

Consultation on the 'Revised National Action Plan for the Sustainable Use of Pesticides (Plant Protection Products)'

December 2020



Department
for Environment
Food & Rural Affairs



Department of
**Agriculture, Environment
and Rural Affairs**



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Llywodraeth Cymru
Welsh Government



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1 Purpose

1.1 Why we are consulting

For the following consultation the UK Governments have produced a draft revised National Action Plan for the Sustainable Use of Pesticides (revised NAP draft). The Revised NAP Draft aims to increase uptake of Integrated Pest Management (IPM) and sustainable crop protection, in line with Defra's 25 Year Environment Plan, the Welsh Minister's Natural Resources Policy, The Environment Strategy for Scotland, and the goals of the Environment Strategy for Northern Ireland to protect and enhance the environment for future generations. The NAP will be delivered in support of Government targets across the UK on biodiversity and carbon net zero. Defra and the Devolved Administrations want to further consider the views of pesticide users, pesticide related industries (including food retail and manufacture), environmental and public health groups, and the general public in an effort to move forward together on issues surrounding pesticides.

The existing National Action Plan for the Sustainable Use of Pesticides (the 2013 NAP) was adopted under the Plant Protection Products (Sustainable Use) Regulations 2012. A review of the 2013 NAP is a statutory requirement as well as a commitment under the 25 Year Environment Plan. The revised NAP draft has been prepared with the input of a range of key stakeholders. However, formal consultation will enable due consideration of the range of views before a final revised NAP is published.

1.2 How we are consulting

This consultation is on the revised NAP draft, with details of how to respond below. This is a 12-week consultation, with the deadline for responses to be submitted by Friday 26 February 2021.

We would like your opinions on all aspects of the revised NAP draft presented in this consultation document, and all options remain open at this point of the review process. However, we have included a set of questions at the end of each of the 5 sections of the draft which we would appreciate your views on.

Defra will act as the main point of contact for the purpose of managing the consultation. Defra will however be working closely with the Devolved Administrations throughout the process and to analyse the consultation responses.

We will analyse the responses and publish a summary. This analysis will further inform the drafting of the final revised NAP.

1.3 How to respond

We welcome your views and comments. Please submit your responses through the following link to Citizen Space (an online consultation tool), <https://consult.defra.gov.uk/pesticides-future-strategy/sustainable-use-of-pesticides-national-action-plan>. This will take you through the consultation questions, as well as provide the option to submit general comments. Should you have any issues with this or require a hard copy to be issued, please contact pesticides@defra.gov.uk.

To help us analyse responses and to further understand the range of stakeholders. In your response, please include the following:

1. Would you like your response to be treated as confidential (in accordance with the Confidentiality and Data Protection statement below)
 - a. Yes
 - b. No
2. Your name?
3. Your e-mail address?
4. About yourself (select most relevant option) - I am responding as:
 - a) *A member of the public*
 - b) *A land or amenity manager or developer*
 - c) *A horticultural grower or professional gardener*
 - d) *A farmer*
 - e) *Representative of a farmers' or growers' organisation*
 - f) *Pesticides manufacturing or distribution industry representative*
 - g) *Retail or food industry representative*
 - h) *Government or local authority representative*
 - i) *Representative of a non-government organisation (NGO)*
 - j) *An agronomist or pest management advisor*
 - k) *A scientist, researcher or academic*
 - l) *Other - please specify in no more than 25 words*
5. The name of your organisation (if applicable)?

1.4 Confidentiality and data protection

Representative groups are asked to give a summary of the people and organisations they represent and where relevant who else they have consulted in reaching their conclusions when they respond.

A summary of responses to this consultation will be published on the Government website at: www.gov.uk/defra. An annex to the consultation summary will list all organisations that responded but will not include personal names, addresses or other contact details.

Defra may publish the content of your response to this consultation to make it available to the public without your personal name and private contact details (e.g. home address, email address, etc).

When responding to the consultation online, you will be given the following options in response to the question asking if you would like anything in your response to be kept confidential:

- a. If you click on 'Yes' in response to the question asking if you would like anything in your response to be kept confidential, you are asked to state clearly what information you would like to be kept as confidential and explain your reasons for confidentiality. The reason for this is that information in responses to this consultation may be subject to release to the public or other parties in accordance with the access to information law (these are primarily the Environmental Information Regulations 2004 (EIRs), the Freedom of Information Act 2000 (FOIA) and the Data Protection Act 2018 (DPA)). We have obligations, mainly under the EIRs, FOIA and DPA, to disclose information to particular recipients or to the public in certain circumstances. In view of this, your explanation of your reasons for requesting confidentiality for all or part of your response would help us balance these obligations for disclosure against any obligation of confidentiality. If we receive a request for the information that you have provided in your response to this consultation, we will take full account of your reasons for requesting confidentiality of your response, but we cannot guarantee that confidentiality can be maintained in all circumstances.
- b. If you click on 'No' in response to the question asking if you would like anything in your response to be kept confidential, we will be able to release the content of your response to the public, but we won't make your personal name and private contact details publicly available.

There may be occasions when Defra will share the information you provide in response to the consultation, including any personal data with external analysts. This is for the purposes of consultation response analysis and provision of a report of the summary of responses only.

This consultation is being conducted in line with the Cabinet Office "Consultation Principles" and be found at: <https://www.gov.uk/government/publications/consultation-principles-guidance>.

If you have any comments or complaints about the consultation process, please address them to:

Consultation Coordinator, Defra
2nd Floor,
Foss House,
Kings Pool,
1-2 Peasholme Green,
York, YO1 7PX

Or email: consultation.coordinator@defra.gov.uk

2 Draft of the ‘Revised National Action Plan for the Sustainable Use of Pesticides (Plant Protection Products)’

2.1 Executive Summary

Pesticides play an important role in supporting the UK’s plant health, crop production and maintenance of national infrastructure and public spaces. Targeted use of pesticides protects our crops and natural landscapes from native and invasive non-native pests; supporting domestic food production, ecosystems and maintaining our recreational, transport and amenity areas. However, it is essential that the use of pesticides does not pose unacceptable risk to environmental health or adversely affect human health. Wherever possible, we want to encourage sustainable pest management that enhances UK biodiversity.

This National Action Plan (the NAP) for the sustainable use of pesticides supersedes the UK National Action Plan 2013 (the 2013 NAP). The NAP covers the whole of the UK and the high-level aim and key goals are shared by all UK governments. It highlights how the governments across the UK will support all users of pesticides, over the next 5 years, to develop more sustainable methods of crop protection, amenity management, and garden pest control. The NAP aims to increase uptake of Integrated Pest Management (IPM) and sustainable crop protection, in line with Defra’s 25 Year Environment Plan, the Welsh Minister’s Natural Resources Policy, The Environment Strategy for Scotland, and the goals of the Environment Strategy for Northern Ireland to protect and enhance the environment for future generations. The NAP will be delivered in support of Government targets across the UK on biodiversity and carbon net zero.

The NAP extends to a number of policy areas where responsibilities are devolved, explaining where policy approaches or delivery mechanisms differ. Co-ordination arrangements are in place to seek consistency of decision-making where this is desirable for example, it is helpful to minimise the occasions on which different parts of the UK authorise different pesticides.

The high-level aim of the NAP is to **minimise the risks and impacts of pesticides to human health and the environment, while ensuring pests¹ and pesticide resistance are managed effectively.**

¹ The term “pest”, defined below, includes weeds and plant diseases.

In order to meet this aim, the NAP focuses on five key goals, to:

- 1. Ensure continued robust regulation to protect our health and environment;**
- 2. Support the development and uptake of Integrated Pest Management;**
- 3. Ensure those that use pesticides do so safely and sustainably;**
- 4. Support in the reduction of the risks associated with pesticides by setting clear targets by the end of 2022, and improving metrics and indicators; and,**
- 5. Ensure that we work effectively with others to deliver the NAP goals.**

More detail on the actions planned for each of these goals is set out below.

1. Ensure continued robust regulation to protect our health and environment

- ***We will work within, and develop, our existing regulatory framework to make the system simpler for users, while maintaining levels of protection for health and the environment.***
- ***We will support the development of the knowledge needed to ensure that regulation of pesticides across the UK promotes positive innovation and change.***
- ***We will review operation of regulation for bio-pesticides, to encourage greater uptake of these within IPM approaches.***

As we end the transition period, it is important that the robust legislative frameworks which support food production while protecting people and the environment remain in place. We will continue to be led by the best available scientific knowledge to develop our regulatory system while also continuing to follow the precautionary principle where there is uncertainty over levels of risk. We want our regulation to be forward facing, rigorously protective of health and the environment and responsive to the changing pressures faced by farmers, the amenity sector and amateur pesticide users. To do this we must continue to work to fully understand the science that underpins our regulation, and how regulation will interact with innovative technologies. We also want to explore the scope to make the operation of our regulatory regime simpler and more responsive without weakening the protection it provides.

2. Support the development and uptake of Integrated Pest Management (IPM)

- ***We will work with stakeholders to ensure all pesticide users will have access to the information and support they need to integrate IPM approaches fully within their respective systems so that pesticides are used sustainably, as part of a targeted and integrated control system.***
- ***We will support the development of IPM approaches which provide maximum opportunity to protect or enhance the environment whilst maintaining crop protection.***

IPM approaches aim to diversify crop protection and reduce the use of pesticides by utilising alternatives and promoting natural processes. IPM aims to optimise and increase target specificity of pesticide use when non-chemical methods are ineffective or unavailable. We will use existing mechanisms to deliver IPM support to all sectors, for example regularly updating IPM principles in BASIS training, ensuring that anyone who manages, uses, sells, or advises on plant protection or pesticides is appropriately trained to fully integrate their pest management measures. New sustainable farming schemes across the four countries of the UK will seek to incorporate IPM principles so that farmers and land managers are supported to take a sustainable approach to managing pests. Additionally, we will develop new ways of supporting farmers and growers, amenity, and amateur users to adopt IPM approaches, working with a broad range of Government funded advisors and stakeholder groups to develop networks and accessible advice and guidance.

3. Ensure those that use pesticides do so safely and sustainably

- ***We will look to enhance the system of enforcement for pesticides, with more frequent checks on selected businesses to ensure compliance.***
- ***We will ensure that individuals are prevented from purchasing pesticides authorised for professional use where the end user does not have appropriate training and certification, and will consider implementing legislation to introduce increased requirements at the point of sale if necessary.***
- ***We will make sure that pesticides classed for use by professionals continue to be used correctly so that risks to the environment are minimised and risks to human health are avoided.***
- ***We will work with partners to promote clear messages for amateur users to encourage non-chemical alternatives wherever possible and will provide improved advice on safe usage and disposal.***

For those who use pesticides, it is important to ensure that they do so safely and sustainably. Since the last National Action Plan, published in 2013, we have seen a continuing development in training and pesticide standards in the agricultural sector, represented by an increase in BASIS professional training and the National Register of Sprayer Operators (see Annex 1 – Table 1, Heading 2). However, there is less evidence of progress in the amenity and amateur sectors. This NAP highlights how, through improved training and

dedicated communications, we will support all farmers and growers, amenity and amateur users in the uptake of IPM principles. Where pesticides must be used, we will ensure that all users know how they can be used and disposed of safely.

The Health and Safety Executive (HSE) have recently recruited a number of additional dedicated Pesticides Enforcement Officers, who will be responsible for undertaking inspections on businesses to ensure compliance with pesticides regulations in line with the Official Controls Regulations. We will work with stakeholders over the next 12 months to develop and enhance our system of enforcement, ensuring inspections are targeted at areas of greatest risk while minimising burdens on business.

4. Support in the reduction of the risks associated with pesticides by setting clear targets by the end of 2022, and improving metrics and indicators.

- *We will establish a set of clear targets to support the reduction of risk associated with pesticide use by the end of 2022.*
- *We will ensure pesticide policy helps to deliver existing commitments on biodiversity and water.*
- *We will develop improved metrics for IPM uptake and updated environmental indicators for pesticides to provide a suitable baseline against which we can establish appropriate reduction targets.*

It is important that we set out a clear process for monitoring progress against the NAP. Working with others, we will review and update our indicators and establish a robust baseline against which to measure progress. This work aims to develop the evidence base required to set a meaningful target for the reduction of the risks associated with pesticide use.

5. Ensure that we work effectively with others to deliver the NAP goals

- *Review the arrangements for delivery of the NAP to drive forward sustainable use of pesticides and IPM. We will consider how this can be achieved through partnership approaches with stakeholders and industry.*

Ensuring sustainable use of pesticides and maximum uptake of IPM is a complex task requiring input from a wide range of stakeholder and partners. It is crucial that we work together to achieve the goals set out in the NAP. We will review the overarching arrangements to bring stakeholders together to deliver the NAP and consider an appropriate structure to ensure a continuing focus on the objectives and targets set.

2.2 Definitions of Terms

2.2.1 Pests

The term 'pest' covers invertebrates, diseases, and weeds. This includes insects, molluscs, nematodes, arachnids, fungi, viruses, bacteria, plants, and any organism adversely impacting cultivated or desired plant health, cultivated products, or having a negative effect on managed land or amenity infrastructure.

2.2.2 Quarantine pest

A quarantine pest is a pest of potential economic detriment to an area that it is yet to migrate to, or present but not widely distributed and being officially controlled.

2.2.3 Pesticides

The term 'pesticide' is used in reference to a variety of chemical and biological products used to kill or control living organisms such as insects, diseases, and plants. This document is only relevant to products covered under the Plant Protection Regulations (EC 1107/2009). Pesticides include products that:

- Protect from direct attack from harmful organisms;
- Influence a plant's life processes, other than as a nutrient or plant biostimulant;
- Preserve plant products;
- Destroy undesirable plants or parts of plants; and,
- Prevent undesired growth of plants.

The NAP covers agricultural, horticultural, amenity, and amateur usage of pesticide products. In this document:

- The terms 'pesticide(s)' and 'plant protection products' are used interchangeably;
- The term 'chemical pesticide(s)' refers to plant protection products with a chemical agent as the active substance; and,
- Biopesticides are plant protection products which contain biological control agents including: products based on pheromones and semiochemicals; products containing micro-organisms (bacteria, fungi, viruses etc.); and, products based on plant extracts.

2.2.4 Pesticide resistance

Pesticide resistance is the decreased susceptibility of a pest to a pesticide that was previously effective. Whilst resistance can occur in response to non-chemical and biopesticide control methods, its development is primarily associated with increased selection pressure to chemical control from repeated exposure. Resistance development is of increasing concern as recent reductions in the number of pesticides approved will result in pests being exposed to fewer pesticides, and a narrower range of modes of action, increasing the pressure of further resistance development.

2.2.5 Integrated Pest Management

Integrated Pest Management (IPM) is defined as combined use of all available control methods, including targeted use of pesticides used when alternatives are ineffective or unavailable. IPM emphasises crop health and minimal disruption to the agro-ecological system. IPM also includes measures to optimise pesticide application, with the aim of reducing non target effects and unnecessary environmental exposure.

IPM follows a step-by-step approach (set out below and in Figure 1) and in practice, must be individually tailored.

1. Prevention

The first line of pest control is the use of preventative cultural methods to reduce the risk of pest damage occurring, such as crop rotation, growing pest-resistant varieties, selecting appropriate sites, sanitation, cultivation and tillage practices, and encouraging natural predators. These measures provide prophylactic pest management with little or no environmental risk.

2. Monitoring

IPM is founded upon effective monitoring including inspection, identification, forecasting and assessing levels of pest populations. Not all potentially damaging insects, weeds, and other living organisms require control, and organisms classified as pests may be important to the structure and function of local ecosystems. As such, regular observation is crucial. Accurate identification of the pest allows the right control to be decided upon. Effective monitoring ensures that pesticides are only used when necessary, but also that the correct pesticide is selected and is applied in the right way at the right time.

