

Farm Business Survey

2014/2015

Crop Production in England



Ben Lang



Crop Production in England 2014/2015

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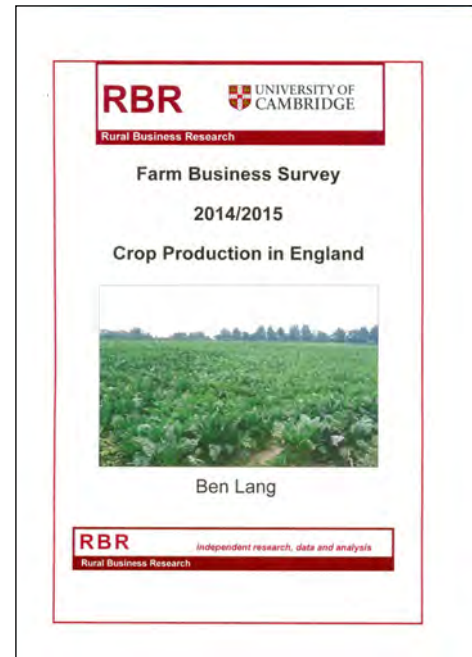
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Crop Production in England 2014/2015

The full printed version of the report is now available and comprises:

- Overview of Profitability, Assets and Liabilities
- Arable Farm Performance: Agriculture
- Agri-environment, Diversification, Single Payment
- Crop Enterprise Performance
- Net Margin and Cost of Production Estimation
- Weather, Economic Context and Policy
- Ten Year Review of Wheat Performance in England



Appendix 1 Agricultural Output and Costs Comparison by
Farm Type, District, Size and Performance (33 tables)

Appendix 2 Gross Margin Results for Comparison by Farm Type,
District, Size and Performance - Non Organic (130 tables)

Appendix 3 Net Margin and Cost of Production, Estimation for Wheat, Barley
and Oilseed Rape.

Price £20 including postage and packing

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This series of reports on the economics of agriculture and horticulture in England celebrates ten years of *Rural Business Research (RBR)* providing independent data and analysis to the individual sectors of the agricultural and horticultural industry. Drawing upon Farm Business Survey data from the 2014/15 financial year our reports are set against a modest decrease in overall Farm Business Income (FBI) of around 8% to an average £39,700 per farm. Of this overall measure of farm business profitability, the income derived from the Single Payment Scheme accounted for around 55%, highlighting the importance of support payments to the average farm business in England. The 2014/15 data relates to the 2014 harvest/production year – since this time there have been some marked downturns in a number of output prices for farm businesses – it is therefore clear that the importance of policy support to businesses at the start of 2016 is even greater than the above data indicates.

Over the ten years that RBR has been presenting this series of reports, farm businesses have witnessed widely fluctuating fortunes due to the vagaries of world market input and output prices and fluctuations in weather patterns. Throughout this period our reports have sought to demonstrate the variation in performance across farm businesses, within the specific sectors covered in each report, and also to provide businesses with the independent data required to benchmark their own performance and explore possibilities for production within the sectors. Ten years on, our aim to provide comprehensive and independent analysis remains at the very core of our work on the Farm Business Survey research programme for England.

The wider agricultural and horticultural market place in the mid-2010s clearly demonstrates the need for farm businesses to focus on the market opportunities for their produce and to understand the wider economic environment in which they operate. There are a number of technical and weather-related issues facing farm businesses at the start of 2016. But arguably the largest political issue over recent decades – the EU referendum which the current government will hold on the 23 June 2016 – represents the greatest uncertainty. There will be numerous debates and discussions about this major political issue over the coming months and, potentially, years. Given the importance of the EU Common Agricultural Policy support to the average FBI figures for 2014/15, the outcome of the EU referendum will be closely watched by those managing UK farm businesses. At the same time, the wider global economy continues to exhibit rather sluggish performance, with UK inflation remaining around the 0% mark, oil prices substantially lower than a year ago and signs of any interest rate increase in the UK being continually pushed further out into the future. With recent price volatility, and generally lower output prices, it remains important for businesses to plan ahead and focus on financial margins in contrast to physical output performance.

Against this wider economic context we hope that this tenth series of reports helps farm businesses in England to examine and benchmark their own performance. Our research work within the FBS programme could not be possible without the direct support of our farmer and grower co-operators and the wider support of agricultural and horticultural businesses and sector stakeholders; our thanks are given to them all.

Professor Paul Wilson

Chief Executive Officer, Rural Business Research

March 2016

www.ruralbusinessresearch.co.uk

ACKNOWLEDGEMENTS

Rural Business Research is very grateful to the farmers who have voluntarily provided records and information on which the FBS and this report are based.

Rural Business Research staff across England collected farm data. At the Rural Business Unit, Richard Dexter and Mark Reader designed the reporting system and Joy Meyrick and Stephen Horsley contributed to production of the report. Mark Reader researched and prepared the krige maps in Chapter 7.

The exceptionally warm and wet 2014 harvest year represented a return to more typical cropping after the unusual 2013 harvest year, in which there was a shift from winter to spring cropping following poor weather conditions.

In 2014/2015, the FBI of Cereals farms averaged £220 per hectare; this was 63 per cent of the five year average and the lowest FBI recorded for this farm type since 2006. The main driver of the reduced FBI on Cereals farms was lower crop prices.

The FBI of General Cropping farms averaged £229 per hectare, 57 per cent of the five year average and the lowest FBI recorded for this farm type since 2005. Crop and livestock output was constrained by the lower potato price. Fixed costs, driven by higher labour costs, increased although machinery costs were lower. Individual farm performance was dependent on exposure to the poorly performing potato crop and the favourably performing sugar beet crop.

Seed expenditure reduced in 2014 due to the return to greater seed availability from the 2013 harvest. Average fertiliser expenditure was little changed, but the cost of crop protection inputs increased.

In 2014 FBT rents on Cereals and General Cropping farms were £231 and £309 per hectare respectively; representing increases of four and seven per cent in comparison with 2013.

Overall borrowing increased by 140 per cent in the five years to 2014 on Cereals farms and by 150 per cent in the same time period on General Cropping farms.

The average contribution to the total FBI of non organic Cereals farms in 2014 was -£47 per hectare and the equivalent contribution on General Cropping farms was -£26 per hectare.

In comparison with the five year average, in 2014, farmers in England grew above average areas of cereal crops, average areas of oilseed rape, sugar beet and potatoes and below average areas of peas, beans, horticultural and other crops.

The total area of land in agri environment schemes in England peaked in 2013 but the contribution of agri environment schemes to FBI increased in 2014. In the final (and tenth) year of the Single Payment Scheme, its contribution to FBI was the lowest recorded.

At 9 tonnes per hectare, the England wheat yield exceeded previous records and at 77.3 tonnes per hectare the sugar beet yield also exceeded previous records

For all of the combinable crops, the net margin was negative and the cost of production exceeded the value of the crop sold. Both root crops in the analysis were profitable. However, using the metric of cost of production, the higher crop yields of 2014 resulted in improved performance as their total production costs were divided over higher crop yields.

There was considerable activity in the supply chain. This was possibly a consequence of falling commodity prices

In our ten year analysis of wheat margins in England, we identified especially high wheat yields in Kent, Cambridgeshire and Essex and strong gross margin performance in Kent, Northumberland and Hampshire. Across counties in England, there is considerable variation in input use when measured as cost per tonne of production; there may be opportunities to reduce expenditure crop inputs on farms with lower yields.

