



OXFORD
ECONOMICS

ANDERSONS
THE ANDERSONS CENTRE



THE IMPACT OF A GLYPHOSATE BAN ON THE UK ECONOMY SUMMARY REPORT



**Crop Protection
Association**



TABLE OF CONTENTS

Introduction: a potential ban on glyphosate	2
The Impact on UK Agriculture	4
How is glyphosate used in UK agriculture currently?	4
What alternatives to glyphosate use in agriculture exist?	5
How would a ban on glyphosate affect crop production?	5
What would UK farming look like after a glyphosate ban?	7
What do these changes mean for farmers?	9
How will changes affect the direct contribution of agriculture to the UK economy?	10
The impact on UK jobs and GDP	12
What would the wider economic impact of changing agricultural practices be following a ban on glyphosate?	12
What are the implications of a glyphosate ban for the economy over the longer-term?	14
Conclusion	15



INTRODUCTION: A POTENTIAL BAN ON GLYPHOSATE

Arable farming forms a central pillar of the British countryside. Crops ranging from wheat and barley to oilseed rape, potatoes and fruit are grown on some five million hectares of land across the UK. The activity and employment sustained by arable farming represent a major part of the rural economy.

Weed control is important to agriculture. Plants compete with crops for light, water and nutrients. This competition risks compromising yield levels by reducing crop growth and lowering productivity—for example, fewer grains in each ear of wheat, and fewer potatoes on each root.¹ The quality of a crop can also be affected by the presence of weeds, both directly, by depriving it of necessary resources, and indirectly, by harbouring pests and diseases that can affect the main crop.

Glyphosate-based herbicides are used for weed management on farms throughout the UK. First marketed in the 1970s, glyphosate's wide applicability and efficacy in controlling weeds for a broad spectrum of crops, as well as its relatively low cost as a treatment option, mean that it has evolved to become a key tool at the disposal of UK farmers. Use of glyphosate facilitates faster preparation of land prior to planting, which makes more efficient crop rotations possible. It also affords higher yields than other weed management options.² As such, in 2014, 2.2 million hectares of UK farmland—representing a third of arable land—was treated with an average of 0.1g of glyphosate per square metre.³

The licence that allows use of glyphosate within the EU is due to expire in 2017. Glyphosate is widely used throughout the EU but there has been some political debate as to whether the licence for its use will be renewed when it expires in 2017. This reflects concerns from some quarters over the active ingredient.

Failure to renew the license—equivalent to a total ban—will have a negative economic impact on UK agriculture, affecting UK GDP, jobs, and tax revenues. Oxford Economics, with the Andersons Centre, has undertaken research commissioned by the Crop Protection Association that explores the possible impact of a ban on the competitiveness of the UK's agricultural sector. Further analysis extends this theme to model the potential wider impact on UK GDP and employment stemming from altered agricultural practices.

This report presents a summary of the research findings. Readers interested in a more detailed discussion of each theme, and the calculations underlying the results presented in this study, are directed to the associated report.

¹ ADAS, "How valuable is glyphosate to UK agriculture and the environment?", *Outlooks on Pest Management*, December (2010): 280-4.

² *Ibid.*

³ Food and Environment Research Agency, *Pesticide Usage Survey Report 263: Arable crops in the United Kingdom 2014* (York: Food and Environment Research Agency, 2015).

IMPACT OF A GLYPHOSATE BAN ON FARMING IN THE UK



THE CONTRIBUTION OF AGRICULTURE TO GDP & TAX REVENUE WILL FALL FOLLOWING A BAN

Contribution to GDP will fall by

£930 million



Tax revenue will fall by

£193 million



This is enough to fund the annual salaries of

7,000 nurses



THE HERBICIDE IS WIDELY USED IN THE UK

2.2 million

hectares of farmland treated annually



In any given year

34%

of land for wheat treated



33%

of land for oilseed rape treated



A BAN = MORE WEEDS & REDUCED YIELDS

Wheat yield down

12%

Oilseed rape yield down

14%

FEWER CROPS WILL BE PRODUCED

Cereal down

15%

Wheat down

20%

Oilseed rape down

37%



THE IMPACT ON UK AGRICULTURE

2.2 million

Hectares of arable
land treated
with glyphosate
in 2014



HOW IS GLYPHOSATE USED IN UK AGRICULTURE CURRENTLY?

Glyphosate is the most widely used herbicide in UK agriculture. According to the most recent Pesticide Usage Survey some 2.2 million hectares of arable land was treated with glyphosate in 2014.⁴ While some land will need treatment on an annual basis, glyphosate is used more generally to lower the overall weed burden on a rotating basis. For instance, data indicate in any given year a third of the land used for growing wheat is treated with the herbicide. This means typically all the land used for growing wheat is treated with glyphosate every three years. A similar proportion of land used for growing oilseed rape is treated with the herbicide in any given year. The herbicide is also used to prepare a large share of the land used for barley, potatoes and sugar beet crops.⁵

The widespread use of glyphosate reflects its unique features. The herbicide has very low toxicity to animals, but is effective on almost all plants.⁶ Its broad spectrum means one application can control both grass weeds and broadleaved weeds. Many other herbicides are effective only on certain categories of plants.⁷

Glyphosate is used both in preparing fields for planting and to make harvesting easier. In the majority of crops, glyphosate is used at two main points. The first is pre-planting (which could equally be described as post-harvest, as it is the period after one crop has been taken off, but before the next has been established) and this use applies to all edible and non-edible crops. This timeframe can also include applications that are 'post-planting, pre-emergence'. This is the brief period after the seeds have been put in the ground, but before they emerge from the soil; however, only a narrow range of crops are treated this way. The second main timing for glyphosate use is immediately before harvest, when the crop is desiccated to aid harvesting. Again, however, this treatment is only suitable for a relatively narrow range of crops including cereals, oilseed rape, dry peas, field beans, mustard and linseed.

