantial adverse impacts on aquatic ecosystems are minimised.
- That efforts are undertaken to improve the standards of practice of infrequent pesticide users.

Overview

Even careful, authorised use of pesticides can result in residues being detected in surface waters, groundwaters and tap water supplied to consumers - the concentrations that are detected do not give rise to environmental or human health concerns. Under EU law surface waters and groundwater must comply with quality standards established for chemical substances. Particular attention is afforded to protection of water abstracted for supply at the tap to consumers. The fact that even tiny amounts of pesticides are detected, or even that there is a rising trend in detections can, potentially, result in the UK failing to comply with EU water quality legislation.

The main pesticides which result in water quality standards being compromised are those applied to autumn sown crops, in particular the molluscicide metaldehyde and the herbicides carbetamide and propyzamide. During 2012 the Forum heard how Defra is assessing the costs and benefits of measures to reduce the risks associated with metaldehyde use and is considering how best to address the issue of carbetamide and propyzamide pollution. The Forum supports careful consideration of this issue, noting the need to protect water whilst ensuring farming has access to a sufficient range of crop protection tools and techniques to control pests, weeds and diseases. We also support industry stewardship initiatives.

Instances of pesticide pollution of water having a harmful effect on the aquatic environment are rare. However, 2012 (the latest year for which we have data) showed a marked increase in the number of incidents compared to recent years. Our investigations suggest that this is the result of an unfortunate series of co-incidences (it was an exceptionally wet year), rather than any fundamental or underlying problem (for example, with the design of machinery).

It has long been recognised that those who use pesticides on an infrequent basis pose, in general, a greater risk to water quality as they tend to be less familiar with risks and how they can be mitigated through best practice. Pesticides used on grassland and in the amenity sector (such as MCPA, mecoprop-P and glyphosate) are amongst those most frequently detected in water. We were pleased to support the establishment of a grassland joint working group (with the Voluntary Initiative) and learn of progress in improving practice in the amenity sectors.
This part of the report contains details of water monitoring data supplied by environmental regulators from across the UK and reports of pesticide pollution incidents. The monitoring data collected by environmental regulators are used to assess compliance against a range of Water Framework Directive (WFD) objectives which have been set to ensure protection of aquatic life and of drinking water sources. Collection and preparation of such data is resource intensive so it is not possible to update this information each year in all cases. Assessment results show that in some instances, especially in groundwaters, the failure to meet WFD objectives is attributable to pesticides which are no longer approved for use but which are still present due to historical use and the amount of time it takes for groundwater to recharge. The data also indicate that the greatest area to focus effort on relates to reducing risks to surface water drinking water catchments. In comparison with WFD standards set for protection of aquatic life this is where regulators see more significant levels of non-compliance.

Indicators

Surface Water Drinking Water Protected Areas

England and Wales

Updated data for this indicator are not available this year. Please see the map on page 38 of the 2012 Annual Report for the most recent information.
Scotland

Figure 10. Drinking Water Protection Areas (DrWPAs) in Scotland at risk of failing to meet Article 7 objectives for pesticides in 2013

Seven of the 516 surface water DrWPAs in Scotland have been identified as being at risk of deterioration from pesticides. This represents 1.4% of all such areas. Two are currently being investigated further and are identified as “at risk” in Figure 10 above. Sporadic evidence of pesticide inputs in a further five DrWPAs are of concern but considered to be at lower risk.

Northern Ireland

No recent data are available.
Surface Water Bodies not currently meeting WFD Environmental Quality Standards (EQS) for Pesticides

**England and Wales**

Updated data for this indicator are not available this year. Please see the map on page 41 of the 2012 Annual Report for the most recent information.

**Scotland**

No surface waters were assessed as failing good status due to pesticides in 2013. Intensive, more targeted monitoring is being carried out in a limited number of Priority Catchments designed to assess impacts from diffuse agricultural pressures. Early monitoring has detected pesticides at some locations. The monitoring approach has been designed to better target water bodies of concern and usage periods.

**Northern Ireland**

Figure 11. Pesticides causing EQS failures from Surface Water Monitoring in Northern Ireland

Source: Northern Ireland Environment Agency

Note: The three waterbody failures reported in the 2012 update are not carried forward to 2013 as tests for these substances were repeated so new data were available.
There are 575 river waterbodies in Northern Ireland. Surveillance monitoring has shown positive detections, all of which were below surface water regulatory standards of the following approved pesticides: chlorpyrifos; dimethoate; linuron, chlortoluron and glyphosate. Pesticides which are no longer approved that were also detected were: atrazine, fenitrothion, dichlorvos, propazine, simazine, diuron, isoproturon, fenuron and monuron.

The main water quality issues were from active substances not used as pesticides. The organophosphate diazinon (which is no longer approved for use as a pesticide) has caused EQS failures in two river waterbodies (both in the North Western river basin district) resulting in a moderate class for Specific Pollutants. There were 32 failures of the annual average EQS for the organophosphate dichlorvos, which is neither currently a specific pollutant or a priority substance within the WFD classification scheme nor approved for use as a pesticide. The map on page 35 shows the two river waterbodies that are moderate status for diazinon and the 32 failing waterbodies for dichlorvos (in the North Western, North Eastern and Neagh Bann river basin districts); these failures due to dichlorvos do not affect WFD status.
Groundwater bodies failing WFD objectives due to pesticides

**England and Wales**

Figure 12. Groundwater bodies in England and Wales failing Water Framework Directive (WFD) objectives due to pesticides

Of the 304 groundwater bodies in England and Wales, 17 (5%) failed WFD ‘good status’ because of substances which have been or are still being used as pesticides. The previous compliance assessment published in 2012 also found a 5% failure rate across groundwater bodies. Several tests are used to determine whether a groundwater body is meeting ‘good status’ or not. These include looking at whether concentrations of any individual pesticide, and combined concentrations of ‘total pesticides’ are rising in groundwater used for drinking water.

The map at Figure 12 shows the location of failing groundwater bodies. Where failure is attributable only to pesticides which are no longer approved the groundwater body is shaded orange. Green groundwater bodies are failing because of pesticides currently approved for use, or because of combinations of currently approved and withdrawn substances.

Pesticides contributing to failure of good status, and currently approved for use in the UK are mecoprop-P, bentazone, metaldehyde, chlorotoluron and asulam. Pesticides which are no longer approved and contributing to failure of good status are isoproturon, atrazine and fenuron.

Source: Environment Agency
Scotland

Figure 13. Groundwater sampling locations where one or more pesticides have been detected at levels which threaten to exceed 0.1 micrograms per litre (µg/l)

Source: Scottish Government
© 2014 Scottish Environment Protection Agency. Some features of this map are based on digital spatial data licensed from the Centre for Ecology and Hydrology, © CEH. Includes material based upon Ordnance Survey mapping with permission of HM Stationery Office, © Crown copyright Licence number 100016991.

No groundwaters in Scotland are currently assessed as failing ‘good status’ due to pesticides. Monitoring during 2012 at 33 sampling locations detected the active substances fluoroxypr; chlorotoluron; diuron; atrazine; bentazone; linuron; mecoprop, fenuron; pencycuron; simazine, bromoxynil, oxadixyl, and MCPA, but at values below regulatory standards.

Northern Ireland

No groundwaters in Northern Ireland have been identified as at ‘poor status’ as a result of pesticide usage. In 2012, monitoring of the 55 sites comprising the Northern Ireland groundwater monitoring network has shown one positive detection of each of the following: 2,3,6-TBA; chlorotoluron; flutriafol; triclopyr.
Substantiated category 1 and 2 pollution incidents, involving agricultural and non-agricultural pesticides

Figure 14. Substantiated category 1 and 2 incidents involving agricultural and non-agricultural pesticides in England and Wales

Source: Environment Agency

In 2012 the Environment Agency investigated nine serious (Category 1 and 2) incidents involving pesticides. The sources of pollution were not traced in all cases, but from the information available it is likely six arose due to agricultural activity, and three due to non-agricultural use of pesticides. It should be noted that the Environment Agency will not capture all pesticide incidents, only those that are reported to them, or that they become aware of through catchment investigations.