Ben Lang
March 2016

1 Overview of Profitability, Assets and Liabilities

1.0 Summary of Profitability, Assets and Liabilities

- On Cereals farms, the FBI of £220 per hectare was the lowest since 2006
- On General Cropping farms, the FBI of £229 per hectare was the lowest since 2005
- Despite a return to more typical cropping patterns and crop yields, low crop prices were the main driver of the lower FBI
- Costs compared closely with the harvest 2012 (but not 2013 when typical cropping patterns were disrupted), labour costs increased
- Farm Business Tenancy rents continued to rise
- Despite reduced income, higher land prices were the driver of further increases in the net worth of arable businesses
- Land prices appear to have peaked in 2014/2015
- Farmers continued to increase their investment in machinery
- Liabilities increased by five and 13 per cent respectively on Cereals and General Cropping Farms

1.1 Time Series Farm Business Income on Cereals and General Cropping Farms

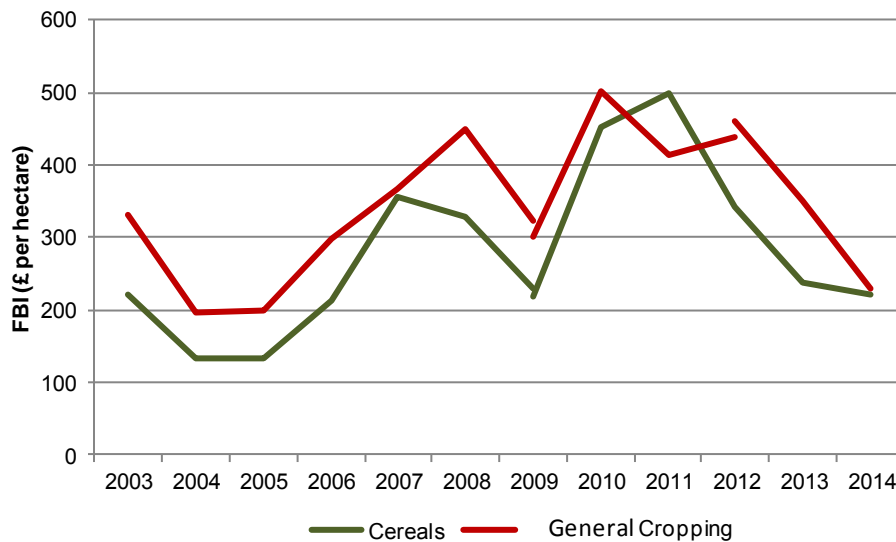
In 2014/2015, the FBI of Cereals farms averaged £220 per hectare (£237 per hectare in 2013). This was 63 per cent of the five year average and the lowest FBI recorded for this farm type since 2006. The 2014 harvest year represented a return to more typical cropping patterns after the unusual 2013 harvest year in which there was a shift from winter to spring cropping following poor weather conditions.

The FBI of General Cropping averaged £229 per hectare (£349 in the previous year). This was 57 per cent of the five year average and the lowest FBI recorded for this farm type since 2005.

The figure below shows the long term FBI from 2003 to 2014.

1 Overview of Profitability, Assets and Liabilities

Time Series FBI for Cereals and General Cropping Farms in England, 2003 to 2012



The tables below respectively summarise the average profitability of Cereals and General Cropping farms in 2013/14 and 2014/15 (£ per hectare unless stated)

Cereals Farms - Farm Business Income

	2014	2015
Number of farms	342	368
Area of farm (ha)	210	205
Crop output	903	895
Livestock output	37	33
Agri-environment	36	41
Other output	204	223
Single Payment	190	183
Total Output	1371	1375
Variable costs	489	502
Fixed costs	654	659
Total costs	1143	1161
Profit on sale of assets	9	6
Farm Business Income	237	220
Less labour	15	14
Add interest	23	23
Less rental costs	99	112
Net Farm Income	147	118

General Cropping Farms - Farm Business Income

	2014	2015
Number of farms	161	162
Area of farm (ha)	194	227
Crop output	1482	1403
Livestock output	72	68
Agri-environment	35	41
Other output	237	233
Single Payment	185	178
Total Output	2011	1923
Variable costs	744	746
Fixed costs	922	953
Total costs	1667	1699
Profit on sale of assets	5	6
Farm Business Income	349	229
Less labour	11	4
Add interest	28	31
Less rental costs	101	110
Net Farm Income	264	147

1 Overview of Profitability, Assets and Liabilities

The main driver of reduced FBI on Cereals farms was lower crop prices, as yields and production returned to the typical patterns seen before the 2013 harvest year. Overall, crop and livestock output was £12 per hectare lower than in 2013. However, output from contracting carried out on other farms increased by £10 per hectare. Although costs increased by £18 per hectare, these were similar to the more usual cropping year of 2012.

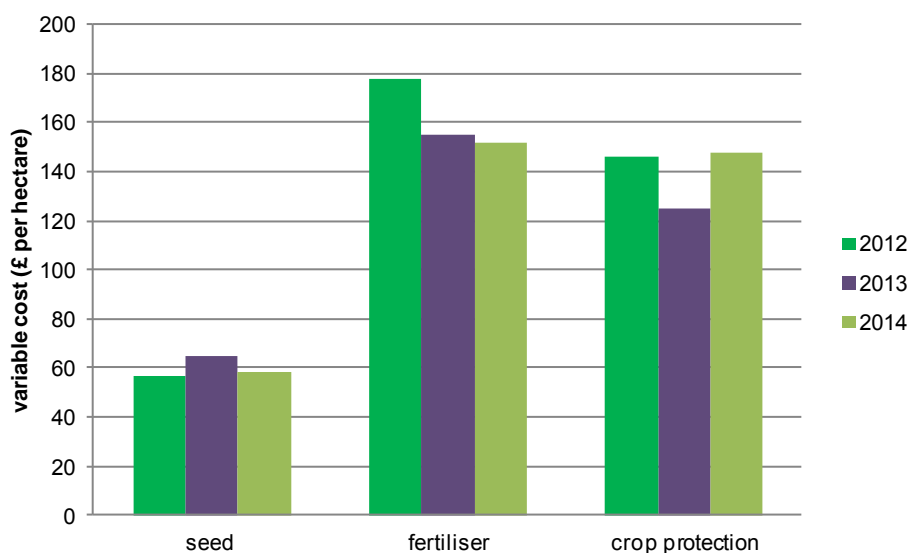
On General Cropping farms, crop and livestock output was £83 per hectare lower, mainly due to the lower potato price. Fixed costs, driven by higher labour costs, increased although machinery costs were lower.

1.2 Farm Business Income 2014/2015

Variable and Fixed Costs

The expenditure on variable and fixed costs on Cereals farms in 2013 and 2014 is set out respectively in the figures below.

Cereals Farms, Variable Costs 2012/2013 and 2014/15



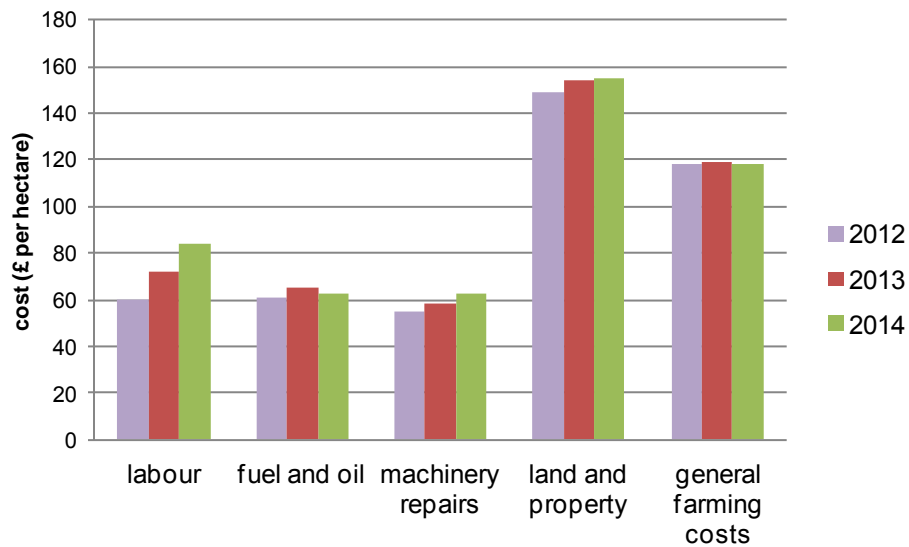
Seed expenditure reduced in 2014 due to the return to greater seed availability from the 2013 harvest. Average fertiliser expenditure was little changed, but the cost of crop protection inputs increased by 18 per cent to an average of £148 per hectare over the whole farm. This increase was due to higher product prices as well as additional volumes used. Defra's index of prices suggests that herbicides, fungicides and insecticides increased by nine, one and four per cent respectively in comparison with the previous year¹.