⁴ Food and Environment Research Agency, *Pesticide Usage Survey Report 263: Arable crops in the United Kingdom 2014* (York: Food and Environment Research Agency, 2015).

⁵ Ibid.

⁶ World Health Organisation, "Environmental Health Criteria 159: Glyphosate", in *International Programme on Chemical Safety* <<http://www.inchem.org/documents/ehc/ehc/ehc159.htm>> [accessed 21 March 2017]

⁷ ADAS, "How valuable is glyphosate to UK agriculture and the environment?", *Outlooks on Pest Management*, December (2010): 280-4.

WHAT ALTERNATIVES TO GLYPHOSATE USE IN AGRICULTURE EXIST?

Glyphosate's characteristics mean there is no like-for-like replacement. If the herbicide is banned in the EU no single alternative chemical or cultivation practice is suitable to replace glyphosate wholesale. Instead, a range of approaches are likely to be adopted by the farming industry in an effort to mitigate the loss of this widely used product.

Following a ban, farmers will need to adopt more mechanical and labour-intensive means to control weeds. Controlling weeds using mechanical rather than chemical means will, however, require additional cultivations of the soil. For example, this might mean a shift to full inversion cultivation on land that previously underwent minimal ploughing. A ban on glyphosate is also likely to require extra cultivation passes, and mowing of fallow and orchards prior to harvesting in order to control weeds. Each of these processes is both time- and labour-intensive, leading to greater costs for farmers. Even where different herbicides—such as pelargonic acid—can be used in the absence of glyphosate, the lower efficacy and narrower spectrum of the available options means additional spray passes may be needed to achieve the same level of weed control as provided by glyphosate.⁸

HOW WOULD A BAN ON GLYPHOSATE AFFECT CROP PRODUCTION?

Even with alternatives in place, the weed burden can be expected to increase as a result of a glyphosate ban. A combination of more mechanical means and alternative chemicals is nonetheless unlikely to fully mitigate the effect on yields and quality from higher weed burdens.⁹ Ultimately this will have an effect on crop outputs, as will changes in land use and crop prices that result. We explore each in turn.

Less effective weed management could reduce yields for a number of important crops for UK farming. Yields may be hit in two important ways. The first is increased contamination through weeds: at present an application of glyphosate every other year, or one year in three, achieves a significant lowering of the overall weed burden. The second is a fall in the quality of crops due to uneven ripening at harvest time which reduces harvested volumes; glyphosate is currently widely used for pre-harvest desiccation to avoid uneven ripening, and to allow harvesting at the optimum time to maintain quality and avoid mycotoxin contamination. Analysis conducted for this study by the Andersons Centre has explored how the absence of glyphosate may, for example,

12 percent

Projected decline in wheat yields after a ban



result in a decline in wheat yields of 12 percent. This is the result of a combination of a three percent fall in yield for wheat treated with glyphosate pre-harvest¹⁰, and a more general yield loss due to cumulative build-up of grass and broadleaved weeds.¹¹ Different glyphosate usage rates mean the impact on yields varies by crop; for example, for oilseed rape the expected yield loss is almost 14 percent. Without glyphosate, over time, a build-up of (especially perennial) weeds will affect all land within the arable rotation. Consequently, losses can be expected to apply across the entire crop area, not just the portion receiving a glyphosate application in any one year; the Andersons Centre modelling reflects the implications of a long-term build-up of the weed burden.

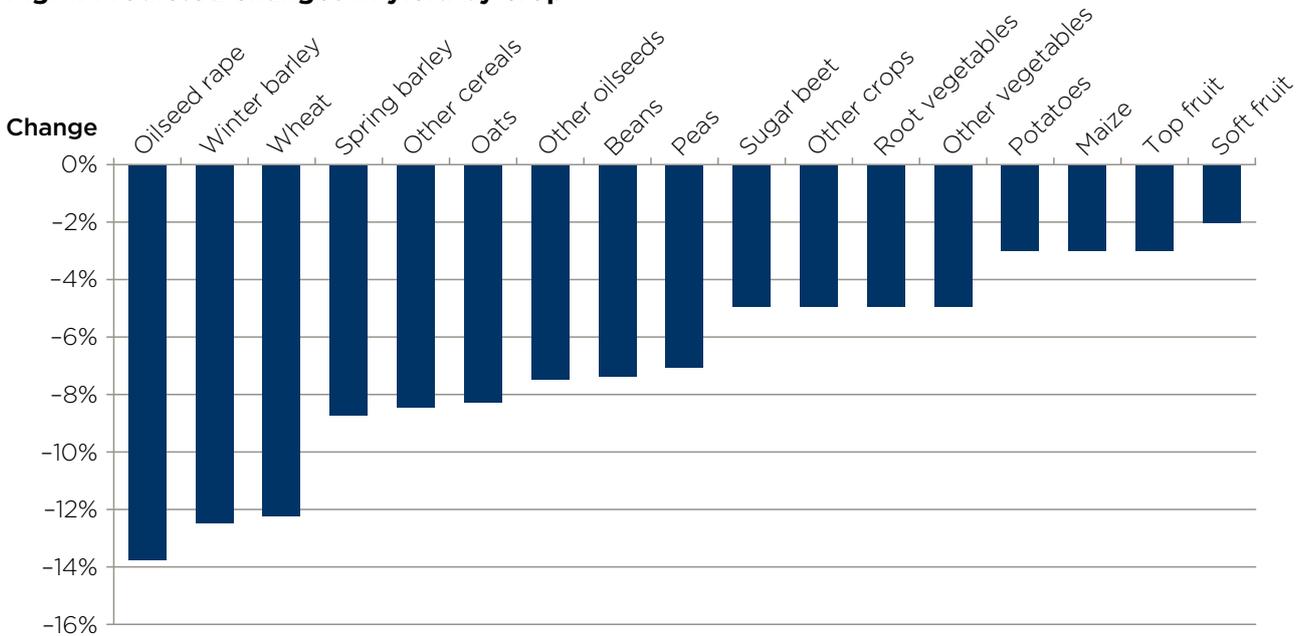
⁸ ADAS, "How valuable is glyphosate to UK agriculture and the environment?", *Outlooks on Pest Management*, December (2010): 280-4.