This indicator shows the numbers of incidents reported in 2012 are higher than in previous years, and stand out in a dataset that would otherwise indicate a downward trend. Ecological impacts on several rivers were particularly severe. A review of more recent data shows these high incident numbers have not been repeated in 2013. At the Forum’s request, the Environment Agency is sharing the information on the 2012 incidents with CRD and industry pesticide initiatives so that it can be used to inform ongoing pollution prevention work on pesticides.

Summary information on the six agricultural incidents:

- June 2012: A crop sprayer being pulled along by a tractor overturned on a culvert bridge. 6000 litres of pesticide mix containing lambda-cyhalothrin, dimoxystrobin and thiabendazole discharged into the watercourse. 24km of watercourse was affected. Whilst 7000 fish were rescued by the Environment Agency, approximately 15 000 died, as well as thousands of invertebrates. The local water company closed their river intake to protect drinking water supplies from contamination. They also assisted by pumping 2 million litres of water from a groundwater borehole into the river to help dilute the pesticides. The company operating the sprayer was prosecuted by the Environment Agency. In total they paid £107 000 in incident response costs, Environment Agency legal costs and a prosecution fine.

- June 2012: A crop sprayer over-turned after being driven too close to a field edge. 1500 litres of pesticide mix containing chlorothalonil, cyproconazole
and lambda-cyhalothrin was discharged into the watercourse. More than 1000 fish and thousands of invertebrates were killed over a 2.5km stretch of watercourse. Wider impacts were prevented by Environment Agency action with a local land owner to construct a temporary earth dam in the impacted tributary and pump out significant quantities of contaminated water to adjacent land. A triathlon swimming event was cancelled downstream as a precaution. The farmer received a formal caution.

- June 2012: A crop sprayer which had just been used was brought back to a farmyard and refilled with water using a hose. It was left unattended and overflowed. The contaminated water entered a surface water drain and discharged to the local watercourse. 100 – 200 native crayfish and a small number of fish were killed. A wide range of pesticides (including withdrawn substances) were detected in the discharge; MCPA, bromoxylin, lindane, chlorothalonil, cypermethrin, chlorpyrifos, cyprodinil, diazinon, diflufenican, ethofumesate, fenpropimorph, flusilazole, isoproturon, lenacil, propiconazole and tebuconazole. The farmer received a formal caution and is funding a crayfish restocking project. Because banned substances were also found in the discharge the case was referred to the Rural Inspectorate Wales to investigate a potential breach under cross compliance rules.

- September 2012: A water company groundwater source used to supply drinking water was temporarily closed due to detection of chlorpyrifos-ethyl in borehole water at levels ten times above the Drinking Water Directive limit for any individual pesticide in tap water (0.1 µg/l). The Environment Agency made pollution prevention visits to all farms situated in the relevant groundwater Source Protection Zone but investigations into the source of the contamination were inconclusive. Pollution prevention advice was provided on the storage, use and handling of pesticides and local risks to groundwater.

- January 2012: A water treatment plant was temporarily closed to avoid metaldehyde breaching regulatory standards at the tap. Catchment investigations identified the source was likely to have been recent application of slug pellets to a field of winter wheat.

- October 2012: A water company abstraction was closed and the associated supply reservoir was drained down to avoid abstraction of water containing metaldehyde and subsequent breach of regulatory standards at the tap. Catchment investigations identified the source was likely to have been recent application of slug pellets to a field of winter wheat within label recommendations but followed by heavy rain.

Summary information on the three non-agricultural incidents

- June 2012: Following suspected vandalism at a chemical blending and repackaging plant, over 800 litres of lambda-cyhalothrin along with thousands of litres of biocides entered highway drains and reached the local river. Approximately 20 000 fish along with invertebrate life were killed over a 46km stretch. Recreational use of the river was disrupted and the local authority closed the downstream shell-fishery as a precaution. Environment Agency prosecution led to a Crown Court fine of £50 000 and a further £42 000 in costs.

- March 2012: A water company abstraction was temporarily closed due to high levels of carbendazim. The Environment Agency and the water company concerned carried out pollution prevention visits in the upstream catchment area. The source could not be identified but, based on the nature of activities
in the catchment, it is considered it was more likely to be from amenity rather than agricultural use of pesticides.

- November 2012: A water company abstraction was temporarily closed due to high levels of carbendazim. Local golf courses were identified as potential sources but this could not be confirmed.
Case study

Scotland’s diffuse pollution strategy –
the River Ugie catchment

To help improve the protection of Scotland’s waters and help deliver the objectives outlined in the Scotland River Basin Management Plan, Scotland launched its Rural Diffuse Pollution Plan in 2010. The plan aims to deliver a national campaign of awareness raising, guidance and training and a targeted priority catchment approach.

The Plan identifies 14 priority catchments in the first river basin management cycle containing some of Scotland’s most important waters (for conservation, drinking water, bathing and fishing etc.). Effort is being targeted within these priority catchments with a sequential process of evidence gathering, awareness raising and farm visits to identify risks, target measures and provide one to one advice.

The River Ugie catchment in the North East of Scotland is one such diffuse pollution priority catchment. The River Ugie is an important public drinking water supply and agricultural pesticides are found in this water prior to treatment (Figure 15). In order to meet the drinking water quality standards these pesticides need to be removed, which can be both energy- and cost-intensive. A more sustainable solution would be to prevent pesticides from entering the drinking water sources in the first instance.

Figure 15. Pesticides detected in the River Ugie at the intake for Forehill Water Treatment Works
(After treatment these pesticides should not exceed 0.1µg/l).
As part of the diffuse pollution strategy, Scottish Environment Protection Agency (SEPA) officers have visited 420 farms within the Ugie catchment to assess compliance with the diffuse pollution general binding rules* and assess diffuse pollution risks from the farm steading and associated land. Offering advice on reducing the risk of pesticide pollution is an important aspect of this work. Of the 420 farms which were visited, breaches of the diffuse pollution general binding rules were found on 180 farms, mainly relating to cultivation within 2 metres of the water environment and poaching / erosion within 5 metres of the water environment. A number of breaches or risks of causing pollution were also identified in relation to pesticide handling areas. Where breaches are found the farm will be revisited within 12 months to assess progress in achieving compliance and reducing pollution risks.

In 2012 Scottish Water launched their Sustainable Land Management (SLM) Incentive Scheme. The Scheme provides financial assistance for land managers to implement measures beyond regulatory compliance for the protection and improvement of drinking water quality. The River Ugie is one of the catchments within this scheme and to date over 16% of the land managers have applied to the SLM Incentive Scheme from the area. Some of the items within the SLM Incentive Scheme will directly address the pesticide issue, such as pesticide sprayer loading areas, biobeds, biofilters and pesticide product substitutions. Other measures will have an indirect benefit, such as installing fencing. The latter will create a physical barrier to avoid cultivation and pesticide applications taking place too close to the watercourse, as well as providing a vegetated buffer zone.

Through the promotion of good practice, advice and guidance (such as that produced by the Voluntary Initiative), visiting farms and providing potential funding for measures, water quality will be better protected. This should help prevent pesticide from entering drinking water sources and minimise the need for water treatment; thereby offering a more sustainable solution to protecting drinking water quality.

Scottish Environment Protection Agency and Scottish Water

*General binding rules (GBRs):
The Water Environment (Controlled Activities) (Scotland) Regulations 2011 as amended, provide three levels of control relative to the risk posed by the specific activity - GBRs, Registration and Licensing. A GBR is the lowest level of control under these regulations and in terms of diffuse pollution provides a statutory baseline or minimal level of good practice.

Further links:
Farmer guidance - http://www.farmingandwaterscotland.org/info/2/know_the_rules
(this page includes pesticide GBRs – see the two pesticide guides)
Case study

The Campaign for the Farmed Environment

During 2013, the Campaign for the Farmed Environment (CFE) extended its scope to include the lowland-grassland sector in England, and to work in partnership with other voluntary industry-led initiatives (including the Voluntary Initiative) to demonstrate how the industry collectively takes responsibility for achieving environmental benefit alongside profitable farming.