Whilst average expenditure on labour, machinery repairs and land and property costs continued to rise, energy and general farming costs were little changed on previous years.

¹ Defra, Agricultural Price Index – index of the purchase price of the means of agricultural production

1 Overview of Profitability, Assets and Liabilities

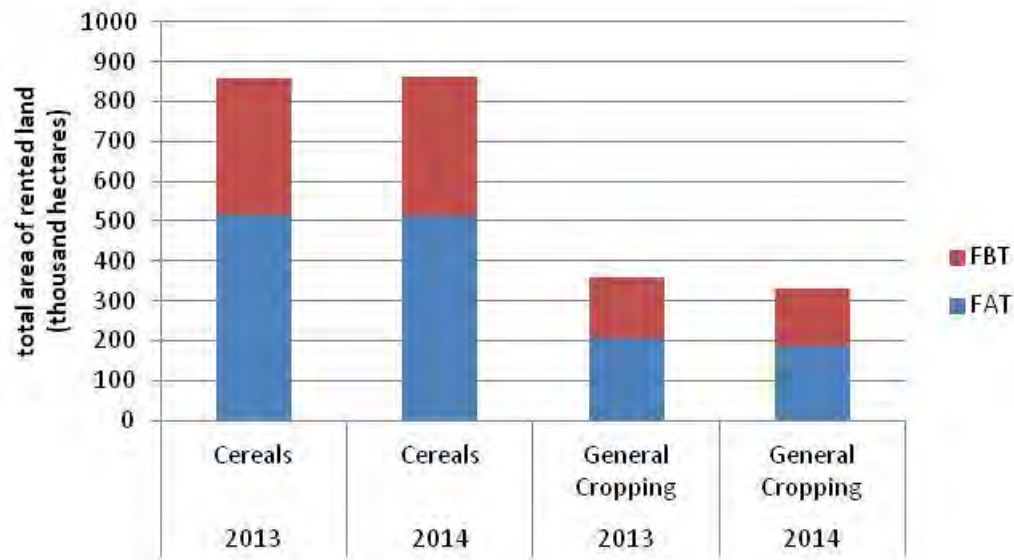
Cereals Farms, Fixed Costs 2013/2014 and 2014/15



Rent

The overall area of rented land on Cereals and General Cropping farms was 1,193 thousand hectares, two per cent lower than in 2013. In the long term, there has been a trend to a lower area of rented land, a decline in the area of Full Agricultural Tenancies (FATs) and an increase in the area of Farm Business Tenancies (FBTs). The results for 2013 and 2014 are shown in the figure below.

Total Area of Land Rented on FAT and FBT Agreements in England, 2013 to 2014



Source: Defra June Survey

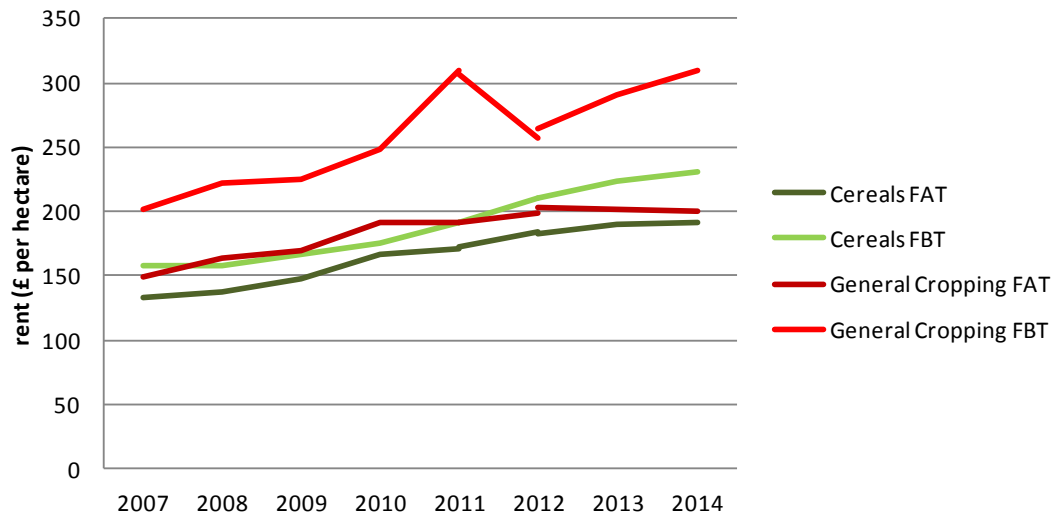
Between 2013 and 2014, there was a three per cent reduction in the area of land on Cereals and General Cropping farms rented on FATs at 700 thousand hectares. The area rented on FBTs was unchanged at 494 thousand hectares.

Reflecting changes in cropping between the two years, the area of rented land on General Cropping farms reduced whilst the area of land rented on Cereals farming increased.

1 Overview of Profitability, Assets and Liabilities

The figure below shows the average rent paid on Cereals and General Cropping farms on both FAT and FBT agreements in England. There were breaks in the data series after 2011 and after 2012.

Average Rent Paid on Land Rented on FAT and FBT Agreements in England, 2007 to 2014



Although most crop prices peaked in 2012, FBT rents continued to increase, whilst FAT rents appear to have reached a plateau. In 2014 FBT rents on Cereals and General Cropping farms were £231 and £309 per hectare respectively; representing increases of four and seven per cent in comparison with 2013. At £192 per hectare, the FAT rent on Cereals farms increased by only one per cent and at £200 per hectare the FAT rent was largely unchanged in comparison with the previous two years.

The Tenant Farmers Association (TFA) argued that short term tenancies result in excessively high rents and hold back progression, investment and sustainable land use¹. It launched its TFA10+ campaign advising that average terms should be for ten years or more. In response, The Crown Estate stated that minimum lease terms impinge on the performance of land owning businesses which might be reluctant to hold agricultural land if compelled to enter long term letting arrangements².

Farmers expressed concern about the local distorting effect of Anaerobic digestion (AD) plants on farm rents. The high cost of hauling forage maize dictates that holders of AD plants seek to source maize or other feedstocks within a small radius of the plant.

1.3 Assets and Liabilities

The two following tables respectively show the Cereals Farms Balance Sheet and General Cropping Farms Balance Sheet for the 2014/2015 financial year.

¹ Farmers Weekly, 30 January 2015

² Farmers Weekly, 10 April 2015

1 Overview of Profitability, Assets and Liabilities

Cereals Farms Balance Sheet (£/ha)

	Opening 2014	Closing 2014
Number of farms	368	368
Area of farm (ha)	205	205
Assets		
Land and buildings	9,877	10,733
Machinery	804	810
SPS Entitlement	260	243
Other fixed assets	42	40
Current assets	1,108	1,146
Liabilities	912	961
Net Worth	11,177	12,012

General Cropping Farms Balance Sheet (£/ha)

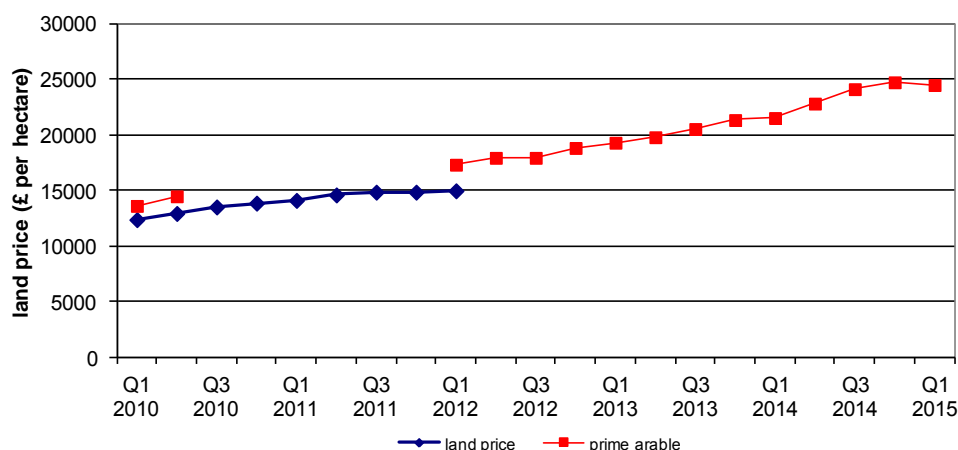
	Opening 2014	Closing 2014
Number of farms	162	162
Area of farm (ha)	227	227
Assets		
Land and buildings	9,991	10,804
Machinery	847	915
SPS Entitlement	252	235
Other fixed assets	84	84
Current assets	1,160	1,152
Liabilities	1,161	1,320
Net Worth	11,172	11,870

The net worth of Cereals farms increased by seven per cent, to £12,012 per hectare, in 2014/2015. The increase was driven by higher land prices, but farmers also increased their investment in machinery. Alongside this increase in assets, liabilities increased by five per cent to £961 per hectare,

On General Cropping farms, the average net worth of General Cropping farms increased by six per cent. On these farms, liabilities increased by 13 per cent to £1,320 per hectare.