⁹ Ibid.

¹⁰ Around four percent of the total wheat crop.

¹¹ ADAS suggests a yield loss in both wheat and oilseed rape of 20%. The Andersons Centre believe that this may be rather high given the mitigation efforts and the rotational changes discussed elsewhere. A similar process has been undertaken for all the major crops grown in the UK, using the best available data and knowledge of industry experts.

Fig. 1: Predicted changes in yield by crop



Source: The Andersons Centre

Any fall in the quality of the crop will also result in a change in the price that farmers receive for them.

Different quality levels of the same crop attract different prices according to their possible usage. For example, on average, farmers received £127 per tonne of malting barley in 2015, while lower quality feed barley cost £107 per tonne.¹² While for some crops no change in price is anticipated as a result of a glyphosate ban, for others the effect is more notable. A portion of the barley crop might, for example, be downgraded from malting specification (which commands a premium) to basic feed barley. In the modelling, this is reflected by an overall 0.8 percent drop in

barley prices. Uneven ripening is forecast to reduce wheat prices by 0.3 percent.

A ban on glyphosate would also be likely to have an impact on cropping patterns in UK farming as the usability of land is affected by weeds.

Glyphosate has facilitated the shift to a predominantly autumn-based planting schedule in the combinable crops sector—being mainly winter wheat and winter oilseed rape. With autumn cropping, the window between harvesting the preceding crop and planting the next one is short. Glyphosate has allowed weed (particularly black-grass) control to take place within this window. Without it, given the greater time needed for mechanical

cultivation for weed control, a shift to more spring cropping is likely. As the profitability of crops is affected by how easily they can be grown on the land, it can be expected that the area in use for some crops will decline, with other crops taking up the space to compensate. These different crops will, in turn, have different revenue and cost patterns, with a knock-on impact on profitability for farmers and the competitiveness of the UK's agricultural output.

WHAT WOULD UK FARMING LOOK LIKE AFTER A GLYPHOSATE BAN?

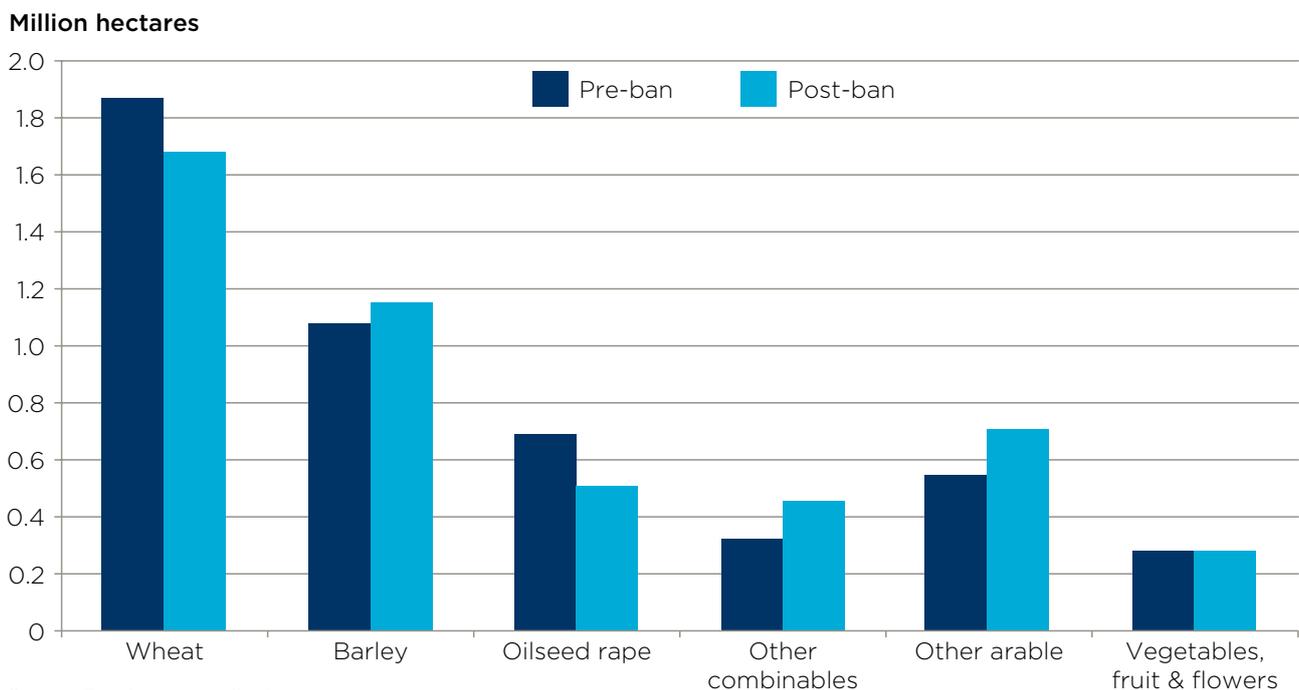
The impact of a glyphosate ban on yields, price, and land use patterns will produce a marked shift in cropping in the UK agricultural sector.