Each year, CFE is monitored through the Defra ‘Survey of land managed voluntarily’ that is issued to 5500 randomly selected farmers across England. The results from the 2012/13 survey recorded farmer attitudes to the environment, finding that:

- 97% see efficient use of inputs as important,
- 100% see protecting soil and water as important, and
- 97% see protecting farm wildlife as important.

CFE continues to encourage farmers to implement voluntary environmental measures alongside their productive business. During 2012/13 adverse weather conditions meant that many fields remained uncultivated in early spring, this contributed to the survey measuring 677 000 hectares being managed under the unpaid measures during the period. Particular measures that play a part in reducing pesticide impacts that are recorded include:

- Grass buffer strips next to a watercourse or pond (17 197 ha)
- In-field grass strips to avoid erosion (3752 ha)
- Management of maize fields to avoid erosion (20 799 ha)
- Fenced watercourses, which create a buffer strip that can reduce risk of direct and diffuse pollution (6781km)
Case study – Amenity sector

Japanese knotweed control - Chesham Moor

As part of its ongoing environmental commitment, Chesham Town Council partnered with conservation bodies and local community groups to form ‘Impress the Chess’, a project to protect and restore the River Chess in the Chilterns, a distinctive habitat for some of the country’s most endangered wildlife.

One of the major challenges facing the conservation project was a 2000m² Japanese Knotweed infestation on the adjacent Chesham Moor. This invasive plant not only posed a threat to the river’s native plants and animals, but was also compromising the space and quality of the moor itself.

Led by its policy and project officer, Kathryn Graves, Chesham Town Council was determined to work with a responsible, Amenity Assured treatment specialist who was sensitive to the requirements for safe herbicide use and could localise the knotweed treatment whilst eliminating any risk of contaminating the surrounding watercourse and vegetation.

A stem injection treatment was recognised by the council as the most ecologically sound and cost-effective treatment method and a staggered three year treatment project was put in place.

Kathryn Graves commented: “We have been delighted with the professionalism of the treatment work and the results which are immediately apparent after each section is completed. Aesthetically it has already had a significant visual impact on The Moor and the staggered programme has enabled the council to cost-effectively manage what was initially a daunting environmental and financial challenge.”

Stem injection treatment
Case study update

Chlorpyrifos: say no to drift

Our report last year included a case study on the “Chlorpyrifos: Say NO to DRIFT” campaign. The Government, with funding from the chlorpyrifos manufacturers, has undertaken work to help assess how effective this industry stewardship campaign has been in raising awareness and changing the behaviour of users of this pesticide in order to protect water quality. The campaign has two main aims, to encourage farmers to: apply chlorpyrifos products using only low-drift nozzle technology; and use 50m (in the case of orchards) or 20m (in the case of all other situations) buffer zones adjacent to watercourses.

The work suggests that the campaign has been successful in raising awareness of the need to change practice with 81% of respondents being aware of the key requirements. However, only 53% of respondents were aware of the reasons behind the campaign. Awareness was greatest in the arable and orchard sectors and lowest in the fodder and grassland sector. In 2012 70% of farmers were recorded as using low-drift nozzles when applying products containing chlorpyrifos, a significant increase from the 33% recorded for 2011. The data suggested that 53% of farmers with a watercourse on their farm may have been using the recommended buffer zones in 2012.

Whilst we would like to see greater understanding of the reasons for this campaign, the key message to draw from this work is that voluntary initiatives, when used as part of an appropriate range of regulatory and non-regulatory controls and incentives, can be effective in promoting behavioural change to help ensure that pesticides are used in a more sustainable fashion.

Visit the campaign website for more details.

Comparison between conventional and low drift nozzles
Picture by kind permission Dow AgroSciences
Part 7: Reduction of risk in specific areas

Key Priorities

- That the particular challenges of pest control in public spaces and conservation areas are understood, and risks and use of pesticides in these areas minimised accordingly.
- That we develop a better understanding of the amenity sector and practices adopted by users.
- That industry bodies continue to play a key role in developing and promoting best practice measures and disseminating advice when pesticides are used in public spaces.

Overview

Use of pesticides in public spaces is an area of particular interest for the Forum. It is also identified as a priority area in the UK National Action Plan. We have heard in the past how the degree of understanding of the risks associated with pesticide use and how these can be mitigated is not, overall, as well-developed in amenity as, for example, arable and horticulture.

We were pleased to hear, therefore, at our meetings last year how Government and industry have been working together to successfully raise awareness of this issue amongst key stakeholders, through for example the Chemicals Regulation Directorate (CRD) letter to Local Authority Chief Executives, and Amenity Forum workshops. We also heard how industry has developed mechanisms and measures, such as the Amenity Assured Standard and NAsOR scheme to help those who are being regulated comply with the law and adopt best practice measures.

The indicators relating to pesticide use in public spaces in our report are drawn from a recent Government survey of use and practice in the sector. Although much remains to be done to deliver fully sustainable pesticide use in amenity, developments reported below and elsewhere in this report and the pace of change are encouraging. A focus for the future will be on tailoring communication and approaches to different sectors of amenity use.

We did not look specifically at pesticide use in conservation areas in 2013. However, we know from information received in relation to controls on aerial spraying of pesticides that such areas are carefully monitored and applications of chemicals are closely controlled. The information available to us suggests that pesticides are responsible for only a very small proportion of conservation areas being designated as in unfavourable condition.
Indicators

Public Spaces

Figure 16. Tonnes of herbicides, fungicides and insecticides applied in major amenity sectors 2006-2012

![Graph showing tonnes of herbicides, fungicides, and insecticides applied in major amenity sectors from 2006 to 2012.](image)

Source: Pesticides Usage Survey – Amenity Pesticides in the UK 2012

Figure 17. Relative weight of amenity pesticide applied in major amenity sectors in the UK – 2012

![Pie chart showing relative weight of amenity pesticides by sector in 2012.](image)

Source: Pesticides Usage Survey – Amenity Pesticides in the UK 2012

It is estimated that 743 tonnes of pesticide active substances were applied to approximately 330,000 hectares in the major amenity sectors. Herbicides accounted for 96% of the weight applied and 93% of the treated area. For fungicides the figures were 3% and 4.5% respectively and for insecticides 1% and 2.5% respectively. Herbicides are used almost exclusively in the industrial sector and on infrastructure. Use of fungicides is greatest, proportionally, in the golf sector, accounting for about 20% of the weight of product applied.
Applications to infrastructure (roads, railways and aquatic use) accounted for about 45% of the weight applied. Applications by, or on behalf of, public authorities (to educational institutes, footpaths and public spaces) accounted for 33% of the weight applied. Turf and golf related control accounted for 14% each. The amount of use in the sector is estimated to have declined by around 40% since 2006. It should however be borne in mind that the tonnage applied may not, in itself, reflect environmental impacts; this point is discussed further at page 70.

Interviews with a small sample of contractors, greenkeepers and local authorities yielded a number of findings which may be helpful in directing future efforts at improving practice in this sector.

- The drivers for vegetation management/weed control are public safety, legal requirements and avoidance of litigation.

- In very general terms contractors are most likely to be aware of practices which are consistent with the principles of sustainable use, followed by local authorities and then greenkeepers.

- There is a strong awareness across the sector of risks to human health (both operators and bystanders). Evidence was provided of users adopting a range of mitigation measures, including use of shrouded booms, weed wiping, spraying late or early in the day or outside of school term-time. Use of signage to warn people of spraying operations was also used.

- Awareness of risks to water was strongest amongst contractors and greenkeepers. The importance of weather as a risk factor was noted, but there was less awareness of factors such as surface type. Evidence was provided of users adopting a range of mitigation measures including use of low drift nozzles, and avoiding spraying next to drains and boreholes.

- There was a good level of awareness of the need to regularly calibrate equipment and ensure it is done at appropriate times. Contractors tended to do this more frequently than others.

- Contractors and local authorities tended to use larger, secure, walk-in bunded storage facilities. Greenkeepers tended to use secure steel cabinets or safes and tended to keep smaller stocks of product.

