

Observatory monitoring framework – indicator data sheet

Process: Farm management

Indicator C3: Pesticide use

This indicator monitors the use of pesticides (herbicides, fungicides, insecticides and growth regulators) on major crops in England using two measurements from the Pesticide Usage Survey (PUS). The first focuses on the area of crop treated with pesticides as a proportion of the crop area. As most crops are treated with more than one pesticide each year this figure is generally greater than 100%. The second indicator focuses on the amount of active substance applied.

The amounts used will vary from year to year depending on the weather and its influence on pest, disease and weed pressure, and over time by changes in pesticide range, the economics of pest control and the resistance of different seed varieties.

C3a % Area of major crops treated with herbicide: England

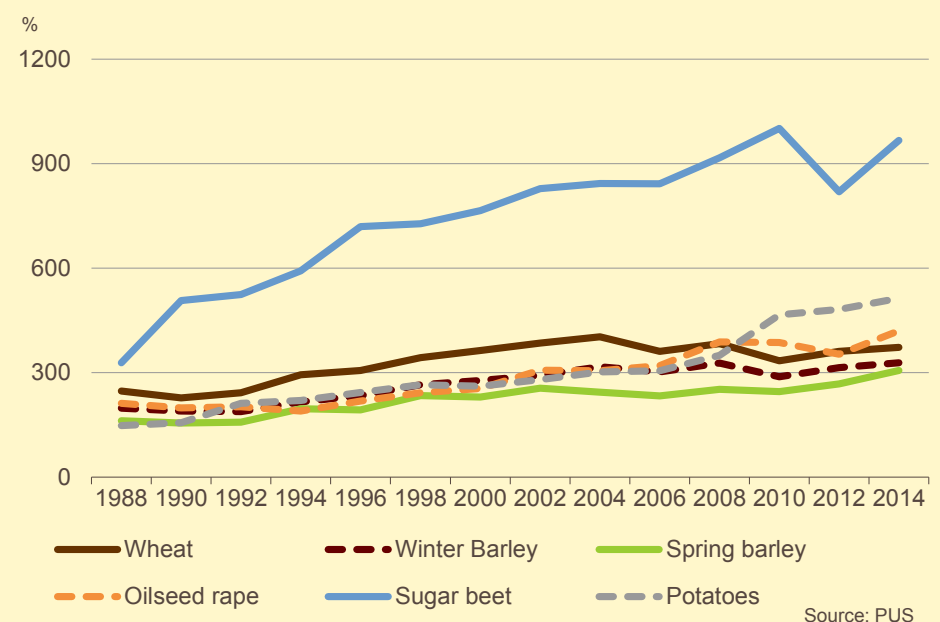


Chart C3a shows the area of major crops in England treated with herbicides as a proportion of the crop's area.

Sugar beet, which is susceptible to weed competition, has the greatest proportion of crop area treated with herbicides. For potatoes, herbicides are used for general weed control and desiccation of crop foliage.

In 2014:

- sugar beet, received on average five herbicides;
- potatoes and oilseed rape had the highest average level of herbicide use among the remaining major crops.

Between 2012 and 2014 the percentage area treated with herbicides increased for all the major crops with the exception of peas which saw a decline of 2%.

Since 1998 there has been an increase in the area treated with herbicides. Caution is required in interpreting these trends as during this time there have been changes in the products used, and different products can require different application rates.