Modelling by the Andersons Centre has explored these effects across all UK crops—further detail on the modelling methodology and the results is set out in the accompanying full paper.

Most notably the absence of glyphosate is forecast to lead to a sharp decline in production of two of farming’s biggest earners—wheat and oilseed rape. The modelling shows that the total land area planted with combinable crops is projected to fall by four percent following a glyphosate ban.¹³ Data from Defra indicate that wheat and oilseed rape are the most and third-most important crops, respectively, in terms of the

value of output generated for farmers.¹⁴ However, following a ban and subsequent decline in the competitiveness of UK crops, the land area devoted to these two crops is expected to decline by ten percent for wheat and 27 percent for oilseed rape, as a result of the reduced ability to implement autumn planting. Other crops will be planted on this land, with farmers favouring the next most productive and profitable alternatives.

Fig. 2: Change in UK cropping hectares following a glyphosate ban



Source: The Andersons Centre

¹³ All non-crop farm activities, such as rearing livestock, are assumed to be unchanged following a ban, as is the total area farmed.

¹⁴ The second most valuable in output terms is barley.

15 percent

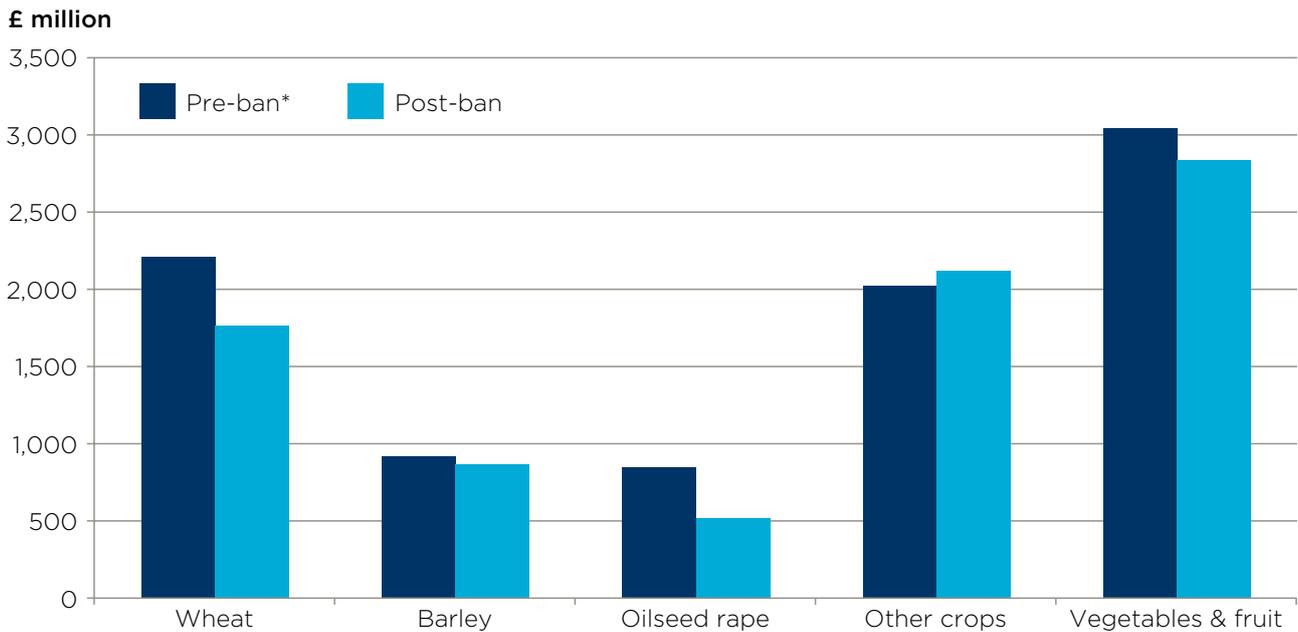
Projected fall
in UK cereal
production
after a ban



However, as a result of changes to cropped areas and reduced yields for some crops, overall production of UK crops will fall. Modelling by the Andersons Centre predicts that total cereal production will shrink by 15 percent. Wheat production will fall by over 20 percent, and barley production by five percent. The decline in wheat production is expected to

directly cut the value of UK crop output by five percent. However, the most notable fall is projected for oilseed rape, which sees a 37 percent fall in production due to the combination of a 27 percent decline in its anticipated cropped area and a fall in yield of nearly 14 percent. This fall is projected to lead to a fall of more than three percent in income from crops.

