

Statistical Publication

Agriculture Series

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A National Statistics Publication for Scotland



A NATIONAL STATISTICS PUBLICATION FOR SCOTLAND

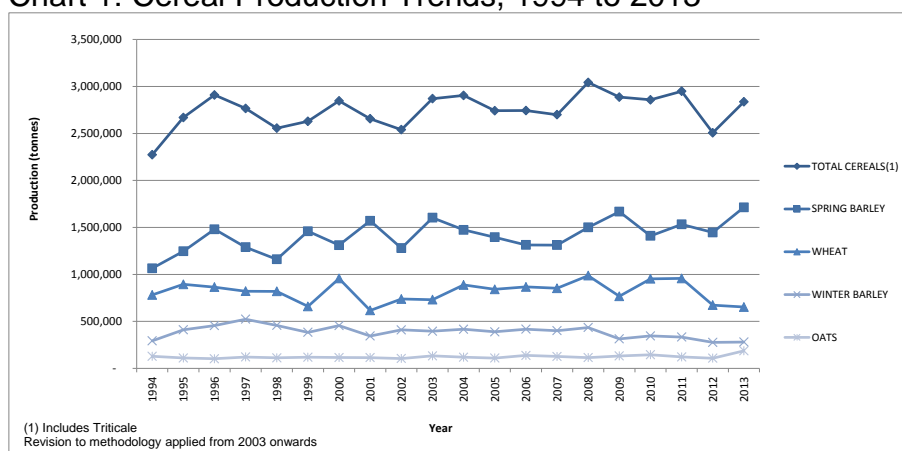
Final Estimate of the Cereal and Oilseed Rape Harvest 2013
18th December 2013

Introduction

This publication, released today by Scotland's Chief Statistician, contains final estimates of the 2013 cereal and oilseed rape harvest along with commentary and graphics on longer term trends. These final harvest estimates update the first estimates published in October.

Between 2012 and 2013 production is estimated to have risen by a third of a million tonnes to 2.8 million tonnes, but remains four per cent lower than 2011 volumes. The estimated increase in cereal production in 2013 represents a partial recovery following a 15 per cent reduction in 2012, which was caused by poor weather conditions and a prolonged harvest period.

Chart 1: Cereal Production Trends, 1994 to 2013



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Relationship Between Area, Yield and Production

Cereal and oilseed rape crop areas represent the amount of area that has been used to grow a particular crop, which is intended for combine harvesting and the production of grain or oilseeds. Area estimates are derived from the June Agricultural Census and specifically exclude any areas of cereals which are not intended for combine harvesting. Whole crop cereals are harvested whole (i.e. without extracting the grain) and are used as a source of animal feed.

Average yields are expressed in tonnes per hectare and represent the amount of cereal grain or oilseed that is extracted from one hectare of combine harvested area. 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) and average yields (in tonnes per hectare). They represent 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 and other plant material which is produced as a by-product and utilised for other purposes.

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

Summary

Between 2012 and 2013 production is estimated to have risen by a third of a million tonnes to 2.8 million tonnes. This represents a partial recovery following a 15 per cent reduction in 2012, caused by poor growing conditions and a wet and prolonged harvest period. It is expected that a recovery from last year's low yields will take at least two years; subject to favourable growing conditions in 2014. The overall increase in cereal production this year is due to a 13 per cent increase in yields, as areas remained largely unchanged.

Although current yields remain relatively low overall cereal yields (including triticale) show improvement over the longer term. The recent 10 year average yield is seven per cent above the previous decade's. Long term increases are likely to be due to improved efficiency in practices and development and use of high yielding varieties.

These estimates indicate that, compared with final estimates from the 2012 harvest:

- Spring barley production increased by 18 per cent to 1.7 million tonnes due to a two per cent increase in area and a 16 per cent increase in yield.
- Winter barley production increased by one per cent to 280,000 tonnes due to a two per cent increase in yield. The area grown remained unchanged at 43,000 hectares.
- Wheat production decreased by three per cent to 653,000 tonnes due to a 14 per cent reduction in area. Yield increased by 12 per cent.
- Oat production increased by 73 per cent to 187,000 tonnes due to a 29 per cent increase in yield and a 34 per cent increase in area.
- Oilseed rape production increased by five per cent to 112,000 tonnes due to a 14 per cent increase in yield. Area decreased by eight per cent.

Comparison against provisional estimates

- Overall cereal production is estimated at 2.9 million tonnes; 56,000 tonnes above provisional estimates. The increase in yields on 2012 is estimated at 14%, three percentage points greater than provisional estimates.
- The estimated increase in production of spring barley (up 18 per cent) is greater than suggested by provisional estimates.
- Increases in winter barley (up two per cent) and oats (up 73 per cent) are lower than previously estimated.
- The fall in production of wheat (down three per cent) is less severe than suggested by provisional estimates.
- Oilseed rape production is estimated to have increased by five per cent, where provisional estimates indicated a fall of two per cent.

The figures released today were produced by independent statistical staff free from any political interference, in accordance with professional standards set out in the Code of Practice for Official Statistics.

Cereals¹

Production

Between 2012 and 2013 production is estimated to have risen by a third of a million tonnes to 2.8 million tonnes, but remains four per cent lower than 2011 volumes. The estimated increase in cereal production in 2013 represents a partial recovery following a 15 per cent reduction in 2012, which was caused by poor weather conditions and a prolonged harvest period. The overall production estimate for 2013 is similar to that of 2000, but with greater volumes of spring barley and oats, and less winter barley and wheat.

Yield

The total cereal area remained largely unchanged compared to 2012, with the estimated rise in production due to a 13 per cent increase in yields. In 2012, despite an increase in planted areas, yields saw an uncharacteristically sharp decline from previous levels; due to poor growing conditions in many areas and a wet and prolonged harvest period. With the more favourable weather conditions this year a partial recovery has been achievable. The Crop Report panel expect a recovery from last year's low yields to take at least two years; subject to favourable growing conditions in 2014.

The long term trend of increasing yields remains, with the recent 10 year average of 6.5 tonnes per hectare seven per cent above the previous 10 year average. This long term increase is likely to be due to an improved efficiency in farming practices as well as development and use of higher yielding crop varieties. Despite this, current yields remain relatively low; in the last decade only 2012 yields were lower. These shorter term variations in cereal yields are more likely to be influenced by weather and other conditions during the growing season.

Area

458,000 hectares of cereals were grown this year. Areas have ranged between 395,000 hectares in 1994 and 476,000 hectares in 1997. Cereal plantings have been influenced by various factors, including differing rates of compulsory set-aside between 1994 and 2008, relative competitiveness and profitability of cereals compared to other crops, as well as physical conditions at the time of planting.

Triticale

Triticale is a marginal crop in Scotland, grown on around 500 hectares. Because there are relatively few farms growing triticale it is difficult to provide reliable yield estimates. However, for the same reason, variances in yield have little impact on overall cereal production. Triticale production is not discussed in this release, but is included in the overall cereal estimates.

Cautionary Note

In 2013 there was a noticeable rise in the number of holdings reporting whole cropping of cereals intended for combine harvesting. Whole cropped cereals are used as animal feed and are not weighed in the same way as cereals sold to merchants. This means that yield and production results cannot be calculated for

¹ Includes triticale.

whole cropped cereals. Unintended whole cropping is likely to occur when quality and yields are low. The exclusion of whole cropped cereals from the Cereal Production Survey (CPS) could lead to an overestimate of cereal production; though this cannot be quantified.

Charts

Chart 2 shows the areas estimated from the June Agricultural Census as bars and the estimated production and estimated average yield as lines. Area is presented in hundreds of hectares, production in thousands of tonnes and yield in tonnes per hectare.

In the same format as chart 2, chart 3 shows the year-on-year change of areas, total production and average yield. This allows the drivers of fluctuations in production to be more easily distinguished and gives a sense of the typical fluctuations from year to year. In chart 3 all measures are presented as the percentage change compared to the previous year.

