



Agricultural Small Area Statistics for Wales 2002 to 2018

24 May 2019
SB 20/2019

This bulletin announces the release of a spreadsheet of results from the June Welsh Agricultural Survey at regional and local level. Results are given for the annual June surveys from 2002 to 2018. The bulletin gives a detailed look at the data quality issues for the survey estimates and presents large data sets as a spreadsheet.

Information from the survey has previously been published at Wales aggregate level. The previous release may better suit users who want more summary information and commentary on the trends. The latest Wales aggregate estimates from the June Agricultural Survey, as well as our other releases, can be found on the [Statistics and Research website](#).

The spreadsheet attempts to balance the competing requirements of small area data. On one hand is the need for locally relevant data. On the other is the need to protect the confidentiality of individual farms and farmers and to maintain statistical data quality. The spreadsheet represents one realisation of this balance. It is presented as a reasonable compromise for a range of purposes. The bulletin explores the confidentiality and data quality issues and the reasoning behind this selection.

The spreadsheet considers a range of variables from the [June Welsh Agricultural Survey](#). The variables cover the key results for the different types of land usage, livestock numbers and agricultural labour. A full listing of the variables made available, a description of the spreadsheet and the data quality issues are given in [Annex A](#).

About this bulletin

Annual update of agricultural land and livestock estimates at below Wales level, with a spreadsheet of results at regional and local level.

The bulletin also contains details about data quality issues for the agricultural estimates.

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Background to Small Area statistics

Traditionally results from the Welsh Agricultural Survey have been published at the all Wales and regional level. Statistics at this level have the advantage of being based on large numbers of observations and so being generally robust. The disadvantage is the lack of local detail.

Publishing small area statistics can provide more local detail. However, there are two key limitations. The first is the need to prevent disclosure of personal information. The second is that, because the results are based on fewer observations, there is a danger that uncertainty surrounding the estimates will be unacceptably large.

The small areas used in this bulletin are specific for agriculture. They do not correspond with the standard statistical geographies based on Lower Super Output Areas (LSOA). A different unit is needed because the standard geography is largely designed to report information about people and agriculture usually takes place where the people are not. The derivation of the agricultural small areas is described in [Annex B](#).

This bulletin introduces the issues about how to strike a balance between undifferentiated but relatively robust large area statistics and the more locally specific but more uncertain small area statistics.

Changes from the previous agricultural small areas statistics

The bulletin is part of an annual series of small area statistics. This bulletin replaces SB 46/2018 - published 11 July 2018 - adding data from the survey in June 2018.

This bulletin does not have farm labour data below the Wales level from 2015 onwards. Older farm labour results are still available. This change began in a previous edition, published 28 July 2015.

Discontinuity in the series for cattle

From the Agricultural Survey of June 2007 information about cattle numbers was drawn from the [Cattle Tracing System](#) rather than direct survey questions. Results from the administrative system are matched to the holdings on the statistical register through the unique holding identifier (CPH code). The change was made to improve the accuracy of the figures and to lower the burden of collection for farmers. A similar change was made in both England and Northern Ireland.

The change means that there is a discontinuity in the series of cattle results. The results from the Cattle Tracing System will be more reliable than the estimates from the June Survey. A short note on the comparison between the two sources is given in [Annex D](#).

Where both sets of cattle data are available, 2004 to 2006, the spreadsheet includes results for both.

Confidentiality issues

Farmers provide data to the Welsh Government through the Agricultural Survey on the understanding that we will publish statistics *at an aggregate level*. The Code of Practice for Statistics requires that this should be the lowest level where the confidentiality of the data supplier – in this case, the farmer – is protected. That is, we cannot identify any individual farmer or farm from the aggregate statistics.

For this bulletin two tests of disclosiveness have been applied. The first test is based on the number of holdings. The second looks for the dominance of the result by one or two large holdings. Any data item

that fails either of these tests it is deemed to be disclosive and so suppressed. At the smaller scales there is clearly a greater risk of statistics being disclosive.

The Welsh Agricultural Survey collects personal information about farmers such as names and addresses. These data are protected by the General Data Protection Regulation, Data Protection Act and the Agricultural Statistics Act. These Acts restrict how the Welsh Government can use this personal information and to whom we can release it. The Acts are, however, concerned with protecting information about individuals. In practical terms they do not restrict the publication of aggregate information where no individuals can be identified.

Data quality issues

The [Code of Practice for Statistics](#) requires the release of data at a level of aggregation that is sufficient to ensure that the results are adequately robust and so “fit for purpose”. This section provides a summary of the major data quality issues. A more detailed consideration is attached as [Annex C](#). For more information please [contact us](#).

