Analysis of the Impact on UK Crop Production of GB Aligning with EU Rules and Decisions on Plant Protection Products

Compiled for

CropLifeUK

Report produced by:
The Andersons Centre
3rd Floor, The Tower
Pera Business Park
Melton Mowbray
Leicestershire
LE13 0PB
United Kingdom

Contact:
Richard King
Office: +44 (0)1664 503 200
Mobile: +44 (0)7977 191 427
rking@theandersonscentre.co.uk

Date: January 2026

THE AUTHORS:

Richard King, Partner and Head of Research, The Andersons Centre

Michael Haverty, Partner, The Andersons Centre

Version: *6*

Last Saved: *Friday, 23 January 2026*

Proof checked by: *Michael Haverty*

Executive Summary

This report analyses the possible impacts on UK crop production of Great Britain (GB) aligning its Plant Protection Product (PPP) regulatory regime with that of the EU, which is a stated aim of the Common Understanding Agreement (CUA) agreed between the UK and EU in May 2025, with an aspiration to be in place by 2027.

The creation of a single regulatory regime for PPPs within the proposed 'common' Sanitary and Phytosanitary (SPS) area could be implemented through different approaches. Our analysis suggests that an immediate 'cliff edge' scenario to meet the suggested timetable would create an estimated loss of 3-6% in Gross Value Added of UK crop production in the first year, meaning that the Total Income from Farming (i.e. industry profit) would fall by between £500m and £810m.

This loss of income to farmers would come from the loss of key crop protection tools, including four new actives, resulting in a decrease of overall production (wheat volumes could fall by 9-16%, potatoes by 4-6% and apples by 3-7%), shifts in cropping patterns and increased costs associated with growing certain crops.

Commodity and horticultural crops would all be affected, and the UK would be less self-sufficient in food. This has implications for the wider food chain which is the UK's largest manufacturing sector, and the loss of production could lead to higher prices for consumers and reduced margins for farmers.

This immediate cliff-edge is the worst-case scenario from a UK perspective in terms of product availability. We analyse two possible approaches to mitigating these losses; delaying the 'cliff edge', and practicing a managed alignment of existing divergence. The relevant PPPs are at risk if GB aligns unilaterally and retrospectively with EU decisions without consideration for GB specific uses and concerns. Therefore, the process of managed alignment, where GB regulatory decisions are respected until a new decision is made under a future single regulatory regime has the greatest mitigating effect.

This issue is important; the CUA makes no reference to aligning existing divergence, only referring to 'Dynamic Alignment', which is typically understood to mean from the point the agreement is signed. However, there is existing divergence between the EU and GB, as the respective regulatory systems have made different decisions on PPP Active Substance approvals, Usage rules, and Maximum Residue Levels (MRLs) since the UK left the EU.

The UK has maintained equivalent legal, scientific, and technical standards to the EU, as it adopted EU legislation wholesale following EU Exit. However, GB and EU decisions on PPPs have diverged over the past five years due to the different considerations of each system. This divergence is not due to a change in rules or standards, with essentially the same system operating in different contexts. Any loss of crop protection tools through aligning these decisions would not be due to any scientific or safety concerns, but a political choice.

The Analysis

CropLife UK commissioned The Andersons Centre to analyse the impacts on British crop production of Great Britain (GB) aligning its Plant Protection Product (PPP) regulatory regime with that of the EU. This report summarises the findings of the project. The analysis was conducted as a desk-based exercise drawing on publicly available sources of evidence. This was supplemented by interviews with key experts in the crop protection sector.

This report takes as a baseline a scenario of an 'Immediate Cliff-Edge', where GB immediately aligns with EU rules and retrospectively aligns existing decisions at the point the SPS agreement comes into force. This scenario assumes that all EU active substance and MRL decisions immediately override all equivalent GB decisions. This Immediate Retrospective Alignment would create a cliff-edge for the British Agri-food sector.

The effects of the loss of key PPPs were looked at for a range of crops. The scope of the project did not allow all crops grown in the UK to be modelled, so the results are likely to be an underestimate. The modelling has been undertaken at UK rather than GB level due to data availability, but this will have little practical effect due to the relatively small area of crops grown in Northern Ireland (NI).

The economic modelling in this report suggests significant losses to total income from crop production in the first year, with effects on income for future years dependent on implementation.

The effects include a drop in Gross Value Added (GVA) of between 3% to 6%, and up to 11% of the profit of the farming and horticultural industry being lost, based on current Total Income from Farming (TIFF) figures. This could well be an understatement as some cropping sectors (e.g. ornamentals) have not been included in the analysis.

The loss of key PPPs is likely to cause a shift in the crops grown in the UK. Some crops will become harder and/or more expensive to grow. As their profitability relative to other crops changes, then farmers will choose to change rotations to maximise profitability. In addition, rotations may alter to aid the control of pests through cultural control – a prime example is a shift to spring cropping to allow weeds to be controlled through the autumn and winter period.

The model assumes the overall farmed area remains the same. In general, winter cropping drops, offset by a rise in spring crops. The area of fallow increases as some land is taken out of production. This may be either the least productive land that is no longer economic to crop, or land taken out of production rotationally to control weeds. The area of temporary grass also rises as this 'crop' is included more regularly in arable rotations to assist with weed control.

It is likely that employment in agriculture will fall as a result of the loss of PPPs affecting both profitability and area of crop grown. In the medium term, the loss of GVA in the food and drink manufacturing sector could be in the region of 2%; this would equate to an economic loss of £740m. If the workforce showed the same level of change, this would see almost 9,000 jobs lost. There would be knock-on effects on the Food Supply Industry (machinery and equipment for Food Manufacturers and Processors), but this is difficult to quantify.

Applying the Cliff-Edge scenario, but with an implementation date two years after the SPS agreement, would provide some mitigation of the scale of effects but would still lead to a significant reduction of UK crop production and income. In contrast, following a Managed Alignment approach would mitigate many of the adverse effects seen in the other scenarios.

Contents

1. Introduction

1.1 This Project

The Common Understanding Agreement (CUA) negotiated between the UK and EU in May 2025 envisages the setting up of a Common Sanitary and Phytosanitary (SPS) Area. As part of this, the regulatory regime for Plant Protection Products (PPP) would be aligned.

CropLife UK has instructed The Andersons Centre ('Andersons') to analyse the potential economic impact on the UK farming sector and wider food chain of aligning past decisions made on PPPs. It does not cover impacts arising from the future 'dynamic alignment' of UK and EU regimes. This report presents a summary of the findings of this project.

1.2 Project Approach and Report Structure

This report has primarily been a desk-based exercise, supplemented with interviews with key industry participants within the crop protection sector including farming organisations and agronomists. Chapter 2 provides a summary of the legal and political background to the work and the approach adopted in undertaking the project.

Chapter 3 sets out the Active Substances and products where divergence has occurred and would thus be affected by alignment. In Chapter 4, the effect of the loss of these tools on key crops is estimated. Chapter 5 gathers the data for individual crops together to arrive at the effect on the UK farming industry as a whole. Behind the estimates in Chapter 5 there is a spreadsheet model containing the calculations. Chapter 6 provides some brief commentary on the effects beyond the farming sector.

1.3 About The Andersons Centre

The Andersons Centre (Andersons), is an agribusiness consultancy that is one of four separate businesses trading under the Andersons registered brand. Andersons has been advising UK farmers for over 50 years across all sectors of agriculture. Over the years, the firm has expanded beyond its original farm business consultancy role to supply economic and policy analysis through its Research Team. It is arguably the leading provider of business information, interpretation and advice for the UK agricultural industry. It has delivered numerous studies on farming, food, the environment and rural economy for a wide variety of organisations over the past decade. It also owns The Agricultural Budgeting and Costing Book and the Nix Farm Management Pocketbook. The Andersons Centre is headquartered in Melton Mowbray, Leicestershire and also has offices in Wales (Brecon) and Yorkshire (Harrogate). More details can be found at www.theandersonscentre.co.uk.