3. Thresholds

Some pests have control thresholds. Thresholds are set, above which pest population levels or pest damage becomes economically or environmentally unsustainable. Once a threshold has been exceeded, actions are taken to control the pest. The emphasis is on control rather than eradication, as allowing a pest population to survive at reasonable levels may not only provide food for natural predators but also help prevent resistance developing by reducing pest exposure to pesticides.

4. Control

The methods of pest control should be selected based on both effectiveness and risk, with a view to reduce dependency on pesticides. Control methods can be selected through the following hierarchy:

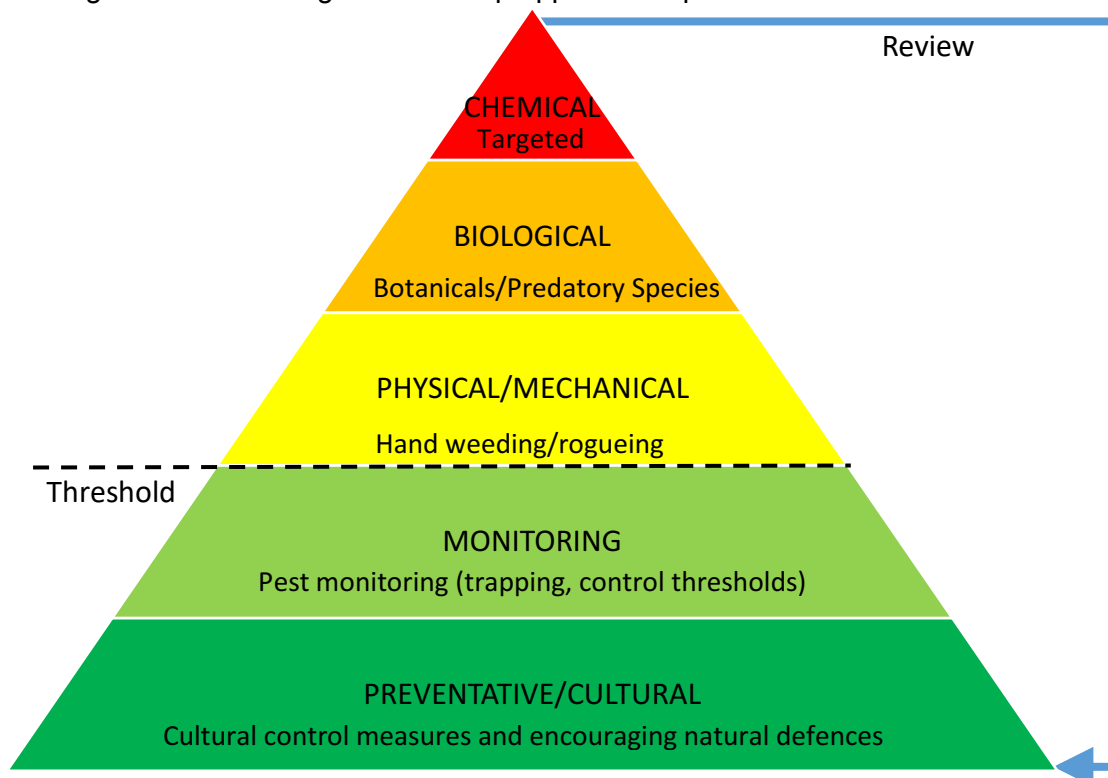
- *Mechanical* – including hand weeding/rogueing, mechanical weeding, physical barriers, and vacuuming.

- *Biological* – natural biological processes and materials can provide control, often with less risk to the environment. These include predatory species, sterile insect techniques, biopesticides, and mating disruption techniques. It is important to recognise that biopesticides do not inherently pose less risk to the environment and, as such, should be also used in a targeted and responsible way.
- *Chemical* – chemical pesticides should only be used when alternatives are ineffective or unavailable. When they are used, they should be applied in the most effective and targeted way, optimising to reduce negative impacts. Use of precision technology, spot treatments, weed wipers, drift reduction, and other similar tools and techniques will aid in optimisation. Anti-resistance strategies should be utilised.

5. Review

It is important that the success of all plant protection and pest control measures are reviewed regularly so that effectiveness can be assessed, adjusted and tailored to each situation.

Figure 1. Integrated Pest Management: 5 step approach to pest control.



2.3 Background

Pesticides are an integral component of UK food production and provide plant protection and vegetation management for control of both invasive non-native and indigenous pests. However, crop protection practices are being increasingly influenced by withdrawals of, and restrictions on pesticides, the development of pest resistance, insufficient available products for the growing season, and a continued need to produce crops using methods with the lowest possible risk to the environment and zero detrimental human health effects. Wherever possible, we want to encourage sustainable pest management that enhances UK biodiversity.

As we set our own national course after the end of the Transition Period, we must maintain and enhance strong levels of protection for human health and the environment. We must also look to increase ambition in line with the goals of Defra's 25 Year Environment Plan, the Welsh Minister's Natural Resource Policy, The Environment Strategy for Scotland, and the Environment Strategy for Northern Ireland. Our actions must also be considerate of the ongoing challenges of protecting and enhancing biodiversity as well as tackling climate change regarding both carbon emissions produced directly and indirectly from pest management, and the effects that climate change has on pest pressures. As such, the governments across the UK recognise the need for swift action to reduce carbon emissions as well as environmental pollutants, and this will form a key part of the decision making in the application of the NAP with consideration of the goals of the UK wide Clean Growth Strategy and respective biodiversity strategies.

The first NAP was published in 2013, and helped cement existing high standards relating to:

- the knowledge and professionalism of pesticide users and those making decisions around pesticide use;
- information available to the public;
- effective monitoring of human health impacts;
- protection of waterbodies and other sensitive areas; and,
- the uptake of integrated approaches.

According to 2013 NAP indicators, progress since 2013 has been generally positive, with the evidence showing high levels of compliance with regulation, increases in professional training (see Annex 1 - Table 1, Heading 2) represented by an increase in BASIS and NRoSO Membership, and increases in the uptake of IPM plans (see Annex 1 - Table 1, Heading 3). The data collected since the last NAP also shows consistent low levels of pesticides in domestically produced food (Annex 1 – Table 1, subheading 5.3), also suggesting that regulations and conditions of pesticide authorisations are being adhered to. The results from environmental indicators are more variable (Annex 1 – Table 1, Headings 7 and 8); Whilst serious pollution incidents in the last 3 years have remained consistently low (Annex 1 – Table 1, subheading 7.5), wild bird populations are generally in decline, (Annex 1 – Table 1, subheadings 8.1 and 8.2) although this cannot be solely linked to pesticide use. Overall, there has been progress towards sustainable use of pesticides since

the 2013 NAP but more work is needed to face new and ongoing challenges, and more data is needed to understand how changes in behaviour of pesticide users are impacting environmental outcomes.

With the NAP, we have the opportunity to address these evidence gaps and work together across the UK to achieve better outcomes for pesticide users, the public, and the environment. Governments across the UK and internationally are clear that to improve environmental protection, reduce the risks of pesticide resistance and protect crops and infrastructure, we must reduce reliance on chemical pesticides and maximise the use of alternative lower risk methods. Development and promotion of IPM approaches are therefore central to our shared ambition.

The high level aim of the 2020 NAP is to **minimise the risks and impacts of pesticides to human health and the environment, while ensuring pests and pesticide resistance are managed effectively.**

The NAP lays out our strategy to:

- Ensure pesticides are used sustainably across all sectors;
- Support the agricultural and horticultural industry in producing a sustainable and resilient food supply;
- Combat increasing resistance to pesticides;
- Meet the challenges of new pests; and,
- Minimise effects of pesticides on the environment, and ensure they pose no risk to human health.

The actions set out are designed to meet the high level aim by focusing on five key goals, to:

- 1. Ensure continued robust regulation to protect our health and environment;**
- 2. Support the development and uptake of Integrated Pest Management (IPM);**
- 3. Ensure those that use pesticides do so safely and sustainably;**
- 4. Support in the reduction of the risks associated with pesticides by setting clear targets by the end of 2022, and improving metrics and indicators; and,**
- 5. Ensure that we work effectively with others to deliver the NAP goals.**

More detail on the actions planned for each of these goals is set out below.

2.4 Goal 1 - Better Regulation

It is the priority of Governments across the UK to protect people and the environment. We ensure this through a regulatory base that develops in line with scientific evidence, supported by government and non-governmental measures to develop and promote good and innovative practices. We also want to explore the scope to make the operation of our regulatory regime simpler and more responsive without weakening the protection it provides.

After the end of the Transition Period, Defra, the Welsh Government, and the Scottish Government will take responsibility for all regulatory decisions on pesticides in Great Britain, including decisions currently taken by the EU including active substance approvals and Maximum Residue Levels². The current EU legislative framework will be retained in national law, with such corrections as are needed to ensure it works sensibly in a national context. After the end of the Transition Period, we will have the obligation and the opportunity to consider the framework of law and policy that best meets our needs. In doing so, we will maintain current protections and will base regulation on the best available scientific knowledge. The situation is different in Northern Ireland, due to the EU Withdrawal Agreement and the Northern Ireland Protocol which specify that certain EU pesticides legislation (specifically EU Regulations 1107/2009 and 396/2005) will continue to apply in Northern Ireland.

Our key regulatory actions to **ensure continued robust regulation to protect our health and environment** are to:

- ***Work within, and develop, our existing regulatory framework to make the system simpler for users, while maintaining levels of protection for health and the environment;***
- ***Support development of the knowledge needed to ensure that regulation of pesticides across the UK promotes positive innovation and change; and,***
- ***Review operation of regulation for bio-pesticides, to encourage greater uptake of these within IPM approaches.***

2.4.1 Development of our regulatory system

To ensure our regulatory system protects human health and the environment we will look to enhance the effectiveness and efficiency of the system, where possible to do so within the constraints of the Northern Ireland Protocol. We will look for opportunities to streamline processes, where this does not interfere with the overriding need for protection, by identifying opportunities for the UK to tailor its policies, and by removing inconsistencies and delays from EU operated the process.

² The UK Internal Market Bill, currently before Parliament, will introduce additional mutual recognition provisions which will apply to maximum residue levels.

We are committed to ensuring our regulatory system supports pesticide users across all sectors to meet the changing pressures they face, whilst maintaining high levels of protection for the environment and further reducing risks in areas of uncertainty, in line with the precautionary principle.

We will ensure that the current high levels of protection from the risks associated with the use of pesticides are maintained and that risk assessment methods are kept up to date to reflect developments in science and technology. We will continue to develop and build on our existing wide range of expertise and experience of risk assessment and risk management, and how these are implemented in practice. In terms of human health, risk assessments will continue to cover all those who come into direct or indirect contact with pesticides and biopesticides or their residues, including those who apply pesticides, those who carry out work on treated areas, and in proximity to treated areas, and consumers of treated products. In terms of environmental health, risk assessments will take into account potential widespread effects of pesticides on the environment with particular focus on the effects on aquatic ecosystems, wild birds, pollinators, and soil health. We are continually developing our metrics and evidence base to understand and reduce environmental risk.

Pesticides are used as part of eradication campaigns against quarantine and invasive non-native pests of agriculture, horticulture and the environment. The regulatory system for pesticides will continue to support such uses by balancing the risks and benefits of the control of quarantine pests and invasive non-native pests.

Recent discussions with stakeholders have shown that, while there is a high level of trust in regulation to protect health from the impacts of pesticides, this is not universal. We will use the findings of these discussions to develop improved communications across all interested parties, including by:

- Targeting communications and advice about protection from health risks of pesticides to reflect the needs of different audiences;
- Increasing the transparency of information about ways that different sources of evidence are used to inform regulatory decisions; and,
- Ensuring that uncertain or contradictory evidence continues to be dealt with using a precautionary approach.

2.4.2 Research and development to support regulation

Innovative technologies and approaches such as big data, artificial intelligence, robotics, remote sensing and novel plant breeding techniques have the potential to transform the way we control pests. The Governments across the UK are keen to ensure that our regulatory regimes support development and adoption of these technologies with respect to pesticides. We will therefore support the development of the knowledge needed to ensure that regulation of pesticides across the UK promotes positive innovation and change.

This support will also cover the research and development needed to ensure that the GB regulatory regime for pesticides continues to protect human health and the environment. In doing so we will ensure that the risks and impacts of using pesticides are understood and controlled in a proportionate fashion based on the latest scientific understanding and principles.

Over the next five years, we commit to further developing scientific research in the following key areas, ensuring that regulation is developed to take account of innovation and change. This will cover:

- new pesticide application technologies;
- new risk assessment methodologies, including for the purpose of minimising animal testing;
- pesticide resistance;
- reviewing environmental risk assessment for biopesticides;
- further developing and refining assessment of the human health risks from pesticide exposure, including for those exposed indirectly through consumption of residues in food, and the combinational effects of chemical mixtures; and,
- working with partners to ensure that risk assessment approaches meet GB-specific exposure and protection goals, better assessing risks to water and the aquatic ecosystem, biodiversity (including pollinator and soil health), and risks to human health from pesticide use.

In order to deliver this ambitious research agenda, we will set up new frameworks for collaboration with partners from the range of government agencies responsible for agriculture, regulation, and protection of the natural environment. We will work together to leverage the support and input of a broad range of stakeholders.

2.4.3 Regulation of Biopesticides

The use of biopesticides supports IPM and can have a number of benefits including reduced impact on some non-target organisms and humans, resistance management, and minimising residues in food. Yet, biopesticides are generally more expensive for the user, and require a greater need for specific technical guidance, for example on storage and application. It is important to note that biopesticides do not inherently pose less risk to human health and the environment and, as such, should be assessed and utilised with the same care applied to chemical pesticides.

The Governments across the UK have so far taken an active role in encouraging the development and registration of biopesticides through the Biopesticides Scheme. The scheme was introduced in 2006 and currently covers three classes of pesticide products: semiochemicals (such as pheromones), micro-organisms and botanicals (such as plant

extracts). The scheme was reviewed in 2013 and several changes were made to strengthen the existing package. The cumulative number of biopesticides registered is a key metric we continue to monitor to measure success (Annex 1– Table 1, Heading 6).

There is a need for more advice and support on biopesticide use for pesticide users. To increase demand and encourage development of new biopesticides, users must be aware of their benefits and risks. We will continue to implement the Biopesticides Scheme and will look for opportunities to expand and improve it, as well as helping users get the advice they need to be confident in their use.

Additionally, we will review the results of The Agriculture and Horticulture Development Board (AHDB) funded projects, including: Application and Management of Biopesticides for Efficacy and Reliability (AMBER); and, Sustainable Crop & Environment Protection - Targeted Research for Edibles Plus (SCEPTREplus), on improving the performance of biopesticide products and speeding up the process of testing and bringing new biopesticide products to market.

2.5 Questions on Goal 1 – Better Regulation

Question 1 – In the context of maintaining current high levels of protection for human health and the environment, what can we do to make the regulatory system for pesticides simpler and more efficient?

Question 2 - What could we do to increase transparency about the way that evidence is used to inform decisions on the regulation of pesticides?

Question 3 - How can we best ensure that our regulatory systems keep up with innovation and scientific development including new technologies?

Question 4 - What actions could we take to expand and improve the current Biopesticides Scheme, to increase the availability of approved biopesticide products and better support potential users?

Question 5 - What are the priorities for research to better understand the impacts of changes in regulation?

Question 6 – What other suggestions do you have for improvements to the regulatory system for pesticides?

2.6 Goal 2 – Promoting the Uptake of IPM

IPM approaches aim to limit dependency on chemical pesticides, reducing unnecessary use, risks of adverse impacts of pesticide exposure to people and the environment, and the development of pesticide resistance. By promoting systems where the need for pesticides is inherently reduced, the four UK administrations collectively aim to minimise the negative impacts of pesticides and, over time, reduce pesticide use, in line with the goals of Defra's 25 Year Environment Plan and the ambitions of the Devolved Administrations, including biodiversity and net zero targets.