In the following sections similar charts are used to display the results for each crop group, though the scales of the chart axes are not the same in every case.

Chart 2 - Total Cereals: Area, Yield and Production (includes triticale)

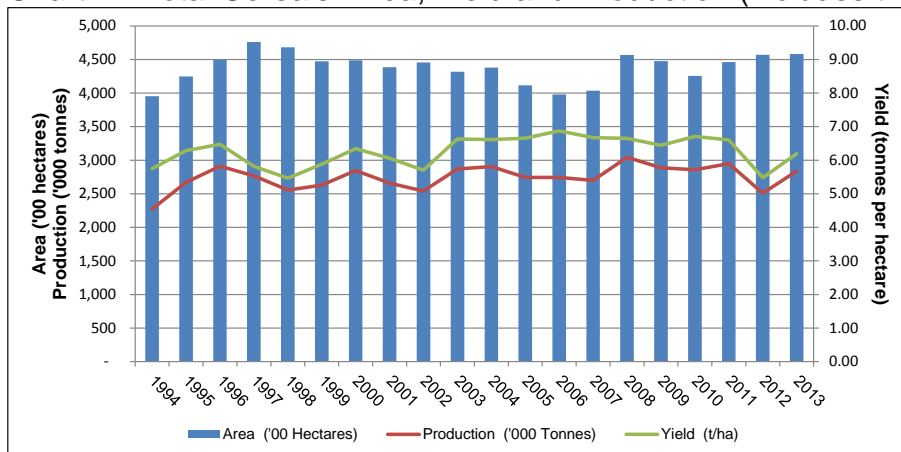
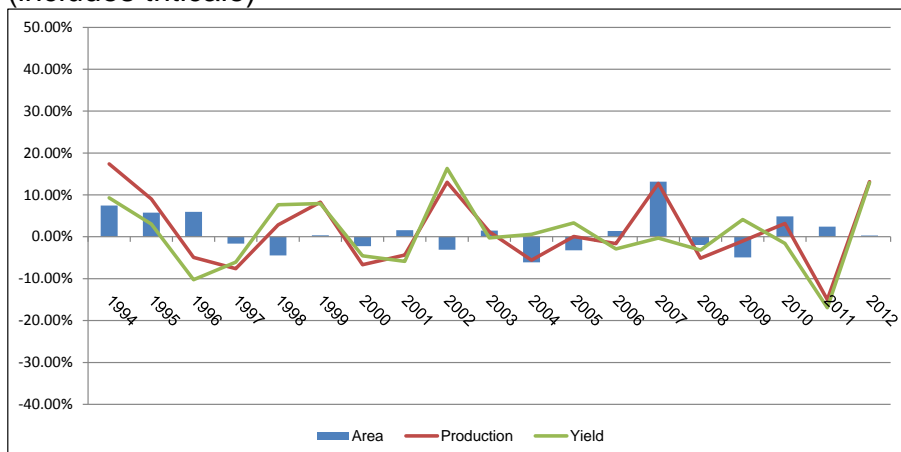


Chart 3 - Total Cereals Year-on-Year Change: Area, Yield and Production (includes triticale)



Barley

Barley is the predominant cereal crop grown in Scotland and, in 2012, contributed around a third of the UK barley area, particularly spring barley which accounted for just under half of the UK total. Despite a strong association with the Scottish whiskey industry, as a key ingredient, most Scottish barley is used as animal feed.

Spring Barley Estimates (charts 4 and 5)

Over the last 20 years spring barley production has been following a generally increasing trend. With an estimated 18 per cent increase in 2013, production is at the highest level over the period, estimated at 1.7 million tonnes (45,000 tonnes above the 2009 peak). This estimated increase was due to both a two per cent increase in area grown and a 16 per cent increase in yield.

Grown areas increased to the highest level in the last 20 years, at 296,000 hectares. The average yield for spring barley in 2013 has been estimated at 5.8 tonnes per hectare. In the last 10 years yields for spring barley remained relatively stable until 2012; when yields experienced the largest change in a decade, with a fall of 14 per cent. This year's yields are estimated to have increased by 16 per cent, roughly equivalent to pre-2012 levels.

The longer term trend in yield is an increasing one, with the average over the most recent decade nine per cent higher than over the previous 10 years – when yields were both lower and more variable.

Winter Barley Estimates (charts 6 and 7)

2013 production is estimated to have increased by one per cent to 281,000 tonnes, 4,000 tonnes above 2012 production estimates. This year's estimated increase has been driven by a two per cent increase in yield, as grown areas fell to their lowest level in 20 years.

Winter barley production follows a similar trend to grown areas; which peaked in 1997 and have been on a general decline since then. 43,000 hectares were grown in Scotland in 2013.

The general trend in winter barley yields has been quite different. Relatively large fluctuations in yield gave way in 2001 to a period of steady increases, rising to a peak in 2006. While yields have declined since then, the recent 10 year average is eight per cent higher than that of the previous decade and, similarly to spring barley, also less variable. The average yield for winter barley in 2013 is estimated at 6.6 tonnes per hectare.