1.4 Definitions

Within this report the chemical that provides protection to the plant is referred to as a 'Pesticide' or alternatively the 'Active Substance'. Whilst not used in this report, an alternative term often used is 'Active Ingredient'. Where the term 'Active' is used, this refers to an Active Substance.

A Plant Protection Product (PPP) is the formulated product presented to the market and used in agriculture and horticulture. It may be made up of one or more active substances and also includes the packaging and labelling. 'Product' is used interchangeably with PPP.

'Pests' is used to mean all weeds, insects and diseases that negatively impact food production.

The terms 'insect' is also used generically to refer to all aphids, moths, flies, midges, and all arthropod pests including mites, centipedes etc.

Great Britain (also abbreviated to GB) is England, Wales and Scotland and is the part of the United Kingdom (UK) fully outside of the EU Single Market. GB does not include Northern Ireland (NI) which, as a result of the Windsor Agreement remains *de-facto* within the Single Market for goods and is subject to EU rules (this is a slight simplification in terms of PPPs[1] – but suffices for this report). Where the UK is referred to, this includes Great Britain and Northern Ireland.

2. Background and Approach

2.1 Plant Protection Product (PPP) Regulation

Since the UK formally left the EU Single Market and Customs Union in 2020, the UK has been managing its own Plant Protection Product (PPP) regulatory regime. At the start of this period, GB and the EU were completely aligned as the UK was a full Member State and followed EU processes. However, there has been divergence over the past 5-6 years as GB and the EU have made different decisions based on their specific circumstances.

To add further complication, NI follows EU substance approvals but must obtain a product authorisation from the UK regulator.

It should be made clear that the overall legal, scientific, and technical basis for approving Active Substances has ***not*** diverged. GB has effectively continued the same approvals system as used in the EU when it left the Single Market. It assimilated EU law with only very minor changes (e.g. to remove references to 'Member States', 'the EU Commission').

The GB domestic approvals system has neither been 'weakened' nor 'strengthened' compared to Europe – it is still fundamentally the same *system*. What has altered is how the system has operated. Some approvals have moved faster in the GB than the EU, and vice versa. Also, there has not been a renewals system in GB, whilst the EU has operated one – albeit with many delays. This has led to a divergence in which Active Substances are permitted in both jurisdictions – and also on their rules for use.

Beyond the approval of Active Substances. there have also been changes in Maximum Residue Levels (MRLs) that are allowed, both in GB and EU, generating further differences between the rules in each region.

Having a well-ordered process for bringing the two equivalent regimes into alignment is necessary to provide certainty and clarity to the sector. Many of the Actives that could be lost are the most modern ones. It is a 'quirk' of bureaucracy and process rather than an issue of safety that could see them lost to UK farmers.

2.2 Common Understanding Agreement and Dynamic Alignment

In May 2025, a Common Understanding Agreement (CUA) was reached between the UK Government and the EU setting out the broad parameters for a deal on a range of issues including a new Sanitary and Phyto-Sanitary (SPS) Agreement that would see a 'common' SPS area covering both the EU and UK (GB). Negotiations for an SPS Agreement are now formally underway. It has been indicated by the UK Government that the aim is to have an SPS agreement in operation by 2027[2]. *Reports have suggested a June 2027 date is being targeted and this is the timescale being used in this study.*

The proposal for an SPS Agreement envisages delivery of a less stringent border model in exchange for the UK following EU agri-food 'rules', including PPP regulation. There would be a single 'rule book' for both the EU and UK – effectively the EU rules. This would require 'Dynamic Alignment', whereby the UK (GB) adopts EU decisions on PPPs as they evolve. As an example, if the EU approved a new Active, it would automatically also be approved in the UK. Similarly, if an Active lost approval in the EU it would no longer be available in the UK.

Whilst this principle is enshrined in the CUA, there is a clear issue of how to deal with the divergence in PPP decisions *that has already occurred*. For the purposes of this report this will be referred to as '**Retrospective Alignment**'. This is to distinguish it from Dynamic Alignment which is taken to refer to new decisions taken ***after*** any SPS agreement comes into effect.

There is a question, left unanswered in the CUA, about whether, and how, this historical divergence of decisions will be addressed. This means that retrospective alignment could operate in a number of different ways. CropLife UK is seeking to understand the impact different scenarios could have on the availability of Plant Protection Products, and how any potential changes in availability could impact the income and profitability of the agricultural sector and UK food security.

2.3 Alignment Options

There are a number of ways that Retrospective Alignment could be applied in practice;

- ***Immediate Cliff-Edge***: at the point the SPS agreement comes into force, GB immediately aligns with EU rules and retrospective decisions. This scenario assumes that all EU active substance and MRL decisions taken since EU would immediately override all equivalent GB decisions taken in the same period. This *immediate alignment* would create a cliff-edge for the British Agri-food sector.
- ***Cliff Edge with Delay:*** the same assumptions as the Immediate Cliff-Edge scenario apply, but implemented 2 years after the SPS agreement enters into force.
- ***Managed Alignment:*** existing Active Substance (and Usage/MRL) decisions would remain valid until due for renewal under the new GB/EU single regulatory regime. At this point, a decision harmonising the GB & EU positions would apply. Where substances have been non-renewed in the EU post-Brexit, the UK regulator would need to consider whether the same decision should apply in GB when considering GB conditions and usage.

Under all three scenarios it is assumed that 'Dynamic Alignment' would apply to any *new* changes to PPP rules following the commencement of the SPS agreement - i.e. GB would incorporate all future changes to PPP decisions made by the EU.

For the purposes of modelling, the focus has been on the Immediate Cliff-Edge alignment scenario, as this would have the maximum (negative) effect on the farming sector. The other scenarios are considered as ways to mitigate the potential downside.

2.4 Approach and Methodology

This report is based on the best available information. Where possible, the data is based on publicly-available, referenced, information. A number of assumptions have had to be made in quantifying the impact of the loss of Active Substances and Products. These are clearly stated and have been cross-checked to ensure a robust result. Although the research is comprehensive and detailed, the aim is to summarise it in a number of 'high-level' figures that will provide an overview of the likely effects.

The project has been undertaken primarily as a desk-based research exercise. It has gathered quantitative data about UK agriculture from a number of sources and analysed these to arrive at conclusions. This has been supplemented with interviews with a number of key individuals within the crop protection and farming industries.

3. Threatened Actives and Uses

3.1 Overview

The key date for assessing PPP availability is June 2027. As set out earlier, this is based on indications from the Government that they wish to see the SPS Agreement in place by 2027

The effects of GB aligning with past EU decisions relating to PPPs fall into four broad categories;

- New Actives approved in GB but not (yet) approved in the EU
- Existing Actives that are no longer approved in the EU but where approvals have been extended in GB
- Actives, or Products, where Usage Rules have diverged between GB and the EU
- Actives, or Products, where Maximum Residue Level (MRL) s have diverged between GB and the EU

These are dealt with in the sections that follow.

There are also two further categories. One is Actives that may not be renewed in the EU in the near future – i.e. before the June 2027 date when the SPS agreement is due to come into force, but may continue to be approved in GB. The other is applications for new Actives that are within the GB approvals process that may be approved prior to June 2027 and before they are approved in the EU.

Effectively, this is additional divergence that may happen in the next 18 months. This is discussed at the end of this Chapter.

3.2 Access to Additional EU Actives

There are some Actives that have been approved by the EU, but not yet approved in GB. These new EU Actives are all bio-pesticides, low risk or basic substances. The EU has not approved any new synthetic-based Actives since 2020.

Within this Interim Update the effects on crop production of having access to these extra Actives under a single regulatory regime have not been included within the project analysis. Based on their representative uses we consider these actives are either non-relevant (used for crops not grown in the UK) or relatively small or niche in terms of UK crop production.

3.3 New Approvals in GB: Not Approved in EU

Figure 1 sets out four new Active Substances that have been approved by the HSE for use in GB since Brexit. The date when the Active gained GB approval, and when this is scheduled to expire (i.e. when it will require re-approval) are listed. Also provided is the category of pesticide and its main uses in GB (UK) farming.

It seems unlikely that all of these four actives will be approved at EU level within the timeframe being looked at in the report.

