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Rural & Environmental Science
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Scottish Government
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Cereal and Oilseed Rape Harvest 2021 First Estimates

Methodology



This document provides a summary of quality related information on the Cereal and Oilseed Rape Harvest 2021 - First Estimates.

The Scottish Government adheres to the Code of Practice for Official Statistics and the Government Statistical Service (GSS) Quality Strategy. In addition, the Scottish Government provides its own guidance on producing official statistics, which is available to view at the Scottish Government's Statistics internet pages.

Further information on quality:

- [Code of Practice for Official Statistics](#)
- [Government Statistical Service Quality Strategy](#)
- [Scottish Government Statistics and Research](#)

Definitions

Area - the amount of area (in hectares) that was used to grow a particular crop, where the crop was intended for combine harvesting or the production of grain or oilseeds. This area may include some crops that were eventually not harvested, or whole-cropped.

Yield - Average yields (tonnes per hectare) represent the amount of cereal grain or oilseed that is extracted from one hectare of crop grown.

Production - the total tonnage of cereal grain and oilseed that is combine harvested from the planted area. This tonnage does not include the weight of straw, whole-cropped or other plant material, which is produced as a by-product or used for other purposes.

When discussing production and area we are referring to estimated totals. When discussing yield we are referring to estimated averages.

Whole-cropped – Whole-crop cereals are harvested whole (i.e. without extracting the grain) and are used as a source of animal feed or for industrial use.

Data Providers

The Scottish Government relies on the data collected by industry bodies to produce these statistics and therefore the quality of the data available from these sources impacts significantly on Scottish Government analysis.

First estimates of the Scottish cereal and oilseed rape harvest are derived at the annual Crop Report Meeting (CRM). A panel of experts from the Scottish cereal industry provide their estimates of the harvest yields, based on their initial soundings, and these are applied to data for areas sown from the June Agricultural Census. This year's CRM took place on Thursday 23rd September 2021. When the meeting took place the harvest was still underway in some areas of Scotland. Representatives from the following organisations attended the CRM this year:

- Scottish Government, Rural and Environment Science and Analytical Services
- Scottish Government, Rural Payments and Inspections Division
- Agricultural Industries Confederation
- National Farmers Union Scotland
- The Agriculture and Horticulture Development Board
- East of Scotland Farmers Limited
- Scotland's Rural College
- Science and Advice for Scottish Agriculture

First estimates from growers are collected by several means: area offices of the Scottish Government Rural Payments and Inspections Division (RPID); area offices of Scotland's Rural College (SRUC); agronomists working for commercial bodies; farming co-operatives; and the National Farmers Union Scotland (NFUS) use electronic, paper based or telephone surveys.

Once all the yields have been collated, the industry bodies at the CRM carry out additional quality assurance by comparing yield results between different crops and regions within Scotland. This leads to an agreed set of yield estimates which are then combined with 2021 June Agricultural Census area results to derive the initial harvest production estimates.

As the moisture content of cereals and oilseeds can vary from year-to-year and farm-to-farm, depending on the level of rainfall, average yields are adjusted to a standard moisture content of 14.5 per cent for cereals and nine per cent for oilseeds. This adjustment ensures there is consistency in estimates of the amount of dry matter which can be extracted from cereal grain and oilseeds.

Production estimates are derived by multiplying crop areas (in hectares) from the 2021 June Agricultural Census and the estimated average yields (in tonnes per hectare).

Relevance

The degree to which the statistical product meets user needs for both coverage and content.

The cereal estimates are produced for a wide range of purposes. The statistics help the government to form, monitor and evaluate policy, and to assess the economic well-being of the cereal sector.

The production estimates feed into the [UK cereals balance sheet](#), which provides an independent, unbiased, timely and comprehensive picture of the supply and demand position of the UK cereal market. The balance sheet is also the prime tool for tracking new developments in the UK cereals industry and determining their impact on the market. The balance sheet is widely used by policy makers and the wider cereals industry.

User Feedback

Though we are not aware of any unmet user needs in relation to these statistics, the Scottish Government is always interested to hear from users about what is most relevant to them and welcomes feedback from users of these statistics. Contact details are available from the [Agriculture Statistics contacts](#) webpage.

Accuracy and Reliability

The closeness between an estimated result and the (unknown) true value.