In this overview there are three key issues to consider:

- Missing values. The Welsh Agricultural Survey is a sample survey. Thus as well as the actual responses we need to estimate results for those farms that were not selected in the sample or that did not respond. These estimated figures mean that a level of uncertainty is attached to the final estimates. Statistical theory allows us to set limits on the general level of uncertainty. This issue is becoming more important because of falling response rates to the survey.
- There is no complete register of farms. This introduces the chance that holdings have been missed. Coverage is best where the holdings are claiming agricultural subsidy. Less robust are specialist poultry, pigs or horticulture producers and very small holdings particularly those run on a non-commercial basis. As with most registers there is also a problem of timing - we might not yet know about some new holdings or we might believe that a holding that has ceased to farm is active.
- Allocation of the farms to small areas. Farms in Wales are not generally compact geographical units. Farms often do not fit neatly into administrative or statistical areas such as local authorities. A farm may have a number of detached fields. Similarly agricultural activity will move around from year to year and season to season. To allow area estimates to be made we have to allocate the activity of a farm to one area. This is usually on the basis of a single “central location”. Clearly this is a great simplification of the real world.

The data for the number of cattle on a farm is taken from an administrative source, rather than survey estimates. The main quality issue for the cattle data is linking farms from the [Cattle Tracing System](#) with the survey data we have about other activities on the farm. This is usually automatic since a common farm reference is used. However, there are a small number of cases where we cannot match a farm from the Cattle Tracing System with one in the survey. The cattle on these farms are included in the published results but not allocated to a small area or region.

The June 2010 survey was close to a full census. The survey was sent to around 21,000 farms instead of around 10,000 in a regular year. The increased sample size was to meet EU requirements.

Assessing the impact of the data quality issues

The Welsh Agricultural Survey does not provide a full set of observations for all farm holdings in Wales. It provides estimates at various levels of aggregation. The accuracy of these results depends primarily on the number of actual responses on which the estimates are based. Estimates based on small numbers of observations are inherently less accurate than those based on large sample sizes.

These data quality issues mean that there is a trade off between the need for local detail and the uncertainty attached to the estimates. This poses a key question for the data user. Does the value to be gained from the apparent extra detail outweigh the additional uncertainty? In practical terms this means making a compromise between the contradictory requirements for precision and accuracy.

No data source can be perfect for all potential uses. For any user an understanding of the data quality is important to give assurance that the data are “fit for purpose”. This may range from a general “ball park” figure up to the need for definitive and comprehensive figures at the smallest level. Data fit for one specific purpose are not necessarily fit for some others.

Recommendations for using agricultural Small Area statistics

It is not possible to produce hard and fast rules on the use of such complicated datasets. However, extensive analysis of the Agricultural Survey suggests that there are seven key observations.

- The Welsh Agricultural Survey provides statistical estimates.
- The Agricultural Survey is a source that is good at giving a broad overview of agriculture in Wales. More detail almost always equates to less accuracy.
- The survey is good at demonstrating trends in the aggregate estimates over time.
- The survey is good at showing the mix of activities on holdings and constructing farm typologies.
- In general the Agricultural Survey produces robust estimates for most of the variables in the survey at *national and regional* levels.
- The nature of the data source means that we can be confident that *on average* the small area estimates are reasonably robust over a wide range of variables. This means that it would be reasonable to consider a map of the distribution of a variable across Wales (for example splitting the small areas into “high”, “medium” and “low” groups).
- The fact that we have robustness for small areas *on average* does not imply that any *specific* small area must also be robust. Applications that require accurate estimates for specific localities are likely to be compromised by data quality issues.

Alternative sources of small area information

The Agricultural Survey has the advantage of looking at all farming activity and providing consistent series of data. However, it is not the only source of agricultural information. For specific applications, some of the following data sources might be more useful than the survey.

- Direct observation. Never underestimate the power of local knowledge.
- Administrative sources. Including results from agricultural subsidy payments system and other grant schemes. Also includes the existing cattle tracing system and, potentially, the sheep tracing system now being developed.
- Remote sensing. Satellite imagery and aerial photography may help to address land usage questions.
- Sector bodies. Many farming activities have their own organisations. For example farming unions, breed societies, small holdings organisations, horticulture organisations, organic farming registration bodies, levy bodies. These organisations may have data about their specific areas of interest.

Further information

The small area spreadsheet is made available on the [Statistics and Research website](#). Please contact us if you have queries about the data or data quality or if you need the data in some other format.

The spreadsheet is only one way of looking at the data. It has been deliberately designed to give an acceptable level of data quality over a broad range of variables. It is designed with the general user in mind. If users have specific applications in mind and wish to discuss gaining access to alternative small area information, please contact the statistician named on the front of the bulletin.