Figure 1: New GB Actives – Not Approved in EU

Active Substance	GB Approved	GB Expiry	Category	Use
Bixlozone (Isoflex)	14-Jun-24	13-Jun-31	Herbicide	Grassweed control in cereals. Minor use but increasing
Cinmethylin (Luximo)	07-Jun-22	06-Jun-32	Herbicide	Major use for grassweeds in cereals, important for resistance
Isoflucypram (Iblon)	04-Oct-23	03-Oct-30	Fungicide	Major cereals fungicide
Pydiflumetofen (Adepidyn)	03-Apr-24	02-Apr-31	Fungicide	Major use in cereals

Source: HSE

As mentioned in section 3.1, other new Actives will be in the GB approvals process and may be authorised before the SPS agreement comes into force – adding to the divergence. But companies will face difficulties on deciding whether to continue investment in both GB Active Substance and Product dossiers due to uncertainty over the process of Retrospective Alignment with EU.

3.4 No Longer Approved in EU: Still Approved in GB

Figure 2 sets out fourteen Active Substances that are no longer approved in the EU, but retain an approval in GB. The date when the Active's approval at EU level expired is listed as well as when expiry is due in GB. Also provided in the table is the category of pesticide and its main uses in GB (UK) farming.

Note that GB expiry dates are correct at the time of writing, but they have been routinely extended under administrative processes so these dates may well not be when the active approval actually ends in GB. Furthermore, it is possible that the Active could be re-approved for use in GB when its current approval expires.

The dates set out in Figure 2 are the 'official' dates of re-approval as set out in legislation. If any Actives are not re-approved then there is usually a period for 'sell-out and use-up' of Products containing the Active. Thus, the actual dates that growers can no longer use PPPs containing the Active (and the dates they may recognise as being key), may be later than those shown in the table. Under the Retrospective Alignment scenarios, the sell-out and use-up provisions are unknown.

Figure 2: Actives No Longer Approved in EU – Still Approved in GB

Active Substance	EU Expiry	GB Expiry	Category	Use
Bacillus firmus strain I-1582	30-Sep-23	30-Sep-26	Insecticide (Bio)	Minor use nematicide seed treatment.
Benthiavalicarb	13-Dec-23	31-Jul-27	Fungicide	Potato blight. Important for resistance management
Clofentezine	11-Nov-23	31-Dec-27	Insecticide	Pome fruits (apples and pears), acaricide – alternatives available
Dimethomorph	20-May-24	31-Jul-27	Fungicide	Potatoes, leafy salads and berry crops
Dimoxystrobin	31-Jul-23	31-Jan-28	Fungicide	Cereals and oilseed rape. Important for resistance management
Flufenacet	10-Jun-25	31-Oct-27	Herbicide	Major active for blackgrass in cereals. Important for resistance management
Ipconazole	31-May-23	31-Dec-27	Fungicide	Cereals seed treatment
Mepanipyrim	20-May-24	30-Apr-29	Fungicide	Minor product for berries
Metribuzin	24-Nov-24	31-Jul-28	Herbicide	Major use in potatoes (few alternatives), Significant cereals use
Penthiopyrad	31-Oct-25	31-May-31	Fungicide	Cereals and pome fruits. Alternatives available
Prochloraz	13-Dec-21	31-Dec-26	Fungicide	Major active in cereals. Alternatives available
S-metolachlor	22-Jan-24	31-Jul-28	Herbicide	Maize
Spirotetramat	30-Apr-24	31-Jul-29	Insecticide	Major product on potatoes, field veg, berries, pome fruit etc.
Triflusulfuron-methyl	20-Nov-23	31-Dec-28	Herbicide	Major active for sugar and fodder beet. Alternatives available.

Source: HSE / EU Commission

There is also Isopyrazam, but this is due to expire in GB on 31st March 2026 and is not being supported for re-approval. Therefore, it is not being considered.

3.5 Changes in Usage Rules in EU versus GB

There are 30 Actives that have been renewed in the EU since Brexit that also currently hold GB approval . When Actives are reapproved, the 'conditions of use' are often amended. A number of the 30 Actives are low risk/biopesticide/pheromones so they are unlikely to have significant changes. In addition, they are more relevant to minor crops, organic or smaller growers so not generally in the scope of the crops being considered in this report.

The Actives that are therefore of most interest are; Aluminium ammonium sulphate, Bifenazate, Captan, Clopyralid, Cyazofamid, Cypermethrin, Ethephon, Etoxazole, Flumioxazin, Folpet, Garlic extract, Glyphosate, Lenacil, Mepiquat, Metconazole, Metrafenone, Potassium hydrogen carbonate and Trinexapac.

It is often difficult to assess whether there has been a material change in the Usage rules during re-approval. CropLife UK has identified five Actives that are believed to be of the most importance. These are set out in Figure 3 below.

Figure 3: EU Usage Changes

Active Substance	EU Expiry	Category	Changes and Possible Effects on GB
Bifenazate	30-Jun-37	Insecticide	EU use restricted to non-edible crops in greenhouses. Existing GB use on protected strawberries would not be allowed
Captan	30-Oct-39	Fungicide	Main use in orchards. EU use restricted to when crop and weeds are not flowering. Precision application required. GB practices would need to alter
Cyazofamid	31-Jul-36	Fungicide	Used in potatoes, tomatoes, and other fruit. Acceptable Operator Exposure Level has been reduced at EU level
Etoxazole	31-Jan-28	Insecticide	Current GB use on protected tomatoes and aubergine would not be allowed
Glyphosate	15-Dec-33	Herbicide	New EU limit of 1.44kg of glyphosate per Ha per year, plus restriction on use for pre-harvest desiccation. Pre-harvest desiccation use still allowed in GB

Source: CropLife UK

3.6 MRL Changes

In addition to PPP Approvals and Usage rules, there is the issue of Maximum Residue Levels (MRL).

An MRL is the maximum concentration of a pesticide residue in or on food or feed of plant and animal origin that is legally tolerated when a plant protection product (PPP) is applied correctly following good agricultural practice (GAP)[3].

They can affect the use of Active Substances through how much of the product can be detected when the crop is marketed.

Divergence in MRLs have a particular impact in high-value horticulture crops where the crop is presented to consumers with minimal intermediate processing.

Divergence on MRLs can happen in two ways – either the EU changes an MRL, or GB does. Since the UK left the EU, the UK Government has revised some MRLs to align with the global '*Codex Alimentarius*' in order to facilitate international trade or facilitate a specific national use. In some cases this has moved them away from the EU MRL. Often the same submissions have been made to the EU, but the evaluation process is slower in the EU (both regimes conduct a risk assessment as part of this process). Approximately one third of the MRL differences between the EU and GB are that the GB MRL is lower than the EU MRL. In these cases alignment of the GB MRL to the higher EU MRL would facilitate import of produce from the EU.

The EU uses MRLs as trade barrier – for example, if the approval for an Active expires in the EU, then the MRL usually defaults to the 'Limit of Determination' (LOD). This is the lowest detectable amount of the chemical. This effectively means the Active is also not available to those producers exporting into the EU. If the Active remains approved in GB, then it is likely to have specific (higher) MRL set – because it has undergone a scientific risk assessment in line with WTO rules.

Extension of Authorisation for Minor Use (EAMU), allows extra uses for a PPP not on its main label, often for 'minor' crops (i.e. those where only small areas are grown in the UK). These EAMU with GB-specific MRLs are often the only PPP options available for pest control on minor crops.

Since 2021, it appears that 70+ Actives have had their MRLs changed in the EU. Over the same timeframe, there have been over 100 changes to MRLs in GB (some covering multiple Actives). For each Active, MRLs are set for every relevant crop. Therefore, this number of Active MRL changes will have generated 1,000s of divergences of individual crop/Active MRLs combinations.

Some of the GB MRL changes relate to imported products from outside the EU, so will have no impact on GB agriculture so fall outside the scope of this report. However, they do have an effect on food supply chains and food security.

There is no easy way to make direct comparisons between MRLs in the EU and GB as they are not included in compatible databases for easy analysis. Indeed, businesses operating in the fresh produce sector employ specialist companies[4] to monitor the rules around MRLs because it is so complex.