Land

The following figure shows arable land values from 2010 to April 2015.



Source: Savills

Agents reported low volumes of land available for sale. Land of higher quality remained attractive to buyers who paid premium prices whilst poorer quality arable land did not attract

1 Overview of Profitability, Assets and Liabilities

such high prices¹. Farmers took a more active role as purchasers of land in 2014. Investors started to return to more traditional investments such as equities².

Land price increases slowed in 2014 and appear to have reached a peak in late 2014. The main drivers were the reduced profitability of agriculture and the recovery of investment opportunities in other sectors.

The average value of land on the balance sheets of Cereals and General Cropping farms, estimated by dividing the value of property assets by the total farm area (and not the area of owner occupied land) was £10,733 and £10,804 respectively.

Single Payment Entitlement

Within the Farm Business Survey, Single Payment Entitlement is valued on the basis of the expected future income stream that is available to the farmer. In reality, after 2014 /2015, this income would be from the Basic Payment Scheme, as long as the claim is for at least five hectares. On this basis, the closing values of Single Payment Entitlement were £243 and £235 per hectare respectively.

In trading of Entitlement during the year, supply exceeded demand, mainly due to the higher threshold farm size for claims and as a result, entitlement values were below those predicted in the FBS. In 2014, agents anticipated sales of Single Payment entitlements as some 16,000 claimants held entitlements of under 5 hectares and would therefore be ineligible to claim Basic Payment³. English non SDA SPS Entitlement traded for around £300 per hectare in autumn 2013, when it was announced that this asset could be rolled forward into BPS⁴. In the spring of 2014, the price fell to £180 to £220 per hectare as supply exceeded demand. By September 2014, Entitlement traded for around £130 per hectare⁵. Ahead of 2015 BPS claims, non SDA Entitlement traded for between £90 and £110 per hectare⁶.

Machinery

Machinery expenditure and the closing value of machinery on farms are shown in the following two figures below.

¹ Savills, Market in Minutes, Q2 UK Farmland Market, July 2014

² Strutt and Parker, English Farmland Market Review, First half of 2014,

³ Farmers Weekly, 4 February 2014

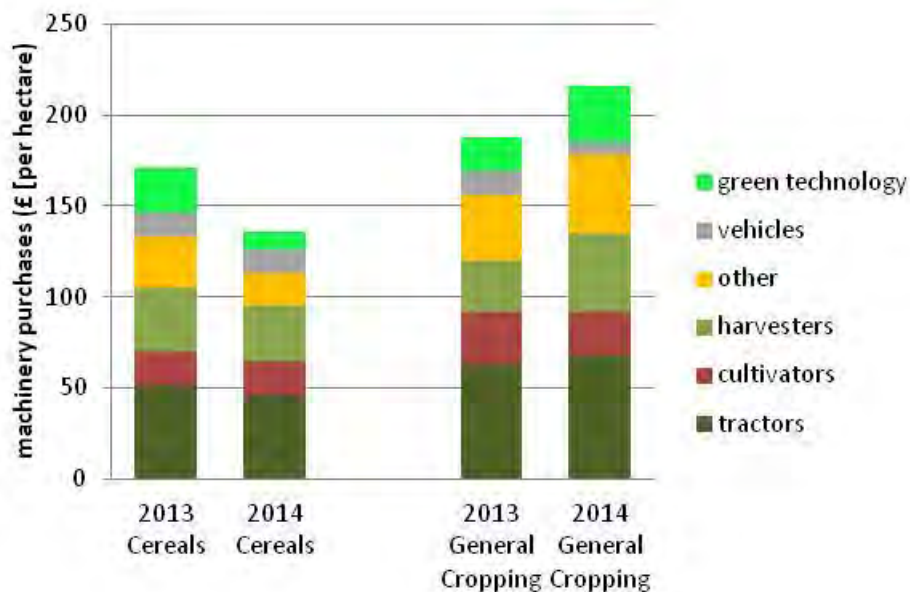
⁴ Farmers Weekly, 21 March 2014

⁵ DCFM Quotas Ltd, www.dcfm.com , 18 September 2014

⁶ Farmers Weekly Interactive, www.fwi.co.uk , 8 April 2015

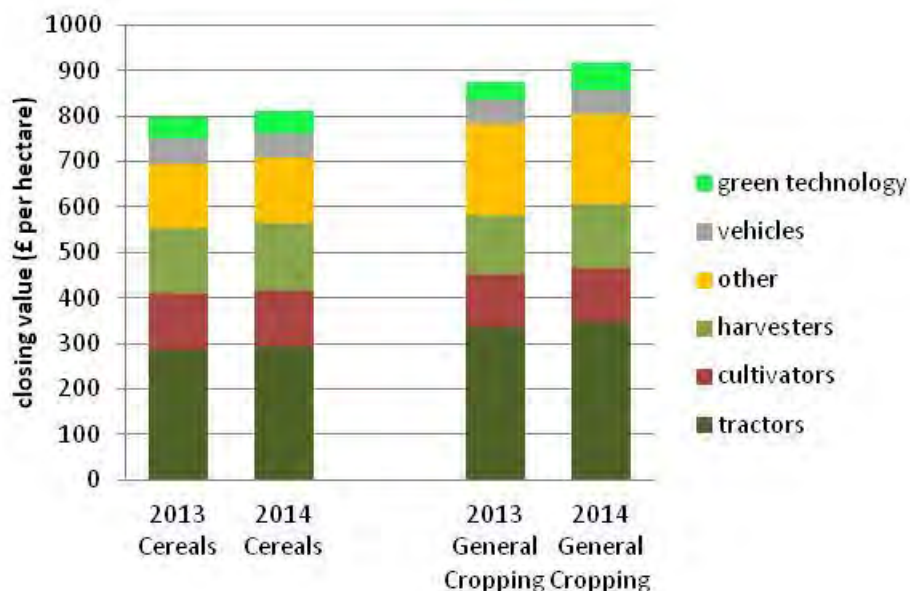
1 Overview of Profitability, Assets and Liabilities

Net Machinery Expenditure on Cereals and General Cropping Farms 2013/2014 and 2014/15



The Agricultural Engineers Association reported a five per cent reduction in expenditure on machinery across all farm types, in the UK, in 2014 in comparison with 2013¹. The association also reported a seven per cent reduction in tractor registrations in the year to April 2015 in comparison with the previous year². Net investment in machinery averaged £136 per hectare on Cereals farms (£171 per hectare in the previous year and £216 per hectare on General Cropping farms (£188 per hectare in 2013/2014).

Closing Valuation of Machinery on Cereals and General Cropping Farms 2013/2014 and 2014/15



Despite the reduced expenditure on Cereals farms, investment exceeded the depreciation charge and the value of machinery increased by two per cent to £810 per hectare. On General Cropping farms, the machinery value increased by five per cent to £915 per hectare

¹ Farmers Weekly

² Agricultural Engineers Association, www.aeauk.com

1 Overview of Profitability, Assets and Liabilities

Liabilities

The average liabilities on Cereals farms was £961 per hectare and the average liabilities of General Cropping farms was £1,320 per hectare. The increased borrowing was through all categories of borrowing including bank term loans, other loans, bank overdraft and other short term loans.