Chart 4 - Spring Barley: Area, Yield and Production

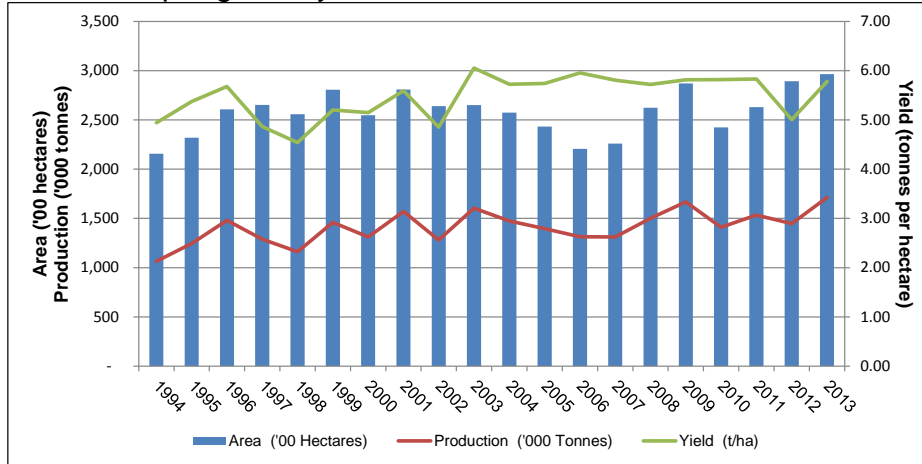


Chart 6 - Winter Barley: Area, Yield and Production

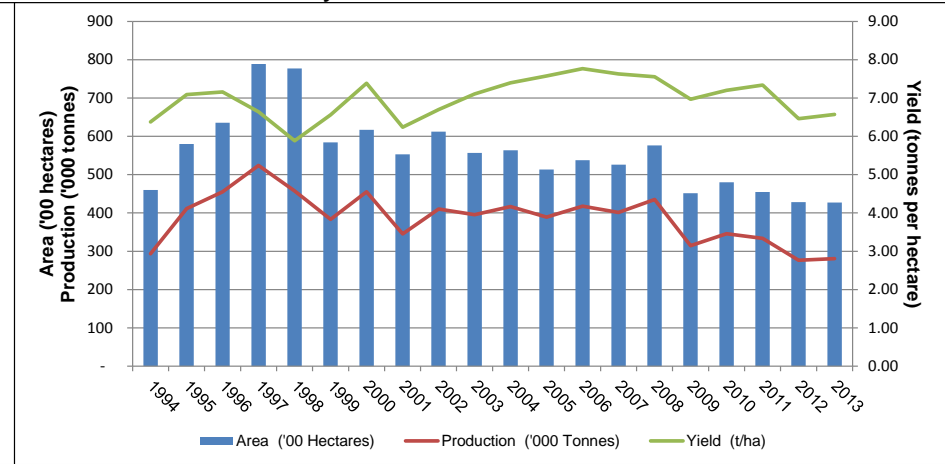


Chart 5 - Spring Barley Year-on-Year Change: Area, Yield and Production

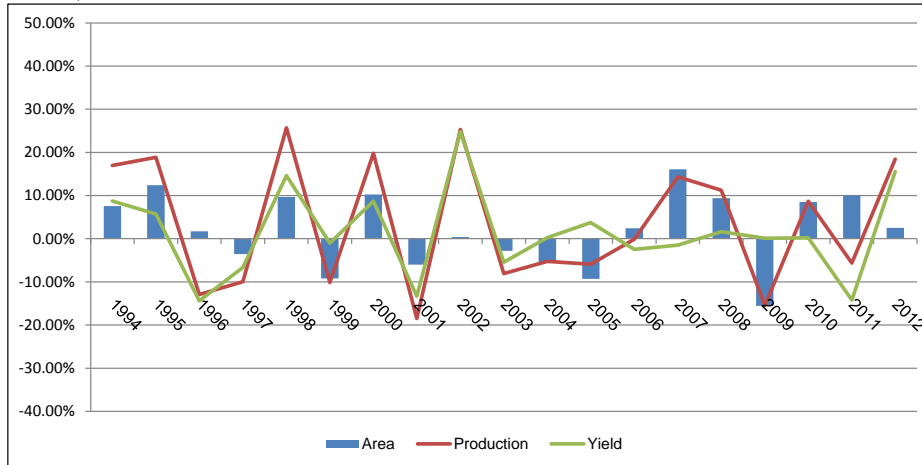
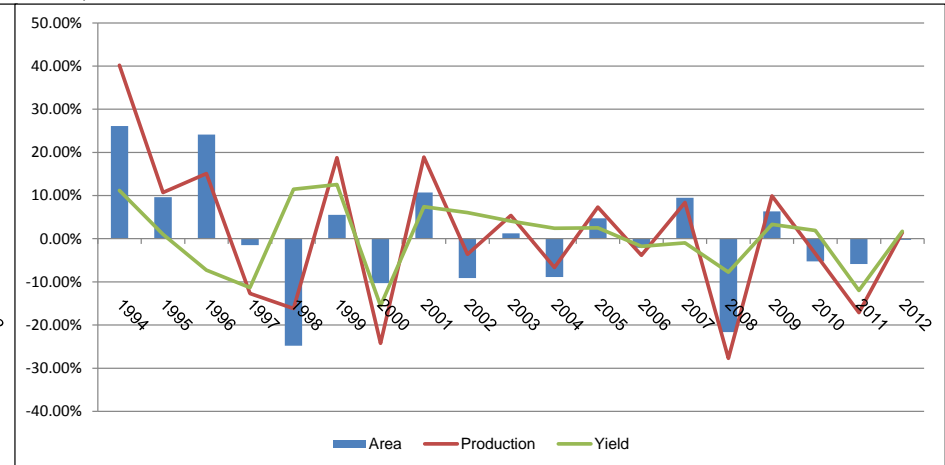


Chart 7 - Winter Barley Year-on-Year Change: Area, Yield and Production



Wheat

Scottish wheat is mostly soft wheats; used predominantly for distilling, but is also used for animal feed. Scotland imports hard wheats for milling (for bread making) as our climate does not suit hard wheat varieties.

Wheat Estimates (charts 8 and 9)

In 2012 wheat production was particularly affected by poor growing conditions and fell by almost a third. Estimated production in 2013 has fallen by a further three per cent to 653,000 tonnes, the lowest production since 2001 and second lowest 20 years. While wheat yields are estimated to have increased by 12 per cent, grown areas are down 14 per cent and are responsible for the decrease in production.

87,000 hectares of wheat were grown this year. In some areas, poor growing conditions early in the year resulted in the replacement of some plantings with spring oats. Areas have fluctuated considerably in the last 20 years, reaching a peak in 2011 and have now fallen to their lowest levels since 2001. Yields do not tend to fluctuate as much and are estimated to have increased to 7.5 tonnes per hectare.

In general, the higher variability in grown areas of wheat exerts a stronger influence over levels of production than relatively small fluctuations in yield. Areas, yields and production have been higher on average in the last decade than the previous one.

Chart 8 - Wheat: Area, Yield and Production

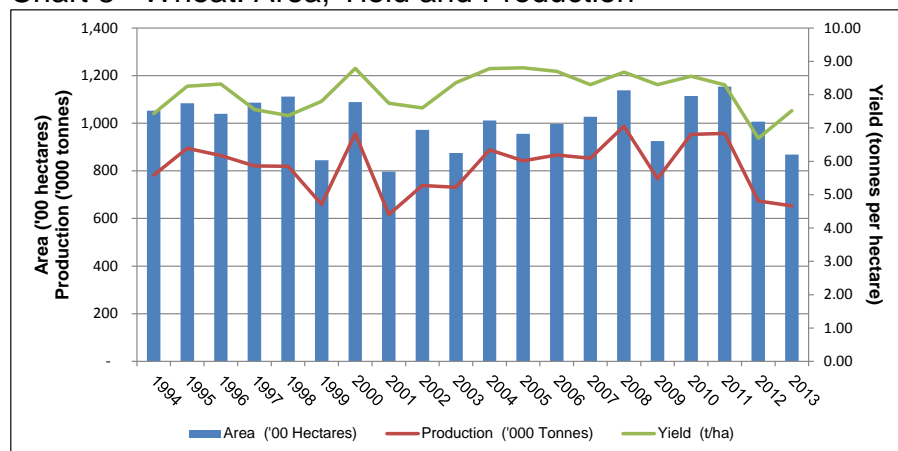
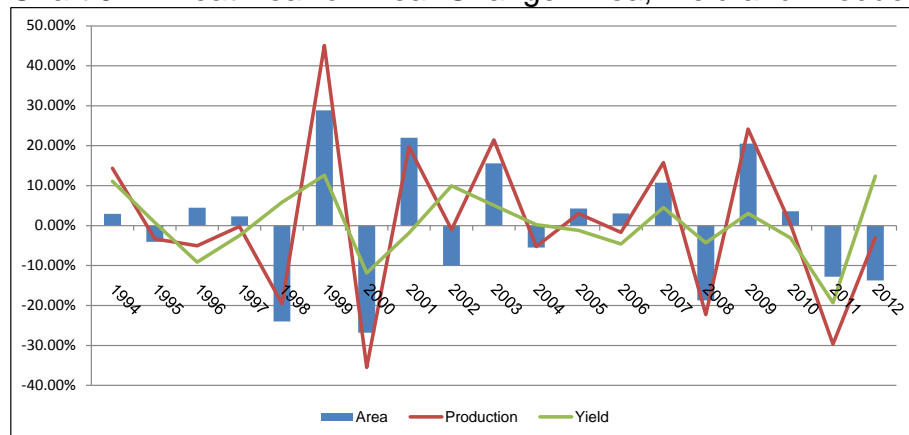


Chart 9 - Wheat Year-on-Year Change: Area, Yield and Production



Oats

The majority of oats grown in Scotland are used for milling and further processing for breakfast cereals, oatcakes, porridge oats and oatmeal for secondary processing outside Scotland. The majority of the remainder is used as specialist feed for horses.

Oats Estimates (charts 10 and 11)

Oat production is estimated to have increased by 73 per cent this year due to 29 per cent increase in yields and a 34 per cent increase in grown areas. Production has fluctuated considerably in recent years, but particularly so in the last year when it reached the highest level in the last 20 years, at 187,000 tonnes.

Grown areas are also at their highest level in 20 years, at 32,000 hectares. The Crop Report panel expect that this is in part due to wheat and oilseed rape sowings which were ploughed out and replaced with spring oats after a poor start to the year in some areas. Spring oats make up around 80 per cent of oat production.