Although many IPM approaches were initially developed for agricultural and horticultural applications, IPM should also be used in forestry, gardens, conservation, and the amenity sector. We are committed to supporting all farmers, land managers, gardeners, and amenity users to fully embrace IPM approaches. We recognise that the majority will be utilising certain components of IPM to some degree, but evidence shows that lack of knowledge is a major barrier to uptake and that some farmers consider IPM as high risk in protecting their crops and economic return. However, we must increase uptake to reduce environmental risks, fight resistance, and increase resilience of crop protection to change across all relevant sectors.

To **support the development and uptake of Integrated Pest Management (IPM)**, we will:

- ***Work with stakeholders to ensure all pesticide users will have access to the information and support they need to integrate IPM approaches fully within their respective systems so that pesticides are used sustainably, as part of a targeted and integrated control system.***
- ***Support the development of IPM approaches which provide maximum opportunity to protect or enhance the environment whilst maintaining crop protection.***

In the below sections we set out how we will support farmers, land managers, amateur users, and amenity users to increase uptake of IPM by: improving education, knowledge sharing platforms, and advisory mechanisms; considering how to offset financial risks that could be associated with uptake of an IPM approach; and, investing in research and development on alternative crop protection options.

Alongside these commitments, we also recognise the importance of market factors in driving the uptake of IPM and are working across government, identifying opportunities to increase the demand for IPM approaches in all relevant sectors.

2.6.1 Improving education, knowledge exchange and advice

Demonstration farms

It is recognised that knowledge exchange is integral to ensuring that pesticide users have easy access to the latest advice and guidance on the safe and sustainable use of pesticides. Demonstration farms are at the cutting edge of farming, led by farmers, putting research into action, demonstrating examples of best practice relevant to their sector and locality, and showing how to enhance protection for particularly vulnerable parts of the agroecosystem such as birds and pollinators. We recognise the value of these farms to lead the way in IPM approaches and communicate best practice. We will work with demonstration farm networks to improve coordination and provide a consistent flow of knowledge exchange for growers and agronomic advisors.

Case Study: AHDB Strategic Farm, Squab Hall Farm, Warwickshire

Running from November 2018 – September 2024, the aim of the Strategic Cereal Farm is to determine the effect of novel practices on cost of production to accelerate the uptake of arable innovation on commercial farms. The project has involved baselining to determine the starting point of a number of indicators within the farmed environment and a range of trials such as the impact of reduced fungicide applications on yield of varieties with different disease resistance ratings. The impact of the work so far includes recommendations for farmers to use pest monitoring and forecast tools to assess risk and apply fungicides accordingly to promote stewardship and practical anti-resistance measures.

Advisory services

Farming advisory services are devolved across the UK. They aim to help farmers and growers understand and meet the requirements of Cross Compliance, Greening, as well as other parts of the Basic Payments Scheme. Farming advisory services exist to provide technical and business advice on the requirements for both water protection and sustainable pesticide use, including IPM planning. In England, the Farming Advice Service uses a number of communication methods including a helpline (call and email centre), website, monthly newsletters, technical articles, and events.

Scotland's Farm Advisory Service is part of the Scottish Rural Development Programme (2014-2020) which is currently co-funded by the EU and Scottish Government, providing information and resources aimed at increasing the profitability and sustainability of farms and crofts. The Agriculture (Retained EU Law and Data) (Scotland) Bill completed Stage 3 on 26 August 2020. This will enable Scotland to deliver the proposals set out in our "Stability and Simplicity" consultation to continue the majority of EU Common Agricultural Policy (CAP) schemes in the transition period until 2024. Without future funding for all CAP Pillar 2 schemes it is difficult to make plans for those schemes in 2021, which includes FAS, the Scottish Government continues to push for clarity on this matter.

In Wales, the Farming Connect programme supports the development of a more professional, profitable and resilient land-based sector. It comprises of an integrated programme of knowledge transfer, innovation, and advisory services designed to deliver greater sustainability, improved competitiveness, and improved environmental performance. In Northern Ireland, the Knowledge Advisory Service promotes the development of farm and food businesses to link economic and environmental performance. Emphasis is placed on productivity, environmental sustainability and resilience agendas.

As agricultural schemes transition from CAP so will the provision of advice. Defra and the devolved administrations are currently considering how best to deliver advice to farmers and land managers in a way that effectively supports our collective objectives. We will review how our farming advisory services contribute to the sustainable use of pesticides and the adoption of IPM approaches.

Agronomists

Agronomists advise widely on crop management and often broader farm management decisions too. Most farmers and commercial growers base their crop protection decisions on advice from professional agronomists or hold professional agronomy credentials themselves. Independent agronomists are typically paid directly to manage a crop area and have no direct association with agrochemical manufacturers. Commercial or distributor agronomists provide a service with income derived from the sale of products, often associated with specific manufacturers. It is important that farmers receive unbiased advice about IPM and the whole range of crop protection products available to them. We will review the evidence on the extent to which impartiality has an effect on the advice that farmers receive and will support industry to develop its advisory model to better support the uptake of IPM.

To increase the provision of professional IPM knowledge, in June 2020 BASIS have revised their Continuing Professional Development (CPD) points system to include IPM. This is a crucial step in supporting agronomists to remain up to date with IPM approaches, ensuring growers get advice on all the available options. We will work with BASIS to ensure the training programme effectively supports agronomists to advise on IPM in line with the goals of this NAP.

IPM plans

UK Farmers are currently required to complete an IPM plan to qualify for assurance schemes such as Red Tractor, LEAF Marque assurance schemes, and Scottish Quality Crops. The area of the UK covered by an IPM plan completed has increased between 2014 and 2018 (Annex 1 – Table 1, Heading 3). However, their practical influence on farm could be improved. In England, Wales and Northern Ireland most farmers utilise the Voluntary Initiative's (VI) IPM plan template. We are currently working with the VI to improve this template to support farmers to improve their IPM year on year and to provide opportunities for knowledge sharing. In Scotland, farmers utilise the Scottish VI and National Farmers Union Scotland IPM plan templates.

Catchment Sensitive Farming

Our surface and ground water bodies are particularly sensitive to pollution from pesticides use, including spray drift and run-off. In England, the Catchment Sensitive Farming (CSF) programme provides training events, guidance and advice for farmers and land managers to better protect our water environment. CSF has reduced pesticide levels in test catchments using a voluntary collaborative approach with farmers and agronomists, which focusses on high priority areas and partnerships with water companies. While particular reference is made to the role of run-off reduction from fields and improved farm yard practices (sprayer filling pads, biobeds, biofilters) in preventing water contamination, the advisory role of CSF is key – helping to focus efforts on sustainable solutions to tackle and reduce pollution from pesticides in a way that is both cost beneficial and will bring optimum benefits to people, the environment and wildlife.

In Scotland, habitats, water bodies and in particular drinking water supplies can be vulnerable to pesticide contamination through spray drift, run-off, drainflow and leaching. Land managers can apply for funding under the Scottish Rural Development Programme to help pay for measures such as biobeds, biofilters and the construction of bunded pesticide handling areas. The [Farm Advisory Service](#) in Scotland also offers specific advice on minimising the risk of pesticide pollution and further guidance is also available through the [Farming and Water Scotland Initiative](#).

In addition, under ‘Scotland’s Diffuse Pollution Strategy’, the Scottish Environment Protection Agency (SEPA) carry out farm visits with diffuse pollution priority catchments. Raising awareness of pesticide pollution, checking the suitability of pesticide handling facilities and highlighting good practice are key objectives of these visits.

Since its establishment in 2013, the Water Catchment Partnership (WCP) working in partnership with NI Water and the Northern Ireland farming industry has helped farmers and land managers understand the main aspects of handling, applying and disposing of pesticides used for grassland weed control. The WCP provides guidance on mechanical control of rushes and has carried out face to face community engagement at events across Northern Ireland to deliver their message. The WCP has also published guidance on the NI Water website including ‘Advice on Pesticides for Water Protection in Northern Ireland’, which sets out ‘5 steps to best practice’ and the ‘Stop and think about the water you drink’ leaflet promoting the responsible use of pesticides to protect drinking water.

To support all pesticide users to fully engage with IPM it is important that IPM principles are included in all relevant advisory programmes. Farmers should fully utilise non-chemical methods to reduce pesticide impacts on water bodies, in the case that non-chemical methods are ineffective or unavailable, spraying practices should be targeted and optimised to reduce environmental risk. To support these changes CSF and BASIS will work collaboratively to develop training for CSF officers, other farm advisors and farmers on IPM and the impact of pesticides on water quality and biodiversity.

2.6.2 Improving standards and knowledge sharing in amenity

Pesticides are widely used to maintain public and private infrastructure and to protect property from damage. It is vital that amenity managers are appropriately trained and utilise the highest standards of practice possible to protect the public and the environment from the risks associated with pesticide use. Fully engaging in IPM has allowed some amenity managers to achieve their pest management goals without the use of chemical pesticides, significantly reducing risks. We are working with stakeholders to increase IPM training and knowledge sharing opportunities and to develop alternative approaches within this diverse sector. We are also working with stakeholders to ensure amenity managers fully utilise IPM, reduce their reliance on chemical pesticides and increase their standards.

Guidance and resources

Guidance and resources are available to enable those commissioning and conducting amenity pest management to improve the quality and sustainability of what they deliver. For example, the Reference Guide for Integrated Weed Management in Amenity Spaces and Public Realm produced by Parks for London with support from the Amenity Forum. The guide describes the process of preparing detailed integrated weed management plans following the hierarchical IPM approach (Figure. 1) and includes templates for a range of specific landscape uses. Some amenity managers are working with civil society organisations (CSOs), community and environmental groups, utilising IPM to phase out non-essential pesticide use and promote biodiversity, considering where chemical pest management is most needed and where there is potential to commit to a non-chemical approach. For example, some local authorities are utilising a range of alternatives including hot foam treatments and manual removal to successfully manage weeds in the areas where these methods are appropriate.

The BASIS Amenity Training Register is an annual Professional Register for the amenity industry. It combines the previous BASIS Amenity Register and the City & Guilds National Amenity Spray Operator Register (NASOR). The BASIS Amenity Training Register is designed for advisors and sprayer operators, and others responsible for pesticide use in the amenity sector.

Amenity Training Register membership provides:

- Recognition and professional development;
- Up-to-date knowledge for more efficient and effective work practices in amenity, including pesticides and integrated approaches;
- Proven skills for professional weed, pest and disease control;
- Career development through ongoing CPD; and,
- Independent recognition of good operator standards.

There is a specific BASIS Nominated Storekeeper course for Amenity, and the BASIS Certificate in Crop Protection for Field Sales and Technical Staff (FSTS) provides training and certification for sellers and suppliers of pesticides, as well as those giving advice on

their use. BASIS have revised their CPD points system to include IPM which will be implemented into the BASIS Crop Protection Certificates for Amenity in January 2021. This is a crucial step in supporting amenity users to remain up to date with IPM approaches, ensuring they get advice on all the available options. We will work with BASIS to increase uptake and ensure the training programme effectively supports amenity users in line with the goals of this NAP.

We will support the development of education, knowledge sharing platforms and advisory mechanisms for the amenity sector. To achieve this, we will work with amenity stakeholders to improve mechanisms for knowledge transfer and demonstration of best practice, and support amenity users through improved training and communications.

To further support the amenity sector, we want to better understand the drivers of change and how this affects decision-making around the choice of amenity management methods. We will explore how best to encourage uptake of alternative methods among amenity managers, including consideration of the economics involved.

Raising standards in amenity

We are aware that the membership of the BASIS Amenity Register has slowed since the register was introduced to the sector in 2015. Whilst this is partly due to more amenity managers joining the BASIS Professional Register, we want to increase uptake of the training and subsequently the uptake of IPM in amenity to ensure managers are well trained and resourced, building both on the work of the Amenity Forum and Local Authorities.

A key challenge in improving sustainability in amenity is reaching those who do not currently adhere to best practice. We will look to update requirements for amenity businesses to comply with recognised standards. This would help to raise good practice and would help engage amenity managers in the pursuit of sustainability through use of integrated approaches.

The Amenity Forum is the UK's industry led voluntary initiative, promoting best practice and the safe and sustainable management of weeds pests and diseases across the amenity sector. The Amenity Forum's Amenity Standard is a potential candidate for an industry wide standard. Introduced in 2019, the Amenity Standard is a bespoke quality management standard for the amenity sector. It promotes the use of IPM and best practice in the control of weeds and pests, including non-chemical alternatives, and the safe and responsible application of chemical pesticides when necessary. The Amenity Standard is designed to:

- Provide an industry benchmark;
- Ensure that all processes are planned;
- Provide a basis for continuous improvement;
- Focus on quality as an objective;
- Provide assurances about the quality of the approved organisation(s);
- Provide and maintain a properly trained and competent workforce;

- Involve all sides of industry in ownership of the standard within a partnership framework.
- Ensure that certification scheme operators under this Amenity Standard umbrella use auditors with technical knowledge and experience of the sector concerned; and,
- Promote confidence in quality assured contractors and other organisations by provision of a robust and transparent system.

The Amenity Forum is working with governments across the UK to promote its Amenity Standard as an equivalent to Red Tractor in the agriculture sector, so that the public can recognise good practice is being followed. Any organisation that wishes to carry the Amenity standard must be part of a sector specific, Amenity Standard approved, assurance scheme. Currently the Amenity Standard approves the Amenity Assured, Lawn Assured, the Property Care Association's Invasive Weed Control schemes. Assurance schemes for golf and sports turf are currently being finalised. The schemes aim to ensure that work is carried out by suitably qualified, audited, and approved operators in order to achieve consistent quality, reliability and the minimisation of risks.

We will work with stakeholders to ensure that assurance schemes provide sufficient information and training on IPM and non-chemical methods of amenity management, as well as qualifications in the use of chemical products.

2.6.3 Amateur use and public awareness

The term IPM is likely to be unfamiliar to many members of the public, but there is already a level of interest that we can build on to minimise pesticide usage in home and community gardens, as well as allotments. Pesticides formulated and authorised for amateur use are likely to remain useful tools for many gardeners. However, to ensure gardeners have access to high quality advice about alternatives to chemical pesticides, we will promote existing sources of guidance more widely and support the development of new resources where needed. For example, the Royal Horticultural Society (RHS) website (<https://www.rhs.org.uk/advice/profile?pid=1023>) provides free information on controlling pests and diseases without chemicals, and the Pesticide Action Network website has a free guide to Gardening without Pesticides (<https://www.pan-uk.org/gardening-without-pesticides/>).

Areas to focus on for amateur pesticide users are therefore similar to those for agriculture, horticulture, and the professional amenity sectors. We will encourage the uptake of IPM and more sustainable approaches to controlling garden pests by working with other organisations to increase awareness of non-chemical methods and their value for nature.

To effectively increase uptake of IPM to pesticide users across all sectors we will ensure IPM principles and messaging remain consistent. We will work with partners to develop a branded IPM uptake campaign to roll out across all IPM training, advice and knowledge sharing delivery systems. The campaign will look to bring the UK's push for IPM under one banner, and will look to increase connectivity between farmers, land managers, amenity and amateur users, as well as awareness amongst the public.

2.6.4 Financial support for IPM

Across the UK, agri-environment schemes continue to provide financial incentives for farmers, woodland owners, foresters and land managers to look after and improve the environment.

As of 2024, the Environmental Land Management scheme will become the cornerstone of English agricultural policy. Founded on the principle of “public money for public goods”, Environmental Land Management is intended to provide a powerful vehicle for achieving the goals of the 25 Year Environment Plan and commitment to net zero carbon emissions, while supporting our rural economy. Farmers and other land managers may enter into agreements to be paid for delivering the following public goods: clean air; clean and plentiful water; thriving plants and wildlife; protection from and mitigation of environmental hazards; beauty, heritage and engagement; and, the mitigation of and adaptation to climate change. Environmental Land Management will enable farmers, and other land managers to have greater flexibility over how they deliver these public goods. We recognise that IPM can make a significant contribution towards the delivery of environmental public goods and therefore we expect IPM to be part of Environmental Land Management.