Fig. 3: Changes in value of UK crop production following a glyphosate ban



Source: The Andersons Centre. Note: *Pre-ban figure are five-year average for 2011-2015

WHAT DO THESE CHANGES MEAN FOR FARMERS?

Downward shifts in production and reduced prices for certain crops would likely reduce the collective turnover of the UK’s farms.

The latest data published by Defra indicate that over the five years to 2015, the UK’s farms achieved an average output of £24.7 billion per year.¹⁵ Modelling by the Andersons Centre estimates that a glyphosate ban would reduce this output by some £940 million, or 3.8 percent. To place this into context, UK farmers received some £2.8 billion in total each year from the EU through the Common Agricultural Policy.

Productivity in the sector is expected to fall as more labour-intensive operations are needed in the absence of glyphosate.

Modelling based on industry standard processes and costs¹⁶ suggests that the mix of crops and techniques that would result from the ban would be more labour intensive than at present. Under a glyphosate ban the model identifies the additional hours of work required as being equivalent to the full-time employment of 1,000 people.¹⁷ But as output is expected to fall, the productivity of these and all other jobs in agriculture is forecast to decline following a ban.

Increased employment means an increase in wage costs and an accompanying decline in farm profits.

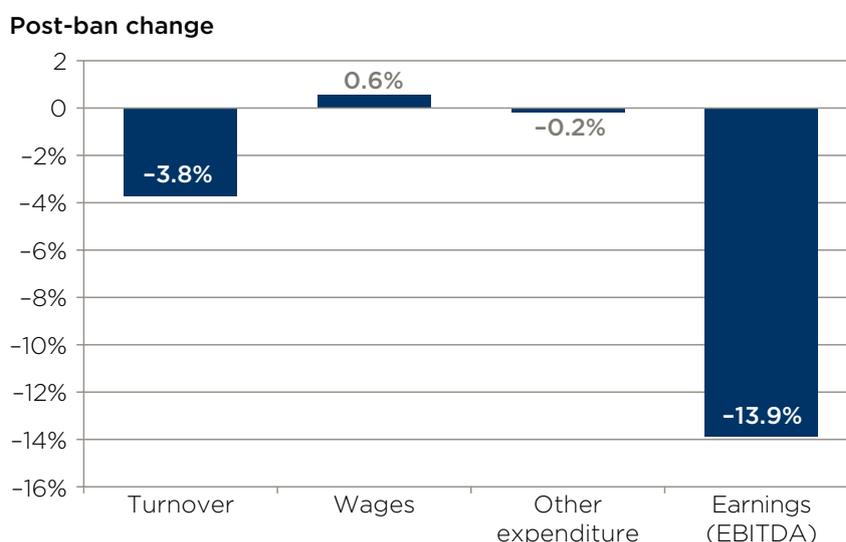
This increased employment is accompanied by an additional wage burden for farms, estimated to be £13 million in total, increasing total wage payments to over £2.4 billion. Spending on other inputs is expected to drop slightly (by £31 million) to just over £15.6 billion. In the five years to 2015, annual farm profits averaged over £6.6 billion; under a ban this is predicted to fall to £5.7 billion.¹⁸

£940m

Projected reduction in UK farms’ output after a ban



Fig. 4: The impact of a glyphosate ban on farm turnover, costs and earnings



Source: The Andersons Centre

¹⁵ Department for Environment, Food and Rural Affairs, *Agriculture in the United Kingdom 2015* (London: Department for Environment, Food and Rural Affairs, 2016).

¹⁶ As set out in the Farm Management Handbook (John Nix, *Farm Management Handbook 2016* (Melton Mowbray: The Pocketbook, 2016).)

¹⁷ However, under the reality of a glyphosate ban existing farmers and farm workers may work longer hours or innovate in other ways, especially when experiencing the other economic costs of a glyphosate ban.

¹⁸ Measured before interest, taxation, depreciation and amortisation (EBITDA).

10 percent



Decline in labour productivity following a glyphosate ban

HOW WILL CHANGES AFFECT THE DIRECT CONTRIBUTION OF AGRICULTURE TO THE UK ECONOMY?

A glyphosate ban would reduce the direct contribution of the agriculture sector to UK GDP by more than £900 million annually. Farms directly contribute to the UK economy through the gross value added (GVA) they create.¹⁹ Agriculture's GVA averaged £9.0 billion over the five years to 2015. The decline in earnings for farmers that would follow a glyphosate ban can be expected to cut the sector's GVA contribution to GDP by more than £900 million, to £8.1 billion.

A ban on glyphosate will also lead to a decline in the efficiency of UK farms with labour productivity forecast to fall by 10 percent following a ban. Several metrics can be used to measure efficiency and each tells the same story of the negative impact on UK farming of a ban on glyphosate. On the simple measure of farm efficiency as the ratio of output to costs, the ban results in a four percent decline in efficiency to 1.20 reflecting the decline in output from £24.7 billion to £23.8 billion.²⁰ A superior measure of efficiency used by economists is labour productivity where the gross value added generated by each worker is calculated. This measure shows the true impact of the removal of glyphosate from farms' input: here the aforementioned

decline in GVA forecast by the Andersons Centre coupled with the expected increase in employment after a ban means a sizable decline in productivity, of 10 percent.