This year's average yield is estimated at 5.9 tonnes per hectare, slightly down on the 2010 peak of 6.3 tonnes per hectare. This is in line with the general increasing trend in oat yields, which has seen a 9 per cent average increase in the last 10 years, compared to the previous decade.

Chart 10 - Oats: Area, Yield and Production

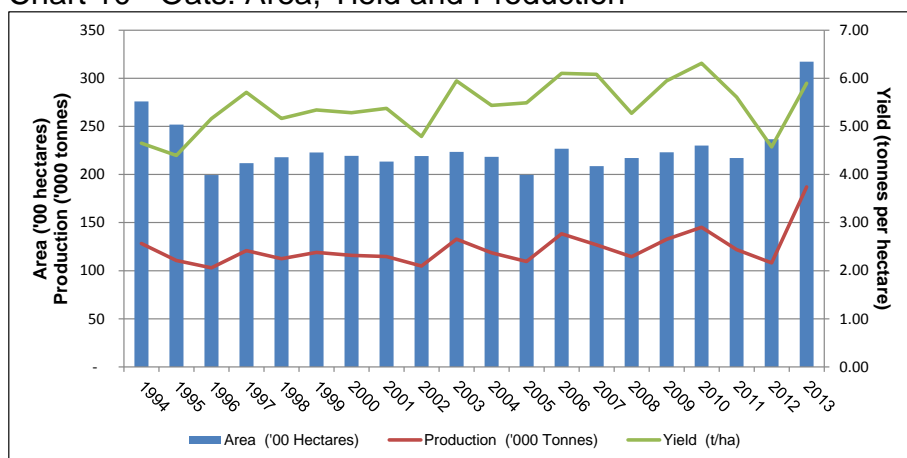
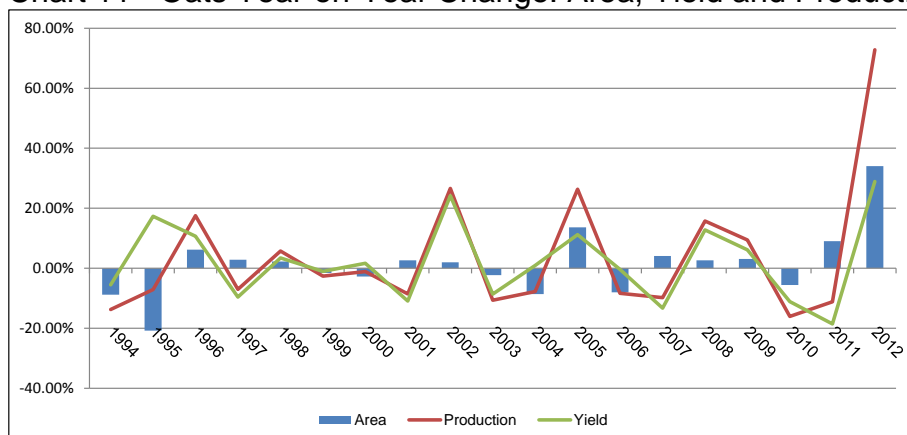


Chart 11 - Oats Year-on-Year Change: Area, Yield and Production



Oilseed Rape

The majority of Scottish oilseed rape is winter oilseed rape and is mainly exported for biofuels, with a very small amount processed in Scotland for edible oil.

Oilseed Rape Estimates (charts 12 and 13)

Estimated oilseed rape production increased slightly in 2013 (up five per cent) to 112,000 tonnes. This was due to an estimated increase in yields, which rose by 14 per cent to 3.3 tonnes per hectare and despite an eight per cent decrease in grown areas.

Most oilseed rape grown in Scotland is winter oilseed rape, which suffered from poor growing conditions early in the year. In some cases this was ploughed out and replaced with spring oats. Spring oilseed rape production is particularly hard to estimate as much of it has not yet been cut.

Over the last 20 years, oilseed rape production has remained relatively stable. This is in part due to a balance between generally decreasing areas grown and general increases in yields achieved. Fluctuations in yield have been more marked in recent years and in particular in 2012, when poor growing conditions saw yields fall by almost a third. In 2013, yields improved slightly and are now estimated at 3.3 tonnes per hectare on average.

Chart 12 – Oilseed Rape: Area, Yield and Production

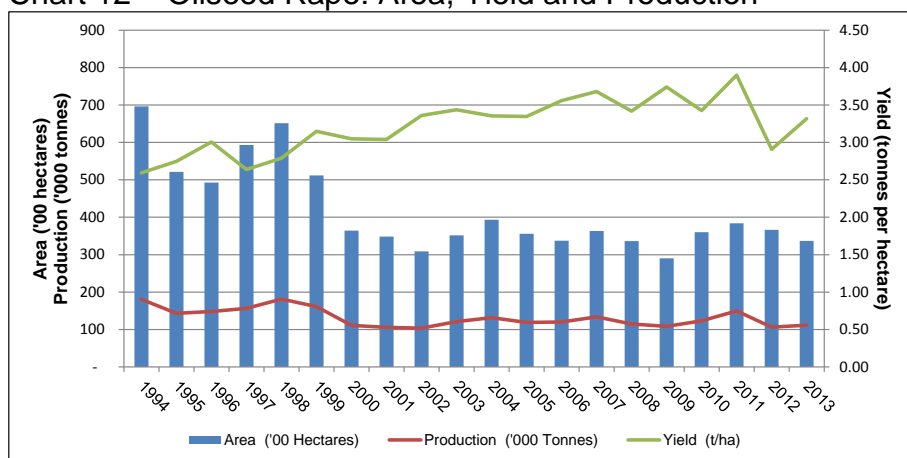
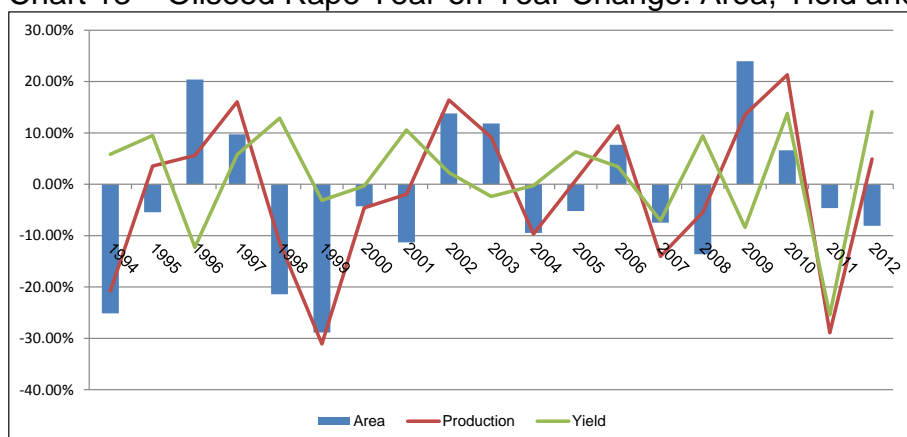


Chart 13 – Oilseed Rape Year-on-Year Change: Area, Yield and Production



Key Statistics: Changes in Cereal Production

2013 Cereal and Oilseed Rape Harvest Change Over the Year

mt = million tonnes
k = thousand

kt = thousand tonnes
t/ha = tonnes per hectare

Production

To: 1.7 mt



From: 1.4 mt

Spring Barley

Due to a 2% increase in area and a 16% increase in yield.
Grown area = 296 k hectares Average yield = 5.8 t/h

To: 281 kt



From: 277 kt

Winter Barley

Due to a 2% increase in yield. Area remained unchanged.
Grown area = 43 k hectares Average yield = 6.6 t/h

From: 673 kt

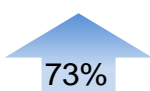


To: 653 kt

Wheat

Due to a 14% reduction in area. Yield increased by 12%.
Grown area = 87 k hectares Average yield = 7.5 t/h