We want to help farmers get their businesses ready for Environmental Land Management and to be able to make more contribution towards the government’s environmental goals and net zero commitments ahead of the full rollout of the scheme in 2024. Some of the core elements of the Sustainable Farming Incentive (SFI) component of the Environmental Land Management scheme will be launched in 2022. Initially, all farmers currently in receipt of the Basic Payment Scheme will be eligible. SFI 2022 will pay participants for delivering some of the foundational elements of environmentally sustainable farming; this is likely to include some IPM actions.

Also, in England, the Government is looking at ways to support farmers to improve the productivity and prosperity of their business by providing a Farming Investment Fund to help them buy equipment, technology, and infrastructure. This will enable them to reduce costs, improve yields, add value to existing products, create new products, and/or sell their own products to consumers. Work is ongoing to enhance this grant scheme to better facilitate IPM uptake and support farmers to reduce their pesticides use.

In Scotland the Farming and Food Production Future Policy Group (FFP-FPG) has been set up to make recommendations on the post-CAP future of food production, roughly from 2024 onwards. The group is nearing the end of its deliberations and we expect it to report in the coming months, taking a holistic approach to innovation, the rural economy, sustainable food production, and environmental protection.

In Wales, through the ‘Sustainable Farming and our Land’ consultation, we propose future farm support is designed around the principle of sustainability and in line with the responsibilities laid out in the Well-being of Future Generations Act. We propose a new payment scheme which will reward farmers for delivering sustainable land management outcomes such as improved biodiversity, air quality and water quality. The intention of this

scheme is to have sustainable farms producing both food and wider public benefits. By taking an outcome-based approach, the new Sustainable Farming Scheme will be less prescriptive, and we are identifying the practical on-farm actions which can be included. This is likely to include actions which emphasise the growth of a healthy crop, with the least possible disruption to ecosystems, as well as actions which encourage natural pest control.

In Northern Ireland, eligibility for financial support under the Environmental Farming Scheme (EFS) requires scheme participants to monitor harmful organisms using IPM principles and to check and record the success of those crop protection measures applied. Participants must keep accurate and up to date records of IPM principles implemented, which must be available for an inspector to check at any time.

2.6.5 Research and development to support IPM

We want to promote the availability of lower risk alternatives to control pests. Work is already taking place to research, develop, and promote means to reduce dependence on pesticides however, a greater understanding of the applied ecological processes that underpin IPM is required. There are a number of projects set up to develop this knowledge base, including:

- **The Arable Crop Pest and Disease Survey** - a Defra funded annual monitoring of endemic invertebrate pest and disease levels and agronomic practice in both winter wheat and winter oilseed rape. It has been running for approximately forty years. The results have provided reliable data on the background incidence and risk of both endemic pests and pathogens to their respective crops. The undertaking of highly coordinated national surveys is the best means of determining changes in the status of indigenous pests and diseases and the resulting uptake of the most reliable advice on their appropriate control strategies. Information concerning the variables that influence crop production and sustainability therefore has been collected, measured and collated to provide a unique dataset;
- The European Research Area Network on **Sustainable Crop Production (SusCrop)** aimed at maintaining food security, serving the increasing demand of industrially used biomass and keeping and improving a healthy environment, natural habitats and biodiversity;
- The **Genetic Improvement Networks (GINs)** focussing on applied pre-breeding research for the main UK crops (wheat, oilseed rape, pulses, and vegetables) aimed at introducing beneficial traits, delivering sustainability and resilience including resistance to pest and diseases, yield stability, nitrogen use efficiency, and drought tolerance;
- The **Crop Health and Protection (CHAP)** - a UK Agri-Tech Centre funded by Innovate UK (Government funded). CHAP brings together the industry to understand challenges and drive research and innovation to help develop and trial solutions to enhance cropping systems;
- The **UK Cereal Pathogen Virulence Survey (UKCPVS)** - an AHDB and Defra funded project which acts as an early warning system for new pathogens by testing pathogen isolates for virulence against wheat and barley; and,

- **Achieving Sustainable Agricultural systems (ASSIST)** - a collaborative long-term national capability programme to support sustainable intensification. Set up in partnership between government, industry and academic research institutions to increase efficiency of food production, resilience to extremes, and reduce the environmental footprint of agriculture.

This developed knowledge base, in tandem with other advancements in agricultural technology such as remote sensing, big data technologies, and precision sprayers, will provide diverse and sophisticated alternative pest management options for growers and amenity users. It will also ensure that when pesticides are applied, this is done with a lower risk to the environment.

Industrial Strategy Challenge Fund

More evidence is required to ensure that novel technology supports our environmental goals. The UK Government has set aside £90m of funding for businesses, researchers and industry through the Industrial Strategy Challenge Fund for transforming food production. The fund has been set up to meet growing demand for food and move towards net zero emissions by 2050. Examples of the type of projects funded include autonomous weeding, precision application, Artificial Intelligence (AI), electrical weeding, robotics and early disease detection.

If implemented correctly, new technology should enhance environmental protection, increase profitability for growers and amenity users, and be available to all scales of business. We will help all pesticide users achieve sustainable practices by supporting research and development towards IPM and alternative approaches.

Case Study: Drones for Blight Detection and Control

In 2019, Rinicom and FOLIUM Science were awarded a grant under the Industrial Strategy Challenge Fund. Their project aims to identify bacterial blight (*Xanthomonas*), a major pest of staple crops worldwide, amongst other infections and deliver targeted treatment all from unmanned aerial vehicles (UAVs). The UAVs will use a combination of high-resolution imaging and AI driven video analytics to detect, identify and classify early signs of infection. The project aims to reduce the risk of pesticide resistance by being target specific, as well as reducing chemical pesticide use.

Resistance management strategies

With increasing pesticide resistance and fewer pesticides available, there is a need for better resistance management strategies. This is partly due to increased exposure of pests to a limited number of modes of action. We are currently providing funding for research to monitor insecticide resistance and validate insecticide resistance management guidance. We will also continue working closely with the UK Insecticide, Fungicide, and Weed Resistance Action Groups (IRAG, FRAG, and WRAG). IPM approaches play an important part in

resistance management by reducing the need for pesticide application, and thereby also reducing the exposure of the pest to a particular pesticide. Understanding the resistance mechanism and status of a pest can also help ensure that, should a pesticide be necessary, it is applied using the right pesticide active substance, at the right dose rate and at the right time.

2.7 Questions on Goal 2 – Promoting the Uptake of IPM

Question 7 - How can we best develop and support management and advisory services to deliver an increase in the uptake of IPM?

Question 8 – What else could we do to ensure that pesticide users are fully informed about the benefits and practicalities of IPM approaches?

Question 9 – How can the promotion of recognised standards be used to encourage the uptake of IPM, in amenity, agriculture and more widely?

Question 10 – What suggestions do you have for a communications campaign to encourage more uptake of IPM?

Question 11 – How could we use financial support schemes to offset risks associated with IPM?

Question 12 – What should government do to facilitate research on the availability of effective methods of pest control?

Question 13 – What other suggestions would you make to improve uptake of IPM approaches?

2.8 Goal 3 - Safe and Responsible use of Pesticides

For those who use pesticides, it is important to ensure that they do so safely and sustainably. Since the 2013 NAP we have seen improvement in training, and compliance has remained high in the agricultural sector (see Annex 1 – Table 1, Headings 2 and 4). There is less evidence of progress in the amenity sector. In the amateur sector, there is a disproportionate number of cases of poisonings reported, both intentional and through misuse. Through the NAP we will ensure that, through improved training and dedicated communications, we will support all pesticide users in the uptake of IPM principles. Where pesticides are employed, we will ensure that all users know how they can be used and disposed of safely.

To ensure those that use pesticides do so safely and sustainably, we will:

- ***Look to enhance the system of enforcement for pesticides, with more frequent checks on selected businesses to ensure compliance.***
- ***Ensure that individuals are prevented from purchasing pesticides authorised for professional use where the end user does not have appropriate training and certification, and will consider implementing legislation to introduce increased requirements at the point of sale if necessary.***
- ***Make sure that pesticides classed for use by professionals continue to be used correctly so that risks to the environment are minimised and risks to human health are avoided.***
- ***Work with partners to promote clear messages for amateur users to encourage non-chemical alternatives wherever possible and will provide improved advice on safe usage and disposal.***

2.8.1 Compliance

Each administration's code of practice³ applies to all professional users of pesticides in respect of Part III of the Food and Environment Protection Act 1985 (FEPA) and the regulations controlling pesticides, particularly plant protection products. These statutory documents provide information on how pesticides can be used in a safe manner and in a way that complies with legal requirements. The statutory basis of the codes means that it can be used in evidence if Court proceedings are required for offences involving pesticides. Responsibility for enforcement of the act is shared between the Health and Safety Executive (HSE), local authorities and the government agriculture departments. Adhering to the Code is also part of Cross Compliance. We will update the codes of practice to reflect aims to make IPM the foundation of our approach to pest control.

³ The Code of Practice for Using Plant Protection Products in England and Wales, The Code of Practice for Using Plant Protection Products in Scotland, and Northern Ireland's Code of Practice for Using Plant Protection Products.

Cross compliance is a condition that applies to all farmers and land managers claiming the Basic Payment Scheme (BPS) and certain Agri-Environment Schemes. Cross Compliance is made up of 'Statutory Management Requirements' (SMRs) and standards for 'Good Agricultural and Environmental Conditions of land' (GAECs). Pesticides come under GAEC 1 and 3, and SMR 4 and 10. If the GAEC and SMR rules that apply to a particular business are not met, their scheme payment(s) may be reduced. In England, Wales, and Northern Ireland, the Rural Payment Agencies base their decisions on the extent of the non-compliance and how severe and permanent it is. In Scotland decisions lie with the Scottish Governments Rural Payments and Inspections Division. Compliance with cross compliance is consistently high (Annex – Table 1, Heading 4).

The governments across the UK have committed to changing the regulatory culture for farmers and land managers. Our goal is to ensure the delivery of a streamlined, supportive and effective regulatory service. To support this, we are working to improve our advice, guidance and support mechanisms to help farmers and land managers comply with the rules, and work with them to develop a plan for their farm to raise standards. We will ensure that farmers have more support in addressing breaches in compliance.

In June 2020 the Official Controls (Plant Protection Products) Regulations 2020 came into force in Great Britain. This represented a first step in developing an enhanced system for pesticides enforcement, providing the powers to enable more effective and proactive inspections across the pesticides supply chain, targeting enforcement based on risk, and adding strength to the regulatory regime under pesticides legislation. In doing so, it will provide additional assurance that adequate controls are in place across the plant protection products supply chain to ensure the safety of British food, and compliance with the EU Official Controls Regulations. As part of this, HSE have recruited several new dedicated Pesticides Enforcement Officers, who will be responsible for conducting inspections across Great Britain. We will work with industry over the next 12 months to develop our system of enforcement, ensuring inspections are targeted at areas of greatest risk while minimising burdens on business.

2.8.2 Sale of professional products

By law, any person who purchases a pesticide authorised for professional use must ensure that the end user holds a specified certificate or will work under the supervision of someone with a certificate.

Internet sales of pesticide products and equipment are subject to the same legal requirements as those sold through more traditional distribution networks. The internet provides an easily accessible product supply that can result in the sale of professional products to amateurs, increasing the chances of unqualified use and risk to human health and the environment. After reports that internet sales may not always accord with best practice and/or legal requirements, HSE worked with major internet retailers to make them aware of their obligations, and industry bodies have produced best practice guidance for

those distributing products through the internet

(https://bpca.org.uk/write/MediaUploads/Documents/Member%20Only%20Documents/BP_CA_Guidance_Document_Identifying_and_reporting_illegal_internet_Version_1_2019.pdf)

We will increase work to prevent individuals from purchasing pesticides authorised for professional use where the end user does not have appropriate training, and will consider implementing legislation to introduce increased requirements at the point of sale if necessary.

We recognise the end user and purchaser of the product will often be different (for example, in the case where a farmer purchases a product for use by a contractor). As such, we will work closely with industry to develop and implement any additional requirements to prevent sales where the end user does not have appropriate training, while allowing legitimate purchases. For example, this may take the form of a requirement for distributors to ensure purchasers understand and acknowledge the training and certification requirements and are made aware of the penalties for non-compliance.

2.8.3 Certification

Select organisations, designated by HSE, are able to award specified certificates, these include: City and Guilds Land-based Services; Lantra; BASIS; and, the Royal Society for Public Health. These awarding bodies must be accredited, or subject to independent review, by UK educational authorities.

Ensuring that everyone who uses, or advises on the use of, pesticides holds the correct qualification and is well trained is key to improving the sustainability of pesticide use. Only those who are appropriately trained and hold specified certificates can use professional pesticides. There is a long-standing regulatory requirement in the UK for users, distributors, and storekeepers to be trained and qualified. Whilst we recognise that there is an industry expectation of training and certification for advisors, it is not currently legally required. We will consider the benefits of addressing the current gap in the legal requirements so that advisors must carry appropriate certification.

On-going training, or Continuing Professional Development (CPD), is currently available to users of professional agricultural and horticultural pesticides, delivered by City & Guilds Land-based Services National Register of Sprayer Operators (NRoSO), and to amenity users through the BASIS Amenity Training Register.

The Crop Protection Association and Horticultural Trades Association have established online training for amateur pesticide retailers, allowing them to confidently provide information at the point of sale. We will work closely with stakeholders to ensure that IPM principles are embedded in retailer training and that amateur users are aware that this advice is on offer.

2.8.4 Enforcement in amenity

From discussions with stakeholders, there is general agreement that better enforcement of existing legislation is needed in the amenity sector. More investment in the inspection regime will help to ensure that infringements are penalised.

We will continue engagement with amenity stakeholders to assess the actions needed to address non-compliance and improve overall safety in the amenity sector. To achieve this, we will investigate such options as:

- Increased enforcement resource to respond to intelligence about amenity non-compliance; and,
- The requirement for amenity businesses to hold a licence for the purchase of professional pesticides, paying a fee to obtain this, with regular inspection of licenced businesses.

We will explore the benefits of a requirement for the people responsible for recommending pest treatment, those commissioning the treatment, and those applying the pest treatment, to hold an appropriate certification.

2.8.5 Guidance for amateur users

Inappropriate disposal

Inappropriate disposal of pesticides and their containers can lead to contamination of water sources, air and soil. Surveys undertaken by the HSE Amateur Liaison Group show that levels of inappropriate disposal in the amateur sector remain a concern. We are committed to ensuring safe and sustainable disposal of pesticides and their containers, and we want to increase use of disposal services. It is important that these services are widely accessible, well-publicised, and requirements for use are clearly communicated. The Amateur Liaison Group is investigating how to improve disposal instructions on product labels and in other sources of information. Where evidence suggests that inappropriate disposal is of particular concern, amnesty collection schemes may provide an effective option in reducing these risks. We will work with local authorities and specialist organisations, such as Waste and Resource Action Programme (WRAP), to review activities in this area and ensure that pesticides and their packaging are disposed of correctly.

Removal of products from the market

It is important that when products are removed from the market the public are supported in safe disposal and finding alternatives. We will work with local authorities and water companies to ensure the public know when products are taken off the market, how to dispose of them properly, and what alternatives are available.

2.8.6 Equipment testing and innovation

Inspection arrangements of equipment have been in place for several years. The National Sprayer Testing Scheme (NSTS) is used to implement inspection systems within the UK and is designated by HSE on behalf of Defra and the Devolved Administrations. Current arrangements are overall considered to work well in the agricultural sector. In the amenity sector, we are working with the Amenity Forum to assess the scale of equipment used and what action is needed to address non-compliance.