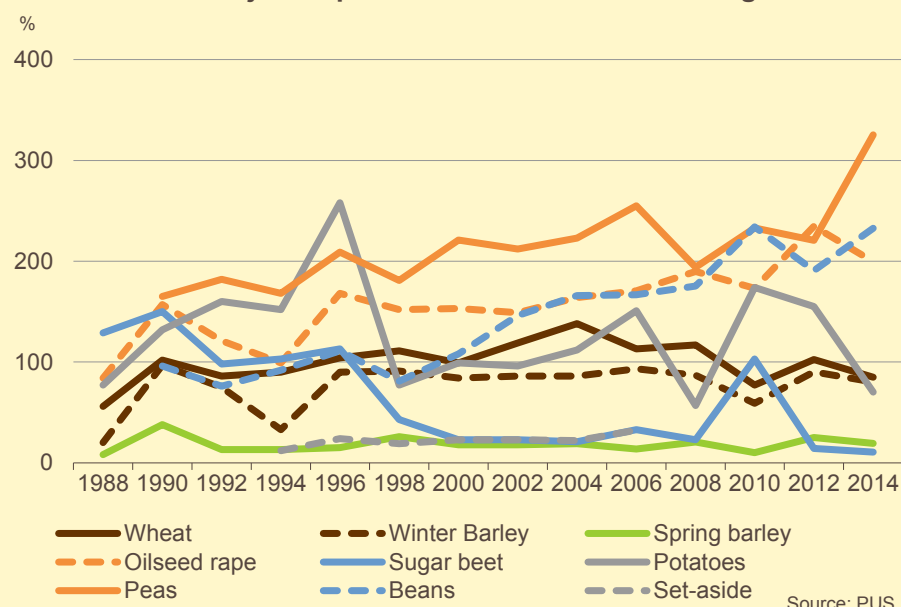
Chart C3b shows the area of major crops treated with insecticides as a proportion of the crop's area.

In 2014:

- peas and beans had the greatest proportion treated with insecticides.

It is difficult to interpret a long term trend as the levels of insecticide used fluctuate over time in response to changes in the prevalence of insect pest species.

C3b % Area of major crops treated with insecticide: England



C3c Pesticide use on cereals: England

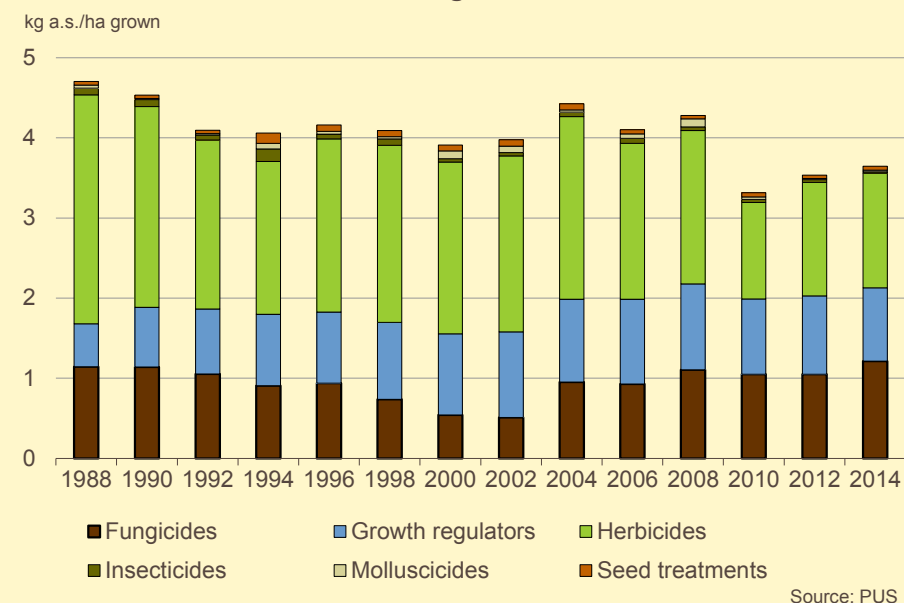


Chart C3c illustrates pesticide usage in terms of the application rate of active substance (a.s.) per hectare of cereals grown.

In 2014 herbicides, fungicides and growth regulators accounted for the majority of pesticides used on cereals.

Between 2012 and 2014 the total pesticide application rate on cereals increased by 3%, largely due to an increase in the weight of fungicides used.

This indicator was updated in October 2015. The next update is expected in 2017.

Further information and contact

Background information can be found in the accompanying fact sheet.