The consequences of a ban on the UK economy may extend further by accelerating a restructuring of the farming sector. The analysis presented above describes a snapshot of the impact a glyphosate ban would have on the economic footprint of agriculture in the UK. However, the impact of a ban may be more keenly felt over the longer term. Lower output, and reduced profitability and efficiency over a prolonged period may weaken farms financially, causing some to cease production. Consequently, the ban could accelerate the trend towards consolidation of smaller farms to exploit economies of scale. Such a change risks social consequences in certain rural areas with a potential to impact rural communities.

¹⁹ Analogous to the sum of EBITDA and compensation of employees.

²⁰ A simple measure describes how effectively farms can turn £1 of expenditure into output, and the larger the ratio the greater the efficiency (or profits). A ratio of less than one would indicate that farms are extremely inefficient and lose money for every £1 spent. Over the five years from 2010 to 2015, UK farms recorded an average annual output of £24.7 billion, and spent £19.7 billion on intermediate inputs, labour, depreciation, rent and interest. This gives an output to cost ratio of 1.25. After a ban, output is expected to fall to £23.8 billion, while costs are forecast to remain unchanged.

The fall in UK farmers' competitiveness will worsen the trade balance in agricultural goods—particularly crops.

If glyphosate were not approved for use in the UK (or EU) but remained available in the rest of the world, this would place domestic production at a considerable disadvantage. Other regions would be able to produce food at a lower cost of production and could be expected to gain market share at the expense of the UK. At the time of writing, with the UK's post-Brexit trade arrangements unclear, but a hard Brexit seemingly likely, any impact on trade flows may be magnified.

The production impact of an EU-wide ban on glyphosate would affect global prices, and therefore food prices, for consumers in the UK and elsewhere.

Agricultural products are commodities and are traded on world markets. Therefore, it is fair to assume that sufficient volumes are available in the EU or worldwide to replace reduced domestic supplies, with little impact on food prices. Indeed, food prices are only partly linked to the cost of the raw material going into it—they also reflect processing and distribution costs, and retailers' margins. Within only one country, the UK say, a

ban on glyphosate would not be expected to affect food prices. However, the non-approval of glyphosate is likely to occur at an EU level and therefore the rest of the Single Market would be grappling with a sharp fall in output in the same way as the UK. In some commodities, the EU comprises a large portion of global output—for example the EU accounts for around 20 percent of world wheat production. Therefore, the effect of falls in EU production could be significant enough to raise the global price.

THE IMPACT ON UK JOBS AND GDP

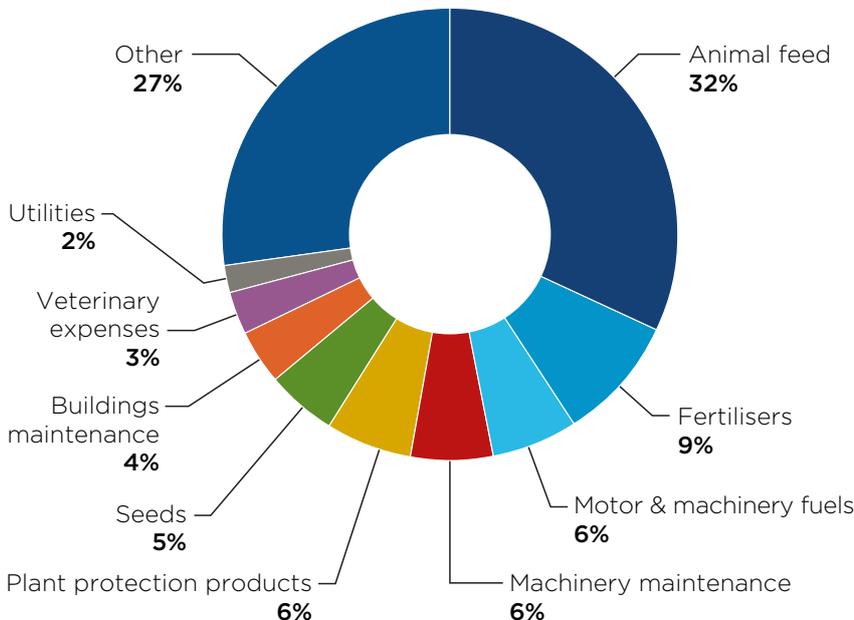
WHAT WOULD THE WIDER ECONOMIC IMPACT OF CHANGING AGRICULTURAL PRACTICES BE FOLLOWING A BAN ON GLYPHOSATE?

The economic impact of the ban will be felt far beyond agriculture. As the preceding section showed, the potential ban on glyphosate will not only affect agricultural practices. It will also fundamentally change the contribution the sector makes to the UK economy and have knock-on effects for GDP, employment and tax revenues across the country. The economic footprint of farming in the UK would shrink and negative effects can be expected to ripple through the rest of the economy.

As explored, in direct terms, the ban would result in a reduction in GDP and an increase in employment. We have highlighted how a ban will reduce the contribution agriculture directly makes to UK GDP by £900 million, to £8.1 billion. But while the value contributed by farms declines, the change in operations necessitated by a glyphosate ban and subsequent decline in agricultural productivity will result in an additional labour demand equivalent to a further 1,000 people being employed in the UK's agriculture sector.