- Awareness of good handling and storage practice appeared to be the most variable of all the areas examined in the survey. Further work could be undertaken to improve practice here.

- When it came to minimising pesticide use and adopting integrated approaches, there was good awareness of the need to identify the problem and evaluate which approach would work best. Contractors noted that their approach tended to be dictated by clients, but there was a high degree of willingness to adopt alternative approaches. Greenkeepers reported use of some alternative approaches and the issue of the relatively high cost of pesticides. Local authorities adopted practices such as sweeping and highlighted the relatively low cost and high degree of effectiveness of pesticides, compared to alternative methods of control.
Conservation areas

The range of sites protected under national/international legislation for their nature conservation interest was referred to in our previous Annual Report. Pesticide use is relevant to these sites in a number of circumstances.

Pesticides may damage sites and their interest features through drift / runoff and in some cases over-spraying. It can often be difficult to monitor or measure the impacts of a drift incident, and this area of risk to designated sites is largely unquantified. Statutory and voluntary buffer zones adjacent to water courses or under agri-environment schemes will offer some protection. Natural England, Scottish Natural Heritage and Natural Resources Wales advise on buffer zones through consultation arrangements for aerial spraying near to designated sites. Incidents of pesticide impact on Sites of Special Scientific Interest (SSSIs) are recorded as reasons for adverse condition, and in 2013 accounted for only 0.01% of the SSSI area in unfavourable condition in England. No damage from pesticides was recorded on SSSIs in Scotland in 2013.

Herbicides may be used for vegetation management on designated sites. Natural England’s “Herbicide Handbook” (currently in the process of revision) provides advice on the use of herbicides in nature conservation management – generally advising their use only where other options are unavailable. Herbicide use has played a key part in bracken management in the UK, including for nature conservation, and Natural England has worked with the Bracken Control Group in providing advice and evidence in support of the emergency authorisation for asulam. Recently outbreaks of non-native invasive pests and diseases have required pesticide application within designated sites (for example aerial application of Bacillus thuringiensis (Bt) to prevent further spread from a localised outbreak of oak processionary moth). The balance of risks to site interest features is taken into account in such operations.

Oak processionary moth (Thaumetopoea processionae) larva
© Crown copyright Forestry Commission/George Gate
Part 8: Handling and storage of pesticides and treatment of their packaging and remnants

Key Priorities

- That practice in the handling, storage and disposal of pesticides is done to high standards in both the professional and non-professional sectors.
- That guidance relating to best practice is available for professional users in all sectors.

Overview

Good handling, storage and disposal practice helps to ensure pesticides are used sustainably.

Our report contains indicator data relating to the management of pesticide waste using biobeds and data from farm inspections. These indicators suggest that overall there is a growing appreciation of more sustainable ways of safely managing pesticide waste and a high degree of compliance with the laws relating to the use and storage of these chemicals.

Information on handling and storage practice reported in the previous part of this report is also relevant to this section.

A major focus in our report this year is on handling and storage practice in the non-professional (home and garden) sector, drawing upon the findings of a survey undertaken on behalf of the Government in 2013 – specifically findings relating to the disposal of products which is a key area of risk and a good indicator of the degree to which risk is perceived and dealt with. The results of this survey were reported to us in 2013.

The survey follows similar enquiries undertaken in 2007 and 2010. They have not been structured to provide a statistically reliable guide to practice, but do give a broad indication of ‘user habits’. The work supports and informs the activities of the Amateur Liaison Group, established by CRD and supported by a range of stakeholders to encourage best practice in use, storage and safe disposal of unused products and containers. The message which emerges from this survey (findings are contained throughout this report) is that whilst there is scope to improve practice significantly in some areas there have been encouraging signs of progress.

Indicators

Uptake of biobeds and biofilters

Biobeds and biofilters offer a cost-effective solution for ensuring pesticide losses to surface and groundwater from yard-based activities are minimised. In England and Wales site operators installing biobeds or biofilters must register a waste exemption with the Environment Agency or Natural Resources Wales. This is because treatment of pesticide washings in a biobed or biofilter is a waste management activity. In 2011 there were 88 biobeds/biofilters registered with Environmental Regulators. In 2012 this had increased to 202, and in 2013 to 3239. It is encouraging to note the work undertaken by regulators and industry to promote uptake has resulted in an upward trend since reporting began, and a significant increase in the number of exemptions issued in 2013.
At our June meeting, following a presentation from Severn Trent Water about its role and responsibilities and the work of its catchment management team, we visited a local farm to see a recently-installed biofilter and wash-down area.

**Cross compliance**

One of the series of checks carried out on farms receiving the Single Farm Payment (SFP) is the level of compliance with pesticide regulations, including the requirement to keep records of pesticide usage.

- **Statutory Management Rule (SMR) 9** relates to correct use of plant protection products to minimise their risk to humans, animals and the environment.

- **Statutory Management Rule (SMR) 11** relates, amongst other things, to keeping records of applications of plant protection products. [Note: SMR 11 requirements (and breaches) affect a wide range of issues such as records of veterinary medicines, biocides, diseases; this record keeping requirement is under EC regulations on food and feed and is therefore not restricted to pesticides breaches.]

Penalties may be levied for non-compliance with SMRs (breaches) depending on the intent (deliberate or negligent), extent (on or off farm), severity (high, medium or low) and permanence (permanent or rectifiable) of the breach. Penalties are set out in a payment reduction matrix and range from a warning letter (WL) to a scale of percentage reductions in payment of farmers’ support scheme claims.

Further details about the operation of cross compliance may be found at the following links:

- Rural Payments Agency (England)
- Scottish Government
- Department of Agriculture and Rural Development Northern Ireland
- Welsh Government

Figure 18 shows a comparison of the number of cross compliance breaches identified during inspection of a representative percentage of SFP claimants and provides an indication of the extent to which pesticide users adhere to legal requirements and the penalties for non-compliance.
In England, penalties were imposed for 88 breaches in 2012 (40 of which were SMR 9), against 72 (32 SMR 9) in the previous year and 48 in 2010. Six breaches were identified in Scotland in 2012 (three of which were for SMR 9), compared with five (three SMR 9) in 2011 and seven (five SMR 9) in 2010. Northern Ireland identified three breaches in 2012, eleven in 2011 and two in 2010. In Wales, ten breaches were sanctioned in 2012, four breaches in 2011 and three in 2010. In the past three years the majority of breach penalties in UK have been between 3% and 5%. Since 2010, eleven penalties over 15% were levied in England compared with one in Scotland (in 2010) and none in either Wales or Northern Ireland.
Home and garden (amateur users) sector

Figure 19. Disposal of rinsings from empty amateur concentrate containers

Source: Pesticides user habits survey (PS2817)

This indicator suggests some improvements in amateur user behaviours. Firstly, an increase in adding rinsings from empty concentrate containers to diluted spray solution; from 8% in 2007, 5% in 2010 to 34% in 2013. Secondly, it shows a reduction in illegal disposal of rinsings to drains/sinks/toilets. Although direct comparison is not possible as the survey questions were amended for 2013, a trend in the disposal of rinsings of concentrate empty containers may be noted: 58% in 2007 (50% drain, 7% sink, 1% toilet); 63% in 2010 (52% drain, 10% sink, 1% toilet); 25% in 2013 (19% drain, 5% sink, 1% toilet). This is a significant improvement with illegal disposal of rinsings from concentrate containers being halved.

In addition, further specific questions in the 2013 survey (PS2817) show that illegal disposal of rinsings from ready-to-use (RTU) plant protection products is also lower than results for concentrate containers in 2007 and 2010 with a total of 40% for RTUs in 2013 (32% drain, 7% sink, 1% toilet).

This image has been reproduced from the website www.recyclenowpartners.org.uk of the Waste and Resources Action Programme.
This indicator shows that of those who disposed of the container with the concentrate product still inside the container (10% of concentrate users), the most common disposal route was the normal household bin and local authority hazardous chemical waste disposal (both 38%), followed by landfill tips (20%) and household recycling (11%). 80% of concentrate users used up all of their product.