National Statistics status

The [United Kingdom Statistics Authority](#) has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the [Code of Practice for Statistics](#).

National Statistics status means that official statistics meet the highest standards of trustworthiness, quality and public value.

All official statistics should comply with all aspects of the Code of Practice for Statistics. They are awarded National Statistics status following an assessment by the UK Statistics Authority's regulatory arm. The Authority considers whether the statistics meet the highest standards of Code compliance, including the value they add to public decisions and debate.

This release was last fully [assessed in 2011](#). In 2019 statistics from the annual Welsh Agricultural Survey underwent a [compliance check](#) by the Office for Statistics Regulation. Although the focus was on the aggregate release of results, the Agricultural Small Areas Bulletin was part of the background information for this compliance check. The compliance check confirmed that the statistics continue to be designated as National Statistics and, in particular, praised the information about data quality in the survey.

Well-being of Future Generations Act (WFG)

The Well-being of Future Generations Act 2015 is about improving the social, economic, environmental and cultural well-being of Wales. The Act puts in place seven well-being goals for Wales. These are for a more equal, prosperous, resilient, healthier and globally responsible Wales, with cohesive communities and a vibrant culture and thriving Welsh language. Under section (10)(1) of the Act, the Welsh Ministers must (a) publish indicators ("national indicators") that must be applied for the purpose of measuring progress towards the achievement of the Well-being goals, and (b) lay a copy of the national indicators before the National Assembly. The 46 national indicators were laid in March 2016.

Information on the indicators, along with narratives for each of the well-being goals and associated technical information is available in the [Well-being of Wales report](#).

Further information on the [Well-being of Future Generations \(Wales\) Act 2015](#).

The statistics included in this release could also provide supporting narrative to the national indicators and be used by public services boards in relation to their local well-being assessments and local well-being plans.

Further details

The document is available at:

<https://gov.wales/agricultural-small-area-statistics>

Next update

May 2020

We want your feedback

We welcome any feedback on any aspect of these statistics which can be provided by email to

stats.agric@gov.wales

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Annex A

Description of the agricultural small area spreadsheet

Introduction

The accompanying data spreadsheet contains non-disclosive results for a set of variables from the Welsh Agricultural Surveys from 2002 to 2018. Results are given at the level of the 235 agricultural small areas and the 7 agricultural regions.

The spreadsheet is intended to be helpful to users who wish to see the broad distribution of agricultural variables over Wales.

This annex describes what is in the spreadsheet and where it can be found. Further annexes consider the data quality and confidentiality issues (Annex C) and describe the agricultural small areas with a map of the boundaries (Annex B).

Spreadsheet structure

The spreadsheet contains the following worksheets.

- Introduction. A description of the spreadsheet.
- Summary. For each variable shows Wales level statistics for 2002 to 2018: estimated aggregate total; number of holdings; sum of squared values (for calculating the standard deviation); value from actual responses; average value per holding; standard deviation; share of the total estimate derived from actual responses. Table 1 below shows a summary table for the 2018 results.
- Regions. Results for each variable and for each agricultural region for each year 2002 to 2018. Note that all these results are non-disclosive.
- SmallAreas. The non-disclosive results for each variable and for each agricultural small area for each year 2002 to 2018. Cells that are disclosive are marked "X".
- Variables. List of the variables used with short notes.
- Lookup. Shows the links between small areas, local authorities and agricultural regions.

Table 1 - Variables in the Welsh Agricultural Small Area data set for 2018

Variable	<u>Value</u> (‘000)	<u>Non-zero</u> <u>farms</u> (‘000)	<u>Average</u> <u>per farm</u> (a)	<u>Standard</u> <u>deviation</u> (a)	<u>Share from</u> <u>responses</u>
Grassland	1,515	23.9	63	127	23%
Over 5 years	1,108	22.5	49	79	23%
Rough grazing	251	4.2	60	179	18%
Under 5 years	156	6.1	25	44	28%
Crops	95	5.0	19	48	22%
Barley	23	1.5	15	17	21%
Wheat	22	0.6	38	57	20%
Maize	12	0.5	26	32	31%
Stockfeed	17	1.8	9	12	21%
Other cereals	6	0.5	12	16	15%
Potatoes	4	0.4	9	21	30%
Horticulture	2	1.7	1	8	45%
Other crops	10	0.8	12	30	18%
Farm woodland	97	7.3	13	25	18%
Other land	16	4.2	4	13	26%
Total	1,723	24.4	71	135	23%
Total sheep	9,531	13.8	693	1,242	16%
Breeding ewes	4,758	12.4	382	659	16%
Rams	97	10.4	9	17	18%
Lambs	4,585	11.3	404	676	16%
Other sheep	90	4.2	22	83	16%
Total cattle	1,134	10.4	109	176	30%
Dairy cows	304	2.9	104	161	40%
Non-dairy cows	210	8.1	26	32	21%
Calves	323	9.1	35	51	28%
Other cattle	298	9.5	31	49	27%
Pigs	23	1.3	17	110	41%
Poultry	8,181	6.2	1,330	13,567	66%
Horses	45	8.3	5	9	14%
Goats	12	1.3	9	50	20%