Current inspection arrangements require that new equipment be tested within five years of purchase, and that professional users calibrate their machinery on a regular basis. Equipment with boom sprayers larger than 3 metres, including boom sprayers mounted on sowing equipment, and equipment mounted on trains, aircraft, and broadcast air assisted machinery, are required to be tested on at least a five-yearly basis, and within three years of 26 November 2020, thereafter on a three-yearly basis. All other equipment must be tested on a six-yearly basis from the date of their first test, with current exemptions for knapsacks and hand-held equipment. We are working to ensure that new pesticide application equipment being placed on the market conforms with legal requirements. It is important that an appropriate range of machinery and equipment is inspected, at a frequency that increases the quality of equipment being brought for inspection, whilst not being overly burdensome. We will work with industry and across government to assess certification requirements for pesticide application equipment and the effectiveness of these requirements.

Case Study: Weed Wipers in Wales

Since 2013, routine raw water monitoring of drinking water sources detected increasing traces of pesticides in areas of Wales not seen before. While these levels are too low to pose a risk to those drinking the water, they are enough to risk breaching rigorous drinking water standard of 0.1micrograms per litre. In 2015, in partnership with Natural Resources Wales, and supported by Welsh Government, Dŵr Cymru Welsh Water ran a pilot project working with agricultural user groups to encourage smarter ways to reduce impacts of pesticides. The trial provided the free hire of weed wipers to promote best practice and reduce the amount of pesticide used. This equipment directly applies pesticide to grassland weeds, like rushes, and therefore uses less chemicals and dramatically reduces spray drift. Since 2015 it is estimated the use of more than 5,500l of pesticide has been avoided through the trial and pesticide user awareness of best practice has increased. The trial has resulted in significant cost and resource savings for Dŵr Cymru Welsh Water. The installation of expensive permanent treatment is avoided as the pesticide risk can be managed through seasonal treatment and catchment-based solutions.

Unmanned Aerial Vehicles (UAVs)

Unmanned Aerial Vehicles, or drones, have the potential to offer benefits in precision and targeted application of pesticides, and the replacement of hand-held equipment in some circumstances. Spraying from drones is classed as aerial spraying.

Additional requirements apply to aerial spraying of pesticides to address the risks that arise from this method of application (in particular spray drift). Only pesticides that have been specifically assessed and authorised for aerial use can be applied and there is also a requirement for permitting of individual spray operations so that specific local concerns such as risks to environmentally sensitive sites can be addressed.

Government is currently encouraging work by drone companies and the farming and pesticide industries to collect information to understand the risks when pesticides are applied by drones. This information includes the amount and patterns of drift and how these are influenced by factors such as: the configuration and power of rotors; the relative positions of rotors and spray nozzles; and, operator exposure resulting from filling and cleaning operations. HSE is also leading a project within the Organisation for Economic Co-operation and Development (OECD) to develop guidance on hazards and risks associated with drone spraying. We will continue to generate a fuller set of data on the risks associated with new technology such as drone spraying and remove unnecessary regulatory barriers to innovation.

2.8.7 Product information

We have recently added the mode of action of a pesticide or biopesticide to the requirements for product labelling, supporting pesticide users when developing their resistance management plan. To further increase transparency of the authorisation and classification process we will also look to include information on the health and environmental risk associated with individual products. This will enable pesticide users to make informed decisions when applying an IPM approach.

2.9 Questions on Goal 3 - Safe and Responsible Use

Question 14 – How should we raise awareness of the health, environmental and legal risks of using professional products without having the correct training and certification?

Question 15 – What would be the benefits and challenges of introducing a legal requirement for certification of pesticide advisors?

Question 16 – What more should retailers be doing to inform amateur pesticide users about the actions they can take to control pests more sustainably?

Question 17 – How can we best target inspection and enforcement to prevent unsafe and environmentally damaging pest management practices?

Question 18 – What kinds of challenges need to be addressed in order to ensure safe disposal of unused pesticides and pesticide containers?

Question 19 – How can we best make sure that members of the public know what to do when pesticide products are withdrawn from sale?

Question 20 – What further actions are needed to ensure that equipment used for application of pesticides complies with safety requirements?

Question 21 – What else should we do to ensure that pesticides are used safely and responsibly?

2.10 Goal 4 – Targets, Metrics and Indicators

It is important that we are able to measure progress towards the high-level aim to minimise the risks and impacts of pesticides to human health and the environment, while ensuring pests and pesticide resistance are managed effectively.

To **support in the reduction of the risks associated with pesticides by setting clear targets by the end of 2022, and improving metrics and indicators**, we will:

- ***Establish a clear set of targets for reducing the risks associated with pesticide use by the end of 2022.***
- ***Ensure pesticides policy helps to deliver existing commitments on biodiversity and water.***
- ***Develop improved metrics for IPM uptake and updated environmental indicators for pesticides to provide a suitable baseline against which we can establish a target.***

The data collected since the publishing of the 2013 NAP highlights our need for a stronger evidence base. Factors affecting environmental and human health are incredibly complex and highly interactive. Therefore, obtaining evidence of causal relationships is difficult. Indicators are used to simplify this process and provide evidence that is easier to measure whilst remaining indicative of the outcomes of interest. Better indicators will allow a baseline to be established from which to measure success. We are committed to improving our indicators to become more informative about ways that pesticides are affecting human health and the environment.

The 2013 UK NAP Indicator Framework (Annex 1 – Figure 1) provides a structure from which to develop the metrics required to measure risks and impacts of pesticides. Over the life of the 2013 NAP, some new metrics have been added but there remain gaps that need to be filled.

Developing improved indicators will allow us to introduce a target (or targets) to reduce the risks associated with pesticide use. We will establish a diverse group of experts to agree appropriate metrics to use as the basis for targets, and to determine the appropriate levels at which targets should be set. We are committed to having targets in place by the end of 2022.

2.10.1 Indicators of pesticide usage and load

The Pesticides Usage Survey (PUS) is the main source of information for pesticide usage in the UK. The data covers the weight and area of pesticides applied. Both measures are important components of understanding pesticide usage patterns. However, focusing on weight applied and area of application alone makes no consideration of the variation in the chemical properties of the active substances applied, and their associated impacts on

human health and the environment. This is a key limitation of pesticide usage monitoring in the UK as pesticide usage data cannot, in isolation, be used to determine how the risks posed to human health and the environment are changing over time.

Considering these complications and annual variations in pesticide requirements, setting numerical targets for usage reduction is challenging. The complexity of assessment is further compounded by factors that influence the impact of pesticides on landscapes once applied, including weather and local sensitivities. It is not currently clear that targets based only on the weight applied or number of pesticide applications could take sufficient account of these variables to be an effective tool in driving the right behaviour changes and may risk creating perverse incentives. Therefore, any targets need careful consideration before introduction, to ensure it is achievable, while also setting a challenging benchmark against which progress can be assessed. To overcome some of these challenges, we are committed to developing new ways of monitoring usage that account for the relative toxicity of substances being used.

UK Pesticide Load Indicator

Defra is conducting research into the development of a UK Pesticide Load Indicator. It will combine UK pesticide usage data with active substance-specific weights for hazard to human health, environmental toxicity and environmental fate. The aim is to provide an indicator of pesticide load in the UK that will show change in the potential risk of total active substances used over time. The load indicator will not give a full picture of the risks associated with pesticide use, which depend on the specific circumstances of use as well as the human and environmental exposures, but it represents an improvement on currently available data used to estimate risks, such as the European Harmonised Risk Indicator.

In Scotland, information on the uptake of IPM activities by Scottish growers is collected and published alongside the Pesticide Usage Surveys. The results demonstrate that, whilst pesticide use is integral to Scottish crop production, all sectors also adopt a range of IPM measures. This data collection series, in combination with statistics describing pesticide use, is designed to inform the Scottish Government about crop protection practices. This will help to describe and predict grower response to crop protection drivers such as changes in pesticide availability, advances in crop protection technologies and the impact of Government initiatives to encourage greater sustainability in the use of pesticides.

Pesticide usage in amenity

The existing research on pesticide usage in the amenity sector has been limited by difficulties in obtaining representative samples of those using or commissioning amenity pest management services. We will explore the best ways to monitor usage in future, potentially utilising sales data.

2.10.2 Environmental indicators

Pesticides are designed to disrupt life processes and therefore there are risks to the environment associated with their use. To ensure the sustainable use of pesticides, we need to understand these risks and the impacts of pesticides on the environment.

Our current environmental monitoring systems cover measurements of emissions and exposure as well as indications of trends in species abundance, such as those for farmland birds and insects. Indicators for exposure and adverse effects of chemicals on wildlife in the environment are currently being developed as part of Defra's outcome indicator framework for the 25 Year Environment Plan (YEP). They are intended to track changes in the exposure of wildlife to harmful chemicals in freshwater, marine, coastal and terrestrial ecosystems, including soil organisms and health. The scope includes exposure of wildlife to pesticides through the Wildlife Incident Investigation Scheme (WIIS) (Annex 1 – Table 1, subheading 8.3), as well as environmental exposure to other chemicals through the H4 indicator (H4 - Exposure and adverse effects of chemicals on wildlife in the environment). The H4 indicator is one of the suite of indicators being developed to monitor progress towards the 25 YEP goals. The purpose of the H4 indicator is to track changes in the exposure of, and consider risk to, wildlife from chemicals in freshwater, marine and terrestrial ecosystems.

Water

Water supplies and aquatic environments are particularly vulnerable to pollution from pesticides. To understand the impact of pesticide use on the quality of our ground and surface water bodies, we work with water companies, taking a risk-based approach to monitor: groundwater bodies, which include groundwater Drinking Water Protected Areas (DrWPAs); and surface water bodies to assess compliance with the Water Framework Directive's (WFD) objectives. Additionally, we monitor surface water DrWPAs where there is a risk to the quality of abstracted raw water (Annex 1 – Table 1, Heading 7). The data shows ongoing widespread compliance with little or no change in the number of water bodies failing to meet the WFD's objectives from already low levels (Annex 1 – Table 1, subheadings 7.2-7.5). However, there is consistently around 25% non-compliance in surface water DrWPAs in England and Wales. We also monitor the number of substantiated pollution incidents (for land, air or water) involving pesticides, which has fallen between 2012 and 2017 (Annex 1 – Table 1, subheading 7.6) In addition to the above, we actively monitor areas covered by Catchment Sensitive Farming in England at least weekly to provide a detailed picture of the timing of pesticide concentrations in water. Whilst these metrics provide some insight into the degree pesticides are impacting on water quality and aquatic ecosystems, to get a fuller picture we will seek to develop our understanding of the impact of pesticides on the aquatic environment and water safety. We will do this by promoting aquatic sediment and terrestrial soil sampling for pesticide residues to better understand environmental impacts across a range of environmental compartments.

In Scotland, a Diffuse Pollution Management Advisory Group (DPMAG) has been in place since 2010, consisting of a number of key rural stakeholders. DPMAG was instrumental in the production of "Know the Rules" guidance on best practice. Scotland also introduced

controls on the application of pesticide through a general binding rule in the Water Environment (Controlled Activities) (Scotland) Regulations 2011, with further amendments in 2017. These regulations complemented the programme of measures in Scotland's River Basin Management Plan (RBMP) where the priority catchment approach resulted in over 4,000 farms visited, to advise on best practice and compliance with legislation. This initiative is being carried forward into the 2nd RBMP. To support land managers a dedicated website, [Farming & Water Scotland](#), provides a one stop information hub on compliance with relevant legislation and good practice advice on activities which have the potential to impact on the water environment.

In Northern Ireland routine screening of pesticides is carried out as part of the annual water quality monitoring by the Northern Ireland Environment Agency (NIEA). The NIEA also carry out an annual assessment of drinking water quality on behalf of NI Water. Reports on the compliance with the drinking water quality standards and drinking water quality tables provide detail of individual water supply zones where full compliance with the regulatory standards has not been met. Drinking water is sampled to ensure that any traces of individual pesticide present, resulting from the use of pesticides, meets the European Health-Based Chemical Standards of 0.10µg/l.

In 2009 the first set of River Basin Management Plans (RBMP) were published for each River Basin District within Northern Ireland. The Plans identified where the Northern Ireland water environment is in poor, moderate, good or excellent condition and set out objectives for improvement or prevention of deterioration. In 2015 the second set of Plans were published providing an overview of changes and progress that have been made. These plans set out supplementary measures to address diffuse and point source pollution of surface and groundwaters from chemicals and agriculture through the reduction in pesticide inputs. In addition to the already established legislative frameworks actions identified included education and awareness to promote best practice when using pesticides on the farm and encourage no-pesticide usage by local authorities when managing green areas.

In 2013 the Water Catchment Partnership was established to help address water quality issues related to pesticides in Northern Ireland. This is a working partnership with representatives from Ulster Farmers Union, Northern Ireland Water, Department of Agriculture, Environment and Rural Affairs (DAERA), College of Agriculture, Food and Rural Enterprise and the Voluntary Initiative. The partnership aims to deliver a unified message incorporating the ethos from all organisations to effectively tackle the problem of pesticides in the water environment; particularly in drinking water catchment areas.

In Wales, Natural Resources Wales (NRW) monitors the river network for pesticides under the Water Framework and Environmental Quality Standards Directives and basic regulatory measures continue to manage any impact on ecology. In the 2021 River Basin Management Plans, NRW will be reporting on some new pesticides and, in some cases, against tighter standards. NRW have therefore extended the monitoring programme including some water column spot samples, and are also making increasing use of passive monitors, which are likely to be able to identify intermittent pollution.

In 2017, the Wales Land Management Forum established a sub-group to focus on tackling agricultural pollution, including pesticide use. It consists of key stakeholders such as the NFU Cymru, the Country Land and Business Association, Dŵr Cymru Welsh Water (DCWW), the Tenant Farmers Association Cymru, Hybu Cig Cymru, NRW and the Welsh Government.

DCWW has recently completed a programme of investigation and monitoring of pesticides to identify risks to raw water quality in catchments used for public supply. The programme has identified 17 catchments across Wales where pesticides are a risk and DCWW will work with NRW and partners over the next 5 years to implement voluntary measures to protect water quality. The PestSmart project will encourage people across Wales to consider 'smarter' ways of weed, pest and disease control that do not impact on people, water or wildlife. Working with farmers, growers, landowners and gardeners, it will help people and communities consider the way they manage their land in order to help safeguard raw water quality.

Wildlife and biodiversity

The 2013 UK NAP Indicator Framework includes measures for wildlife and biodiversity (Annex 1 – Table 1, Heading 8). These metrics focus around wild bird populations (Annex 1 – Table 1, subheading 8.1 and 8.2), chick food indices (Annex 1 – Table 1, subheadings 8.8 and 8.9), and grey partridge chick survival rate (Annex 1 – Table 1, subheading 8.10) which act as a proxy for wider environmental health. High availability of chick food represents healthy insect populations, just as flourishing wild bird populations represents reduced impact of anthropogenic factors on wider biodiversity. The long-term trend of these metrics shows a significant, and widely documented, decline but more recent data shows a levelling off with no change in UK bird populations and chick food indices between 2012 and 2017. The decline has continued at a slower rate more recently; the smoothed farmland bird index significantly decreased by 6% between 2012 and 2017

The 2013 NAP indicator framework provides a good overview of farmland biodiversity but can be developed to cover other non-agricultural areas where pesticides have an impact. WIIS identifies and investigates poisonings of wildlife and pets, assessing where pesticide pollution occurs. WIIS offers opportunity to inform enforcement, however it does not provide comparable data to get a clear view of changes in the impacts of amateur and amenity use over time. To gain better insight into these sectors, we will include metrics focused on garden wildlife populations, such as hedgehogs and garden birds, to help identify need for further research on potential impacts as a result of non-agricultural pesticide usage.

It is evident that to meet our wider wildlife and biodiversity goals we must work to gain a clearer picture of how pesticides impact the environment and act to mitigate these effects. Where there are knowledge gaps, we will aim to develop new environmental indicators to improve our understanding of the risks and impacts of pesticides on the environment. Environmental indicators should: aim to be as representative of the ecosystem as possible; react quickly to adverse environmental change; and be easy to compile, analyse and

communicate to policy makers and the general public. Some environmental indicators should also have a degree of sector specificity to reflect the varying pressures placed on the environment by different industries. Building on existing work, we will secure additional evidence and extend the set of environmental indicators monitored to get a clearer view of pesticide impacts on the environment and where those impacts originate.