For queries or information on this indicator contact Defra's Observatory team on +44 (0) 1904 455058 or email observatory@defra.gsi.gov.uk

Observatory Monitoring Framework – indicator fact sheet

Farm management

Indicator C3: Pesticide use

<i>Indicator</i>	C3a and C3b - Area of major crops treated with herbicides and insecticides as a percentage of crop area. C3c - Pesticide application rates for total cereals.
<i>Data</i>	C3 and C3b – Percentage of crop area treated. C3c - Kilograms of active substance (a.s.) per hectare of crop grown.
<i>Geographic coverage</i>	England
<i>Years</i>	1988 to 2014 (every 2 years).
<i>Source</i>	Defra
<i>Origin of data</i>	Pesticide Usage Survey
<i>Updates</i>	Every 2 years. The next update is expected in 2017.
<i>Background</i>	<p>The use of pesticides is closely correlated to cropping patterns and will vary from year to year dependant on weather patterns and economics. Pesticides contribute to the pollution of soil and water. They have also contributed to the loss of biodiversity.</p> <p>Pesticide residues cause concerns for human health and for biodiversity. Pesticide residues in food are negligible, residues in river and ground water have to be removed before it can be used in drinking water. The EC Drinking water directive sets maximum concentrations for any (0.1 µg/litre or 1 part per billion) and total (0.5 µg/litre) residues in drinking water.</p> <p>C3a and C3b focus on the area of crop treated with pesticide as a proportion of the crop area. As most crops are treated with more than one pesticide each year this figure is generally greater than 100%.</p> <p>The weight of the active substance (C3c) is not proportional to the effectiveness, the proportion of active substance in formulated insecticides is often comparatively low.</p> <p>Herbicides are used to remove weeds from crops thus preventing competition, contamination of grain and interference with harvesting. However, weeds also serve as a food source for herbivorous invertebrates which are themselves a source of food for birds. If uncontrolled, weeds can have a significant effect on yield. Herbicides may also contaminate watercourses; all the pesticides most frequently found in water are herbicides.</p> <p>Herbicides will remove the food source and habitats from some beneficial insects, potentially increasing the need for insecticides, this will also affect the food chain for other wild fauna. Most insecticides are relatively non-selective and can kill beneficial insects and arthropods as well as pest species. Pyrethroids in particular can cause high mortality of invertebrates and fish if they enter watercourses. Growth regulators are not generally considered as damaging to the environment as they break down quickly in the soil.</p> <p>Most insecticides are relatively non-selective and can kill beneficial insects and arthropods as well as pest species. Pyrethroids in particular can cause high mortality of</p>

invertebrates and fish if they enter watercourses.

A Voluntary Initiative on pesticide management practices is in place for the protection of biodiversity and water. The European Water Framework Directive introduces a long term and co-ordinated river basin planning framework for water management for both river and ground water, including the use of pesticides.

It should be remembered that pesticides vary considerably in their activity level per gram and hence in the amount used to achieve the recommended dose. Over the period shown, new active substances have been introduced which are often applied at lower rates.

Herbicide usage on wheat changed dramatically between 2008 and 2010 primarily due to the loss of approval, and therefore use, of both isoproturon and trifluralin. Replacement active substances used to control blackgrass, such as diflufenican/flufenacet, and the continued use of iodosulfuron-methyl-sodium/mesosulfuron-methyl, which are applied at relatively lower rates of application than isoproturon and trifluralin, resulted in a reduction in the weight of herbicide active substances applied.

Statistical & methodological information

The Pesticide Usage Survey is conducted by the Food & Environment Research Agency on behalf of the Chemicals Regulation Directorate (a Directorate of the Health and Safety Executive (HSE)). There is a rolling programme of surveys with arable crops usually surveyed every 2 years and other crops every 4 years. Surveys began in 1965 following concerns over the use of organochlorine pesticides on fresh produce and represent the longest and most detailed monitoring of pesticide use anywhere in the world.

This survey produces national estimates from a stratified sample of growers. Stratification is by holding size and region. The sample is drawn from June survey returns. Data are collected on farm visits by experienced pesticide usage surveyors.

Further information

Further information about pesticides can be found on the Health and Safety Executive (HSE) website:

<http://www.pesticides.gov.uk/guidance/industries/pesticides>

Further information on the Pesticide Usage Survey can be found on the Food & Environment Research Agency website at:

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

Further information about the Voluntary Initiative can be found at:

<http://www.voluntaryinitiative.org.uk/>

Information on the Pesticides Forum (including further indicators) can be found at:

<http://www.pesticides.gov.uk/guidance/industries/pesticides/News/Other-News/pesticides-forum-annual-reports>