To: 187 kt



From: 108 kt

Oats

Due to a 29% increase in yield and a 34% increase in area.
Grown area = 32 k hectares Average yield = 5.9 t/h

To: 2.8 mt



From: 2.5 mt

Total Cereals

Due to a 13% increase in yield. Area remained unchanged
Grown area = 458 k hectares Average yield = 6.2 t/h

To: 112 kt



From: 106 kt

Oilseed Rape

Due to a 14% increase in yield. Area decreased by 8%.
Grown area = 34 k hectares Average yield = 3.3 t/h

Reference Tables

Table 1: Cereal Area, Yield and Production 2012 and 2013

Crop	2012			2013			% Change 2012/2013		
	Area ² (000 ha)	Yield (t/ha)	Production (000 t)	Area ² (000 ha)	Yield (t/ha)	Production (000 t)	Area ²	Yield	Production
Wheat	101	6.7	673	87	7.5	653	-13.7%	12.4%	-3.0%
Winter Barley	43	6.5	277	43	6.6	281	-0.3%	1.7%	1.4%
Spring Barley	289	5.0	1,447	296	5.8	1,714	2.5%	15.5%	18.4%
Total Barley	332	5.2	1,723	339	5.9	1,994	2.1%	13.3%	15.7%
Oats	24	4.6	108	32	5.9	187	34.0%	28.9%	72.8%
Total Cereals¹	457	5.5	2,507	458	6.2	2,837	0.3%	12.8%	13.2%
Oilseed Rape	37	2.9	106	34	3.3	112	-8.1%	14.1%	4.9%

¹ Estimates for Total Cereals include Triticale.

² Area estimates are based on final June Census results.

Table 2: Cereal Area, Yield and Production 1994 to 2013

Year ²	TOTAL CEREALS ⁽¹⁾			SPRING BARLEY			WINTER BARLEY			WHEAT			OATS		
	Area (Hectare)	Yield (t/ha)	Production (Tonnes)	Area (Hectare)	Yield (t/ha)	Production (Tonnes)	Area (Hectare)	Yield (t/ha)	Production (Tonnes)	Area (Hectare)	Yield (t/ha)	Production (Tonnes)	Area (Hectare)	Yield (t/ha)	Production (Tonnes)
1994	395,286	5.75	2,273,770	215,624	4.94	1,065,494	45,987	6.38	293,244	105,275	7.43	782,057	27,597	4.65	128,352
1995	424,720	6.29	2,669,660	231,934	5.37	1,246,109	57,993	7.09	411,105	108,379	8.25	894,324	25,181	4.40	110,713
1996	449,298	6.48	2,909,649	260,726	5.68	1,480,776	63,566	7.16	455,093	103,974	8.32	864,552	19,950	5.16	102,909
1997	475,958	5.81	2,766,710	265,212	4.86	1,289,532	78,893	6.64	523,763	108,655	7.56	820,943	21,185	5.71	120,932
1998	468,154	5.46	2,556,349	255,822	4.54	1,160,886	77,705	5.89	457,320	111,172	7.37	819,316	21,784	5.16	112,470
1999	447,236	5.88	2,629,266	280,546	5.20	1,459,163	58,442	6.56	383,414	84,476	7.80	659,177	22,278	5.34	118,971
2000	448,720	6.34	2,846,939	254,718	5.15	1,311,105	61,678	7.38	455,349	108,853	8.79	956,432	21,927	5.28	115,874
2001	438,623	6.06	2,656,550	280,786	5.59	1,570,617	55,319	6.24	345,045	79,680	7.74	616,970	21,333	5.37	114,630
2002	445,512	5.70	2,540,349	263,914	4.85	1,279,984	61,234	6.70	410,268	97,192	7.60	738,662	21,907	4.79	104,897
2003	431,720	6.63	2,870,410	264,920	6.05	1,603,596	55,649	7.11	395,428	87,498	8.36	731,351	22,340	5.95	132,822
2004	438,039	6.61	2,904,878	257,462	5.72	1,473,709	56,348	7.40	416,719	101,126	8.78	888,156	21,831	5.44	118,688
2005	411,329	6.65	2,742,230	243,298	5.74	1,396,231	51,341	7.58	388,938	95,595	8.81	841,744	19,955	5.49	109,505
2006	398,050	6.87	2,744,088	220,639	5.95	1,313,527	53,762	7.76	417,444	99,681	8.70	867,053	22,682	6.10	138,391
2007	403,493	6.67	2,699,921	226,019	5.80	1,312,003	52,625	7.63	401,377	102,744	8.30	852,603	20,868	6.08	126,887
2008	456,547	6.65	3,043,330	262,322	5.72	1,500,118	57,612	7.55	435,085	113,797	8.68	987,256	21,720	5.27	114,515
2009	447,554	6.44	2,887,132	287,011	5.81	1,668,240	45,149	6.97	314,527	92,482	8.30	767,651	22,299	5.95	132,570
2010	425,496	6.71	2,857,814	242,364	5.82	1,410,270	48,010	7.20	345,615	111,436	8.55	953,239	23,000	6.31	145,117
2011	446,181	6.60	2,948,871	262,948	5.83	1,532,979	45,477	7.34	333,623	115,412	8.29	956,985	21,715	5.61	121,826
2012	456,902	5.48	2,507,016	289,222	5.00	1,446,950	42,816	6.46	276,511	100,637	6.69	673,288	23,672	4.57	108,249
2013	458,219	6.19	2,836,836	296,444	5.78	1,713,548	42,694	6.57	280,511	86,840	7.52	652,933	31,728	5.89	187,021

¹ Includes Triticale

² Revisions have been made to estimates from 2003 to 2011.

Table 3: Oilseed rape Area, Yield and Production 1994 to 2013

Year ¹	OILSEED RAPE		
	Area (Hectare)	Yield (t/ha)	Production (Tonnes)
1994	69,612	2.6	180,591
1995	52,121	2.7	143,090
1996	49,290	3.0	148,171
1997	59,341	2.6	156,479
1998	65,117	2.8	181,587
1999	51,173	3.1	161,070
2000	36,406	3.0	110,993
2001	34,850	3.0	105,893
2002	30,901	3.4	103,823
2003	35,163	3.4	120,847
2004	39,316	3.4	131,906
2005	35,591	3.3	119,117
2006	33,743	3.6	120,030
2007	36,334	3.7	133,657
2008	33,623	3.4	114,902
2009	29,043	3.7	108,605
2010	36,002	3.4	123,334
2011	38,388	3.9	149,627
2012	36,611	2.9	106,420
2013	33,653	3.3	111,652

¹ Revisions have been made to estimates from 2003 to 2011.

Table 5: Cereals - Comparison of Provisional and Final Estimates 2003 to 2012
(Percentage differences are of Final minus Provisional)

AREA

Year	TOTAL CEREALS			SPRING BARLEY			WINTER BARLEY			WHEAT			OATS		
	Provisional	Final	Percentage Difference	Provisional	Final	Percentage Difference	Provisional	Final	Percentage Difference	Provisional	Final	Percentage Difference	Provisional	Final	Percentage Difference
2004	441,240	438,039	-0.7%	257,660	257,462	-0.1%	56,390	56,348	-0.1%	103,860	101,126	-2.6%	22,100	21,831	-1.2%
2005	415,367	411,329	-1.0%	245,670	243,298	-1.0%	52,180	51,341	-1.6%	96,090	95,595	-0.5%	20,276	19,955	-1.6%
2006	398,330	398,050	-0.1%	221,280	220,639	-0.3%	53,620	53,762	0.3%	99,680	99,681	0.0%	22,520	22,682	0.7%
2007	401,410	403,493	0.5%	224,140	226,019	0.8%	52,860	52,625	-0.4%	101,790	102,744	0.9%	21,520	20,868	-3.0%
2008	455,830	456,547	0.2%	261,890	262,322	0.2%	57,520	57,612	0.2%	113,649	113,797	0.1%	21,670	21,720	0.2%
2009	447,554	447,554	0.0%	287,011	287,011	0.0%	45,149	45,149	0.0%	92,482	92,482	0.0%	22,299	22,299	0.0%
2010	424,492	425,496	0.2%	241,758	242,364	0.3%	47,939	48,010	0.1%	111,269	111,436	0.1%	22,299	23,000	3.1%
2011	446,181	446,181	0.0%	262,948	262,948	0.0%	45,477	45,477	0.0%	115,412	115,412	0.0%	21,715	21,715	0.0%
2012	456,901	456,902	0.0%	289,222	289,222	0.0%	42,816	42,816	0.0%	100,637	100,637	0.0%	23,672	23,672	0.0%
2013	458,219	458,219	0.0%	296,444	296,444	0.0%	42,694	42,694	0.0%	86,840	86,840	0.0%	31,728	31,728	0.0%