For the purposes of this project, a general 'overview' of the effects of Retrospective Alignment on MRL rules has been used, rather than a detailed analysis on the crop-by-crop basis. These can be summarised as follows;

GB rules;

Fungicides: Notable divergence hotspots for brassica vegetables, leafy veg and herbs, as well as berries and small fruit.

Insecticides: Significant divergence across most UK fruit - pome (e.g. apples & pears), stone, berries, etc. and leafy vegetables.

Herbicides: No major divergence identified.

These findings will be included within the overall analysis of yield (and quality) losses in the following Chapter.

One final point relates to crop storage. This could be an issue in sectors such as potatoes, onions or apples where fresh produce may not immediately be presented to the market. They will be further examples where crops are frozen for later sale. A crop could be grown under the rules prevailing at that time. It may then be put in store and Retrospective Alignment see MRLs change whilst it is being stored. The crop could become unsalable under the new rules.

3.7 Future Divergence

Until an SPS agreement is agreed and implemented, then divergence between the EU and GB PPP authorisations systems can continue. With an SPS agreement in negotiation, there is perhaps less likelihood that companies will put Actives forward for approval only in GB. There may be less effort to change MRL standards from the GB perspective too. However, the EU will continue its re-approval process – with no requirement to consider a future UK-EU SPS agreement.

Looking at the EU Actives Database there are currently 180+ Actives that have expiry dates between the end of 2025 and when the SPS agreement may come into force in 2027. The latest renewals programme

is set out in the EU 'AIR 6' document, but previous AIR programmes have seen long delays and many Actives in the earlier AIR groups have been granted routine extensions to their expiry dates.

The renewals process is both scientific and, within the EU, political. It is difficult to say with any certainty whether an Active will be renewed. Whilst the proceedings of the Standing Committee on Plants, Animals, Food and Feed (SCoPAFF) meetings can provide guidance, final votes can sometimes depart from earlier indications. It is also a large task to 'read the runes' for almost 200 actives. Therefore, any future divergence has not been included in this analysis.

However, it should be noted that there will be more divergence over the next 18 months, which could increase the effect of an Immediate Cliff Edge Retrospective Alignment on GB farmers.

One final point is the recent publication of the EU's 'Omnibus' Food and Feed Safety Package[5]. This legislative proposal would include a simplification of the approvals process for PPPs. This would appear to be positive for the farming industry. However, it is not known how long the new measures will take to be put in place and any change in the regulatory system brings uncertainty. Although the new system is designed to be simpler and quicker there is no guarantee that this will actually be the case once it has gone through the legislative process.

4. Effects of Losses

4.1 Key Effects

This section discusses some of the main on-farm effects of the potential losses outlined in the previous chapter. Note that it does not attempt to cover every Active, every crop and all pests and diseases. Instead it looks at some of the key issues.

4.1.1 Weeds in Combinable Crops

Grassweeds are a major pest within UK combinable crops, especially cereals as grasses and cereal crops are genetically similar. The two largest problems are with Blackgrass and Ryegrass. In general, the former is more of a problem in the East, whilst the latter is a bigger issue in the West, although problems can occur nationwide.

An indication of the size of the issue comes from a recent report from Rothamsted Research[6]. This estimated that the UK is currently losing 0.82 million tonnes in wheat yield each year (equivalent to roughly 5% of the UK's domestic wheat consumption) due to herbicide resistant Blackgrass. The cost of this is £380 million per annum. The report goes on to estimate that, if all fields were subject to a high proportion of resistant Blackgrass this could result in an annual cost of £1 billion, with a wheat yield loss of 3.4 million tonnes per year.

The current effect of resistant Blackgrass will already be included within the aggregate UK figures. The scenario of all fields having resistant populations is clearly 'worst-case' but it does provide a useful reference point for this study.

Cinmethylin (Luximo) has rapidly become a highly important herbicide in UK cereal crops for control of resistant blackgrass populations. In addition, Flufenacet remains a mainstay of treatment programmes and Metribuzin is also widely used. Lack of good control options had seen autumn cereals plantings move later to enable better grassweed control (especially Blackgrass). An ADAS publication[7] suggests that a yield reduction of 0.2 t per Ha per week when drilling is delayed from late September up to late November. Conversations with agronomists suggest that drilling dates have drifted back a month on average over the past decade, but better control options (notably Cinmethylin) have allowed half of this to be regained in more recent times.

There would be significant yield effects in both winter wheat and barley should Retrospective Alignment result in the Actives listed in Chapter 4 being lost. The effect on oats would be less noticeable as there are fewer grassweed issues – the crop is more competitive.

In general, the weed control options in break crops such as oilseed rape and pulses are wider and, therefore, a lower yield effect would be expected under Retrospective Alignment.

4.1.2 Fungal Disease in Combinable Crops

The two Actives Pydiflumetofen and Isoflucypram have seen strong take-up in cereals (notably wheat and barley). In wheat the main disease risk is *Septoria Tritici* (especially in the wetter South and West). Losses of 50% may occur in severely affected crops[8], but current PPP programmes currently limit losses to a much lower level. In wheat, other diseases such as Fusarium are important. There are currently alternative Actives that would prevent a complete breakdown but resistance-development is an ever-present danger, hence the need for new Active substances/modes of actions, often in combination with older Actives to extend effective life-span.

In barley, Mildews, Net Blotch and Rynchosporium are key diseases. However as with wheat there are options available beyond those Actives under threat through Retrospective Alignment. However, Pydiflumetofen is the only Active that gives effective control of Ramularia[9]. This Active has allowed a general uplift in (Winter) Barley yields – raising the baseline of average yields.

4.1.3 Desiccation in Combinable Crops

This is an issue of Usage Rules (see section 3.5). Due to its damp maritime climate, the UK makes greater use of pre-harvest desiccants than many countries in Continental Europe. This is to ensure the crop is all at the same stage of ripeness and can be easily harvested. The key crop here is oilseed rape. However, further north in the UK, in a difficult season, then other combinable crops may also be desiccated using Glyphosate. With Immediate Restrospective Alignment of decisions desiccation would be lost as the EU renewal of glyphosate (which did not consider GB uses) removed this use.

It has been assumed that the yield effects on crops from the loss of this use would be relatively small. Instead, it is the operation of the farm that is affected. This has been accounted for in the model through changes such as reduced crop areas or increased fuel use (for drying crops).

4.1.4 Weeds in Maize (and Sweetcorn) and Beet Crops

S-metolachlor is the 'go-to' herbicide in maize crops. Whilst alternatives do exist they are more expensive and tend not to be as effective. Overall, the loss of this Active to GB growers is estimated to result in a small yield loss.

In a similar way, Triflusulfuron-methyl is a key Active to control weeds in beet crops – mainly sugar beet but also fodder beet. Again, alternatives do exist, but there would be an effect from its loss.

4.1.5 Weeds in Vegetables and Roots

The two 'new' herbicides, Bixlozone and Cinmethylin have not yet been widely deployed in the roots and vegetable sectors crops as they have been targeted at the (far larger) combinable crop market. However, vegetable growers and agronomists see good potential in these Actives and were looking forward to adding them to their portfolio. This is particularly the case with potato growers, who may lose access to Metribuzin soon which is a very important Active in this crop. They are looking for alternative options for both grassweed and broadleaved weed control. Metribuzin is also important in other 'minor' root crops such as parsnips.

4.1.6 Fungal Disease in Vegetables and Roots

An important issue is here is the control of blight in potatoes – this crop being the most important vegetable crop grown in the UK by volume and value. Benthiavalicarb is theoretically still available to GB growers but it is difficult to source supplies of the Active as the manufacturing capacity has been removed due to its expiry in the EU. Dimethomorph is also used on potatoes – primarily earlies. Cyazofamid (e.g. Ranman Top) is a widely used and well understood Active. Although still available in the EU its Usage rules have changed. GB growers would have to adopt these if Retrospective Alignment occurred.