(a) Calculated using only holdings with a non-zero value for the variable

In the table land areas are shown in thousands of hectares and livestock in thousands of animals.

The “share from responses” shows the share of the total estimate that is from actual responses to the survey. This shows the share of the total estimate that is known rather than estimated.

Note that the cattle data are not taken from survey responses but from the [Cattle Tracing System](#). All the cattle results are thus effectively responses. The “share from responses” shows where we can link the cattle data with an actual survey response and so have details of all land, livestock and labour on the farm.

Variables released

The spreadsheet contains a limited range of the variables collected in the June Agricultural Survey. The variables cover the key areas of land usage, numbers of livestock and the numbers of farm workers (not available from 2015 onwards). The spreadsheet also contains counts of the number of farm holdings that have a particular activity. The range of variables has been selected to maximise the amount of non-disclosive information.

The variables in the spreadsheet are summarised in the following table. The table also includes some basic data quality information. The data quality issues are discussed in [Annex C](#).

Geographies used

The results are presented at two geographical scales.

- The 235 agricultural small areas
- The 7 agricultural regions

The derivation of the small areas (including a map of the areas) is described in [Annex B](#). The boundaries for the small areas are available on request as a shape file that can be read into geographic information systems.

The 7 regions are the ones that have historically been used in the Welsh Agricultural Statistics publication. They are based on groups of local authorities:

- North West – Isle of Anglesey; Gwynedd
- North East – Conwy; Denbighshire; Flintshire; Wrexham
- Powys
- Ceredigion
- Pembrokeshire
- Carmarthenshire
- South Wales – Swansea; Neath Port Talbot; Bridgend; Vale of Glamorgan; Cardiff; Rhondda Cynon Taff; Merthyr Tydfil; Caerphilly; Blaenau Gwent; Torfaen; Monmouthshire; Newport

The tests of disclosure have been applied separately at these two levels. This enables additional non-disclosive information to be released at the regional level.

The spreadsheet also links the agricultural small areas to local authorities. This allows the user to calculate sums for local authorities. A separate calculation of disclosiveness has not been reported for local authority areas. This is largely because of the problems caused by the largely non-agricultural south Wales authorities.

Annex B

Description of the agricultural small areas

The data gained from the June Welsh Agricultural Survey provides the basic physical statistics of farming; areas of land use and of crops; numbers of main livestock types i.e. cattle, sheep and the numbers and kinds of persons working on the farms. All figures relate to the areas of land and numbers of animals and persons on the agricultural holding on the survey date (which is the first weekday in June).

Small areas

Small area groups are based on aggregations of communities within local authorities. Where possible, attempts have been made to follow the geographical extent of existing designated boundaries. The 866 communities within Wales are grouped into 235 small areas. A small area will contain approximately 100 to 200 farms.

Small areas were designed to fit into the unitary authority boundaries when they were first launched. They were first used with June 1993 results. In order to enable trends in the data to be interpreted the boundaries of the small areas have been fixed. Subsequent changes in the unitary authority boundaries are therefore not included in the small area dataset.

Communities and small area groups

The Welsh Government derives estimates at the individual farm level. However, these cannot be released at this level due to the need to maintain confidentiality and avoid disclosing information about individual farmers.

Previously, information from the agricultural survey was published at country or county/unitary authority level. It was also released at district level (in the pre-Unitary Authority structure), however increasing problems in maintaining confidentiality were being experienced as one progressed towards the individual farm holding. In addition, the District was considered too coarse a geographical area to enable effective differentiation.

It was felt that it would be helpful to construct a set of community groups that would be a more detailed level than District but would be large enough to preserve confidentiality. These statistics could then be made available on a regular basis rather than only on request.