YIELD

Year	TOTAL CEREALS			SPRING BARLEY			WINTER BARLEY			WHEAT			OATS		
	Provisional	Final	Percentage Difference	Provisional	Final	Percentage Difference	Provisional	Final	Percentage Difference	Provisional	Final	Percentage Difference	Provisional	Final	Percentage Difference
2004	6.78	6.61	-2.4%	5.80	5.72	-1.3%	7.63	7.40	-3.1%	8.91	8.78	-1.4%	5.97	5.44	-8.9%
2005	6.64	6.65	0.2%	5.72	5.74	0.3%	7.29	7.58	3.9%	8.72	8.81	1.0%	6.34	5.49	-13.4%
2006	6.54	6.87	5.1%	5.38	5.95	10.7%	7.57	7.76	2.6%	8.70	8.70	0.0%	6.02	6.10	1.4%
2007	6.61	6.67	1.0%	5.72	5.80	1.5%	7.59	7.63	0.5%	8.18	8.30	1.4%	6.11	6.08	-0.5%
2008	6.67	6.65	-0.3%	5.63	5.72	1.6%	7.79	7.55	-3.1%	8.61	8.68	0.8%	5.95	5.27	-11.4%
2009	6.40	6.44	0.7%	5.73	5.81	1.4%	7.41	6.97	-6.0%	8.07	8.30	2.9%	6.10	5.95	-2.5%
2010	6.51	6.71	3.0%	5.34	5.82	9.0%	7.05	7.20	2.1%	8.94	8.55	-4.3%	6.02	6.31	4.8%
2011	6.88	6.60	-4.0%	6.16	5.83	-5.4%	7.23	7.34	1.5%	8.53	8.29	-2.8%	6.06	5.61	-7.5%
2012	5.48	5.48	0.1%	4.87	5.00	2.8%	6.51	6.46	-0.8%	6.79	6.69	-1.5%	5.53	4.57	-17.4%
2013	6.07	6.19	2.0%	5.60	5.78	3.3%	6.88	6.57	-4.6%	7.25	7.52	3.6%	6.15	5.89	-4.1%

PRODUCTION

Year	TOTAL CEREALS			SPRING BARLEY			WINTER BARLEY			WHEAT			OATS		
	Provisional	Final	Percentage Difference	Provisional	Final	Percentage Difference	Provisional	Final	Percentage Difference	Provisional	Final	Percentage Difference	Provisional	Final	Percentage Difference
2004	2,989,947	2,904,878	-2.8%	1,495,074	1,473,709	-1.4%	430,422	416,719	-3.2%	925,615	888,156	-4.0%	131,822	118,688	-10.0%
2005	2,758,037	2,742,230	-0.6%	1,405,232	1,396,231	-0.6%	380,392	388,938	2.2%	837,897	841,744	0.5%	128,550	109,505	-14.8%
2006	2,605,600	2,744,088	5.3%	1,189,393	1,313,527	10.4%	406,081	417,444	2.8%	867,245	867,053	0.0%	135,534	138,391	2.1%
2007	2,653,398	2,699,921	1.8%	1,281,338	1,312,003	2.4%	401,066	401,377	0.1%	833,014	852,603	2.4%	131,425	126,887	-3.5%
2008	3,042,256	3,043,330	0.0%	1,474,441	1,500,118	1.7%	448,081	435,085	-2.9%	978,518	987,256	0.9%	128,937	114,515	-11.2%
2009	2,872,228	2,887,132	0.5%	1,645,541	1,668,240	1.4%	334,338	314,527	-5.9%	745,969	767,651	2.9%	135,970	132,570	-2.5%
2010	2,872,228	2,857,814	-0.5%	1,289,851	1,410,270	9.3%	337,987	345,615	2.3%	994,322	953,239	-4.1%	137,657	145,117	5.4%
2011	3,067,714	2,948,871	-3.9%	1,619,867	1,532,979	-5.4%	328,803	333,623	1.5%	984,421	956,985	-2.8%	131,668	121,826	-7.5%
2012	2,502,839	2,507,016	0.2%	1,407,715	1,446,950	2.8%	278,613	276,511	-0.8%	683,445	673,288	-1.5%	131,009	108,249	-17.4%
2013	2,781,049	2,836,836	2.0%	1,659,309	1,713,548	3.3%	293,944	280,511	-4.6%	629,963	652,933	3.6%	195,010	187,021	-4.1%

Methodology and Quality Note

This section provides a summary of information on these statistics against five dimensions of quality, based on the European Statistical System (ESS) quality framework: Relevance; Accuracy; Timeliness and Punctuality; Accessibility and Clarity; and Comparability. The Scottish Government adheres to the Code of Practice for Official Statistics and the National Statistician's guidance on quality. In addition the Scottish Government provides its own guidance on quality, which is available to view at the Scottish Government's Statistics internet pages.

Further information on quality:

- [Code of Practice for Official Statistics](#)
- [National Statistician's Guidance on Quality](#)
- [Scottish Government's Corporate Policy Statement](#)
- [Scottish Government Guide to basic quality assurance](#)
- [European Statistics Code of Practice \(including quality framework\)](#)

Methodology

The 2013 final estimates of production are based mainly on final yield results from the 2013 Cereal Production Survey (CPS) and final crop areas from the 2013 June Census. The CPS is a disproportionate stratified random sample of around 400 farms in Scotland stratified by region. The construction of the sample is based on the Neyman Allocation which apportions larger sample sizes to the strata with the most variation in yields.

In 2013, the number of holdings submitting a return for Spring Barley was 359, Winter Barley was 92, Wheat was 125, Oats was 73 and Oilseed Rape was 78. For some regions relatively few returns were received for some crops.

Totals of sample production and sample crop area for each stratum (i.e. crop and region combination) are used to derive a sample estimate of yield. These yield values are applied to national crop areas from the June Agricultural Census to provide national estimates of production. Where sample sizes for strata are insufficient to calculate production results national average yield estimates for the crop are used to calculate estimates of production.

2013 regional results were based on national averages for: spring oilseed rape and winter oats (except in the South East); and winter oilseed rape in the South West. Estimates of Triticale production are based on estimates from the annual Crop Report Meeting (CRM).

The Cereal Production Survey is carried out by Rural Payments & Inspections Division (RPID) and Rural and Environment Science & Analytical Services (RESAS)

within the Scottish Government (SG). The survey is carried out by telephone with forms mailed to farms on request. Completed returns are analysed by RESAS.

The data undergo several validation processes as follows; (i) checking for any obvious errors on the paper survey forms upon receipt, (ii) cross checking against Census area data and internal validation within survey forms to ensure totals match, (iii) results are standardised to 14.5 per cent moisture content for cereals and 9 per cent moisture content for oilseed rape (iv) assessing data for any extreme yield values and removing if necessary, (v) if required, area offices are contacted to ensure that data is correct.

Additional quality assurance is provided at the later stages by utilising expert knowledge within the Scottish Government.