Of those who disposed of RTU product still in the container: 12% of respondents disposed of the pesticide with the container and 80% used it all up. 3% sprayed or emptied the product onto waste ground and 2% of respondents disposed of the product down the drain. Of the 12% who disposed of such products in the container, the most common method employed was the normal household bin (49%), followed by local authority hazardous chemical waste disposal facility (21%), then household recycling from the kerbside and landfill tips (both 16%).

The correct disposal route for containers with product left inside will depend on the specific label instructions for the product.

Improvements in disposal practice remain a major objective for the Amateur Liaison Group. In recent years maximum pack sizes have been introduced and (with the support of the manufacturers) two-for-one and other bulk marketing initiatives discouraged. This has been linked with wider guidance to ‘only buy what you need’. Over this period, improved labelling instructions on the safe disposal of unused product and containers have been introduced and most Local Authorities now provide special facilities for chemical disposal. The Group is considering further steps to improve practice in the future in the light of the latest survey results.

The Crop Protection Association’s website provides details of the location of the nearest Household Waste Recycling Centre (HWRC) to any postcode entered.
Part 9: Low pesticide input management, including Integrated Pest Management (IPM)

Key Priorities

- That low-pesticide input management systems continue to be developed, promoted and taken up by users of professional pesticides products.
- That awareness of the general principles of IPM increases and that they are adopted, as appropriate by professional users.
- That an effective range of non-pesticide and integrated approaches to pest, weed and disease control be developed and is made available.
- That the systems which are adopted emphasise growth of a healthy crop with the least possible disruption to agro-ecosystems and encourage natural pest control mechanisms.

Overview

The Sustainable Use Directive on pesticides requires governments to promote low pesticide-input pest management including integrated pest management and organic farming. The declining availability of pesticide products and continuing emergence of pest resistance means that there are additional practical drivers for those who use, or cause or permit the use of pesticides to consider a range of products and techniques for controlling pests, weeds and diseases. Studies undertaken by the government several years ago indicate that virtually all pesticide users undertake some form of management which is consistent with aspects of integrated control. However, it is clear that more needs to be done, both in developing a range of cost-effective tools and techniques and then ensuring that these are adopted widely.

Our meetings in 2013 heard how initiatives such as the UK Agri-Tech Strategy and R&D funded at national and European level could provide an opportunity to further develop this aspect of sustainable use. We also learned how integrated approaches are developed and promoted by the Forestry Commission and of the NFU’s plans to develop an Integrated Pest Management Plan for farmers. Details of the development of an Integrated Pest Management Plan on the RSPB’s Hope Farm can be found in a case study on page 67 of this report.

There are practical and cost issues associated with the collection of data showing the development and uptake of low pesticide input approaches and this is something we will be considering for future reports. This report contains information on: the availability of biopesticide products; amount of land in organic production; bird populations and availability of chick-food; and uptake of measures with agri-environment schemes which are consistent with the concept of an integrated approach. These are supplemented by case studies outlining other work relevant to this issue.
Indicators

Figure 21. Cumulative numbers of active substances and products approved as biopesticides

![Graph showing cumulative numbers of active substances and products approved as biopesticides from 1996 to 2013.]

Source: CRD

This indicator shows the number of products authorised and the number of active substances approved as biopesticides since 1996. The number of active substances and products continues to slowly increase, and the trend of the majority of the active substances being fungicides and insecticides continues, with both recent additions being insecticides.

Biopesticides are:

- products based on pheromones or semiochemicals; semiochemicals are natural chemicals emitted by plants, animals and other organisms (or synthetic chemicals designed to mimic the natural substances) that evoke a behavioural or physiological response in the target species (such as deterring target insects from entering the crop or attracting them away from the crop to the margins);
- products containing a micro-organism (e.g., bacterium, fungus, protozoa, virus, viroid);
- products based on plant extracts. There is a large spectrum of plant extracts (i.e., unprocessed extracts representing a ‘cluster of substances’, or those which are highly refined containing one active substance);
- other novel alternative products. As the description suggests, these are potential products which do not easily sit within one of the specific categories above.

The review of HSE’s approach on biopesticides (PS2810) was concluded in July 2013. A package of measures has been introduced to strengthen support for biopesticides. CRD have strengthened their package of support for companies by discounting pre-submission fees from a new biopesticide active substance application once received. They are working with the European Commission and other Member States with initiatives to provide guidance on procedures. Support
will be given to any revisions to data requirements. And finally CRD will work with other Member States to develop zonal and mutual recognition procedures.

CRD will also work with the International Biological Manufacturing Association (IBMA) on training initiatives to improve understanding of the regulatory process and improve quality and quantity of applications. At the same time, greater priority will be given to applied research within the budget available for biopesticides acknowledging the ADAS report which noted growers’ support for the more applied direction of recent pesticide research.
**Case study**

**Changes in the use of the biopesticide - *Bacillus subtilis***

*Bacillus subtilis* (*B. subtilis*) was first encountered in the Fera pesticide usage surveys in 2003 where it was used in trials on ornamental protected crops.

It was not until 2010 that significant usage of authorised products containing this biopesticide was reported. This was mainly on soft fruit crops and in particular on strawberries where over 3000 hectares (including repeat applications to a single crop) were treated, mainly for powdery mildew and late season *Botrytis* control.

**Figure 22: Changes in the use of the biopesticide *Bacillus subtilis* in Great Britain**

In 2012 the area of strawberries treated (including repeat applications) with *B. subtilis* increased to just over 5000 hectares where it played a significant part in late season disease control. The normal practice on farms in 2012 was to use *B. subtilis* two to three weeks before picking, with its use coinciding with a reduction in conventional pesticides. This enabled disease control with the biopesticide alongside minimisation in the risk of pesticide residues from conventional pesticides in harvested fruit.
Organic Land Use

Figure 23. Area of organic land use in UK


Figure 24. Total of in-conversion and organic land use in UK


Organic systems are designed to develop a good soil and healthy crops which have natural resistance to pests and diseases, and to encourage natural predators, for example through well-designed crop rotations.
Organic farming systems and Organic Certification bodies aim to avoid the use of pesticides. Only a limited list of selected pesticides is permitted, these are used where there are no natural or system-based alternatives, and are only used with the approval of the Organic Certification bodies.

Government provides support to those who convert to organic farming through mechanisms such as the Organic Entry Level Scheme. These tables show the area of organic land classified as either ‘in conversion’ or ‘fully organic’ in recent years and a breakdown of organic land-type. ‘In conversion’ means that the landowner is in the process of changing from a conventional to organic system of production.

### Populations of selected farmland bird species in the UK

**Figure 25. Populations of selected farmland bird species in the UK**

![Populations of selected farmland bird species in the UK](image)

Source: Defra/RSPB/BTO/JNCC

Birds have long been considered by scientists to provide a good indication of the broad state of wildlife: they occupy a wide range of habitats, they tend to be near the top of food chains and they are widely and routinely surveyed.

The three species shown in this indicator were chosen because they have been proven to be indirectly impacted by the use of pesticides. By ‘indirect effects’ we mean that pesticides do not, in themselves, kill these birds but their use puts pressure on populations by removing insect and seed food supplies.

In 2012 the corn bunting and grey partridge had each declined by approximately 90% relative to 1970 levels. Numbers of yellowhammer have approximately halved over the same period. All of these species are farmland specialists: they are restricted to, or highly dependent on, farmland habitats.
Populations of all bird species in the UK

Figure 26: All species indicator

The UK breeding farmland bird index, made up of 19 species including the three in Figure 25, has halved since 1970. The index has remained at this level, the lowest ever recorded, since 2010. Not all farmland species have declined: for example woodpigeon numbers have more than doubled. However the overall trend has been driven by the fortunes of the farmland specialists, which have declined by 67% since 1970. As the figure shows, species living in other habitats have generally fared better than farmland birds.