Pollinating insects

Pollinating insects provide a crucial service to the agricultural sector and play an important role in ecosystems. As such they are particularly vulnerable to impacts from pesticides. Government commitments to support pollinators are outlined in our national pollinator strategies:

- In England, the National Pollinator Strategy sets out how Government, conservation groups, farmers, beekeepers and researchers can work together to improve the status of pollinating insect species in England.
- The Pollinator Strategy for Scotland (2017-2027) was launched in 2017 along with an accompanying Implementation Plan, which aims to ensure that by 2027:
 - action to support pollinators will be firmly embedded in relevant strategies, policies and practices across Government and the public sector;
 - our understanding of pollinator ecology, status and trends is improved to allow policies and practices to be informed by the best evidence;
 - regulation of importation of honey bees and bumble bees will minimise the risks of introducing new pests and diseases;
 - local bee-based industries will be better supported;
 - we will have a wide understanding of the value of Scotland's pollinating insects and strong public support to restore populations and habitats, monitor populations and research pollinator biodiversity;
 - there will be a strong network of good-quality pollinator habitats in place;
 - it can be demonstrated that Scotland's pollinators are thriving.
- The Action Plan for Pollinators in Wales (APP) was launched in 2013 with the aim of reducing and reversing the decline in pollinators in Wales. The ambitions of the plan include: providing more diverse flower rich habitats; maintaining healthy, sustainable populations of pollinators; raising awareness and providing information; encouraging positive action by everyone; and building an evidence base to inform future actions.
- Northern Ireland is covered by the All-Ireland Pollinator Plan 2015-2020 which recognises pesticide usage as one of the pressures causing the decline in Ireland's pollinators. Within the plan 81 actions are identified to help provide habitat and nectar rich food for pollinators, setting out what can be done across the agricultural and public amenity sectors and home gardeners, including the reduction in the use of harmful pesticides and chemicals.

Pollinators are currently monitored under these strategies at a UK level as the UK biodiversity indicator D1C reports on the status of pollinating insects. However, to understand the impacts of pesticides on pollinators we are working to include specific

measures on pollinator hazards as part of our suite of environmental indicators. We are also working with the Pollinator Advisory Steering Group and the Pesticide Forum's Knowledge Transfer Group to assess current IPM knowledge and applied research developments. We will review guidance and develop best practice to promote an integrated approach, in line with our National Pollinator Strategies.

2.10.3 Existing goals

Delivering the overarching objectives of the NAP will have a key role to play in helping to deliver wider goals and targets for delivering a better environment for future generations.

In England, the 25 Year Environment Plan has targets to:

- improve at least three quarters of our waters to be close to their natural state as soon as is practicable;
- restore 75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term; and,
- recover threatened, iconic or economically important species of animals, plants and fungi.

In Wales the Welsh Minister's Natural Resources Policy sets out our three national priorities for managing Wales' natural resources. These have been developed to support the delivery of our programme for Government and the national strategy, 'Prosperity for All', which supports its delivery. The priorities also embed the contribution of our Natural Resources across all the Well-being Goals, and take an integrated, long term approach in line with our new ways of working.

The three national priorities for managing Wales' natural resources are:

- Delivering nature-based solutions;
- Increasing renewable energy and resource efficiency; and,
- Taking a place-based approach.

These priorities have been designed to work together to help us to tackle challenges and realise opportunities that our natural resources provide.

The Environment Strategy for Scotland sets out a vision for Scotland's environment and role in tackling the global environmental and climate crises – helping to secure the wellbeing of people and planet for generations to come. To achieve this vision, the Scottish Government and partners will focus collective efforts on delivering six shared outcomes:

- Scotland's nature is protected and restored with flourishing biodiversity and clean and healthy air, water, seas and soils;
- Play our full role in tackling the global climate emergency and limiting temperature rise to 1.5°C;
- Use and re-use resources wisely and have ended the throw-away culture;

- Scotland's thriving sustainable economy conserves and grows our natural assets;
- Scotland's healthy environment supports a fairer, healthier, more inclusive society; and,
- Being responsible global citizens with a sustainable international footprint.

The Environment Strategy for Northern Ireland is in the early stage of development. Six draft outcomes have been identified, including:

- halting biodiversity loss, maintaining ecosystems in a healthy state, and well managed landscapes;
- achieving sustainable consumption and production on land and sea; and,
- having excellent air, water, land and neighbourhood quality.

These outcomes are intended to cover a range of key high-level environmental issues.

Ensuring robust regulation and safe use of pesticides, as well as supporting the uptake of IPM will all play a key contribution in helping to deliver these goals.

2.10.4 Monitoring and risk assessment

We will continue to support and develop existing monitoring schemes which gather data on pesticide residues in food, and on reported adverse effects on human health from contact with pesticides.

Maximum Residue Levels (MRLs)

The general picture that emerges from the data on pesticide residues in food is that there is a high level of compliance with consistently low fruit and vegetable samples found with residues above Maximum Residue Levels (Annex 1 – Table 1, 5.3). There is also a downward trend in reported incidents of adverse impact on human health. MRLs are set in law at the highest level of pesticide that the relevant regulatory body would expect to find in that crop when it has been treated in line with good agricultural practice. If a food has a higher level of residue than the MRL, it does not automatically mean that the food is not safe to eat. A residue above the MRL may show that the farmer or grower has not used the pesticide properly.

National Poisons Information Service (NPIS)

Data provided by the National Poisons Information Service (NPIS) records detail cases referred by health professionals and is our current best indication of the pattern of acute pesticide poisonings. Over the last nine years, it shows an overall reduction in the incidence of severe toxicity resulting from pesticide exposure. Most exposures are shown to be acute and unintentional, with the majority involving amateur (home and garden) pesticide products (Annex 1 – Table 1, 5.2).

Further information about trends is available in the most recent report from the Expert Committee on Pesticide Residues in Food, with the data is also summarised in the Pesticide Forum Annual Reports.

Health studies

The HSE's Pesticide Users' Health Study (PUHS) and the follow-on Prospective Investigation of Pesticide Applicators' Health (PIPAH) study were established to investigate chronic ill health arising as a result of occupational exposure to pesticides. Further analysis of this data will be supported as a way of assessing the potential chronic effects of exposure to pesticides. We recognise the challenges in measuring chronic effects of pesticides, such as the difficulty in accounting for changing patterns of usage and substances used over time.

We continually keep our system for gathering information on acute and chronic pesticide poisoning incidents under review, to make sure it is effective and to incorporate any new developments. We will maintain vigilance for any adverse effects as scientific understanding increases, and will continue to scrutinise developing evidence around potential adverse effects and their causes.

Over the period of the NAP, we commit to working with stakeholders to consider the potential for development of a human biomonitoring programme, to monitor exposure within the UK population to pesticides as well as other chemicals.

2.11 Questions on Goal 4 – Targets, Metrics and Indicators

Question 22 – What are the priorities for data collection and research on pesticide usage?

Question 23 – What are the priorities for research on the environmental impact of pesticides?

Question 24 – What are the priorities for research on the health impacts of pesticides?

Question 25 – What suggestions do you have for ways of measuring our progress against the goals set out in this NAP?

2.12 Goal 5 - Delivery of the NAP

The NAP and its delivery are overseen by Defra, the Scottish and Welsh Governments, and DAERA in Northern Ireland. Delivery is also administered and supported by the UK pesticides regulator, the Health and Safety Executive's Chemicals Regulation Directorate, along with various government agencies, principally the Environment Agency, Natural England, Natural Resources Wales, and the Scottish Environment Protection Agency. Other Government Departments and agencies are also active across specific elements of the NAP.

The NAP is delivered in partnership with a wide range of stakeholders including those from industry, agriculture, environment, education, and other sectors. The NAP is also developed with public participation at its core, allowing any interested party to have their say through the consultation process – this ensures our collective approach meets the needs of all pesticide users, the public and the environment.

To ensure that we work effectively with others to deliver the NAP goals, we will:

- ***Review the arrangements for delivery of the NAP to drive forward sustainable use of pesticides and IPM. We will consider how this can be achieved through partnership approaches with stakeholders and industry.***

It is in everyone's interests that pesticides are used as little as reasonably possible, and in a responsible and sustainable manner. As such, it is crucial that all pesticide users endorse the approach set out in the NAP and recognise their essential role in securing its success by:

- Adopting a fully integrated approach to control and manage pests that minimises risks to people and the environment;
- Complying with all relevant regulations and record-keeping requirements for pesticides;
- Complying with Codes of Practice and following guidance, including that from industry groups, for using pesticides appropriate to the local situation; and,
- Supporting the measures in this plan relevant to their sector.

IPM principles are delivered in partnership with stakeholders, including industry and non-government organisational bodies. A diverse range of expertise is needed to deliver our objectives on human health and environmental protection while supporting the food production industry. We will review the arrangements for delivery of the NAP to drive uptake of IPM. As part of this we will review and update the role of the Pesticides Forum and its related stakeholder groups and work with the Voluntary Initiative and Amenity Forum to create cross-sector partnerships to measure success, promote best practice, and deliver improvement in the sustainable use of pesticides.

2.13 Concluding Questions

Question 26 – How can we best bring together stakeholders with diverse interests to support delivery of the NAP, working towards a common goal of sustainable pest management?

Question 27 – Considering the NAP as a whole, what other comments and suggestions would you like to make in addition to those covered by previous questions?

This NAP reflects developments since the original version was published in February 2013. This document is representative of plans over the next 5 years, we recognise that government and non-government initiatives may change within this period, and welcome comments at any time.

3 Annex 1- 2013 UK National Action Plan for Sustainable use of Pesticide: Indicator Review

December 2020

3.1 Introduction

The first UK National Action Plan for the Sustainable Use of Pesticides (NAP) was published in 2013, with a suite of quantitative and qualitative indicators to monitor how pesticides are being used and the impact they are having. The indicators cover:

- Surveys of pesticide use in the agricultural and non-agricultural sectors;
- Results of farm inspections;
- Cropping statistics and the availability of methods of control;
- Rates of adoption and impact of industry initiatives; and
- Monitoring of the impacts of pesticide use on human health, water quality and the environment.

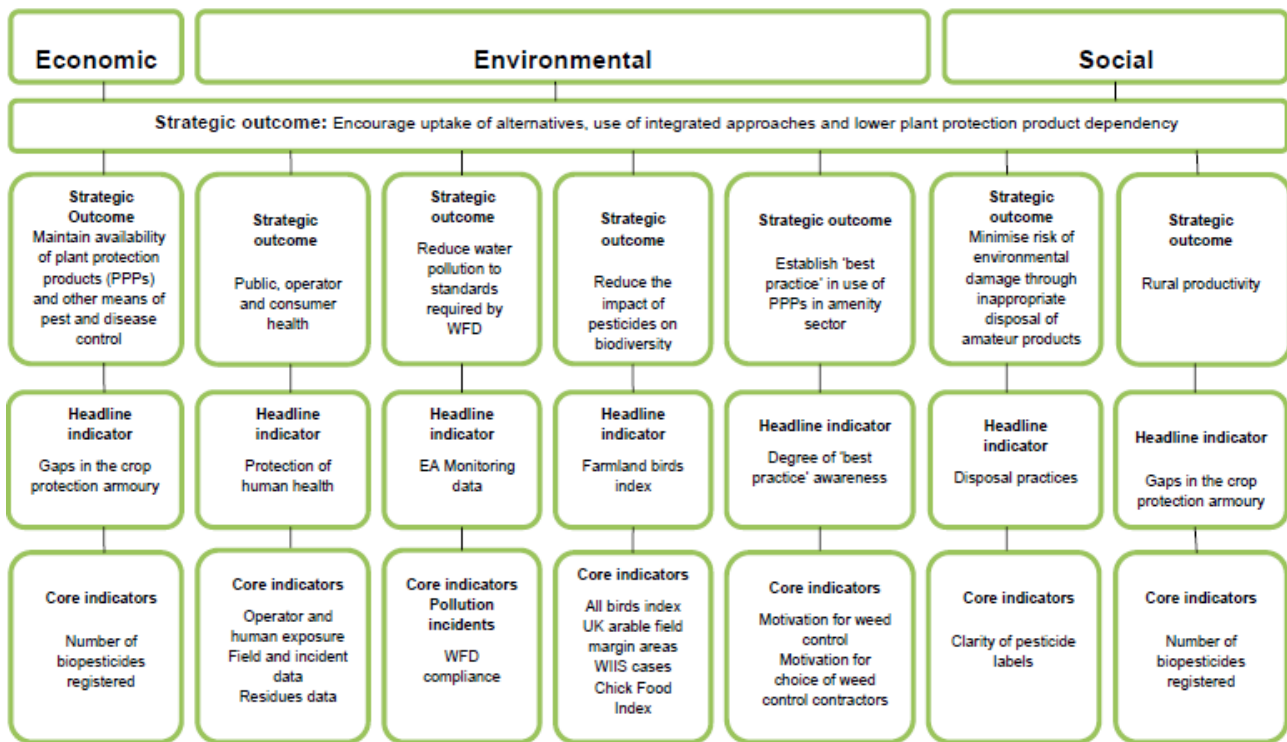
Indicators are useful tools for summarising and communicating broad trends. They aim to be indicative of wider changes. This report reviews progress in these indicators to date and provide a high-level overview. The indicators were developed in partnership with the Pesticides Forum. The Pesticides Forum has released annual reports providing updates of these indicators. This annex is intended to complement the information presented in the Pesticides Forum Reports and therefore not all indicators are presented. The most recent Pesticide Forum report (2018) is available online.

<https://webcommunities.hse.gov.uk/connect.ti/pesticidesforum/view?objectId=56979&exp=e1>

Figure 1 shows the indicators framework as published in 2013 NAP.⁴ This was based upon the indicators framework first published in Annex B of the 2011 Pesticide Forum Annual report (Pesticides Forum, 2012).

⁴ UK National Action Plan, Annex 3: List of 2011 UK indicators and framework, <https://www.gov.uk/government/publications/pesticides-uk-national-action-plan>. 2013

Figure 1. 2013 UK NAP indicators framework.



Source: UK National Action Plan for the Sustainable Use of Pesticides (Plant Protection Products) February 2013.

3.2 Overview assessment of change for 2013 NAP indicators

3.3 Assessing indicators

Each indicator is summarised or assessed separately using a set of 'traffic lights'. The traffic lights show 'change over time'. They do not show whether the measure has reached any published or implied targets, or indeed whether the status is 'good' or 'bad'. The assessment is made by government analysts and the traffic lights are determined by:

- 1) identifying the overall trend in the determined period by assessing whether there has been a consistent upward or downward trend; and
- 2) by calculating whether the change is greater than a threshold value of 3%.

This 3% threshold is arbitrary, it was selected because it is a common threshold in other government indicators. If there is a consistent trend in the data and there is a 3% difference between the first year and last year of the time period then the assessment of change will be either 'moving in preferred direction of change' or 'moving away from preferred direction of change' depending on the indicators desired direction of change towards sustainable use. Where an indicator value has changed by less than the threshold of 3% and/or the trend between the time points is inconsistent, the traffic light has been set as 'no clear direction of change'. For some indicators, showing 'no clear direction of change' is desirable as the indicator may already be at desired levels and therefore 'no clear direction of change' may point to the continued sustainable use of pesticides. Where the data is not available, is no longer collected or is not suitable for comparison across different years, it is noted as having 'insufficient or no comparable data'.

Please see the key for assessment of change in the summary table (table 1):



= moving in preferred direction of change



= no clear direction of change



= moving away from preferred direction of change



















= insufficient or no comparable data.





















Up or down arrows show whether the indicator is numerically increasing or decreasing.