Data quality and assurance measures used for June Census area data are contained in [Final Results From The 2013 June Agricultural Census](#).

Provisional Estimates – published on 10th October 2013

The provisional estimates are derived from yield values of individual growers collated by several industry bodies. These industry bodies meet to discuss and quality assure these estimates at the annual Crop Report Meeting (CRM), which in 2012 was attended by representatives from:

- Scottish Government, Rural an Environment Science and Analytical Services
- Rural Payments Agency
- Bairds Malt
- Scotland's Rural College
- Agricultural Industries Confederation
- National Farmers Union Scotland
- Highland Grain Marketing Ltd
- The Agriculture and Horticulture Development Board (which now includes the Home Grown Cereals Authority)

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

Average yields from known harvested areas are collected from all regions in Scotland for each individual crop. For consistency, these average yields are adjusted to a standard moisture content of 14.5 per cent for cereals and 9 per cent for oilseed rape.

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

More information on the methodology and results of the 2013 first estimates of the cereal and oilseed rape harvest can be found in the [first estimates of the cereal and oilseed rape harvest](#) release.

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. They are also required by law by the Statistical Office of the European Communities, as the information is essential for management of the EU markets. These early provisional estimates are timed to enable provision of data for an EU regulatory deadline. Specific regulations are listed on pages 3 to 5 of our [2009/10 annual statistics plan](#).

The production estimates also 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, the EU Commission and the wider cereals industry. The balance sheets are published by the Home Grown Cereals Authority (HGCA).

User Feedback

Though we are not aware of any unmet user needs in relation to these statistics, the Scottish Government is always interested to here 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](#).

Details of both current and past user consultations are available on the Agriculture Statistics [consultations webpage](#).

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Accuracy

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

The number of agricultural holdings surveyed in the CPS was (413) in 2012. Usable returns were received for 405 of these; a response rate of 98%. Although 413 holdings were surveyed, many holdings grow more than one crop. The total number of returns received for all crops combined was 727, this equates to a sampling rate of 5% overall. The 2013 CPS sample covered 5% of the relevant planted areas in Scotland.

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.

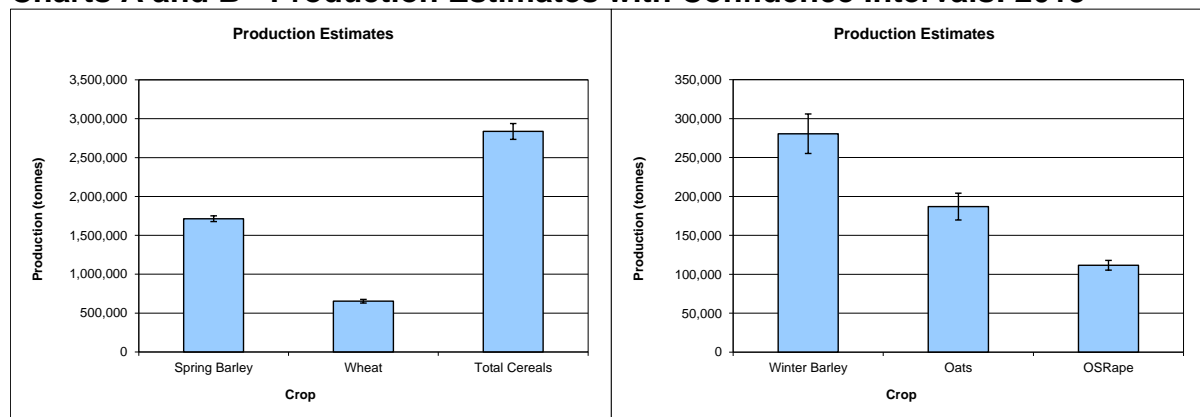
The sampling error can be estimated and used to produce confidence intervals around the survey results. These intervals tell us the range of values within which the true value lies, with a given degree of confidence. The intervals below are 95% confidence intervals; this means that if the sample survey was repeated a large number of times, 95% of the resulting estimates would lie within the intervals around our sample estimates. For example, there is a 95% chance that the true production value for all cereals in Scotland will lie within the range of 2.8 million tonnes $\pm 102,000$ tonnes. Charts A and B, below, show the main production estimates marked with the upper and lower bounds of the associated confidence intervals. This is shown on two charts with different scales to allow results to be viewed clearly.

Table A – 95% Confidence Intervals for 2013 CPS Estimates

Crop	Number of Holdings (June Census)	Sample Size	Sampling %	Production ('000 tonnes)	Confidence Limits ('000 tonnes)	Confidence Limits (%)
Total Cereals ¹	9,121	649	7.12	2,837	± 102	± 3.62
Spring Barley	8,122	359	4.42	1,714	± 37	± 2.13
Winter Barley	1,726	92	5.33	281	± 25	± 9.04
Wheat	2,505	125	4.99	653	± 23	± 3.57
Oats	1,547	72	4.65	187	± 17	± 9.3
Oilseed Rape	1,175	78	6.64	112	± 6	± 5.8

¹ includes Triticale, excludes Oilseed Rape

Charts A and B - Production Estimates with Confidence Intervals: 2013



Area data are sourced from the June Agricultural Census and are assumed to be accurate as farmers face financial penalties for supplying incorrect information.

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 Cereal Production Survey (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.

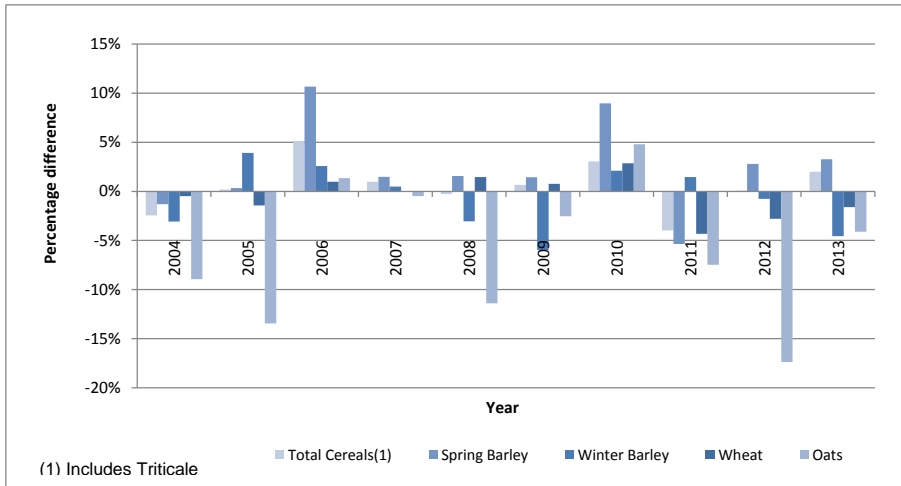
The Cereal Production Survey is based on a sample of around 400 to 450 farms in Scotland stratified by region and farm size. In 2013, 413 agricultural holdings were surveyed. Although 445 holdings were surveyed, many holdings grow more than one crop. The total number of returns received for all crops combined was 649/727, this equates to a sampling rate of five per cent overall.

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.

The 2013 first estimates of overall production were outside these limits. This year, the increase in whole cropping of crops intended for combining is expected to have contributed to the larger difference between provisional and final estimates; though this cannot be quantified.

It can be seen from Chart C that in the last 10 years the provisional estimate of the total cereal harvest has been within five per cent of the final estimate. In most years, the largest differences between provisional and final production estimates are for oats, with the largest difference being 17 per cent in 2012. This year the difference was two per cent.