Beyond this, the ban will also have a knock-on effect in agriculture's supply chains. To deliver its produce agriculture relies on a broad and diverse supply chain that spans the country. UK businesses provide crucial inputs to farming, ranging from seeds and fertilisers, to utilities and maintenance. In the five years to 2015, UK farms collectively spent nearly £15.7 billion on inputs of goods and services annually. Around one-third of this was accounted for by animal feed, with a further tenth spent on fertilisers. Plant protection products, including glyphosate, represented six percent of the sector's spending on goods and services.

Fig. 5: Inputs in UK farming



Source: The Andersons Centre

Overall in farming, a ban would curb spending on inputs only slightly as reductions in spend on glyphosate are countered by an increased spend in other areas. The shift in spending as a result of the ban will not be uniform on all spending categories, as the size of cropped areas and the composition of farming's inputs changes. Analysis by the Andersons Centre shows that spending on seeds and fertilisers will fall, by 1.3 percent and 4.1 percent, respectively. At the same time, the increased need for other forms of weed control, and an increase in the number of spray passes, will

likely see spending on plant protection, motor fuels and vehicle maintenance grow by an estimated 2.2 percent, 1.2 percent and 1.0 percent, respectively.

Agriculture's purchases of goods and services from UK businesses stimulate economic activity throughout the rest of the economy.

The bespoke model we have constructed for this study enables us to map these linkages and quantify agriculture's supply chain impact in the UK. Furthermore, it enables us to quantify how this impact will change once a ban on glyphosate comes into operation.

The impact of a glyphosate ban also ripples beyond agriculture's supply chain into the wider consumer economy. The wage-financed spending of people working within agriculture, or in its supply chain, forms the final channel of the sector's economic footprint in the UK. This reflects the economic contribution that arises when employees in the sector and within its supply chain make purchases at retail and leisure outlets throughout the UK. Taking account of these supply chain and consumer spending effects enables us to fully quantify the potential economic impact of the changes to UK agriculture that would accompany a glyphosate ban.

In total, we estimate that a ban will reduce the contribution of agriculture to UK GDP by £930 million. This is equivalent to nearly a fifth of the Cambridge economy, or a tenth of Liverpool's economy. While the majority of lost GDP occurs within agriculture itself, there are knock-on effects in the wider economy. Indeed, although we estimate the equivalent of some 1,000 additional jobs will be supported in agriculture to implement the new practices, an estimated 350 fewer jobs will be supported in the rest of the economy.

Moreover, a glyphosate ban will have significant repercussions for government revenue. We estimate that a ban will lead to a reduction in the tax revenues generated by agriculture and its supply chain by some £193 million, equivalent to £3 for every UK resident, or the annual salaries of over 7,000 nurses.

£930m

Estimated reduction in agriculture's economic footprint in the UK



WHAT ARE THE IMPLICATIONS OF A GLYPHOSATE BAN FOR THE ECONOMY OVER THE LONGER-TERM?

A glyphosate ban is likely to see a substantial shift in the UK's food trading position.

Our initial modelling assumes that the demand for crops will be unchanged and satisfied by global markets when UK production is reduced. In other words, businesses in the UK that are reliant on crops—breakfast cereal manufacturers, for example—continue to operate, but now draw on imported rather than domestically produced crops. Consequently, the UK will either import more, export less or a combination of both, following a ban. For example, the UK imported some 1.7 million tonnes of wheat in 2015, and exported nearly 2.0 million tonnes.²¹ Modelling by the Andersons Centre indicates that after a ban domestic wheat production could fall by nearly 3.1 million tonnes. Therefore, a possible outcome to make up this shortfall would be for exports of wheat to stop, and imports to increase by two-thirds to 2.8 million tonnes. In this scenario, earnings from wheat exports will disappear, while the UK's import bill will increase.

Over the long term, the ban may lead to substantial changes in the UK's food processing industry. While it is reasonable to assume that imports will make up shortfalls in the short term, the story may be very different in the longer term as a reliance on imported crops persists. As a consequence, costly importing practices may influence future investment decisions, encouraging firms to relocate processing plants to where crops are produced rather than continuing to import crops. The extent and timing of this impact is unknowable, as firms will review investments at different rates and will prioritise proximity to inputs and proximity to customers differently. But, with more than 100,000 jobs in the UK's bakery and grain mill processing sectors, the long-term implications could be potentially sizeable.²²

²¹ Department for Environment, Food and Rural Affairs, *Agriculture in the United Kingdom 2015* (London: Department for Environment, Food and Rural Affairs, 2016).

²² The most recent data from the ONS Annual Business Survey show 97,000 people worked in the manufacture of bakery and farinaceous products sector in 2015. Employment data in 2015 is suppressed for the manufacture of grain mill products, starches and starch products sector for confidentiality reasons, however, in 2014 some 10,000 people were employed in the sector.

CONCLUSION

The EU is currently debating whether to renew the license for using glyphosate-based herbicides. Its decision, due before the end of 2017, could have far-reaching implications for the UK's agricultural sector.

Widespread usage of the herbicide in agriculture makes UK farmers vulnerable to a ban. Glyphosate has become a key input for the UK's farmers—who treated nearly a third of arable land with the herbicide in 2014—providing a cheap and effective tool for tackling weeds. Use of glyphosate has facilitated faster preparation of land prior to planting, increased the number of crop rotations possible, and engendered higher yields than other weed management options. Consequently, a failure to renew glyphosate's license will have a significant negative impact on UK farmers.