Most of the declines in farmland bird populations occurred between the late seventies and the early nineties. These steep falls in bird numbers were caused by land management changes and the intensification of farming including, amongst other things, increased pesticide use. At the same time as increasing agricultural yields, these changes had negative consequences for birds including habitat loss, a lack of suitable nesting habitat, and a reduction in food sources. Although some farming practices can still have a negative impact on bird populations, many farmers are now taking steps to help farmland wildlife, for example through implementing agri-environment measures. However, despite these efforts the farmland bird index showed an ongoing decline of 13% between 2003 and 2012. For some species, additional pressures such as weather, disease and climate change affecting birds on migration may now be contributory factors. Clearly the need for measures to help farmland wildlife is as great as ever. The adoption of integrated pest management should help to reduce direct and indirect effects of pesticides on wildlife, while agri-environment schemes in the new CAP programming period will continue to provide vital funding to land managers making a positive contribution to wildlife.
Case study

Changes in the Chick Food Index

Figure 27. Percentage change in invertebrate long term abundance trends over time

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(* indicates significance at P < 0.05)

Source: Game and Wildlife Conservation Trust (GWCT)

The GWCT’s Sussex study provides information on the long-term changes in cereal invertebrates from 1970 to the present day. Research into changes in invertebrate abundance on the study area has focussed on how these changes feed into changes in the diet of farmland bird chicks. Components of the diet of grey partridge chicks has been of especial interest, as the Sussex study was originally designed to monitor the abundance and productivity of grey partridges on the area (http://www.gwct.org.uk/research/long-term-monitoring/sussex-study/).

Components of the diet of grey partridge chicks have been combined into the grey partridge chick food index (CFI) which has shown a long-term decline in the Sussex study (Figure 27). The beginning of this decline coincides with the start of the widespread use of insecticides on the Sussex study during the early 1970s (herbicide use was already widespread before monitoring began), and it is during this decade that the majority of the decline in grey partridge CFI occurred.
The grey partridge CFI contains five groups of invertebrates. There were initial declines in the 1970s across all of the five groups that make up the grey partridge CFI. Changes in abundance of these five groups have not coincided since then. In particular, two groups that are associated with arable flora, plant bugs/hoppers and leaf beetles & weevils, have increased over the past decade, in line with increasing uptake of agri-environment options throughout the study area. However, aphids and ground & click beetles have declined in the past decade and caterpillars of sawflies, butterflies, moths & lacewings, after a recovery in the 1980s and 90s, have again declined in the last decade. Analysis is currently on-going to examine the effects of changes in pesticide applications on these long-term trends.

On the Sussex study, it is not just grey partridge CFI that declined rapidly in the 1970s. Chick food indices for corn bunting, skylark and yellowhammer, as well as the generic CFI, all declined in the 1970s; there is some sign that the index of corn bunting chick food has increased over the last two decades. The generic CFI, as well as that for chicks of skylark and yellowhammer, have all declined significantly in the past decade.
**Agri-environment**

Figure 28. Areas of different agri-environment options used by farmers to provide valuable food wildlife resources and mitigate impacts of crop inputs on arable farmland in England

![Bar Chart](chart.png)

Source: Natural England

Options in farmer agreements under Entry Level and Higher Level Stewardship (ELS and HLS) in England, and under the Scotland Rural Development Programme (SRDP) in Scotland can contribute towards mitigating some of the impacts of pesticide and fertiliser use in agriculture by, for example, providing habitat and foraging areas for farmland birds and pollinating insects and by buffering the effects of pesticides on adjacent habitats. This indicator shows the current uptake of the key groups of agri-environment options which are known to benefit biodiversity and the environment more widely on farmland. Some options can also potentially enhance IPM strategies by encouraging natural enemies of pests, although more research is needed to quantify and maximise this effect (see [http://publications.naturalengland.org.uk/publication/2322452](http://publications.naturalengland.org.uk/publication/2322452)).

**England**

Many of these benefits come from ELS options which will not be available under new rural development programme (RDP) arrangements. Over the next six years many of these options will come to an end when ELS and HLS agreements naturally finish. Activity is underway by Natural England with input from key industry stakeholders, to work together to produce effective targeting approaches that will recapture the best areas of these options and optimise the quality of delivery. This ensures we provide the environmental outcomes we need to reduce any impacts of pesticide use and turn around declines in farmland species, on the least amount of area, and which maintains arable land in sustainable crop production.

A new programme of incentive support is being developed to follow on from Environmental Stewardship which closed in December 2013. It will contain many of the current arable options and some new ones including two-year sown legume fallows and autumn-sown BumbleBird mixtures which both provide field-scale habitat and foraging resources with no pesticide or fertiliser inputs, helping to reduce impacts more widely over time.
Scotland
The numbers of Rural Priorities options approved to 4 September 2013 were as follows:

- water margins, biodiversity: 2044 cases;
- water margins, diffuse pollution: 347 cases;
- hedgerows, 3 years for biodiversity benefits: 1520 cases;
- hedgerows, 2 years for landscape benefits: 161 cases;
- management of extended hedges and hedgerow trees: 649 cases;
- grass margins and beetle banks, create/manage – mixed arable: 558 cases;
- grass margins and beetle banks, create/manage – organic: 15 cases;
- grass margins and beetle banks, management only – mixed arable: 6 cases;
- wild bird seed mix/unharvested crops: 1214 cases.

Grass margins and beetle banks covered a total of 1250 hectares. Wild bird seed mixes and unharvested crops options covered 2030 hectares. All hedgerow options totalled 3900 kilometres.

Integrated Pest Management Plans (IPMPs)

**Integrated Pest Management Plans – National Farmers’ Union (NFU)**

Under the Sustainable Use Directive there is a Member State requirement to demonstrate that users of professional pesticides are considering the principles of IPM. The Voluntary Initiative (VI) on Pesticides has taken the step of changing its Crop Protection Management Plans into IPM plans (IPMPs) to help meet this Member State requirement; it is hoped that these plans will be available from spring 2014 for growers to complete during 2014.

The plans are designed to help users of professional pesticides in the agricultural sector demonstrate their thought process and decision-making when planning control of pests, weeds and diseases of plants. They are also designed to be appropriate to individual enterprises, identifying key protection practices, risks to water, key pest management issues and strategies used to manage those issues in an integrated way. The plans are intended for annual review and should be completed with input from the farm manager and professional advisers, so that the plans can act as a record and stimulus for review of crop protection practices.

If growers complete other similar plans under schemes such as LEAF these will equally meet these requirements and there would be no need to complete an IPMP in addition to the existing plan. The plans are largely intended for online completion; however hard copies will be available on request.
Case study
Developing an IPM Plan at RSPB’s Hope Farm, Cambridgeshire

in 2013 RSPB commissioned ADAS to develop an Integrated Pest Management Plan for Hope Farm, Cambridgeshire. The full plan is available from the RSPB on request (contact agriculturepolicy@rspb.org.uk). The Plan included the full range of weeds, pests and diseases. This case study, however, focuses on how control of black-grass (a highly problematic weed across the entire rotation and highly resistant to herbicides) was assessed.

The project began by looking at practices consistent with an integrated approach and assessing whether they were done fully, partially or not at all. An assessment was then made as to whether the costs associated with adopting the necessary measures were high, low or medium.

The current control programme includes the following elements:

- **Crop rotation.** Winter wheat, winter oilseed rape and spring legumes are typically included. Each of these crops offers a benefit in terms of black-grass control. Winter wheat has a wide range of herbicide active substances available and is moderately competitive with black-grass; winter oilseed rape is very competitive and offers herbicide choices with no known resistance; spring crops offer a period prior to drilling when most of the black-grass can germinate and be treated with a non-selective herbicide (eg glyphosate). Spring cropping can also benefit biodiversity.

It was considered that fallow could be the next step towards reducing both black-grass populations and herbicide inputs and could provide environmental benefit if managed appropriately. Where both agronomic and environmental benefits can be achieved this might be an effective option with costs being
off-set by any greening or environmental payment opportunities. A 12 month fallow can reduce the seedbank population of black-grass by 54-68% depending on how the fallow is managed (eg what cultivation occurs). A longer term fallow (18-24 months) would further reduce populations. Black-grass control in the crop immediately following the fallow is crucial.