4.1.7 Insect Damage in Vegetable and Fruit Crops

The main threat here is from the loss of Spirotetramat (e.g. Movento). This insecticide is effective on a wide range of pests but is particularly important in controlling aphids. It is often the diseases spread by the insects (e.g. virus yellows) that can compromise crop yields. In the fresh produce sector, blemished or damaged crops can mean reduced marketable yields – i.e. that part of the crop that meets retailer standards.

Spirotetramat has strong persistency in most crops meaning they remain protected without repeated applications. There is no direct replacement.

Whilst not used widely, the change in Usage rules around Bifenazate would also restrict another option for insect control.

Many EAMU authorisations for high value horticultural crops (e.g. soft fruit) are likely to be lost in GB with the alignment of MRLs.

4.1.8 Resistance

Although not specifically mentioned in all of the analyses above, the topic of resistance management is highly relevant. Having a wide range of Actives, with different modes of action means a pest can be controlled from a 'variety of angles'. Past experience has shown that relying on a single Active for control often sees natural selection operate to see a pest or disease swiftly develop resistance – and consequently, control can be quickly lost. Swapping between different Actives, or using them in combination can significantly reduce this threat. Therefore, reducing the 'toolkit' available to farmers is highly likely to cause additional losses in the future. These 'potential' losses are not modelled in this report because the spread of future resistance is unknown. However, it is a real danger to the cropping sector.

4.1.9 Replacements

One final point to make is that, in the past, there has usually been a progression of Actives. For example the herbicide Isoproturon (IPU) was phased-out in 2009, but there was a replacement product that did a similar (or better) job in the form of Flufenacet. For many of the Actives that may be lost to UK farmers due to Retrospective Alignment there is no replacement coming through. In many cases what is being lost ***is*** the replacement – the most recently authorised product available. As was mentioned in section 2.1, the loss is not an issue of safety, but is being driven by bureaucratic process.

4.2 Summary of Effects

Figure 4 below summarises the assumptions used in the model as regards the effects on the crops being modelled. A range is provided as there is a high degree of uncertainty around the cumulative effects of the potential loss of PPPs (or change in usage rules).

The effects are the estimated *average* effects in an average crop year. It should be noted that, in a year with high pest or disease pressure, or in particular areas, then the loss of certain Actives could have potentially far greater effects – to the extent that an entire crop may be lost.

The yield changes shown are the 'first year' effects from the immediate implementation of Retrospective Alignment. This is effectively the 'worst-case' scenario as outlined earlier. Given the proposed SPS agreement implementation date, they might be taken to be the effect on the 2027/28 cropping year (harvest 2028), but they have not been related to a specific crop year – simply a change from the baseline.

Thereafter, the effects will alter as the divergence between the EU and GB alters. This is discussed in greater detail at the end of Chapter 5.

Figure 4: Potential Effects on Key Crops of Dynamic Alignment

Crop	Commentary	Modelled Yield Changes*
Winter Wheat	Major issue is grassweed control (especially blackgrass and ryegrass). Resistance management would become more difficult. Also loss of fungicides, mainly for septoria.	4-9% yield loss
Winter Barley	Similar grassweed issues to Winter Wheat. Fungicide loss to affect control of rusts, mildew etc.	4-9% yield loss
Spring Barley	Lower effect than winter crops due to lower pest pressure in spring crops.	1-4% yield loss
Oats (W & Spring)	Grassweed issues as with wheat/barley above. Lessor effect as oats more competitive with weeds and less susceptible to disease.	1-3% yield loss
Oilseed Rape	Some losses due to less fungicide availability but limited effect on OSR. Loss of pre-harvest desiccation option from glyphosate to affect harvested yields	2-4% yield loss
Beans and Peas	Limited effect on pulses from identified PPP loss	0-2% yield loss
Maize	Loss of S-metolachlor an issue for weed control.	2-4% yield loss
Potatoes	Key herbicides, fungicides and insecticides all potentially lost. Significant effect on yields estimated.	7-10% yield loss~
Sugar Beet	Loss of herbicide Triflusulfuron-methyl would be significant	2-4% yield loss
Carrots	Some effect from loss of insecticides.	1-3% yield loss~
Onions	Similar to carrots	1-3% yield loss~
Brassicas	Some loss of insecticide options. MRL changes on fungicides also an issue.	3-7% yield loss#
Apples	A reduction in the fungicide and insecticide control options available likely to result in some yield (and quality) loss. Lower MRLs to have an effect	3-5% yield loss#
Strawberries	Mainly insecticides to be lost, but also some fungicide options. MRL changes.	3-5% yield loss#

Source: The Andersons Centre * in almost all cases there will also be quality effects (i.e. lower prices on average) - these have been included in the modelling. ~ including storage losses # indicates 'marketable yield' – i.e. produce meeting retailer specifications

These estimates have been used within the modelling framework. As set out earlier there will also be quality effects on crops, rotation changes and shifts in farming practices. These have also been modelled. Of all these factors, it is yield and rotation that drive the biggest economic shifts. The rotation changes modelled can be seen in Figure 6 that follows.

5. Economic Impact on Farming

5.1 Economic Results

Figure 5 below summarises the results of the economic modelling. As outlined in section 3.5. this is based on Defra's aggregate agricultural accounts for the UK. A range is provided due to the inherent uncertainty involved in this type of modelling. Commentary on the results is provided below the table.

Figure 5: Summary Financial Effects - £ million

£m	Base (2022-2024 Ave.)	Post-Loss: Low Estimate	Post-Loss: High Estimate
Revenue			
Wheat	3,060	2,819	2,616
Barley	1,441	1,411	1,392
Oats and Other Cereals	196	220	219
Oilseed Rape	565	508	482
Beans and Peas (Combining)	210	208	208
Sugar Beet	312	310	303
Potatoes	1,197	1,133	1,084
Maize and Other Forage Crops	235	253	259
Carrots	203	196	190
Onions	211	204	198
Brassicas	339	317	303
Other Vegetables	1,169	1,169	1,169
Apples	236	220	209
Strawberries and Other Soft Fruit	658	613	576
Other Fruit	162	162	162
Ornamental Crops	1,662	1,662	1,662
All Other Crops	652	657	657
All Livestock Output	19,396	19,396	19,396
Other Farming Income	1,624	1,624	1,624
Diversification	1,934	1,934	1,934
Total Income	**35,462**	**35,016**	**34,642**
Costs (Intermediate Consumption)			
Seeds	949	938	933
Fertilisers	2,003	1,967	1,953
Plant Protection products	1,006	993	979
Energy (including Fuel)	1,883	1,906	1,899
Animal Feed	7,662	7,662	7,662
Machinery Expenses	1,218	1,235	1,230
Contracting Costs	1,624	1,647	1,641
Other 'Intermediate Consumption'	4,767	4,767	4,767
Total Costs	**21,649**	**21,652**	**21,602**
Gross Value Added at Mkt Prices	**13,812**	**13,364**	**13,040**

Figure 5 *cont*.: Summary Financial Effects - £ million

Gross Value Added at Mkt Prices	**13,812**	**13,364**	**13,040**
Other Costs (Overhead Costs)			
Depreciation	5,188	5,228	5,216
Subsidies (less Taxes)	-2,860	-2,860	-2,860
Wages	3,048	3,097	3,097
Rent and Interest	1,175	1,142	1,142
Total Other Costs	**6,551**	**6,608**	6,589
Total Income from Farming (Profit)	**7,261**	**6,756**	**6,451**
Change		drop of **506**	drop of **810**
		-7%	**-11%**

Source: The Andersons Centre

The drop in Gross Value Added (GVA) equates to a fall of between 3% to 6%. The figures for Total Income from Farming (TIFF) are clearly shown in the table, with up to 11% of the profit of the farming and horticultural industry being lost. This could well be an understatement as some large cropping sectors (e.g. ornamentals) have not been included in the analysis.

Some crop categories show income rises. This is because the ***area*** of the crop is rising – offsetting any yield drops. This is a result of changes in cropping patterns brought about by the loss of certain PPPs.