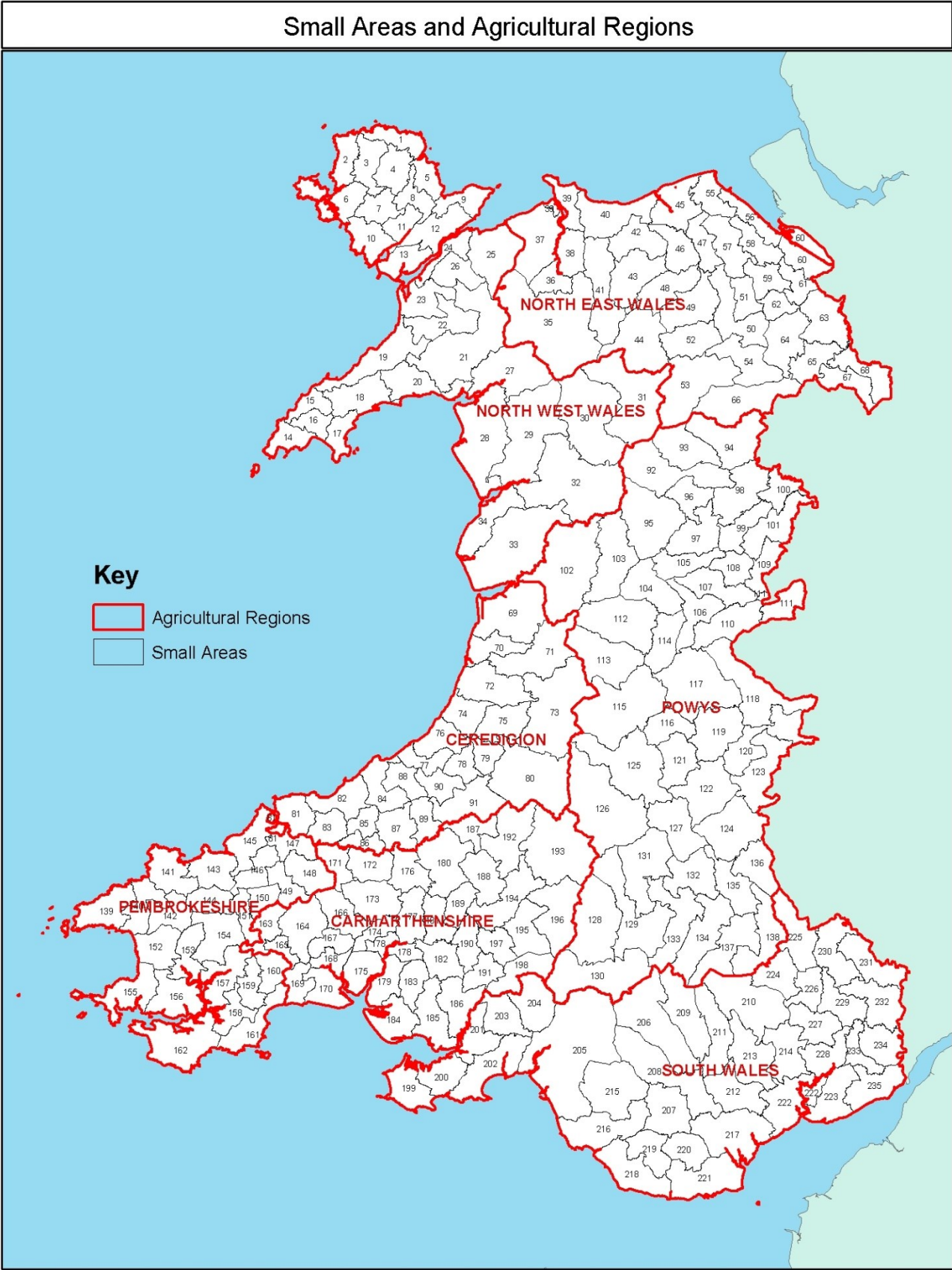
Following local government reorganisation in 1974, Civil Parish Boundaries were reorganised into **Communities** and have differed significantly from the Agricultural Parish Boundaries (**Parishes**). The current Ordnance Survey (OS) administrative boundary data set is based on the community as the base level of mapping and not the parish, and it is communities that are amalgamated to form unitary authorities.

Using agricultural Small Areas

[Map 1](#) shows the boundaries of the Welsh agricultural small areas, together with the agricultural regions.

The electronic file containing these boundaries ("shape file") can be provided to users who wish to use these data with a Geographical Information System. Please [contact us](#).

Map 1



Annex C

Data quality issues

The following key points should always be remembered.

- The Welsh Agricultural Survey is actually a sample survey not a census. The figures thus contain estimates.
- The results are not definitive or comprehensive.
- Where we have an actual response then the values will be generally accurate.
- The accuracy of the estimates for missing data depends very largely on the number of actual responses on which the estimate is based.
- The register of farms on which the survey is based is not a compulsory register and so can only be our best estimate of the true population.
- The survey is based on farms as a building block. These farms are not geographically compact units. We can make estimates for geographical areas but these will contain additional errors because of location issues.