When considering the accuracy of these statistics it is important to note that the collection of estimates prior to the completion of the harvest will lead to a level of inaccuracy.

Providing early estimates of cereal yields and production is a challenging task. The CRM takes place before the end of the harvest season and provides an indication of the harvest at this point in time. The unpredictability of the weather and the knock-on effects this has on production (e.g. poorer yields in later harvested crops which have been subjected to longer periods in unfavourable growing conditions) make estimating the final harvest yields and production difficult.

These estimates are based on the most up-to-date industry reports available at the time of the CRM. As harvest progress continues it is inevitable that these reports will become more reliable.

These statistics are provisional estimates and will be followed by final estimates in December 2021. Final estimates of the 2021 cereal and oilseed rape harvest is based on data gathered from a sample of farms across Scotland. They are usually within five per cent of the first estimates of production – see chart 1.

The nature of the industry bodies involved in the production of provisional estimates means that the results are likely to be more representative of commercial cropping farms, and less representative of farms growing crops for on-farm uses. This is most likely why the provisional estimates tend to overestimate production and yields compared to the final Cereal Production Survey (CPS) estimates.

Comparison of provisional and final results

This section compares past provisional estimates of the harvest to the final estimates of the harvest. Provisional estimates are derived from averaged yield estimates of growers, collated through the cooperation of several organisations within the agricultural sector, applied to crop area estimates from the June Agricultural Census.

Final estimates are derived from average yields from the CPS. The purpose of this section is to quantify the size and direction of the differences between the two estimates in order to give an indication of the robustness of these provisional estimates.

The CPS is based on a sample of around 400 to 550 farms in Scotland, stratified by region. In 2020 the CPS did not take place, the data collection was paused during the COVID-19 pandemic to reduce the burden on farmers. Final estimates for 2020 were established by holding a second CRM at the end of the Scottish harvest. In the 2019 CPS, 586 agricultural holdings were surveyed, with many holdings growing more than one crop. Returns were received from 258 holdings, but many holdings grow more than one crop. The total number of returns received for all crops was 504.

The results from the CPS have a margin of error associated with them, reflecting the error resulting from sampling. Sampling error is the difference between the estimate derived from a sample survey and the true value that would result if a census of the whole population were taken under the same conditions. The intervals were calculated as 95 per cent confidence intervals, meaning that there was a 95 per cent chance that the true population value was within the resulting interval.

Initial estimates are generally quite accurate, although in recent years production and yield have been slightly higher than the final estimates. In 2019 the initial estimates were higher than the final estimates and outside the confidence interval for spring barley, wheat and oats. Winter barley and oilseed rape estimates were within the confidence interval.

More information on the quality of the final estimates and the differences between first and final estimates are contained in the [Final Estimates of the Cereal and Oilseed Rape Harvest 2020](#) release.

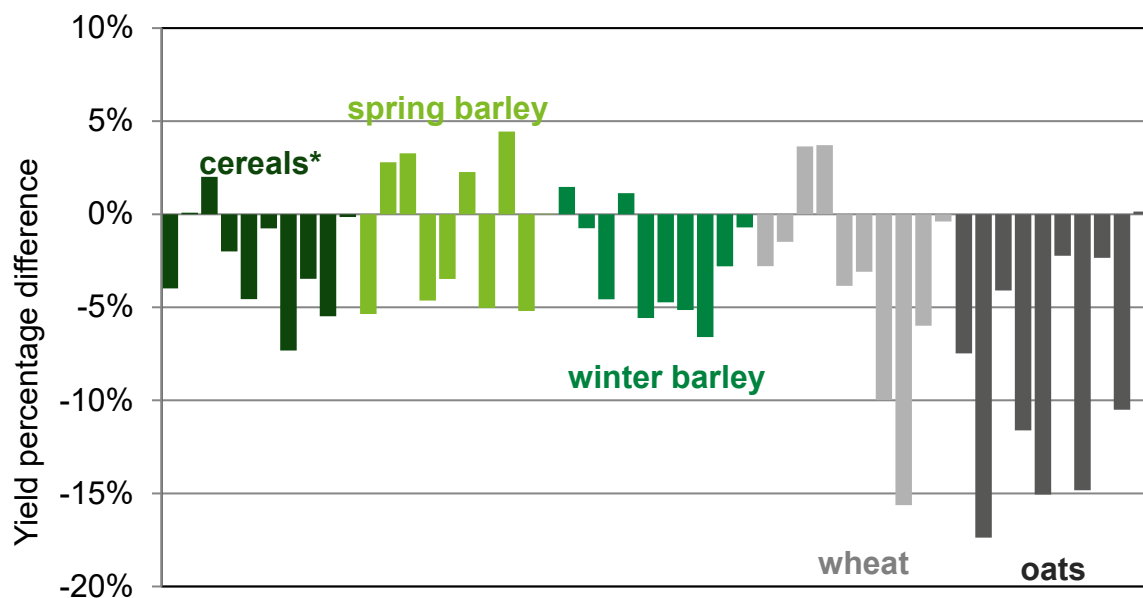
In previous years, provisional June Agricultural Census area figures used to calculate provisional production estimates have been slightly different from the final June Agricultural Census areas used to calculate the final production estimates. However, these differences have generally been small (less than one per cent) and are not a main contributor to differences in the production estimates.