As outlined above, the loss shown is effectively a first-year loss assuming Dynamic Alignment is introduced in the near future. The level of losses would not be the same in year 5 or year 10 of Dynamic Alignment. This is because the differences between GB and EU PPP regulation are continually evolving. For example, in the future, GB may choose not to reapprove an Active that is already not approved in the EU. This brings GB 'closer' to EU rules and effectively reduces the level of loss from Dynamic Alignment. Conversely, the GB could approve many new Actives taking it further away from the EU position. These future changes are, of course, unknowable at present, so cannot be accurately modelled.

5.2 Rotation and Output Changes

The loss of key PPPs is likely to cause a shift in the crops grown in the UK. Some crops will become harder and/or more expensive to grow. As their profitability relative to other crops changes, then farmers will choose to change rotations to maximise profitability. In addition, rotations may alter to aid the control of pests through cultural control – a prime example is a shift to spring cropping to allow weeds to be controlled through the autumn and winter period.

The model assumes the overall farmed area remains the same. In general, winter cropping drops at the expense of spring crops. The area of fallow rises as some land is taken out of production. This will be either the least productive land that is no longer economic to crop, or land taken out of production rotationally to control weeds. The area of temporary grass also rises as this 'crop' is included more regularly in arable rotations to assist with weed control.

Such changes are built into the model and are summarised in Figure 6 below.

Figure 6: Rotation Changes

'000 Ha	Base (2022-2024 Ave.)	Post-Loss: Low Estimate		Post-Loss: High Estimate	
Wheat (all)	1,688	1,598	*-5%*	1,550	*-10%*
Winter Barley	425	382	*-10%*	374	*-12%*
Spring Barley	724	753	*+4%*	775	*+7%*
Oats	175	196	*+12%*	201	*+15%*
Other Cereals	64	77	*+20%*	80	*+25%*
Oilseed Rape	350	328	*-6%*	314	*-10%*
Other Oilseeds	28	32	*+12%*	32	*+12%*
Peas (combining)	69	72	*+4%*	73	*+5%*
Beans	187	198	*+6%*	202	*+8%*
Combinable Cropping Area	3,710	3,636	*-2%*	3,600	*-3%*
Sugar Beet	98	99	*+1%*	100	*+2%*
Potatoes	120	124	*+3%*	125	*+4%*
Maize and Other Forage Crops	243	267	*+10%*	279	*+15%*
Other Field Crops	137	135	*-1%*	135	*-1%*
Carrots	10	10	*0%*	10	*-5%*
Onions	9	9	*0%*	8	*-5%*
Brassicas	22	21	*-4%*	20	*-6%*
All Other Vegetables	63	63	*0%*	63	*0%*
Apples	8	8	*0%*	8	*-2%*
Strawberries and Other Soft Fruit	11	10	*-3%*	10	*-4%*
Other Fruit	13	13	*0%*	13	*0%*
Ornamental Crops	11	11	*0%*	11	*0%*
Total Cropped Area	***4,455***	***4,406***	*-1%*	***4,383***	*-2%*
Fallow and Agri-Env. Scheme Area	400	440	*+10%*	450	*+12%*
Temporary Grass	1,258	1,270	*+1%*	1,280	*+2%*
Permanent Grass	6,033	6,030	*0%*	6,030	*0%*
Rough Grazing	4,910	4,910	*0%*	4,910	*0%*
All Other Land on Farm	1,321	1,321	*0%*	1,321	*0%*
Total Farm Area	**18,377**	**18,377**	*0%*	**18,374**	*0%*

Source: The Andersons Centre

A combination of yield changes (including 'marketable yield) and area shifts results in the overall quantities of UK produce changing. Figure 7 below, summaries the new annual output of the crops modelled against the baseline quantities delivered presently.

Figure 7: Output Changes

'000 tonnes	Base (2022-2024 Ave.)	Post-Loss: Low Estimate		Post-Loss: High Estimate	
Wheat	13,503	12,274	*-9%*	11,283	*-16%*
Barley	7,138	6,862	*-4%*	6,666	*-7%*
Oilseed Rape	1,125	1,032	*-8%*	969	*-14%*
Potatoes	5,119	4,904	*-4%*	4,792	*-6%*
Carrots	764	734	*-4%*	705	*-8%*
Onions	307	295	*-4%*	283	*-8%*
Brassicas	328	306	*-7%*	287	*-12%*
Apples (dessert)	194	188	*-3%*	181	*-7%*
Strawberries and Other Soft Fruit	149	140	*-6%*	136	*-9%*

Source: The Andersons Centre

5.3 Further Consequences

These changes in the financial status and structure of the farming sector will have consequences that are not fully covered in the model. Lower output and profitability is likely to accelerate a restructuring of the farming sector. Farms that are financially weaker or less efficient are likely to cease production with their land taken over by 'better' businesses. Thus, the long-term trend towards fewer, but larger farming enterprises in UK agriculture could well increase. Whether this is a good or bad thing is debatable. It may result in a more streamlined sector, but there may also be social consequences in certain areas with the loss of traditional 'family farms'. Obviously, for any individual farm that is rendered uneconomic by the changes, the effects are massive, and usually traumatic. It is also arguable that larger, 'leaner' businesses might be less willing to spend on landscape maintenance or biodiversity enhancement.

In certain sectors the demand for labour might actually rise. This is especially true in the horticultural sector, where hand-weeding or additional labour for grading may be required. However, the past few years have illustrated the difficulty the horticultural sector has had in attracting workers to undertake these tasks, which tend to be physical and often relatively low paid. Even in the recent recession, when unemployment was high, the sector was forced to rely heavily on migrant labour for this work.

The analysis in this report has assumed that the challenges around availability of labour are unlikely to change. It would be difficult for growers to pay higher wages to attract more workers, particularly as they are under economic pressure from imported produce with fewer restrictions on pesticides use. Once the UK is part of a common SPS, there will also be greater competition from EU growers subsidised by the CAP. Therefore, it has been assumed that a lower area of horticultural crops would be grown, partly as a result of there not being the labour to satisfy the new labour-intensive production systems.

Overall, it is likely that employment in agriculture will fall as a result of the loss of PPPs affecting both profitability and area of crop grown.

5.4 Other Scenarios and Mitigation

The losses outlined above are the first-year annual losses under the worst-case scenario where GB immediately aligns with existing EU PPP decisions. In section 2.3 two alternative scenarios were set out. These reduce the level of economic loss and are discussed below.

5.4.1 Cliff-Edge with Delay

Under this scenario, Dynamic Alignment would apply from point of agreement, but with a phase-out of separate GB Substance & MRL lists within limited timeframe. It has been suggested that a period of two years might be politically acceptable to both sides in the negotiations.

A delay provides the GB farming sector with a short period of time during which it can plan and adjust for the changes in PPP availability as a result of Retrospective Alignment. For example, it would allow time for rotations and practices to be changed. However, it should be noted that crop production is a long-term undertaking and two years is a relatively short timescale. For example, crops such as roots and vegetables are grown in long rotations of 5-8 years with other arable crops. Investment in machinery and equipment is undertaken on the basis of working lives of multiple years.

It may also be the case the some of the 'new' Actives will be approved by the EU in the additional time given by the phase-out. This would effectively decrease divergence and reduce the level of economic loss

This scenario postpones the economic effects of an Immediate Cliff-Edge Dynamic Alignment, but only for the duration of the delay. Thus, the losses of £500m-£810m identified in section 5.1 will be mitigated for two years. After that point, a similar level of impact would then be seen. The economic effect would be smaller if the Actives approved in the GB and EU have converged in that time.

5.4.2 Managed Alignment

Under this scenario, Dynamic Alignment would apply from the point of an SPS agreement, but there would be a gradual phase-out of separate GB Substance & MRL lists – i.e. a Substance would remain approved under GB rules until it was assessed under EU processes, at which point a common decision would apply. This can be considered the Retrospective Alignment option that provides the most effective mitigation.

This approach would minimise immediate losses. Indeed, in the early years of the SPS agreement there would be little or no change from the current situation in GB – all the Actives currently available to British Farmers would remain so. Thus, the first-year losses identified in section 6.1 would be almost totally mitigated.