Overview

For those holdings that make a response to the survey we have an accurate record of the agricultural activity. The survey asks for simple land areas, livestock and labour counts. These are variables that any farmer will know – although different terminologies can lead to misunderstandings (particularly in the labour questions).

Since the results are derived from a sample survey they are subject to various sources of uncertainty. The key sources of uncertainty are:

- Missing data.
- Register of farms.
- Geographical location of farms.

Missing data

The June Agricultural Survey is a sample survey of farms. Not all farms are selected for the sample. Not all farms that are selected complete the questionnaire. Standard statistical techniques are used to estimate the Wales total figures, including the missing holdings.

[Table 1](#) in Annex A shows the proportions of the agricultural variables in the released data set that come from actual responses. The actual value of the share from responses changes from variable to variable and between surveys. As a rule of thumb, the share usually falls between 40% and 50%. *The remainder will be imputed and so subject to a degree of sampling error.*

The overall Wales totals are estimated from the survey results by assuming that the increase from last year for the population as a whole is the same as that we see in the sample. Given that we have taken a

random sample of farms this assumption is supported by statistical theory. Analysis of actual results also shows that *at the aggregate level* these estimates are adequately robust.

These estimates will be at their best when there are a lot of similarly sized farms that are, broadly speaking, following the same patterns. This is usually the case for cattle and sheep farms in Wales. The estimates are more problematic when an activity is dominated by a few large farms or when there is great volatility. Specialist chicken producers would be an example of the former while very small or non-commercial farms would be an example of the latter.

To enable a full set of results to be produced – including cross tabulations of one variable against another – we attempt to impute missing values for farms that were not in the survey or did not provide a response. These imputed farm values are constructed so that they equal the Wales total estimates. The imputations are made in the same way as the total estimates by assuming that the whole population and the sample have the same increase over last year.

A limitation of this methodology is the assumption that an imputed farm will have the same set of agricultural activities as it did in the base year. For the individual holding there can be no changes to the types of crops grown or livestock kept – although the areas and numbers will change.

Clearly these imputed farm level results are not particularly accurate *for individual farms*. Their usefulness comes in being a flexible building block to construct a very wide range of aggregate estimates. The accuracy of these aggregate estimates comes from combining a large number of individual farms. Statistical theory shows how this process of aggregations leads to more accurate estimates.

Falling response rates increase the importance of this issue. Various options are being assessed to try and tackle the falling rates. From a practical point of view the falling response rates increase the risk that results for individual small areas are based on few (if any) actual responses.

Register of farms

There is no compulsory register of farms in the UK. The voluntary nature of the register means that it will always have issues about missing farms (false exclusions) and farms that have ceased to operate but that are still on the register (false inclusions). If nothing else there will be issues of how quickly we are informed of changes.

There are three main routine sources of information for the register.

- Links with administrative systems. The register is updated with information from various administrative systems. The main sources are the subsidy payment system and the compulsory register of cattle keepers (BCMS). Data are received from time to time from other administrative systems.
- Correspondence through running the various agricultural surveys. This provides updated name and address details plus a number of forms that are returned undelivered.

- The agricultural magazine that the Welsh Government, [Gwlad](#)). The statistical register is used as the basis for the magazine mailing lists. Farmers notify the magazine of name and address changes. They can also ask to be removed from the circulation list. This is important for the register because farmers see the magazine as a benefit that they want to continue to receive. Improving the quality of the statistical register is a welcome bonus from this fact.

From these sources it is clear that register information will be at its best when we have regular contact with the farms. The coverage will be at its best for farms that are within the agricultural subsidy system because they have the strongest reason to be registered. In Wales the majority of farms are claimants.

For holdings outside the subsidy system there are four key types of holding that are known to have coverage problems.

- Specialist poultry producers.
- Specialist pig producers.
- Specialist horticulturists.
- The very smallest holdings including non-commercial concerns.

The specialist producers are a particular concern because there tend to be few of these in Wales and these sectors are dominated by a small number of farms. The most extreme is for chicken producers where more than 90% of the birds are on less than 1% of the farms with chickens.

The smallest farms do not make a significant contribution to most agricultural variables. Typically these holdings will have well below 1% of the Wales total. Note that the very smallest farms contribute a significant proportion of the total number of horses in Wales.

There are, however, large numbers of these very small farms. This may be important if what we want to know is all holdings with a particular activity – for example livestock keepers at the time of the Foot and Mouth outbreak.