The main reason for differences in the provisional and final production estimates are differences in provisional and final yield estimates. Chart 1 shows these differences for the last ten years. A full breakdown of the differences between the estimates is provided in Table 4 within the publication.

It can be seen from Chart 1 that in the last ten years the provisional estimate of the total cereal harvest has typically been within five per cent of the final estimate. In 2018 the provisional estimates were between two and sixteen per cent higher than the final estimates. This was due to fewer farm results being available for the CRM, especially for wheat. There were more farm results available at the 2019 CRM and so we are more confident in the estimates.

Chart 1: Cereal Production, percentage comparison of Provisional v Final Estimates, 2011 to 2020

(Positive numbers mean the final estimate was higher than the provisional)



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Timeliness and Punctuality

Timeliness refers to the lapse of time between publication and the period to which the data refer.

Punctuality refers to the time lag between the actual and planned dates of publication.

In order to provide timely estimates of cereal and oilseed rape production the CRM is held as early as is practical following data collection by the industry representatives attending the meeting. The progress of the harvest limits how early this meeting can be held. Yield estimates collected before the completion of the harvest are inevitably less reliable than estimates completed after the harvest.

When reliable results can be expected, the planned publication date of the first estimates of the cereal and oilseed rape harvest is scheduled no later than the release date of UK harvest estimates, as both feed into the UK cereals balance sheet.

Coherence and Comparability

Comparability is the degree to which data can be compared over time and domain.

The first estimates of the cereal and oilseed rape harvest (from the CRM) contained in this document are compared to final estimates (from the Cereal Production Survey) for previous years.

Results for England, Wales and Northern Ireland, also released in October, are based on provisional results from surveys similar to that of the Scottish Cereal Production Survey. The latest results of the UK cereal and oilseed rape harvest, including Scottish estimates, are available from the Gov.uk website:

www.gov.uk.

The European Commission (EC) regularly produces estimates of cereal and oilseed production as both totals of EU-27 countries and individual countries. Further information on EC cereal statistics is available at the following website:

<https://ec.europa.eu/eurostat/web/agriculture/overview>

Typically EC results are published later than Scottish or UK results due to the additional time required to collate, validate and analyse data from several countries. Users interested in comparing results between countries should evaluate the relevant methodologies of sources used.

Accessibility and Clarity

Accessibility is the ease with which users are able to access the data. It also relates to the format(s) in which the data are available and the availability of supporting information.

Clarity refers to the quality and sufficiency of the metadata, illustrations and accompanying advice.

These statistics are made available online at the Scottish Government's website in accessible formats (html and pdf versions are available). Data tables are made available in excel format to allow users to carry out further analysis. Anonymised farm-level datasets may be made available to recognised research organisations.

Methodological notes and additional notes to tables, identifying specific quality issues, are included in this document, which is available online and linked to from all National Statistics outputs containing cereal production estimates. Links to the

Agriculture Statistics series of outputs are available from the Gov.uk website:
www.gov.uk.

Related publications

The final estimates of the 2021 Scottish cereal and oilseed rape harvest are due to be published in December 2021 and will be available on the Gov.scot website:
www.gov.scot