Overall borrowing increased by 140 per cent in the five years to 2014 on Cereals farms and by 150 per cent in the same time period on General Cropping farms.

The Bank of England again reported record levels of lending to agriculture and forestry industries in the UK. At the end of March 2015, lending reached £16,652 million. Almost ten per cent higher than in March 2014¹.

We have previously reported on new sources of finance for farmers. Anglia Farmers reported an increase in their member to member finance scheme. In 2013, 72 members borrowed a total of £2.6 million in unsecured loans at a fixed interest rate of six per cent².



¹ Bank of England, www.bankofengland.co.uk

² Farmers Weekly, 3 January 2014

2 Arable Farm Performance: Agriculture

2.0 Agriculture Performance

- On average, the contribution of agriculture to FBI was negative on Cereals and General Cropping farms
- The area of cereals was four per cent above the five year average
- Farmers grew a reduced area of oilseeds
- Cereals farm performance was very similar to the previous year, except that crop protection costs increased
- General Cropping farm performance reflected the very poor performance of the potato crop, but favourable performance of sugar beet

The results presented in this Chapter relate solely to the activity of **agriculture**. The outputs, costs and agricultural Farm Business Income (FBI) attributable to this activity can be summed with that from agri-environment scheme participation, diversification outside agriculture and the Single Payment Scheme to give results for the whole farm business. Whilst output and variable costs can be readily split between cost centres, some element of estimation is needed in order to share labour, machinery, property and overhead costs. Within the FBS, this is carried out on a consistent basis using an agreed approach¹.

2.1 Agriculture, Agri-environment, Diversification and Single Payment

The average total FBI of Cereals farms in 2014 was £220 per hectare, but the contributions from agriculture, agri environment, diversification and single payment were -£47, £34, £67 and £166 respectively. The equivalent contributions on General Cropping farms were -£26, £31, £62 and £163 respectively to give an overall FBI of £229.

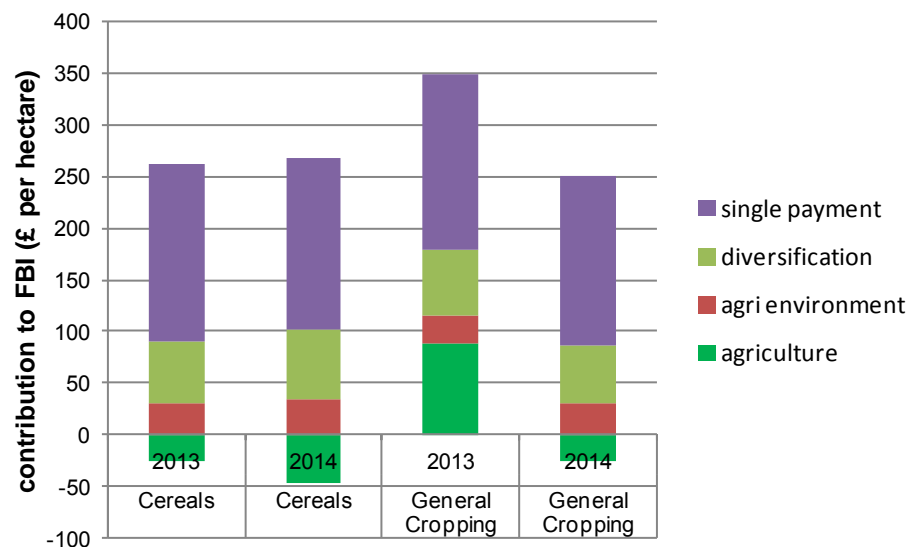


These results are summarised in the figure below.

¹ Appendix 2 (Item VI) Farm Accounts in England 2008/2009 Defra statistics
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/423700/fbs-fixedcostmethod-23apr15.pdf

2 Arable Farm Performance: Agriculture

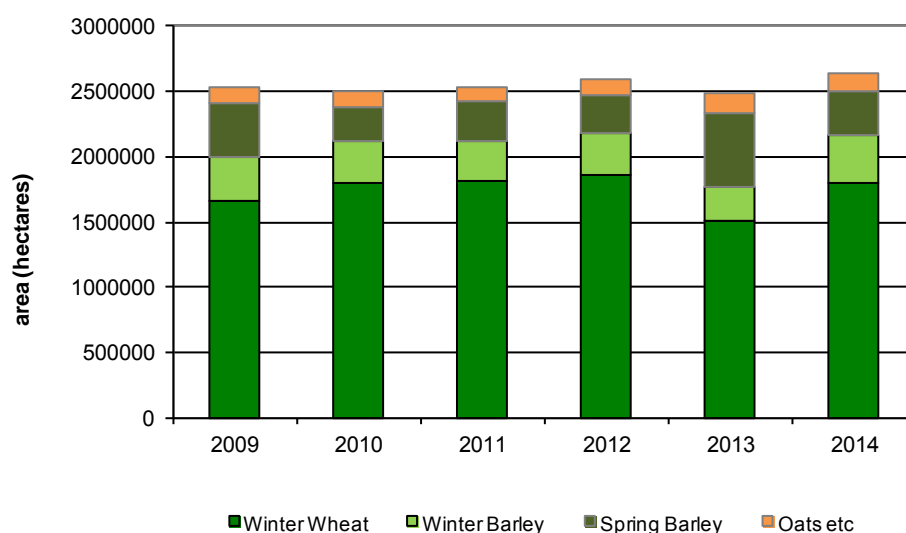
The Contribution of Agriculture, Agri environment, Diversification and Single Payment to FBI on Cereals and General Cropping Farms, 2013 and 2014



2.2 Cropping and Crop Areas

In comparison with the five year average, in 2014, farmers in England grew above average areas of cereal crops, average areas of oilseed rape, sugar beet and potatoes and below average areas of peas, beans, horticultural and other crops. Cropping in the previous year was influenced by a wet autumn and characterised by reduced plantings of autumn cereals, compensated by increased spring cropping. The details are shown in the following three figures respectively for cereals, break crops and root crops.

Cereal Crop Area, 2009 to 2014 in England

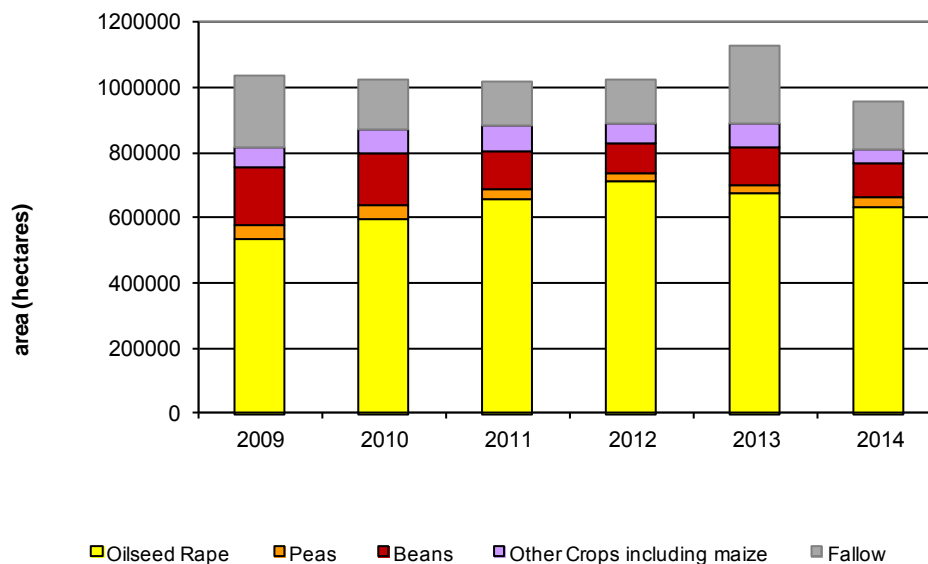


The area of winter wheat and of all barley increased by four per cent relative to the five year average; the winter wheat crop area was 1,797,000 hectares. The winter barley area, at 363,000 hectares, exceeded the five year average by 17 per cent, whilst the more variable spring barley area of 345,000 hectares was seven per cent lower than average.