A ban on glyphosate usage is projected to lead to falling yields and production within the UK's agricultural sector. Indeed, analysis conducted by the Andersons Centre indicates a ban could reduce the value of farm output

by £940 million. While the available alternatives to glyphosate will require more workers, these will be low productivity jobs. Moreover, such a challenging business environment will potentially presage a restructuring of UK agriculture, with smaller farms absorbed into larger commercial operations to make lower profit margins more bearable.

But the impact of a ban is not just limited to agriculture. The changes in farming practices as a result of the ban are projected to see agriculture's contribution to GDP fall by some £930 million, as the sector's demand for inputs from British suppliers alters. And falling profits in agriculture and its supply chain are projected to cause tax revenues to fall by £193 million—equivalent to the salaries of more than 7,000 nurses.

The long-term implications of a ban could be greater still. Falling domestic production will see an increasing reliance on imports, which is likely to weigh on future investment decisions in the UK's food processing industry.



OXFORD ECONOMICS

Oxford Economics was founded in 1981 as a commercial venture with Oxford University's business college to provide economic forecasting and modelling to UK companies and financial institutions expanding abroad. Since then, we have become one of the world's foremost independent global advisory firms, providing reports, forecasts and analytical tools on 200 countries, 100 industrial sectors and over 3,000 cities. Our best-of-class global economic and industry models and analytical tools give us an unparalleled ability to forecast external market trends and assess their economic, social and business impact.

Headquartered in Oxford, England, with regional centres in London, New York, and Singapore, Oxford Economics has offices across the globe in Belfast, Chicago, Dubai, Miami, Milan, Paris, Philadelphia, San Francisco, and Washington DC. We employ over 230 full-time people, including more than 150 professional economists, industry experts and business editors—one of the largest teams of macroeconomists and thought leadership specialists. Our global team is highly skilled in a full range of research techniques and thought leadership capabilities, from econometric modelling, scenario framing, and economic impact analysis to market surveys, case studies, expert panels, and web analytics. Underpinning our in-house expertise is a contributor network of over 500 economists, analysts and journalists around the world.

Oxford Economics is a key adviser to corporate, financial and government decision-makers and thought leaders. Our worldwide client base now comprises over 1000 international organisations, including leading multinational companies and financial institutions; key government bodies and trade associations; and top universities, consultancies, and think tanks

June 2017

All data shown in tables and charts are Oxford Economics' own data, except where otherwise stated and cited in footnotes, and are copyright © Oxford Economics Ltd.

The results presented here are based on modelling and information provided by third parties, including the Andersons Centre, upon which Oxford Economics has relied in producing its report and forecasts in good faith. Any subsequent revision or update of those data will affect the assessments and projections shown.

To discuss the report further please contact:

Pete Collings:

petecollings@oxfordeconomics.com

Oxford Economics
Broadwall House,
21 Broadwall,
London,
SE1 9PL, UK

Tel: +44 (0)203 910 8000

THE ANDERSONS CENTRE

The Andersons Centre provides top quality advice and business information to the agricultural, rural and food sectors. Their aim is to deliver practical solutions that are technically, financially and strategically sound and help business progress. As well as providing agricultural consultancy and farm business advice, the Andersons Centre also works with companies trading with farmers, the public sector and other rural professionals.

The Andersons Centre's Research Team is arguably the leading provider of business information, interpretation and advice for the UK agricultural and food industry. It undertakes one-off bespoke pieces of research or projects, produces regular briefings and analyses, publishes management information, and delivers seminars and talks.

The Andersons Centre is a partnership based in Melton Mowbray, Leicestershire. Farm and rural business consultancy is delivered throughout England and Wales. Agri-business research, agri-industry and public sector work is performed throughout Great Britain.



OXFORD
ECONOMICS

Global headquarters

Oxford Economics Ltd
Abbey House
121 St Aldates
Oxford, OX1 1HB
UK
Tel: +44 (0)1865 268900

London

Broadwall House
21 Broadwall
London, SE1 9PL
UK
Tel: +44 (0)203 910 8000

New York

5 Hanover Square, 8th Floor
New York, NY 10004
USA
Tel: +1 (646) 786 1879

Singapore

6 Battery Road
#38-05
Singapore 049909
Tel: +65 6850 0110

Belfast

Tel: + 44 (0)2892 635400

Paarl

Tel: +27(0)21 863-6200

Frankfurt

Tel: +49 69 95 925 280

Paris

Tel: +33 (0)1 78 91 50 52

Milan

Tel: +39 02 9406 1054

Dubai

Tel: +971 56 396 7998

Philadelphia

Tel: +1 (610) 995 9600

Mexico City

Tel: +52 (55) 52503252

Boston

Tel: +1 (617) 206 6112

Chicago

Tel: +1 (773) 372-5762

Los Angeles

Tel: +1 (424) 238-4331

Florida

Tel: +1 (954) 916 5373

Toronto

Tel: +1 (905) 361 6573

Hong Kong

Tel: +852 3103 1096

Tokyo

Tel: +81 3 6870 7175

Sydney

Tel: +61 (0)2 8458 4200

Melbourne

Tel: +61 (0)3 8679 7300

Email:

mailbox@oxfordeconomics.com

Website:

www.oxfordeconomics.com