Geographical location of farms

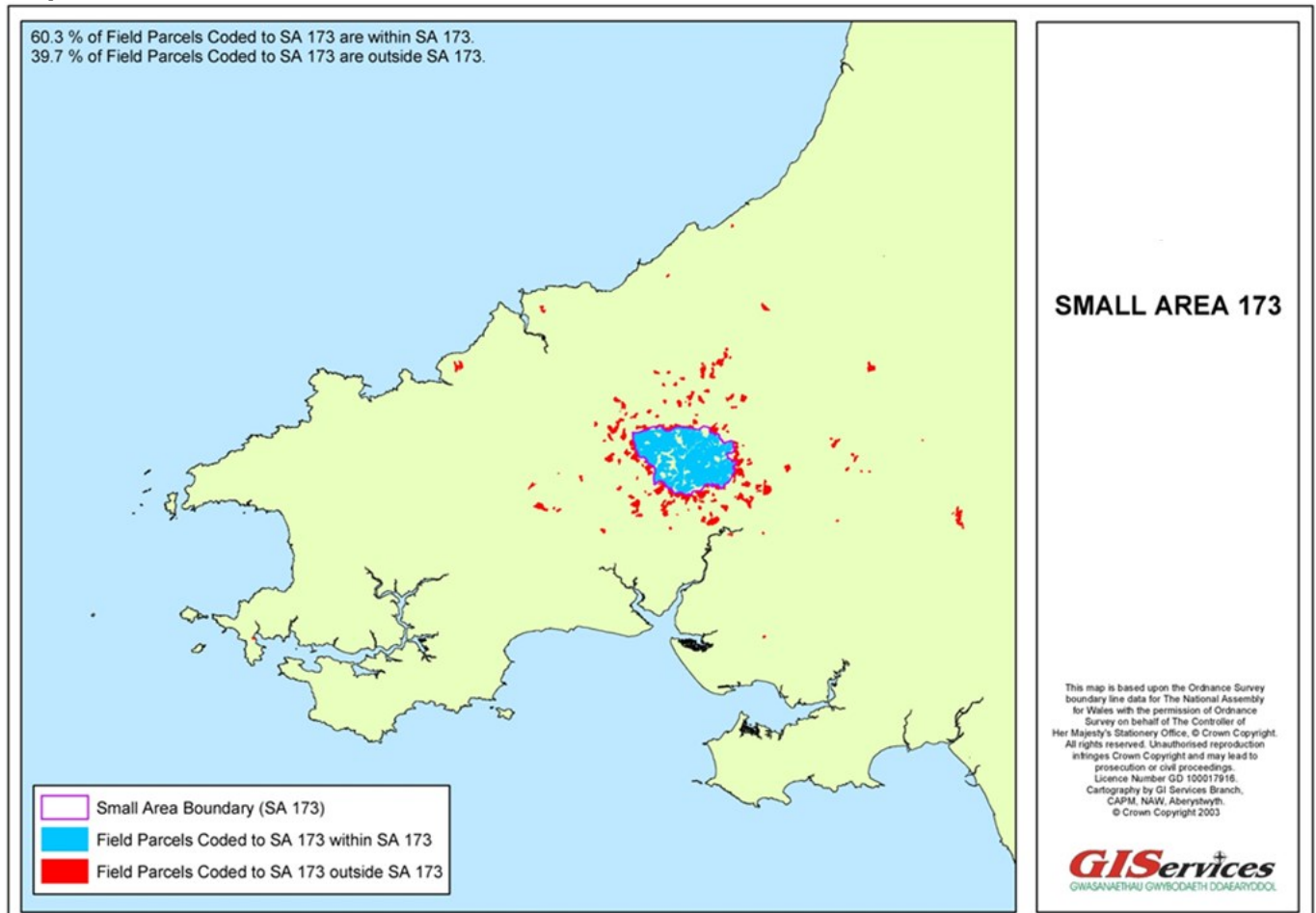
The Welsh Agricultural Survey collects information at the level of the individual farm. These farms are collections of land farmed together as a unit. *They are not necessarily contiguous sets of fields.* The fields on a farm may be scattered over a wide area. Therefore, while we will know the number of animals on a farm we do not know where the animals graze. Similarly while we know the total area of crops we do not know where the crops are grown.

It is possible to make an estimate of the general location of a farm. These estimates can use the digital field boundaries where these are available through the subsidy system and address information otherwise. We can then build up geographical estimates by assuming that all the activity on a farm takes place at this estimated location. *Clearly this an estimate and a great simplification of reality.*

The accuracy of the geographical estimates depends mainly on using areas that contain a sufficiently large number of farms. With a large number of farms the overall net error will decrease as a false inclusion on one farm is balanced by a false exclusion on another. However, for very specific location, with small numbers of farms involved, the level of error because of the location issues must be more significant.