Table 1. A summary of traffic light assessments for the 2013 NAP indicators, including assessment of long and short term change.

Indicator	Source	Scope	Latest Data	Long-term Change ⁵	Short-term Change ⁶
1	Pesticide Usage				
1.1 Pesticide usage: estimated annual usage for all crops in Great Britain (tonnes of active substance applied)	Pesticide Usage Survey, Fera	GB & UK	2018		
1.2 Cropped areas (in hectares) in the UK.	Defra	UK	2019		
1.3 Pesticide average inputs per crop, including soil sterilants.	Pesticide Usage Survey, Fera	GB & UK	2018		
1.4 Pesticide average inputs per crop, excluding soil sterilants.	Pesticide Usage Survey, Fera	GB & UK	2018		
1.5 Pesticide average inputs for wheat (kg active substance applied per crop) in Great Britain.	Pesticide Usage Survey, Fera	GB & UK	2018		
1.6 Herbicide use on wheat (number of products and total doses of active substances per hectare).	Pesticide Usage Survey, Fera	GB & UK	2018		
2	Training and Testing				
2.1 National Sprayer Testing Scheme (NSTS) – number of tests and % sprayed area.	National Sprayer Testing Scheme (NSTS)	UK	2018		
2.2 National Register of Sprayer Operators (NRoSO)	City & Guilds	UK	2018		

⁵ The long-term change assessment refers to 10 years prior to the latest year. The latest year used for each measure is shown in the table.



⁶ The short-term change assessment is taken 5 years prior to the latest year. The latest year used for each measure is shown in the table.

– number of members and % sprayed area.					
2.3 Number of members of BASIS Professional Registers by category.	BASIS	UK	2018		
2.4 Number of members of BASIS Amenity Registers by category.	BASIS	UK	2018		
2.5 Nominated Storekeeper Training Course/Nominated Storekeeper Refresher Training Course passes	BASIS	UK	2018		
2.6 Nominated Storekeeper Amenity Training Course/Nominated Storekeeper Refresher Training Course passes	BASIS	UK	2018		
3	Intergrated Pest Management				
3.1 Crop protection management plans (area covered in hectares).	Voluntary Initiative (VI)	UK	2018		
4	Cross Compliance				
4.1 Cross Compliance inspection results for proper use of plant protection products (SMR 9 2013, SMR 10 2015-2018) in England.	Rural Payments Agency England	England	2018		
4.2 Cross Compliance inspection results for proper use of plant protection products (SMR 9 2010-2014, SMR 10 2015-2016) in Scotland.	Scottish Government	Scotland	2018		
4.3 Cross Compliance inspection results for proper use of plant protection products (SMR 9 2010-2014, SMR 10 2015-2016) in Northern Ireland	DAERA Northern Ireland	Northern Ireland	2016		
4.4 Inspection results for proper use of plant protection products (SMR 9 2010-2014, SMR 10 2015-2016) in Wales, where 220 Glastir and 180 Cross Compliance inspections are carried out each year.	Welsh Government	Wales	2019		

5		Human Health				
5.1 Human health protection: Pesticide Incidents Appraisal Panel (PIAP) investigations.	No longer reported	GB	2015 /16			
5.2 National Poisons Information Service (NPIS): monitoring adverse effects of pesticides exposure in humans.	National Poisons Information Service (NPIS)	UK	2017 /18			
5.3 Consumer protection: Maximum residue levels compliance – % of fruit and vegetable samples tested and found with one or more residues above the MRL.	Health and Safety Executive / PriF	UK	2017			
6		Biopesticides				
6.1 Cumulative numbers of active substances and products approved as biopesticides, in any one year.	EU - Pesticides database	UK	2018			
7		Water ⁷				
7.1 Surface water Drinking Water Protected Areas (DrWPAs) in England where assessments indicate pesticides are putting WFD Article 7 compliance at risk.	Environment Agency	England	2018			
7.2 Surface water Drinking Water Protected Areas (DrWPAs) in Wales where assessments indicate pesticides are putting WFD Article 7 compliance at risk.	Environment Agency	Wales	2016			
7.3 Drinking Water Protection Areas (DrWPAs) in Scotland at risk of failing to meet Article 7 objectives for pesticides.	Scottish Environment Protection Agency (SEPA)	Scotland	2017			
7.4 Groundwater bodies in England failing WFD objectives due to pesticides.	Environment Agency	England	2018			

⁷ Collection of data on protected areas, ground water and water bodies vary year on year and therefore we have not assessed the trend over time using the traffic light system.

7.5 Groundwater bodies in Wales failing WFD objectives due to pesticides.	Environment Agency	Wales	2016		
7.6 Scottish groundwater sampling locations where one or more pesticides have been detected at levels which threaten to exceed 0.1ug/l.	Scottish Environment Protection Agency (SEPA)	Scotland	2017		
7.7 Surface Water Bodies in England not currently meeting WFD Environmental Quality Standards for Pesticides.	Environment Agency	England	2017		
7.8 Surface Water Bodies in Wales not meeting WFD Environmental Quality Standards for Pesticides	Environment Agency	Wales	2015		
7.9 Groundwater sampling locations where one or more pesticides have been detected at levels which threaten to exceed 0.1ug/l	Scottish Environment Protection Agency (SEPA)	Scotland	2017		
7.10 Number of substantiated category 1 & 2 pollution incidents for land, air or water, involving agricultural and non-agricultural pesticides.	Environment Agency, Scottish Environment Protection Agency, Natural Resources Wales, DAERA	UK	2018		
8	Wildlife				
8.1 Populations of selected farmland bird species in the UK.	Defra	UK	2017		
8.2 Populations of all bird species in UK.	Defra	UK	2017		
8.3 Pesticide poisoning incidents investigated by the Wildlife Incident Investigation Scheme (WIIS) in the UK.	Wildlife Incident Investigation Scheme (WIIS)	UK	2017		
8.4 Areas of different agri-environment options used by farmers: England	Natural England	England	2018		
8.5 Areas of different agri-environment options used	Scottish Government	Scotland	2019		

by farmers: Scotland					
8.6 Areas of different agri-environment options used by farmers: Wales	Natural Resources Wales	Wales	2018		
8.7 Agri-environment schemes: Northern Ireland	DAERA	Northern Ireland	2018		
8.8 Long-term trend in the generic farmland bird chick food index measured in winter wheat crops on the GWCT's Sussex Study area.	The Game and Wildlife Conservation Trust (GWCT)	England	2017		
8.9 Grey partridge chick food index measured in winter wheat crops on the GWCT's Sussex Study area.	The Game and Wildlife Conservation Trust (GWCT)	England	2017		
8.10 Grey partridge chick survival rate (%) on the GWCT's Sussex Study area.	The Game and Wildlife Conservation Trust (GWCT)	England	2017		

3.4 Pesticide Usage

Estimates of pesticide usage are derived from the Pesticide Usage Survey (PUS). Data are collected by Fera Science Ltd for England and Wales, by the Scottish Agricultural Science Agency for Scotland and the Agri-Food and Biosciences Institute of Northern Ireland for Northern Ireland. The PUS reports the mass of pesticide applied, the number of products/actives applied, the frequency of treatments and the area to which it is applied.

Since 2010 the surveys have followed a biennial cycle with arable, potato storage, soft fruit and orchards being conducted in even years (2010, 2012, 2014 etc.) and outdoor vegetable and edible protected crops in odd years (2011, 2013, 2015, 2017 etc.). Surveys of grassland & fodder crops (last survey 2017) and amenity situations (last survey 2016) are conducted every four years. As a result, results below are broken down by individual surveys, to allow for comparisons across years. This review focuses on arable survey data showing the weight of pesticides applied, the number of products/actives applied and the frequency of treatments.

The PUS also records the area pesticides are applied to. However, this is limited in its usefulness as the area recorded is additive and therefore the area is larger than the actual crop area in the UK, i.e. if two active substances are applied to an area the area is doubled, if three active substances are applied to the area is tripled and so on. Instead this review uses measures of the number of spray rounds which are considered more useful for assessing change in pesticide use over time.

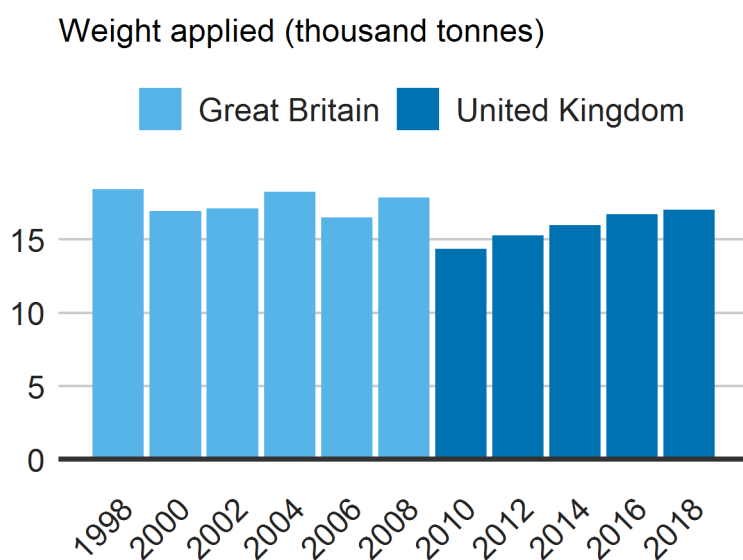
Please note that data before 2010 refers to Great Britain and 2010 onwards is for the United Kingdom. Since 2010 all surveys of pesticide usage in agriculture and horticulture are fully co-ordinated by the survey teams of England & Wales, Scotland and Northern Ireland.

3.4.1 Arable crops

Aside from permanent grassland, arable crops make up the largest use of agricultural land in the UK – almost 4.6 million ha in 2019. Arable pesticide usage surveys are undertaken biennially, for this reason a longer time series is presented to show change. The estimated total weight applied to arable crops in Great Britain shows an overall slight decline between 1998 and 2008, with significant variation year to year during this period. The largest decline was from 2008 to 2010 in spite of the data also including Northern Ireland from 2010 onwards. This is due to major declines in the use of isoproturon and trifluralin following changes in their approval and a significant reduction in the use of metaldehyde since the 2008. This was followed by an overall increase in weight applied from 2010 to 2018 (Figure 2). This overall increase in weight applied from 2010 to 2018 is mostly due to an increase in the use of chlorothalonil, glyphosate and lambda-cyhalothrin.

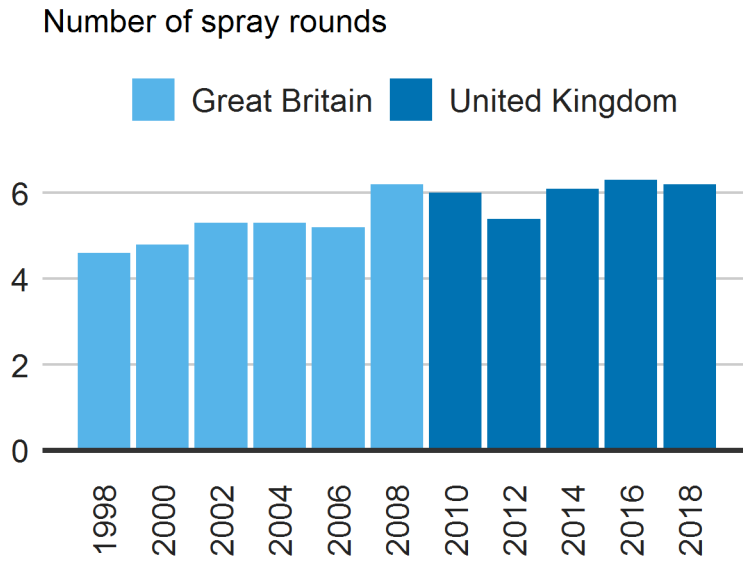
The frequency that pesticides are applied to crops is also changing (Figure 2). The number of spray rounds applied to arable crops has increased from 4.6 in 1998 to 6.2 in 2018. Similarly, the number active substances and products applied to arable crops has also increased over this time period (figure 3 and figure 4).

Figure 2. Estimated pesticide usage (including seed treatments) in arable crops, Great Britain (1998-2008), United Kingdom (2010-2018).



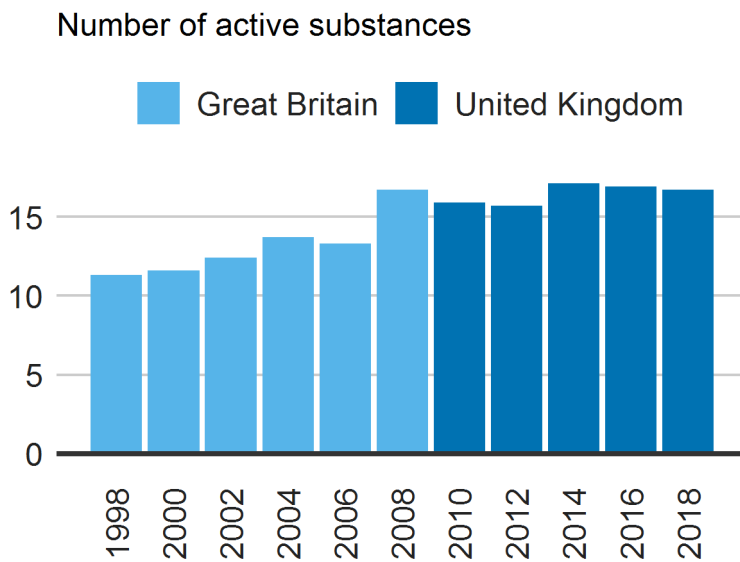
Source: Pesticide Usage Survey, Fera.

Figure 3. Average number of spray rounds applied to arable crops, Great Britain (1998-2008), United Kingdom (2010-2018).



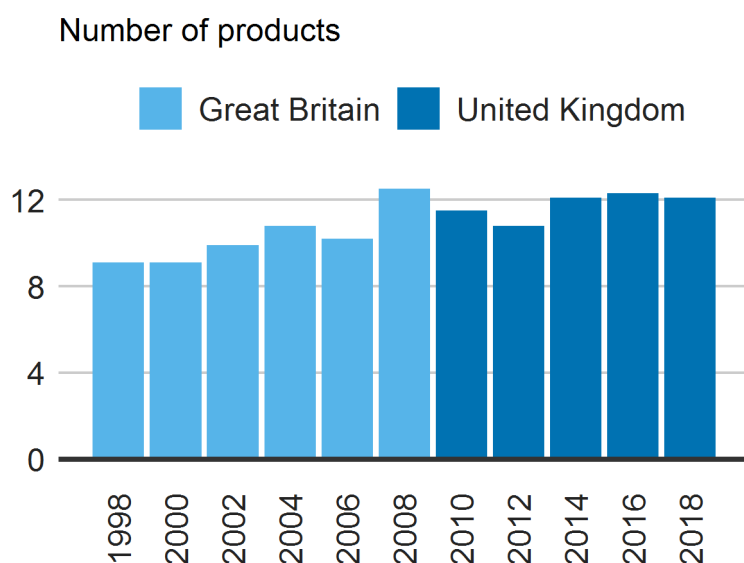
Source: Pesticide Usage Survey, Fera.

Figure 4. Average number of active substances applied to arable crops Great Britain (1998-2008), United Kingdom (2010-2018).



Source: Pesticide Usage Survey, Fera.

Figure 5. Average number of products applied to arable crops, Great Britain (1998-2008), United Kingdom (2010-2018).