Over time, as the EU assessed the Actives currently only authorised in GB, then regulation would converge. As the EU and GB operate the same PPP regulatory systems, any Active already approved in GB should gain approval in the EU when it assessed. This would mean the 'first-year' economic losses of around £500m-£810m would gradually taper off – in future years there would be less divergence and, therefore, lower losses.

However, this simply looks at losses generated from the current situation. There would also be potential future additional losses under this scenario. These will be generated from two broad areas;

- The EU may decide not to renew the approval of Actives that would have continued to be approved in GB. Likewise, Usage Rules and MRLs may be set differently to those the GB regulator would have done.
- New Actives that would have been approved in GB (perhaps specifically tailored to GB circumstances) may not be approved at EU level.

These potential future losses cannot be quantified because future approval decisions are unknowable – they should be acknowledged by policy-makers however.

Whilst the CUA is not explicit on the point, some in the agrifood sector fear that, under the new regime, the UK will have no say in decisions on PPP regulation at an EU level. Although it may have 'observer' status at meetings, the UK will not be able to vote, making the UK subject to a regulatory regime for PPPs over which it has no say. The specific needs and circumstances of UK farming are unlikely to be at the forefront of EU rule-makers' minds. The UK will need to focus on building influence and alliances with other EU Member States (e.g. Ireland) that are likely to face similar challenges.

6. Wider Effects

6.1 Wider Economic Effects

The preceding Chapter looked at the economic effects on the farming sector. However, any potential change in PPP availability will impact other areas of Great Britain as well.

Firstly, farming provides the feedstock for the wider food chain. Figure 8 below sets out the relative contributions of the food chain sectors to both Gross Value Added (GVA) and employment. The table does not include the Agricultural Supply Industry (those selling products and services to farmers).

Figure 8: The UK Food Chain - 2023

Sector	Gross Value Added (GVA) - bn	% of Total UK GVA	Employment* - million
Agriculture (exc. Fishing)	£13.7	0.55%	0.402
Food and Drink Manufacturing	£37.1	1.49%	0.447
Food and Drink Wholesaling	£16.9	0.68%	0.207
Food and Drink Retailing	£40.2	1.61%	1.078
Non-Residential Catering	£45.2	1.86%	2.019
	£153.2	**6.2%**	**4.153**

Source: Defra * 2024

The starting point is that it is assumed that the UK population will not consume any less food and will continue to consume it in the same way i.e. the balance between food consumed inside and outside the home will remain broadly constant. (This balance may well change if food became more expensive – recessions tend to result in a decline in eating-out due to economic pressures.) With the same amount of food being consumed, the effect on retailers and caterers is likely to be negligible. Food wholesalers will also be largely unaffected as they would amend their supply chains to source more imported products at the expense of home-produced food.

The key sectors affected would be Food and Drink Manufacturers, Agricultural Wholesalers and the Agricultural Supply Industry. In addition, the Distribution sector, which links all these together, would also see losses.

Taking these in turn, the effect on Food and Drink Manufacturers would have the largest economic effect. It can be seen that the GVA of this sector is around three times larger than farming, thus any changes will have a more significant impact.

Food processors and manufacturers tend to base themselves near to their supply of raw materials. This is because the unprocessed product (for example wheat, milk, etc.) tends to be bulky, whilst the processed product such as bread and cheese is less so. As a result, transport costs are minimised. Traceability and provenance are also reasons why manufacturers like to be close to, and have a relationship with, their primary suppliers. Often, in marketing and branding terms, having the raw material sourced from a specific location is part of the appeal (e.g. Scotch Whisky). In some cases, these geographical links are enforced legally through the system of labelling food products.

Figure 7 above set out how the output of key commodities from the UK could change. It is unlikely that food manufacturing will decline by a similar percentage to the fall in raw material availability. This is because;

- The change in PPP availability mainly affects crop production. The effect on livestock production would be less marked (although feed prices would rise). As much food manufacturing (at least half) is involved with the processing of livestock products, the loss of PPPs would be minimal on this sector.
- Food processors and manufacturers have a considerable amount of 'sunk costs' in their current plants and factories. Although they favour domestic sourcing, it is likely that they would import raw materials to keep these facilities operating at economic throughputs. Therefore, it is unlikely that there would be an immediate 'offshoring' of a large element of UK food production. Instead, when new investment was being made, it would be far more likely to be made outside of the UK. Therefore, there would be a gradual decline over a period of time in the manufacturing sector.
- Although the raw material losses are higher in the fresh produce sector, the amount of processing tends to be less.

For all these reasons it is considered that, in the medium term (once 'offshoring had taken place), the loss of GVA in the food and drink manufacturing sector could be in the region of 2%. This would equate to an economic loss of £740m. If the workforce showed the same level of change, this would see almost 9,000 jobs lost. There would be knock-on effects on the Food Supply Industry (machinery and equipment for Food Manufacturers and Processors), but this is difficult to quantify.

As a group, Agricultural Wholesalers both sell products (inputs) to farms and also buy and trade their produce. This dual role exposes them to reductions in the size of the primary agricultural industry. In terms of inputs, the model demonstrates that, although values of seeds, fertiliser, plant protection products and fuel will fall, the drop is not dramatic.

More dramatic changes will result from the output side. The Wholesalers are involved in the trading of combinable crops and other crops. As the volumes of grain available from UK farms drops then the amount of business to be undertaken declines.

The Agricultural Supply Industry is defined as manufacturers of products (and providers of services) for use in agriculture. Products include machinery, equipment, fertilisers and pesticides. It has been demonstrated that the total amount of agricultural activity in the UK will only drop slightly as a result of Retrospective Alignment. Indeed with more cultivations, the demand for farm equipment and machinery may actually increase.

Finally, it should be remembered that the 'lost' output from UK agriculture illustrated in Figure 5 is assumed to be replaced by greater imports. The UK already runs a substantial trade deficit in foodstuffs. The UK balance of payments would worsen following Retrospective Alignment.

6.2 Other Effects

Some other likely effects are worth noting;

- ***Food Availability:*** there is a general presumption that any loss of UK output will be replaced by imports from other regions around the world. The UK consumer is relatively wealthy in global terms, so could 'outbid' other buyers for the food we demand. Whilst this is fine for the UK, it does not help food availability in other parts of the world. The assumption of 'always-available' supply may also be tested by global climate change and geopolitics.
- ***Food Prices:*** the UK is a relatively small producer in global terms in most agricultural commodities. Therefore, changes in UK yields and output will not, generally, move commodity prices. However, they may be local effects – for example if UK pricing moves from 'export parity' to 'import parity' as

a result of reduced output. In the more specialised fruit and vegetable sectors there is not always the same 'commodity market' with freely-available supply. Over time, supply chains would probably adjust so that more product was imported. However, there may well be short-term price and availability issues.

- ***Resilience:*** the concept of food security is much-debated. In many cases it is conflated with self-sufficiency - i.e. if we produce what we consume on these islands, then our food security is ensured. In a modern, open trading economy this perhaps does not make much sense. It is no more vital that the UK has high self-sufficiency in food than, for example, the Isle of Wight does. However, in an increasingly volatile world, it seems sensible to source a relatively high proportion of food from our own land. This makes the UK more resilient to shocks to the global supply chain. A reduction in PPP availability makes it more likely that the UK will import a higher percentage of its food materials.
- ***Environment:*** there could also be an environmental impact. Importing food from distant locations increases the 'food miles' and associated emissions.. GB farming has some of the highest standards in the world and imports are likely to come from locations where environmental protection is less stringent.

One final consideration is the effect on agriscience Research and Development (R&D) in GB. One of the mooted benefits of leaving the EU was to free UK Regulators to be more agile, efficient and innovative, making decisions that take account of unique British growing conditions and practices. The UK has great strengths in agricultural research and basic science, leading to improvements in productivity, sustainability and competitiveness for growers. However, these discoveries have often been commercialised elsewhere in the world, due to the historically restrictive EU regulations. Dynamic alignment would risk abandoning these opportunities. Such a loss is not quantifiable within a report such as this, as they are unknown, but the lost opportunity should be recognised.

Annex I – Report Methodology

Actives Lost and Usage Rules.