The significance of this problem can be seen in [Map 2](#). This uses the individual field parcels from the subsidy payments system. Each of these field parcels is shown on the map. While most of the parcels fall within the selected small area there are a significant number outside and some a long way from the specific small area.

Map 2



Source: Welsh Government

Annex D

Cattle data from the Cattle Tracing System

Introduction

The [Cattle Tracing System](#) (CTS) manages the registration of cattle in Great Britain (Northern Ireland has its own system). The system records births, deaths and movements of animals.

Information from the Cattle Tracing System has been used to replace survey questions in order to improve the accuracy of the data and to reduce the burden on farmers.

The data available to the Knowledge and Analytical Services division is a snapshot of the number of animals on holdings in Wales. The results in this bulletin have the snapshot taken as at 1 June. Data taken at December are also available. To ensure that as many of the animal movements as possible have been reported, and any anomalies sorted out, the cattle data are usually received about 4 months after the date they refer to. Data are currently available each year from 2004.

Categories of animals available

The Cattle Tracing System collects the age, sex and breed of each animal. This means that we cannot reproduce the full range of categories from the June Survey. We cannot find out if the females are in milk or in calf. We do not know if the males are for breeding purposes (“bulls for service”).

In the small area dataset we approximate the number of breeding females by simply using age (animals at least 2 years old) and sex. The breed codes are used to determine if the animal is for dairy or beef purposes. A set of breeds have been identified as being dairy breeds. All other breeds are then assumed to be not dairy.

The category of “bulls for service” has been dropped. Male cattle of at least 1 year are counted as “others”.

Matching holdings with other survey results

There are two issues about linking results from the Cattle Tracing System with all the other results from the June Survey.

The first stage is to allocate each of the holdings to its country within Great Britain. There are a small number of holdings that cannot be allocated. Note also that, since holdings in one country may also use grazing in another, the allocation is illustrative rather than definitive.

The second stage is to match the unique identifiers from Cattle Tracing with those from the June Survey. Again there is a small residual of holdings which are recorded as having cattle but we cannot find the identifier in the survey records. The majority of these are where a holding has been allocated a temporary identifier for some administrative purpose.

Coverage of the Cattle Tracing System

Registration of cattle in Great Britain is mandatory. The registration data is used when animals are sold or slaughtered so coverage for commercial keepers will be almost complete. Fortunately the non-commercial sector is very small for cattle so, even if unregistered animals occur more often, the overall effect will still be limited.

As with all administrative systems there will be an issue about timing. Farmers have a certain time in which they are required to report births, deaths and movements. Some will by accident miss these deadlines. Some awkward cases will take longer. In practical terms we address these timing issues by not taking the June snapshot before September. This seems to give a sensible balance between catching all the data but remaining reasonably timely.

Comparison tables

The following tables show the information taken from the Cattle Tracing System from 2004 to 2007 and compare it to survey estimates in the period when both sources were available, 2004 to 2006.

Welsh cattle numbers from Cattle Tracing Service, 2004 to 2007 (thousands)

	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
Total cattle and calves	1,267	1,251	1,216	1,164
Cattle aged 2 or more years	614	616	610	585
Females - dairy breeds	303	299	298	289
Females - non-dairy breeds	263	264	259	247
Males	48	53	53	49
Cattle aged 1-2 years	291	292	275	264
Females - dairy breeds	59	56	54	51
Females - non-dairy breeds	105	109	104	101
Males	127	127	117	111
Calves under 1 year	362	343	332	316
Females - dairy breeds	57	55	52	55
Females - non-dairy breeds	135	132	129	121
Males	170	157	151	140

Comparing Cattle Tracing Service and June Survey, 2004 to 2007 (thousands)

	2004	2005	2006	2007
Total Cattle and Calves (all ages)				
Cattle Tracing System	1,267	1,251	1,216	1,164
June Agricultural Survey	1,281	1,241	1,323	na
Difference from C.T.S.	1%	-1%	9%	na
Females (all ages)				
Cattle Tracing System	922	915	896	864
June Agricultural Survey	944	920	977	na
Difference from C.T.S.	2%	1%	9%	na
Males (all ages)				
Cattle Tracing System	344	336	321	300
June Agricultural Survey	338	321	346	na
Difference from C.T.S.	-2%	-4%	8%	na

Results at June each year

The comparison between the two sources seems to be reasonably close for 2004 and 2005. The large mismatch in 2006 seems to be a problem with the Survey data. The run of figures from the Cattle Tracing System seems consistent. It seems likely that a quirk in the survey responses has been magnified by the calculations that raise the survey results to the overall Wales estimates.