In assessing the costs to implement IPM measures it was noted that there is a cost already incurred in that the gross margin achieved on a spring beans crop is less than that of winter wheat or winter oilseed rape. However this cost is offset by the reduction in black-grass which would otherwise have a greater yield effect on other crops in the rotation (yield loss between 5 and 50% can occur). If fallow was included in the rotation the cost would be high as there would be no production that year. This would be offset by a reduction in variable costs (eg seed, fertilisers and pesticides) and could be further offset by the improved control of black-grass in future crops.

The outcome was that winter wheat, winter oilseed rape and spring-sown legumes rotation is considered the best option for this farm. If fallow was incorporated into the rotation, the period during and after the fallow should be optimised (eg weeds sprayed off prior to seeding). Some elements of this were already done on the farm, but implementation costs were seen as high.

### Reducing weed seed numbers prior to crop establishment

All fields were cultivated and sprayed off with glyphosate prior to crop drilling. When spring beans were being sown multiple weed flushes could be controlled.

It was considered that delayed drilling of the winter wheat crop will allow for a greater number of weeds to emerge and be sprayed off and thus help reduce the black-grass populations requiring control within the crop. Delaying drilling presents possible trade-offs with crop establishment, particularly on heavy soils and as such a moderate delay to the first week of October was suggested. This date should have some degree of flexibility depending on seasonal conditions and black-grass dormancy.

In assessing the costs to implement IPM measures it was noted that an additional cultivation would cost approximately £34/hectare (ha) while an additional application of glyphosate would cost £5.50/ha.

Delayed drilling does not necessarily mean additional costs but on heavy land, such as that at Hope Farm, there is a risk that the crop will not be drilled (eg if weather does not permit). There is also a risk that crop establishment will be poor. In both of these situations the cost of delayed drilling would be high.

It was concluded that although all fields are sprayed off prior to drilling there is some scope to increase the impact of stale seedbed techniques (eg aim for two preparations prior to winter wheat), ensuring that drilling is delayed until at least the first week of October. Some elements of this were already done on the farm, but implementation costs were seen as moderate.

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■ **Cultivation technique.** Research has shown that inversion ploughing following a year with high black-grass seed return can substantially reduce the problem over subsequent years. Ploughing works by burying seed which would be on the soil surface but therefore brings up some seed which has been stored in the seedbed. Seeds buried to a depth of over 10cm are unlikely to germinate unless moved back to the top 10cm prior to natural death (approximately 70% of black-grass seeds become unviable each year buried). In order for ploughing to be effective, it should not be performed year after year. Rotational cultivation is a practical and balanced approach.

In assessing the costs to implement IPM measures it was noted that the cost of ploughing can be greater than that of other cultivation strategies, particularly on heavy land. Additionally, it is a slower process and therefore will require more labour hours. The cost would vary each year depending on how many passes and what specific equipment was used. The additional cost required in labour hours however could be more significant. The average work rate of ploughing on heavy land is 6.5ha/day whilst that of a one pass tillage train is 15ha/day.

It was concluded that including ploughing in a long-term cultivation strategy would be useful. Frequency of ploughing will be determined by black-grass populations and seasonal soil conditions. It was expected that ploughing intensity would be no greater than every 3-4 years. This was not already done on the farm, but implementation costs were seen as moderate.

A number of priority actions were identified: including spring cropping in the rotation; optimising management of fallow when included in the rotation; improving control prior to crop establishment (including delayed drilling); and changing cultivation strategy to include rotational ploughing. Annual reviews will be undertaken to monitor progress and determine any need for new actions or changes in priorities.

*RSPB’s Hope Farm at the time of the wheat harvest. Images © Andy Hay (rspb-images.com)*
Part 10: Indicators

Key Priorities

- That indicators enable everyone to understand where, why and how pesticides are being used. Taken together, all the indicators in this report should provide an objective measure of progress towards meeting the objectives of the Sustainable Use Directive.
- That the analysis of the messages emerging from indicator data/information is explained in clear and easily understood fashion.
- That our suite of indicators is used to identify; priority items such as active substances, crops, regions or practices requiring particular attention; or good practices in sustainable pesticide use.

Overview

This report has been designed to provide an overview of where, why and how pesticides are used and the impacts of this use. We have selected a range of data and information which helps to do this and highlighted any strengths and/or limitations in our approach. This part of the report contains information on overall pesticide use, areas of cropped land and use of pesticides on key crops. It helps to provide some context for the data and information contained elsewhere in the report.

Pesticide usage is closely correlated to cropping patterns and is also subject to seasonal variation in response to weather conditions and the introduction of new active substances with lower application rates. Over 70% of the land area is used for agriculture in England and Wales. Different types of farming systems can have different impacts on the environment. The drive for higher agricultural output has given way to the view that increasingly farmers must be seen as guardians of the countryside as well as food producers. Cropping patterns tend to change only over long periods but are affected by market prices for commodities and support payments that may be available.

Pesticide use in any one year is related to the area of individual crops grown and the husbandry of them. In the UK, winter wheat is the dominant crop and can give a good indication of trends in pesticide usage. Even this alone does not give a reliable indication since the impacts of husbandry can influence demand for pesticide use. In particular drilling date will have a major impact on weed, pest and disease pressures. Weather conditions and time pressures determine drilling date. Equipment and labour form the major costs on an arable farm; to lower the cost per hectare (and per tonne) drilling needs to start early. Late drilling runs the risk of weather changing and crops not being sown at all, so there is continual likelihood that farmers will drill early in most years as the resultant increased pesticide use, and hence cost, is less than the benefit of spreading equipment and labour costs. In years of more extreme autumn weather the amount of spring cropping is increased and this is normally associated with lower pesticide inputs.

Amenity and forestry pesticide use is largely to control weeds in public spaces, on transport infrastructure, industrial areas and woodland. There is very little fungicide use and virtually no use of insecticides. Pesticide use promotes public safety, provides access to high quality facilities or assists in woodland establishment. Home and Garden use (Amateur use) varies by season and is relatively sensitive to economic conditions. The main usage in this sector is for moss control in lawns, herbicides combined with fertilisers for lawn use, slug and snail control, and general disease and insect control on roses and brassica vegetables.
Indicators

Figure 29. Estimated annual pesticide usage for all crops in Great Britain/UK

The increase in pesticide usage in 2012 was anticipated and the reasons outlined in last year’s report. The wet weather conditions in 2012 resulted in increased fungicide usage, not only in arable crops but also in top fruit which showed a 44% increase in the weight of all pesticides applied to these crops since the previous survey in 2008. In particular, the weight of all of the major fungicides applied to top fruit, including captan, myclobutanil and dithianon have increased by at least 27%.

It should be noted that weight of pesticides applied does not necessarily correlate with risks or impacts on the environment or human health. Such impacts depend on a variety of factors including toxicity of the active substance and when and how it is applied. A small amount of a highly potent chemical could have a greater environmental impact than a large amount of a less effective pesticide. Many modern pesticides can be used at lower rates than older chemicals because they are more toxic to target species. Changes to the total amount of pesticides applied may simply reflect the changing products on the market. It is not possible to draw conclusions about overall pest management approaches (for example the use of integrated pest management approaches) from the data above.

Source: Fera
Croppable land consists of land currently under arable or horticultural crops, bare fallow and temporary grass. In June 2013 the total croppable land area on agricultural holdings remained almost unchanged from 2012, at 6.3 million hectares.

The 2013 June Census estimated that the total area of cropped land reduced slightly to 4.6 million hectares, whereas the area of un-cropped arable land increased to 255,000 hectares, up 66% on the 2012 estimate. This was largely as a result of poor weather conditions leaving many farmers unable to plant crops. The proportion of land under temporary grass and other arable crops remained little changed from 2012, at 22% and 9% respectively of all croppable land.

This indicator shows that cereals continue to account for about half of the cropped area, or three quarters of the non-grass cropped area. The areas of land growing the UK’s three most popular crops changed in 2013, due to weather patterns in autumn/winter 2012/13: wheat decreased by 19% or 377,000 hectares; barley increased by 21% overall (or 211,000 hectares) and oilseed rape decreased by 5% (or 41,000 hectares); the poor weather also reduced many crop yields, particularly those of wheat and oilseeds.