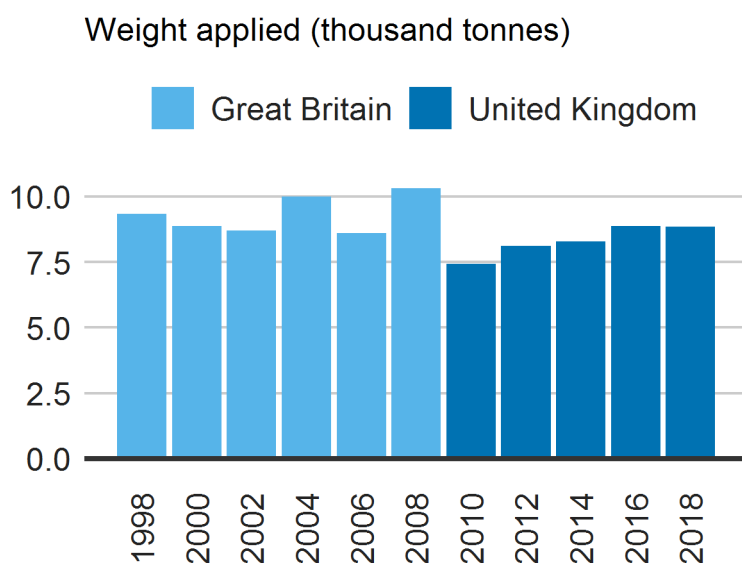


Source: Pesticide Usage Survey, Fera.

3.4.2 Wheat

In 2019, 1.8 million ha was used to grow wheat in the UK (40% of the area used to grow arable crops).⁸ Wheat was identified for reporting in the previous NAP and so the following summary figures are presented below. The Pesticide Forum reports similar data on Oilseed Rape.

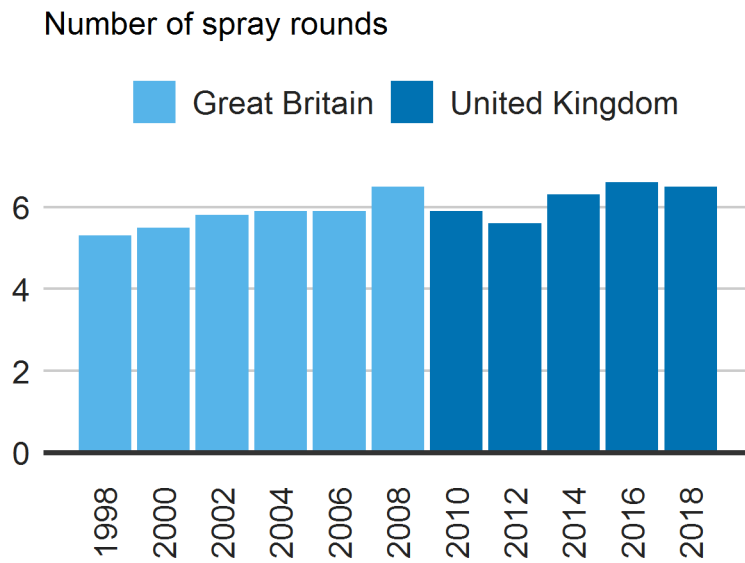
Figure 6. Estimated pesticide usage (including seed treatments) to wheat, Great Britain (1998-2008), United Kingdom (2010-2018).



Source: Pesticide Usage Survey, Fera.

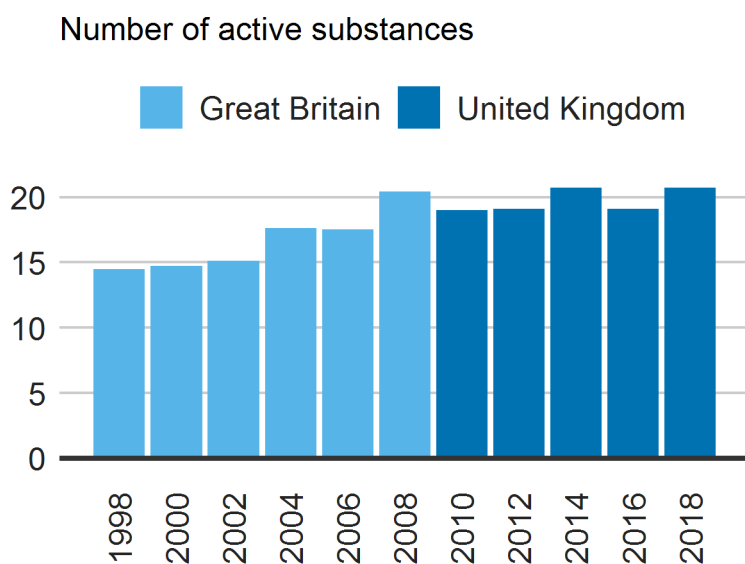
⁸ Defra June Survey, 2019

Figure 7. Average number of spray rounds applied to wheat, Great Britain (1998-2008), United Kingdom (2010-2018).



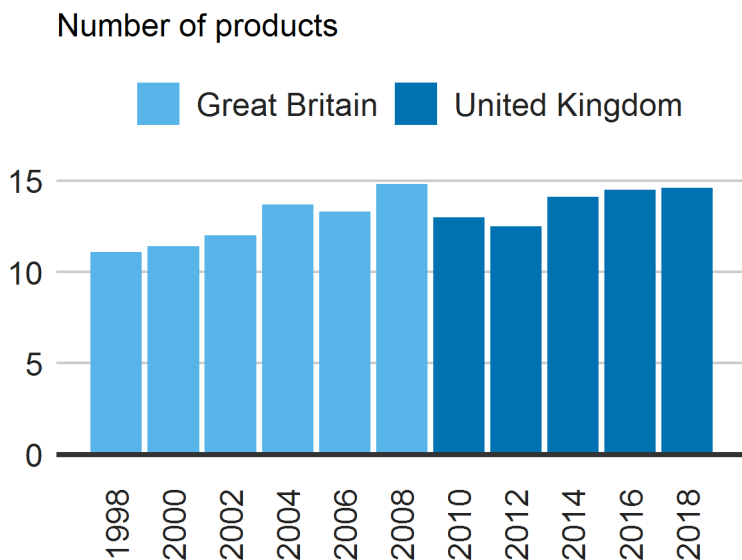
Source: Pesticide Usage Survey, Fera.

Figure 8. Average number of active substances applied to arable wheat Great Britain (1998-2008), United Kingdom (2010-2018).



Source: Pesticide Usage Survey, Fera.

Figure 9. Average number of products applied to wheat, Great Britain (1998-2008), United Kingdom (2010-2018).



Source: Pesticide Usage Survey, Fera.

3.5 Water Protection⁹

Pesticides can get into water through a variety of paths such as through surface run-off, over spray, drift, drain flow and disposal.

Groundwater provides a third of drinking water in England, as well as maintaining the flow in many rivers. In some areas of Southern England, groundwater supplies up to 80% of the drinking water from taps (Environment Agency). All groundwater bodies in England are designated as drinking water protected areas (DrWPAs). This aims to protect groundwater from over-abstraction and to prevent deterioration in groundwater quality that could increase the treatment of drinking water. Treating drinking water is energy and resource intensive. A body of groundwater is defined in the Water Framework Directive as a distinct volume of groundwater within an aquifer or aquifers.

Water data for the UK are reported on an annual basis without comparison to previous years. In England and Wales, data were collected on Drinking Water Protected Areas (DrWPAs) at risk of non-compliance with WFD Article 7 (Waters used for the abstraction of drinking water) due to pesticide contamination, groundwater bodies in failing WFD objectives due to pesticides and Surface Water Bodies in not meeting WFD Environmental Quality Standards for Pesticides. In Scotland data were collected on DrWPAs at risk of non-compliance with

⁹ The summary included here is based on data until 2018 and does not include the most recent WFD Classification Status data published on 17th September 2020. This data will be considered for inclusion in future drafts.

WFD Article 7 due to pesticide contamination, groundwater bodies in failing WFD objectives due to pesticides, and groundwater sampling locations where one or more pesticides have been detected at levels which threaten to exceed 0.1ug/l.

Bentazone is an active herbicide and is the most commonly found pesticide in UK groundwater (Environment Agency 2018).

In England there are 485 DrWPAs (Table 2). In 2018, 129 DrWPAs (26.6%) were at risk of non-compliance with WFD Article 7 due to pesticide contamination. The non-compliance percentage has increased by 0.5% compared with 2017's value of 26.1%, when 127 DrWPAs were found to be at risk. The numbers of waterbodies classed 'at risk' due to specific pesticides, or those under consideration for 'at risk' classification due to specific pesticides, have generally remained static.

In Wales in 2016 there were 313 DrWPAS and 25 were reported as at risk (Table 3). In 2016 there were also no failures of ground water bodies due to pesticides. The most recent data for surface water bodies not currently meeting WFD environmental quality standards for pesticides was reported in 2015. Out of 937 surface water bodies, one was assessed as failing good status due to pesticides. No data were available for 2017 and 2018.

In Scotland there were no surface waters assessed as failing good status due to pesticides in 2017 (Table 4). Three of the 517 surface water DrWPAs were identified as being at risk of deterioration from pesticides. This represents less than 1% of total DrWPAs. Three groundwater bodies in Scotland are currently assessed as failing 'good status' due to the levels of pesticides in 2017. Monitoring during 2017 at sampling locations detected around 45 pesticide active substances above the limit of detection.

Table 2. Water data for England

Year	Surface water Drinking Water Protected Areas (DrWPAs) in England where assessments indicate pesticides are putting WFD Article 7 compliance at risk	Groundwater bodies in England failing WFD objectives due to pesticides	Surface Water Bodies in England not meeting WFD Environmental Quality Standards for Pesticides
2014	485 DrWPAs 115 at risk from pesticides	No data	No data
2015	486 DrWPAS 123 at risk from pesticides	271 groundwater bodies 16 failures due to pesticides	4678 surface water bodies 10 failures between 2012-2014
2016	No data	No data	4678 surface water bodies Situation unchanged since 2015 (10 failures)
2017	485 DrWPAS 127 at risk from pesticides	225 ground water bodies 7 failures due to pesticides	No data
2018	485 DrWPAS 129 at risk from pesticides	No data	No data

Source: Environment Agency.

Table 3. Water data for Wales

Year	Surface water Drinking Water Protected Areas (DrWPAs) in Wales where assessments indicate pesticides are putting WFD Article 7 compliance at risk	Groundwater bodies in Wales failing WFD objectives due to pesticides	Surface Water Bodies in Wales not meeting WFD Environmental Quality Standards for Pesticides
2014	67 DrWPAs Low number at risk	No data	No data
2015	No data	No failures of groundwater bodies due to pesticides were identified in the latest groundwater WFD classification round for Wales, which was based on 2013 data	937 surface water bodies 1 assessed as failing good status due to pesticides
2016	313 DrWPAS 25 at risk from pesticides	There were no failures of groundwater bodies due to pesticides in the latest groundwater WFD classification round	No data
2017	No data	No data	No data
2018	No data	No data	No data

Source: Pesticides Forum Reports 2014-2018

[https://webcommunities.hse.gov.uk/connect.ti/pesticidesforum/view?objectId=38419.](https://webcommunities.hse.gov.uk/connect.ti/pesticidesforum/view?objectId=38419)

Table 4. Water Data for Scotland

Year	Surface Water Drinking Water Protection Areas (DrWPAs) at risk of failing to meet Article 7 objectives for pesticides (identified as being at risk of deterioration from pesticides)	Groundwater bodies failing WFD objectives, due to pesticides	Groundwater sampling locations where one or more pesticides have been detected at levels which threaten to exceed 0.1µg/l
2011	5 of the 346 surface water DrWPAs. This represents 1.4% of all such areas in Scotland	No groundwaters assessed as failing 'good status'	Monitoring during the period 2008 - 2010 at 15 sampling locations (from 12 of the 352 groundwater bodies in Scotland) detected the active substances fluroxpyr; trichlopyr; benazolin; chlorotoluron; diuron; metoxuron; atrazine; bentazone; epoxiconazole; isoproturon; linuron; MCPB; metoxuron; pencycuron; simazine; but at values below regulatory standards.
2012	7 of the 516 surface water DrWPAs This represents 1.4% of all such areas in Scotland	No groundwaters assessed as failing 'good status'	Monitoring during 2012 detected the active substances fluroxpyr; chlorotoluron; diuron; atrazine; bentazone; linuron; mecoprop; fenuron; pencycuron; simazine; bromoxynil; oxadixyl; and MCPA, but at values below regulatory standards.
2013	7 of the 516 surface water DrWPAs. This represents 1.4% of all such areas.	No groundwaters assessed as failing 'good status'	32 active ingredients above the limit of detection.
2014	5 of the 516 surface water DrWPAs. This represents 1 % of all such areas in Scotland	Three groundwater assessed failing 'good status' due to the levels of triazine herbicides. Two of the failures are for simazine and the other is caused by atrazine.	50 active ingredients above the limit of detection. Overall, less than 2% of the analyses carried out by SEPA for groundwater resulted in the detection of a residue.
2015	6 of the 516 surface water DrWPAs. This represents 1.2 % of all such areas in Scotland	Three groundwater bodies in Scotland assessed as failing 'good status' due to the levels of pesticides. One of the failures is for Atrazine and the other two are for simazine.	52 active ingredients above the limit of detection. Overall, less than 3% of the analyses carried out by SEPA for groundwater resulted in the detection of a residue. Of these detections, 44 results exceeded 0.075 µg/ (this is the concentration that denotes a risk of breaching the 0.1 µg/l limit). Of these 0.2 % of analyses threaten to exceed the 0.1 µg/l limit.
2016	4 of the 517 surface water DrWPAs. This represents 1 % of all such areas in Scotland.	Three groundwater assessed as failing 'good status' due to the levels of pesticides. One of the failures is for Atrazine and the other two are for simazine.	40 active ingredients above the limit of detection. Overall, less than 3% of the analyses carried out by SEPA for groundwater resulted in the detection of a residue. 24 results exceeded 0.075 µg/l (this is the concentration that denotes a risk of breaching the 0.1 µg/l limit). Of these, 0.3% of analyses threaten to exceed the 0.1 µg/l limit.

Year	Surface Water Drinking Water Protection Areas (DrWPAs) at risk of failing to meet Article 7 objectives for pesticides (identified as being at risk of deterioration from pesticides)	Groundwater bodies failing WFD objectives, due to pesticides	Groundwater sampling locations where one or more pesticides have been detected at levels which threaten to exceed 0.1 µg/l
2017	3 of the 517 surface water DrWPAs in Scotland are identified as being at risk of deterioration from pesticides. This represents <1 % of all such areas in Scotland. (2017 monitoring results)	Three groundwater bodies assessed as failing 'good status' due to the levels of pesticides. One of the failures is for atrazine and the other two are for simazine.	45 active ingredients above the limit of detection. Overall, fewer than 3 % of the analyses carried out by SEPA for groundwater resulted in the detection of a residue and of these, 0.3 % of analyses threaten to exceed the 0.1 µg/l limit. 18 results exceeded 0.075 µg/l (this is the concentration that denotes a risk of breaching the 0.1 µg/l limit).

Source: Scottish Environmental Protection Agency.

3.6 Agri-environment Schemes

The 2013 NAP indicators framework sought to utilise agri-environment participation data as an indicator for progress in environmental protection (Table 1 – subheadings 8.4-8.7). Variation in scheme design since 2013 has led to this data being non-comparable and therefore non-representative of changes in environmental protection. For example, in England, the Environmental Stewardship scheme was superseded by the Countryside Stewardship scheme in 2015. Countryside Stewardship operates fundamentally differently from its predecessor and seeks to incentivise more focussed and targeted actions, accessible at the individual field level as opposed to the broader whole farm approach of Environmental Stewardship. This change in approach led to a drop in participation however, many farms not in Countryside Stewardship were required to continue environmental actions in compliance with greening measures under the Basic Payments Scheme. Therefore, as the Countryside Stewardship scheme was rolled out, a baseline shift occurred resulting in environmental outcomes continuing to improve despite a perception of reduced participation. The schemes were also recorded on different spatial scales with members of Environmental Stewardship registering the hectareage of their whole farm whilst members of Countryside Stewardship registering only the fields managed with incentivised actions. Similar situations occurred in the other nations of the UK. As agri-environment schemes run for a predetermined length of time and are updated and superseded, their participation alone is not a reliable indicator for environmental outcomes.



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