2 Arable Farm Performance: Agriculture

In the UK, 2.7 per cent of production from the wheat area and 0.8 per cent of production from the barley area were used in the production of bioethanol in 2014¹. These are the highest levels of use for biofuel since records began in 2008.

Break Crop Area, 2007 to 2014 in England



It is now apparent that the area of oilseed rape had peaked at 713,000 hectares in 2012 and by 2014 had reduced to 632,000 hectares. This response to lower oilseed rape prices was replicated across Europe². Some growers faced the challenge of establishing oilseed rape after late harvested wheat as late as the second half of September³. At 31,000 and 103,000 hectares respectively, pea and bean areas fell below the five year average.

The area of 'other crops' includes 29,000 hectares of maize used in anaerobic digestion plants for the first time as well as 3,000 and 7,000 hectares respectively of short rotation coppice and *Miscanthus*. In the UK, 1.9 per cent of production from the oilseed rape area was used in the production of biodiesel in 2014.

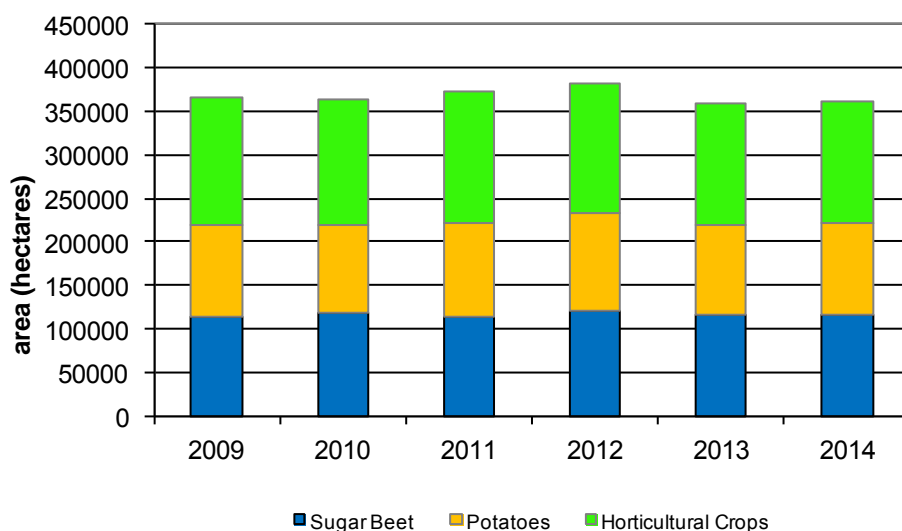
¹ Defra, Area of Crops Grown for Bioenergy in England and the UK: 2008 – 2014, 10 December 2015

² Farmers Weekly Interactive, www.fwi.co.uk, 2 December 2013

³ Crops, 7 September 2015

2 Arable Farm Performance: Agriculture

Sugar Beet, Potato and Horticultural Crop Area 2007 to 2014 in England



Source: Defra June Survey

At 116,000 and 105,000 hectares respectively, the areas of sugar beet and potatoes were very slightly lower than five year average levels. For potatoes, this represented a 1.9 per cent increase in the area grown.

In the UK, 6.9 per cent of production from the sugar beet area, some 8,000 hectares, was used in the production of bioethanol in 2014¹.

2.3 Cereals Farms Performance (excluding organic farms)

The contribution to FBI from agriculture reduced by £20 per hectare to -£45 per hectare. In comparison with the previous year, the results from a similar set of farms, show changes that were observed across counties and farms of all types of tenure status:

- Similar levels of agricultural output
- higher crop specific costs
- almost identical fixed costs in all categories.

Cereals Farms – County and Joint Character Area (JCA)

In comparison with 2013, counties with improved crop output generally saw an improvement in the contribution to FBI from agriculture, whilst the converse was true for counties with reduced crop output. Fixed costs were comparable between the years.

The contribution of agriculture to FBI ranged from £131 per hectare in Lincolnshire, the county with the highest agricultural output and gross margin (of £836 per hectare), to -£186 per hectare in Northumberland.

Oxfordshire was the county with the lowest crop output and also had the lowest gross margin despite incurring the lowest variable costs.

¹ Defra, Area of Crops Grown for Bioenergy in England and the UK: 2008 – 2014, 10 December 2015

2 Arable Farm Performance: Agriculture

FBI comparisons should be made with caution when there are differences in tenure status and requirement for paid labour. Farms in Northumberland and Oxfordshire owned the smallest proportion of their land (41 and 42 per cent respectively) whilst the greatest proportion, of 87 per cent was owned in Hertfordshire. Overall, fixed costs ranged from £603 per hectare in Leicestershire and Wiltshire, to £838 per hectare in Suffolk.

The range in machinery costs was from £276 per hectare in Wiltshire to £396 per hectare in Suffolk. There was a wider range of composition of machinery costs, for example, contract costs ranged from £60 per hectare in Essex to £135 per hectare in Hertfordshire, the county with the lowest depreciation charge (of £78 per hectare). In general, it is likely that farms with a high clay component in their soils require timely access to the land and therefore prefer to use their own machines, and are less reliant on contractors. Farms in North Yorkshire incurred the highest depreciation charge of £163 per hectare.

Cereals Farms – Performance Group

FBI comparisons should be made with caution when there are differences in tenure status and requirement for paid labour. The top quartile group of farms, by contribution of agriculture to FBI, were likely to grow more wheat, less barley, and more sugar beet than average performing farms. They typically had only limited involvement in livestock production and had an average agricultural output of £1,221 per hectare. At £313 per hectare, their machinery costs were lower than the national average.

The bottom quartile group of farms were likely to grow less wheat, oilseeds and sugar beet than the national average, but more likely to be involved in livestock production. Their agricultural output averaged £934 per hectare. This group carried above average machinery costs, including higher repairs, fuel use, depreciation and contract charges.

2.4 General Cropping Farms Performance (excluding organic farms)

In comparison with the previous year, FBI performance was dependent on exposure to the poorly performing potato crop and the favourably performing sugar beet crop. The contribution of agriculture to FBI averaged -£27 per hectare on General Cropping farms in England in 2014/2015. The main driver of reduced FBI was the by five per cent reduction in output to £1,600 per hectare.

General Cropping Farms – Performance Group

The top quartile group of farms, when ranked in terms of the contribution of agriculture to FBI, which averaged £332 per hectare. They also, tended to have an above average area of horticultural crops.

The bottom quartile group of farms, with an average contribution of -£306 per hectare from agriculture to FBI. They carried substantial investment in buildings and machinery and incurred high labour costs; these cost structures are difficult to justify at 2014 commodity prices.

3 Agri-environment, Diversification, Single Payment

3.0 Agri environment, Diversification and Single Payment Summary

- The total area of land in agri environment schemes in England peaked in 2013
- The contribution of agri environment schemes to FBI increased in 2014
- The contribution of diversification to FBI increased on Cereals farms but decreased on general Cropping farms.
- In the final (and tenth) year of the Single Payment Scheme, its contribution to FBI was the lowest recorded

The results presented in this Chapter relate to **agri-environment scheme participation, diversification outside agriculture and the Single Payment scheme**. The outputs, costs and net income attributable to these activities can be summed with that from agriculture to give FBI for the whole farm business. Whilst output and variable costs can be readily split between cost centres, some element of estimation is needed in order to share labour, machinery, property and overhead costs. Within the FBS, this is carried out on a consistent basis using an agreed approach¹.

3.1 Agri-environment

The table below shows the calculation of the average contribution of agri environment to FBI on Cereals and General Cropping farms. The results are averaged over all farms, although some did not participate in agri environment schemes.