The list of Active Substances that could be lost and changes in Usage Rules (including MRLs) has been created by a comparison of the GB Active Substance Approvals Register[10] operated by the Health and Safety Directorate with the EU Active Substance Database[11]. This has been crossed-checked by experts within CropLife UK and elsewhere in the industry.

Effects on Crops

The effect on crop production of the loss, and change in usage rules, of the Actives listed in Chapter 3 is the most challenging area of this study. Essentially, it is trying to estimate a counter-factual – what would happen if certain products were not available? It is very difficult to collect direct evidence for this – for example, no studies have been undertaken growing crops in the UK with only the Actives allowed in the EU. Indeed, there has been very little academic work done on the effect of the loss of PPP over the past decade. Two reports from ADAS[12] [13] from well over a decade ago appear to still be the most recent analysis in this area (although there has been some slightly more recent work undertaken in relation to Scotland[14]). Agronomic methods and the tools available to growers have moved on since then.

Therefore, expert opinion has been used to gauge the likely effects. This has involved speaking to those closely involved in GB crop protection, notably agronomists, and using their insights. Whilst these are only opinions rather than results of trials, they are seen as the best available evidence. Multiple opinions have been sought to 'triangulate' the views and find a consensus.

In this section, the main focus is on the level of yield loss. However, other factors are noted for inclusion in the later analysis. These include;

- Reduction in crop quality and effects on human and animal health
- Effect on rotations
- Effect on husbandry practices (e.g. greater use of cultivations, spray passes etc.)
- Medium/long term effects such as the build-up of resistance

UK agriculture is diverse and grows a vast range of crops. It operates across a spread of landscapes, climates and soil types. Some crops are more important than others in terms of land area covered, value produced, and proportion of domestic food supply. Therefore, this report focuses on a number of key crops produced in the UK;

- Winter Wheat
- Winter Barley
- Spring Barley
- Oats (Winter and Spring)
- Oilseed Rape
- Beans and Peas
- Maize
- Potatoes
- Sugar Beet
- Carrots
- Onions

- Brassicas
- Apples
- Strawberries

For each crop, the most important pests are considered. Then, taking into account the likely active substances from Chapter 3 that could be lost, an estimate of effects is outlined. Where multiple Actives/PPPs in the same category are in danger, the cumulative effects are highlighted.

As the scope of this project has not allowed all crops to be modelled, then the economic effects calculated are likely to be an *under-estimate* of the total effect on all of UK farming.

Modelling

To gauge the effect of the loss of the Plant Protection Products (PPP) outlined in Chapter 4, the outcomes discussed in Chapter 5 were fed into a spreadsheet model. This provides a set of outputs – it shows both the monetary loss of the changes, and also changes in yields and cropping. The latter is important when the discussion is broadened to look at the effects beyond the farming sector – in terms of raw materials for the food processing industry and consumers.

The model is based on the aggregate UK farming accounts as compiled by Defra. These are published annually in 'Agriculture in the UK'[15]. They are regarded as the definitive guide to the financial performance of the farming industry. From these accounts, a measure of profitability for UK agriculture known as Total Income from Farming (or TIFF) is derived. This is the aggregate return to all the entrepreneurs in UK agriculture and horticulture for their management, labour and their own capital in their businesses. Note that the use of the term 'Income' can be confusing – what is essentially being shown is the profit of the farming industry.

The modelling is undertaken at a UK level as this is how the TIFF figures are presented. The effects of Dynamic Alignment are primarily an issue in Great Britain. Whilst the inclusion of Northern Ireland creates a mis-match in the data, this is not a significant issue. The effect of the loss of PPP is largely an issue for arable cropping sectors, of which there is relatively little in NI. Also, the inclusion of NI farming would be more than accounted for within the 'margin-of-error' inherent in a modelling exercise such as this.

As aggregate accounts, the TIFF data shows total income and costs for each of the main categories in UK farming. For example, income from wheat or milk is shown as one figure; then the cost of fertiliser or labour is also shown. Therefore the data is not produced from gross margins for individual enterprises as the figures for an individual farm might be.

To provide more detailed analysis, the financial data comprised in the TIFF accounts is supplemented in the model by physical data for each crop. This covers areas, yields and prices. These are all reconciled to produce a financial output figure. The source of the physical data is the UK June Agricultural Survey[16], Cereals and Oilseeds Yields Data[17], and the Basic Horticultural Statistics publication[18].

In all cases, for both financial and physical data, three-year averages for the years 2022 to 2024 have been used. This means the most current data is being used in the model. At present, the 2024 year is the latest available. However, farming is an inherently volatile industry so the use of a three-year average means that the base figures are not distorted by unusual yearly events – for example weather effects.

From this 'Base' scenario, the estimated effects on crops from Chapter 4 have been applied. This changes planted areas, yields, prices and, of course, financial returns. UK cropping is fully reconciled following the

predicted changes – i.e. if an area of one crop falls due to the loss of PPPs, then the area of another crop would rise, or the area of fallow or grass would increase instead.

Further changes have been included in the model. As cropping patterns change, the use of variable inputs such as seeds, fertilisers and pesticides will alter. In addition, production systems will change – for example more cultivations, or a greater number of passes with a sprayer. These effects have been built in to alter the figures in the respective cost categories – machinery costs, fuel, labour etc.

In compiling the comparison of the Base scenario with the Post-Loss, it is assumed all other conditions remain constant. Therefore, the analysis is undertaken at today's prices (and premiums) and cost levels. In this way the effect of the loss of PPPs can be seen in isolation.

As outlined earlier, the Post-Loss scenario modelled is the most extreme one – the Immediate Alignment to EU PPP rules. There is some discussion at the end of Chapter 5 as to how the other scenarios could mitigate these losses.

A large number of assumptions are naturally required in the model – these are outlined in section 4 and this Annex. Inevitably, some of the consequences of these are unknown and all estimations will contain a degree of expert judgement. It would be possible to argue a different outcome for any of the individual assumptions. However, as the model is made up of a large number of calculations any individual figure is not crucial to the overall outcome.

Annex II - References

[1] See https://www.hse.gov.uk/pesticides/brexit.htm
[2] See https://www.gov.uk/government/speeches/speech-on-the-uks-future-relationship-with-the-european-union
[3] See https://www.hse.gov.uk/pesticides/mrls/index-overview.htm#:~:text=Internal%20Market%20Act-,Introduction,the%20needs%20of%20international%20trade.
[4] An example is Audax (see https://www.audax-aims.co.uk/) who assisted with this project
[5] See https://ec.europa.eu/commission/presscorner/api/files/document/print/en/ip_25_3081/IP_25_3081_EN.pdf
[6] See https://www.nature.com/articles/s41893-019-0450-8 and https://www.rothamsted.ac.uk/news/herbicide-resistant-weed-could-cost-uk-ps1-billion-year
[7] See ADAS Crop Action issue 24, 23rd October 2025
[8] See https://ahdb.org.uk/knowledge-library/septoria-tritici-in-winter-wheat/
[9] Internal analysis (unpublished) undertaken by Velcourt kindly shared for this project.
[10] See https://www.hse.gov.uk/pesticides/active-substances/register.htm
[11] See https://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/start/screen/active-substances
[12] Clarke JH, Wynn SC, Twining SE, Berry P, Cook S, Ellis E and Gladders P, HGCA Research Review 70: Pesticide Availability for Cereals and Oilseeds Following Revision of Directive 91/414/EEC; Effects of Losses and New Research Priorities. Kenilworth (2009). See - http://archive.hgca.com/document.aspx?fn=load&media_id=5195&publicationId=5850
[13] ADAS (Anon): Impact of Changing Pesticide Availability on Horticulture. Wolverhampton (2010). See - http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=17126
[14] See https://www.planthealthcentre.scot/sites/www.planthealthcentre.scot/files/2021-04/phc2018_15_impacts_arising_from_pesticide_withdrawals.pdf
[15] See https://www.gov.uk/government/statistics/agriculture-in-the-united-kingdom-2024
[16] See https://www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june
[17] See https://www.gov.uk/government/statistics/cereal-and-oilseed-rape-production
[18] See https://www.gov.uk/government/statistics/latest-horticulture-statistics