Chart C: Cereal Production, Comparison of Provisional v Final Estimates, 2004 to 2013 (final estimates minus first estimates, as percentage difference)

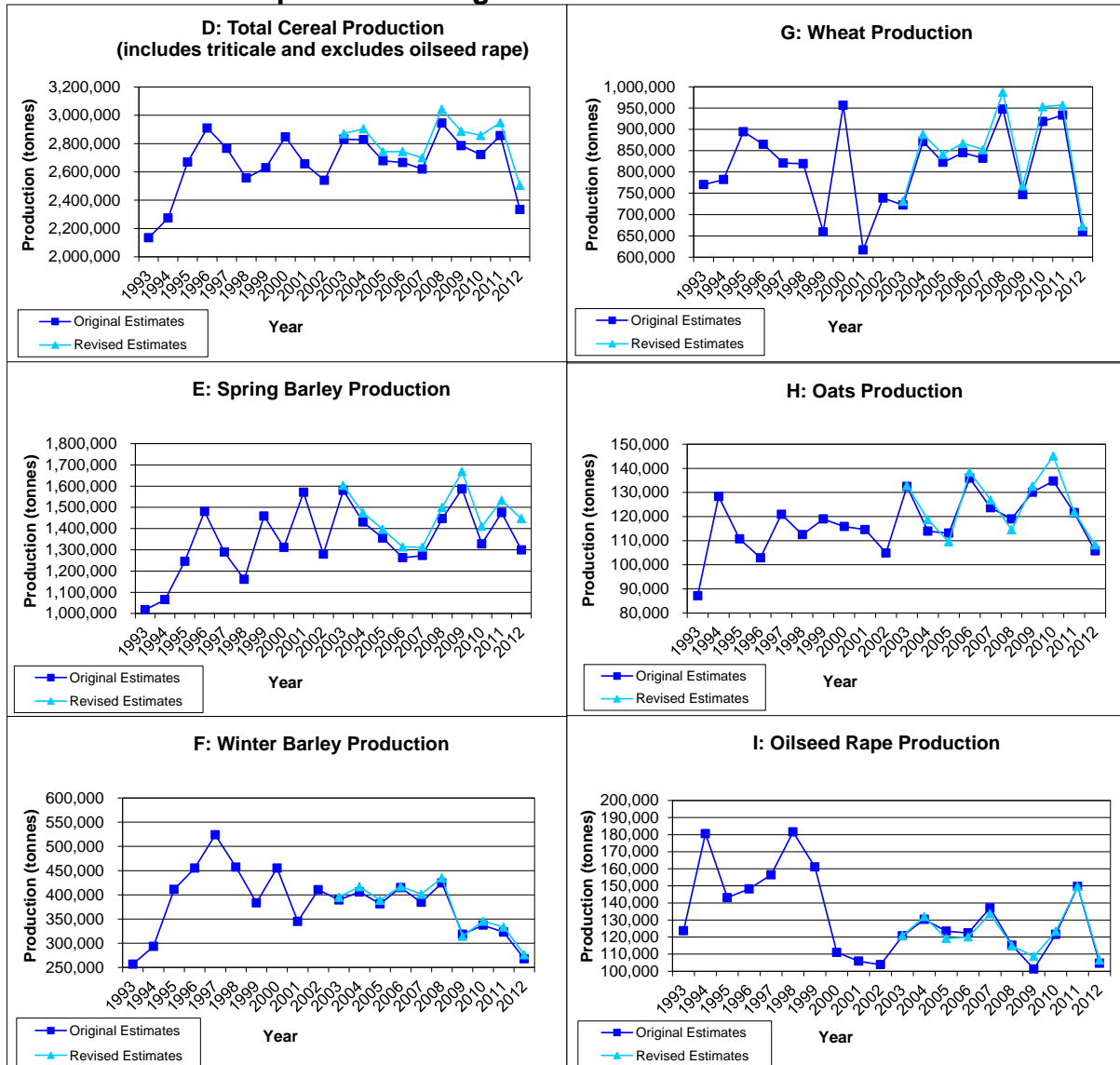


Revisions

Prior to 2012 the CPS sample was stratified by region and size group. To help ensure sufficient sample sizes for most crop types stratification by size group was replaced by crop type in 2012. Before 2012 production estimates were based on the mean average of individual yield values for each of the strata. This has been changed to provide more reliable results (see methodology section).

Results have been revised from 2003 onwards. At this time it is not possible to revise results prior to 2003. Charts D to I, below, show the impact of the revisions on the production estimates for the main crop groups. Note that the vertical axes of the charts do not start at zero; this is to highlight the variation between years and the differences between results of original and revised estimates.

Charts D to I - Comparison of Original and Revised Production Estimates



In 2012, the revised estimate of total cereal production was 172,000 tonnes (7%) higher than the original estimate. Since 2003 the difference between the resulting estimates of the two methods has fluctuated between 1% and 7%. In 2012 the new revised estimates result in differences of: +147,000 tonnes (up 11%) for spring barley; +9,000 tonnes (up 3%) for winter barley; +14,000 tonnes (up 2%) for wheat; +2,000 tonnes (up 2%) for oats; and +2,000 tonnes (up 2%) for oilseed rape.

Timeliness and Punctuality

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

To provide reliable estimates of the year on year changes in production, the CPS is carried out at the same time each year. The reference date for the CPS, the date at which respondents are asked for production information, is the 31st October each year. Typically, at the end of October the vast majority of the Scottish cereal and oilseed rape harvest is complete, allowing for reliable estimates to be made.

The release of results is completed within two months of this date, to allow sufficient time for data collection, processing, quality assurance and compilation and dissemination of final results.

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

The results of the 2013 CPS were released on the scheduled date of 18th December 2013.

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 statistics website in accessible formats (html and pdf versions are available). All data tables are made available in excel format to allow users to carry out further analysis. 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 other UK Agriculture Statistics outputs are available at [Gov.UK website](#).

Comparability

The degree to which data can be compared over time and domain.

Results for England, Wales and Northern Ireland are compiled on a comparable basis with Scottish estimates.

The EC regularly produces estimates of cereal and oilseed production both EU-27 countries and individual countries. Further information on EC cereal statistics is available at the [Eurostat website](#).

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.

Respondent Burden (the estimated overall cost to respondents)

The estimated respondent burden is calculated as the total number of survey responses (A), multiplied by the median time taken to respond to the survey (B), multiplied by the median average hourly wage of typical respondents (C).

(A x B x C)

(A) The 2012 Cereal Production Survey (CPS) received 413 responses.

The time taken to respond to the survey varies with each respondent. Scottish Government (SG) Rural Payments and Inspections Directorate (RPID) staff conducting the survey were asked to provide estimates of the average time taken to administer the telephone survey. Estimates were collected from each area office involved in the survey and the median time to respond in hours was calculated from these responses.

(B) The median time taken to respond to the survey is 0.083 hours.

Respondents to the CPS are usually farm owners themselves or farm managers. Both are usually full-time workers.

(C) The estimated median hourly pay rate for full-time employees in Scotland in 2013 was £13.03

(Further information on average hourly wages can be found in the [Annual Survey of Hours and Earnings](#), available on the Office for National Statistics (ONS) website.)

The respondent burden for CPS data collection in 2013 was

413 X 0.083 X £13.03

= £446.66

Related publications

[First estimates of the cereal and oilseed rape harvest 2013](#)

[Economic Report on Scottish Agriculture](#) (ERSA) contains Cereal usage figures derived from the CPS survey. These were last published in June 2013.

[Agriculture statistics publications](#) contains all published results from Scottish Government agricultural surveys.

A NATIONAL STATISTICS PUBLICATION FOR SCOTLAND

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 Official Statistics.

Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs;
- are well explained and readily accessible;
- are produced according to sound methods, and
- are managed impartially and objectively in the public interest.

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.

Further information about Official and National Statistics can be found on the UK Statistics Authority website at www.statisticsauthority.gov.uk

SCOTTISH GOVERNMENT STATISTICIAN GROUP

Our Aim

To provide relevant and reliable information, analysis and advice that meet the needs of government, business and the people of Scotland.

For more information on the Statistician Group, please see the Scottish Government website at www.scotland.gov.uk/statistics

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