Agri-environment Output and Costs, Cereals and General Cropping Farms 2013/2014 and 2014/2015

	Cereals		General Cropping	
	£ per hectare			
	2013	2014	2013	2014
Agri environment output	36	41	35	41
Agri environment costs	6	7	8	10
Agri environment FBI	30	34	27	31
Whole business FBI	237	220	349	229

The total area of land in agri environment schemes in England peaked in 2013, which was also the final year of the (former) Countryside Stewardship Scheme and Environmentally Sensitive Areas scheme. The total area of land in Environmental Stewardship also peaked in 2013 at 6.66 million hectares, but fell to 6.53 million hectares in 2014 as the area in ELS fell from 6.5 million hectares in 2013 to 6.39 million hectares in 2014². In summary, the area of ELS reduced as some farmers decided not to renew expiring agreements. Although the area in HLS expanded to 1,348 hectares, the area of new HLS agreements in the year was lower than the area of land lost from Countryside Stewardship and Environmentally Sensitive Areas

¹ Appendix 2 (Item VI) Farm Accounts in England 2008 /2009 Defra statistics
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/423700/fbs-fixedcostmethod-23apr15.pdf

² Defra, Observatory Monitoring Framework – Indicator Data Sheet

3 Agri-environment, Diversification, Single Payment

schemes. Similar changes were observed for the number of agreements which also peaked in 2013.

The contribution of agri environment scheme participation to FBI in 2014 was £34 per hectare on Cereals farms and £31 per hectare on General Cropping farms. Comparison of agri environment receipts should be made with care because administrative changes resulted in a change to payment dates¹.

3.2 Diversification

The table below shows the calculation of the average contribution of diversification to FBI on Cereals and General Cropping farms. The results are averaged over all farms, although some did not have diversified activities within their business.

Diversification Output and Costs, Cereals and General Cropping Farms, 2013/2014 and 2014/2015

	Cereals		General Cropping	
	£ per hectare			
	2013	2014	2013	2014
Diversification output	104	113	108	110
Of which:				
Rental	78	79	70	73
Recreation	8	7	3	4
Food processing and retailers	0	1	15	8
Tourism	4	6	8	8
Other	14	19	12	17
Costs	44	46	43	48
Diversification FBI	61	67	64	62
Whole farm FBI	237	220	349	229

As a likely indicator of the improving rural economy outside agriculture, output from diversification increased on both Cereals and General Cropping farms and across most types of diversified enterprise. Costs also increased. The resulting contribution of diversification to FBI was £67 per hectare on Cereals farms (£61 per hectare in 2013) and £62 per hectare on General Cropping farms (£64 per hectare in 2013).

Rental activity remained the most significant source of non agricultural output, representing 70 and 66 per cent of output respectively on Cereals and General Cropping farms. Following a peak in vacant commercial space in 2010 to 2012, agents report recovery in commercial rents².

¹ British Farmer and Grower, June 2014

² Smiths Gore, www.smithsgore.co.uk

3 Agri-environment, Diversification, Single Payment

3.3 Single Payment

The final year of receipts under the Single Payment Scheme (SPS) was 2014. A financial analysis of the performance of the Single Payment cost centre is shown in the following table.

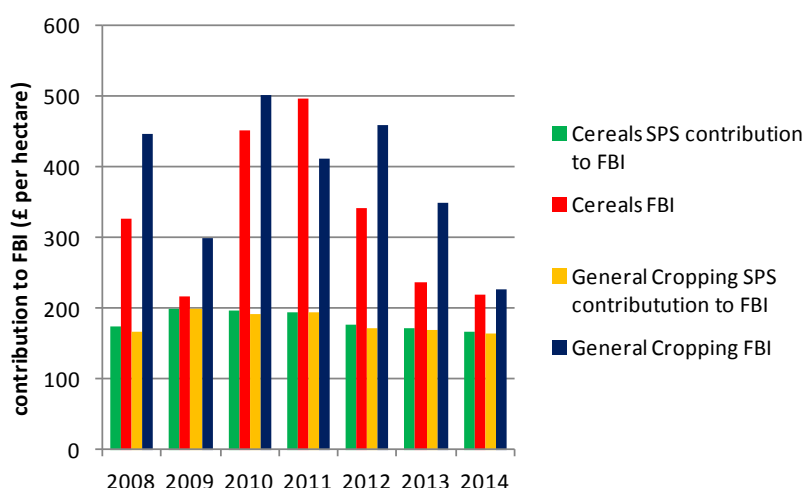
Single Payment Scheme Output and Costs, Cereals and General Cropping Farms 2013/2014 and 2014/2015

	Cereals		General Cropping	
	£ per hectare			
	2013	2014	2013	2014
Single Payment	190	183	185	178
Costs	18	17	15	15
Single Payment FBI	172	166	170	163
Whole farm FBI	237	220	349	229

As sterling strengthened against the euro, the exchange rate used to convert Single Payment claims to sterling was €1 to £0.77730 (€1 to 0.83605 last year), some seven per cent lower than in 2013. Although no modulation was deducted from 2014 claims, under the Financial Discipline Mechanism, claims of over €2,000 were reduced by 1.3 per cent to create a financial reserve for use in times of crisis in the farming industry.

The resulting base rate was €251.39 per hectare for non SDA entitlements¹. This translated to a payment of about £195 per hectare for non SDA land. This was higher than the recorded FBS receipt of £183 per hectare on Cereals farms and £178 on General Cropping farms as land is frequently rented on arrangements in which the landlord receives the Single Payment.

Net Contribution of Single Payment to FBI on Cereals and General Cropping Farms, 2005 to 2014



The Single Payment Scheme was introduced in 2005 and the final year of the scheme was 2014, prior to the introduction of the Basic Payment Scheme. In 2014, farmers received their lowest payment of the decade, partly due to the high value of sterling relative to the euro. The highest receipts were in 2009 and have fallen in every subsequent year.

¹ Farmers Weekly Interactive, www.fwi.co.uk, 30 September 2015

4 Crop Enterprise Performance

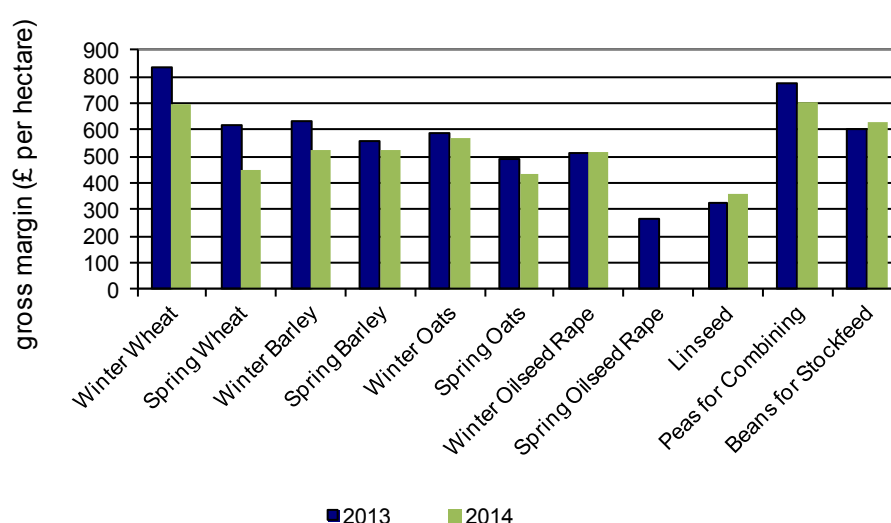
4.0 Crop Gross Margins

- At 9 tonnes per hectare, the England wheat yield exceeded previous records
- At 77.3 tonnes per hectare the sugar beet yield also exceeded previous records
- The potato crop achieved a record yield of 42.5 tonnes per hectare.
- Reduced prices of cereals, oilseeds and proteins
- Lower expenditure on seed and fertiliser due to reduced unit cost
- Increased use and expenditure on crop protection; especially fungicides

4.1 Crop Gross Margins (excluding organic crops)

The gross margin performance of combinable crops in 2013 and 2014 is summarised in the figure below.

Gross Margins of Arable Crops 2013/2014 and 2014/2015



In comparison with the previous year, growers of combinable crops spent less on seed and fertiliser but more on crop protection.

Blackgrass Prevalence and Farmer Response

In 2014, the wet growing conditions proved ideal for the development of herbicide resistant blackgrass. Levels of blackgrass infestation varied between farms, due to differences in management practice, and within fields due to differences in soil type. In some cases, patches of wheat with exceptionally high blackgrass populations were sprayed off with glyphosate.

4 Crop Enterprise Performance

Significant pressure from herbicide resistant blackgrass led growers to explore and implement new strategies to reduce blackgrass populations. In practice, these often combined herbicide use with cultural control methods, of which some are described in the table below.