Wheat, winter barley and oilseed rape production all suffered following the difficult weather conditions of winter and spring. However, oats and spring barley both showed increases in production, with spring barley showing a large increase as farmers had to replace winter with spring planting following the very poor weather over the winter.

Sources: Defra UK June Agricultural Survey Statistics; Welsh Government; Department for Agriculture and Rural Development for Northern Ireland
The area of pulses (peas and beans) increased in 2013 by over 18% (27 000 hectares), with much of this land being sown replacing planned wheat or oilseed rape (again due to the very difficult autumn/winter conditions). Given that the typical pesticide use on wheat and oilseeds is higher than pulses or spring barley, these changes will reduce the overall use of pesticides and hence potential impact.

The current predictions are to return to near normal patterns of cropping for 2014 harvest.

**Figure 31. UK pesticide average inputs per crop (including soil sterilants)**

This indicator shows the average total dose of pesticides applied to a range of crops. It demonstrates how, on strawberries, significant soil sterilant use is. Compared to previous surveys, soil sterilant usage on strawberries in 2012 was reduced in terms of weight of actives applied but the area treated with soil sterilants has increased from 9% to 11% of the area grown. Relatively high numbers of fungicide applications are required for many horticultural crops. This higher use helps ensure that crops meet quality standards and reflects several products which have high weights of active substance applied per hectare. However, the area of these crops is relatively small, and pesticide use on these crops is only a small proportion of the total UK use.
This indicator shows the average total dose of pesticides applied per hectare of wheat. We focus on wheat because it is the crop grown most extensively in the UK and accounts for approximately half of the overall pesticide treated area (49%) and almost half of the weight of all pesticides applied (46%). Wheat crops can be affected by: fungi such as septoria, rust, mildews, ear diseases; weeds such as black-grass, cleavers and other grass weeds; and insects such as aphids, orange wheat blossom midge and wheat bulb fly. They receive on average 3 fungicide, 3 herbicide, 2 growth regulator and 1 insecticide applications.

Total pesticide usage on wheat in 2012 increased very slightly compared to 2010 due to slightly increased herbicide usage, typically to overcome herbicide resistance, with approximately 4kg of active substances applied per hectare. In 2004 the total applied was almost 6kg/hectare. This reflected use of products containing chlorpyrifos to combat orange wheat blossom midge at this time. Chlorpyrifos was the insecticide most frequently used for controlling this pest and, compared to other insecticides, has a relatively high rate of application. Although orange wheat blossom midge has continued to be a pest since 2004 the scale of the problem has not been as great and alternative insecticides such as lambda-cyhalothrin, applied at relatively low rates, have been used alongside resistant varieties.

In terms of the total treated crop area fungicides account for the greatest proportion (approximately 41%) of usage on wheat, followed by herbicides (26%), growth regulators (17%), seed treatments (8%), insecticides (7%) and molluscicides (1%) with the remaining area being fairly evenly split between growth regulators and seed treatments. Molluscicides account for a relatively small proportion of the treated area.
Despite the number of herbicide applications increasing only slightly, both the average dose in kg/hectare and as a proportion of the full label recommendations have increased since 2010. This is perhaps a response to increasing resistance to weed species such as black-grass, with subsequent increases in the use of flufenacet, pendimethalin and metsulfuron-methyl to control this weed.

Whilst the average total dose and number of fungicide products applied to wheat remained relatively unchanged between 2010 and 2012, the average dose (in terms of full label units) did increase between the two years. The discrepancy between these changes is potentially due to the move away from chlorothalonil usage, applied at relatively higher rates than prothioconazole, epoxiconazole and tebuconazole, whose usage had increased significantly since the last survey.
Section B: Forward Look

The direction of the Forum’s activities will continue to be shaped by the priority areas identified in the UK National Action Plan for the Sustainable Use of Pesticides. These are: protecting water; improving practice in the amateur and amenity sectors; and promotion of integrated pest management (IPM).

We are anticipating that there will be an increasing profile for water protection as preparations commence for the second round of River Basin Management Plans in 2015 and there being a need to demonstrate progress towards meeting the objectives of the Water Framework Directive. We expect to see further progress being made towards improving practice in the non-agricultural sectors, in particular amenity – where we anticipate new guidance to emerge promoting practices which will deliver more sustainable use. Development and promotion of IPM remains an interesting area, we are awaiting clarification of the exact mechanisms and measures which will be adopted to assist users to adopt low-input approaches to pest, weed and disease management. The Forum will then determine how best it can help to shape developments.

We will need to keep abreast of developments related to implementation of the EU directive on sustainable pesticide use – in particular training and certification of those currently operating under ‘Grandfather Rights’ (which end in November 2015); and the testing of pesticide application equipment (which will be a compulsory requirement from November 2016).

Of course, there will always be unexpected events which emerge and require our attention. For example, we saw restrictions imposed on the use of neonicotinoid pesticides from December 2013, and Defra is considering options for reducing detections of certain pesticides in water abstracted for supply to consumers. These actions could have implications for patterns of pesticide use and cropping. The Forum will be looking to ensure it can monitor and assess the impacts.

Sustainable pesticide use has probably never had a higher profile than at the present time. The experience of the Forum has shown that this is best done by all stakeholders working together to share opinions, experiences and resources – we look forward to this continuing in the future.
UK National Action Plan for Pesticides Framework

National Action Plan for Pesticides aims and outcomes

Non-regulatory approaches

Regulatory
- Pesticides
- Environment (water and biodiversity)
- Waste management
- Food safety
- Health and safety

Incentives
- Environmental schemes
  - Single payment/cross compliance

Industry approaches
- Voluntary Initiative
  - Metaldehyde
  - Stewardship Group
  - Amenity Forum
- Assured crops schemes

R&D and knowledge transfer
- Government
- Industry
- Joint programmes
- NDPB and NGO

Pesticides Forum (including Indicators sub-group)

Grower Liaison Group

Amenity Use Liaison Group

Amateur Liaison Group (Home and Garden)

Short-term working groups
- As required
Annex 1: Our Objectives and Terms of Reference

Our objectives

Overall aims:
- To provide ongoing stakeholder input into and oversight of the UK National Action Plan for pesticides, monitor the effects of policies, laws and other initiatives that affect or are affected by the use of pesticides, and offer advice to Government and stakeholders as appropriate.
- To provide a forum for exchanging views, and wherever possible allowing our stakeholders (the people who have an interest in our work) to come to a general agreement.

Specific objectives

Communications
- To promote effective ways of helping all those involved in selling, supplying, storing, using and disposing of pesticides and pesticide waste products to use technologies and techniques which:
  - limit the need to use these products (and the risks that can arise from using them) in a way which is consistent with sustainable production and the control of pests, weeds and diseases; and
  - share best practice between all farming systems, whether these systems use conventional pesticides, are organic or use other control options.
- To monitor, review and improve the quality and relevance of information available to all those involved in selling, supplying, storing, using and disposing of pesticides and pesticide waste products.
- To prepare and publish an annual report of our activities and maintain a close working relationship with the independent Advisory Committee on Pesticides.

Monitoring impacts
- To consider how to most effectively monitor all impacts arising from the use of pesticides (including using indicators), and communicate these findings to Government, our stakeholders and the public.

Knowledge transfer
- To monitor pesticide-related research and development and aim to inform funding organisations of any significant gaps in the programme.
- To promote the most effective and practical ways for sharing best practice and encouraging the use of technology and research and development, by encouraging discussions between researchers and research funders, and between all those involved in selling, supplying, storing, using and disposing of pesticides.
Our terms of reference

The Forum’s terms of reference are:

- To bring together the views of those concerned with the use and effects of pesticides.
- To identify their common interests.
- To assist the effective dissemination of best practice, advances in technology, and research and development results.
- To advise Government on the development, promotion and implementation of its policy relating to the responsible use of pesticides.
Acknowledgements

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Photographs

Cover picture: Wildlife corridor

If you have any comments or views on this report please contact me:

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