Cultural Control of Blackgrass

cultural control method	blackgrass control %	farm economic impact
Ploughing	69	Additional fixed cost
Delayed drilling	31	Possible yield reduction
Higher seed rates	26	Higher variable costs
Competitive cultivars	22	Possible higher variable costs
Spring cropping	88	Reduced gross margin
Fallowing/grass leys	75	Reduced gross margin

Source: Rothamsted Research

There is evidence from CropMonitor that farmers intentionally delayed wheat establishment as a means of reducing the blackgrass population¹. For the second year running, less than ten per cent of the crop was drilled before 20 September, and yet weather conditions for drilling were favourable. Some 13 per cent of the crop was drilled after 31 October.

4.2 Winter Wheat

The winter wheat gross margin, of £698 per hectare, was the second highest combinable crop gross margin after peas. The crop attained a record national average yield of nine tonnes per hectare (12 per cent above the five year average). Possible reasons for this high yield are:

- Favourable weather conditions at critical times: establishment, spring and summer
- A reduced area of second wheat due to the reduction in the wheat area in 2013
- Reduced nutrient offtake in 2013 when fewer crops with a high nutrient demand were grown

However the price, of £130 per tonne, was 14 per cent below the five year average. As a result, output of £1,223 was only two per cent below the five year average. Despite year on year changes in variable costs, the 2014 expenditure, of £525 per hectare, was 11 per cent above the five year average.

Agronomy and Crop Development

The average expenditure on seed was £72 per hectare, down from £78 per hectare in 2013 when the supply of seed of suitable quality was constrained.

The table below shows the choice of wheat varieties that farmers made for harvest 2014.

¹ CropMonitor Winter Wheat Commercial Crops Survey 2014, www.cropmonitor.co.uk

4 Crop Enterprise Performance

Percentage Allocation of Wheat area to nabim group 2010 to 2014, Great Britain

	2010 /2011	2011/2012	2012/2013	2013/2014	2014/2015
Group 1	17	17	17	14	17
Group 2	15	11	9	12	8
Group 3	11	15	21	15	12
Group 4	51	54	52	56	63

Source: AHDB/HGCA planting and variety survey

The area of nabim group 1 milling wheat recovered to the long term proportion of 17 per cent, indicating that the 2013 harvest year was an anomaly due to the unsatisfactory drilling conditions in autumn 2012. The increased interest in group 1 wheat confirms that farmers prioritised yield over possible premiums for group 2 or group 3 wheats. Favourable progress was made with drilling and 67 per cent of the crop was drilled between 20 September and 10 October¹.

The average overall nitrogen, phosphate and potash fertiliser applications to winter wheat were 186 kilograms per hectare, 26 kilograms per hectare and 33 kilograms per hectare respectively². Fertiliser expenditure averaged £206 per hectare, down from £220 per hectare in 2013.

The generally warm and wet weather conditions gave rise to high levels of foliar disease. Yellow rust developed early and was observed on a range of varieties in the autumn³. The disease remained prevalent into the spring⁴. *Septoria tritici* became more prevalent in April⁵. By May, there was high disease pressure from both *Septoria* and yellow rust. As a consequence, yield responses from fungicide use were very high, reportedly up to four tonnes per hectare from a single spray at the T2 timing⁶. CropMonitor data suggests that *Septoria tritici* levels were the highest seen since records began in 1970⁷. The disease was most prevalent in the North West and least prevalent in the East of England. Tan spot was present in many crops but not in the North West, or North East of England. Powdery mildew was the third most common disease. Crops typically received 3.8 applications of fungicide (3.2 applications in 2013), this was the highest numbers since records began in 1970⁸. Since 2010, the use of SDHI fungicides has increased annually and in 2014, 92 per cent of crops were treated with fungicides from this group⁹. The use of strobilurin and morpholine fungicides reduced in this period. The net result was that crop protection expenditure, of £211 per hectare was 13 per cent higher than in 2013.

Harvest, Yield, Quality and Marketing

The average national yield, as measured in the FBS, was 9.0 tonnes per hectare, exceeding the previous record of 8.9 tonnes per hectare in 2008. Within the FBS, the top ten producers

¹ CropMonitor Winter Wheat Commercial Crops Survey 2014, www.cropmonitor.co.uk

² Defra, British survey of Fertiliser Practice 2014, www.gov.uk

³ Farmers Weekly Interactive, www.fwi.co.uk, 2 December 2013

⁴ HGCA, www.hgca.com, 28 March 2014

⁵ HGCA, www.hgca.com, 30 April 2014

⁶ Crops, 7 February 2015

⁷ CropMonitor Winter Wheat Commercial Crops Survey 2014, www.cropmonitor.co.uk

⁸ CropMonitor Winter Wheat Commercial Crops Survey 2014, www.cropmonitor.co.uk

⁹ CropMonitor Winter Wheat Commercial Crops Survey 2014, www.cropmonitor.co.uk

4 Crop Enterprise Performance

averaged 12 tonnes per hectare. These businesses represent 2.7 per cent of the wheat area and 3.6 per cent of wheat production.

The following table shows the quality of wheat crops at the 2013 and 2014 harvests.

Cereal Quality Survey 2013 and 2014, Great Britain

	specific weight kg/hl 2013	specific weight kg/hl 2014	hagberg s 2013	hagberg s 2014	protein % 2013	protein % 2014
Group 1	77.8	78.1	339	330	13.0	12.2
Group 2	77.8	78.4	334	337	12.5	11.8
Group 3	76.2	76.3	285	294	11.7	11.0
Group 4	76.1	76.3	288	289	11.4	10.7

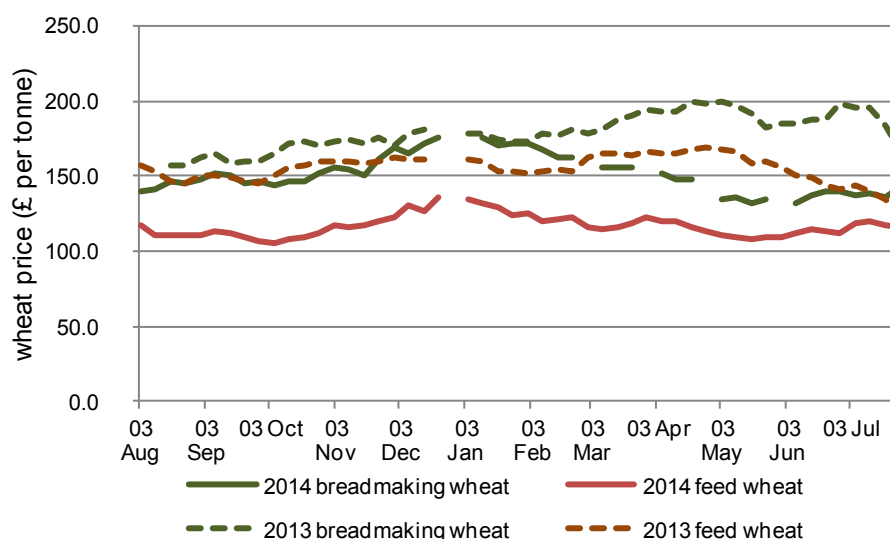
Source: AHDB /HGCA Cereal Quality Survey Final Results

Overall wheat quality was favourable with high specific weights and high hagberg falling number. The protein content was below the three year average. However mild growing conditions gave rise to ergot problems in some crops¹.

About 40 per cent of the crop was harvested by 5 August but heavy showers slowed progress with harvest in the second week of the month². By the start of September, 90 per cent of the wheat harvest was complete³.

The figure below shows how the feed and milling wheat price developed through the 2014/2015 marketing season, and in comparison with the previous year.

Wheat Price 2013/2014 and 2014/2015



Source: Defra

The wheat price in the 2014/2015 marketing season was constrained by the high value of sterling and the greatly increased UK harvest of 16.6 million tonnes (11.9 million tonnes in 2013)¹.

¹ Farmers Weekly Interactive, www.fwi.co.uk, 8 September 2014

² Farmers Weekly, 15 August 2014

³ Farmers Weekly Interactive, www.fwi.co.uk, 4 September 2014

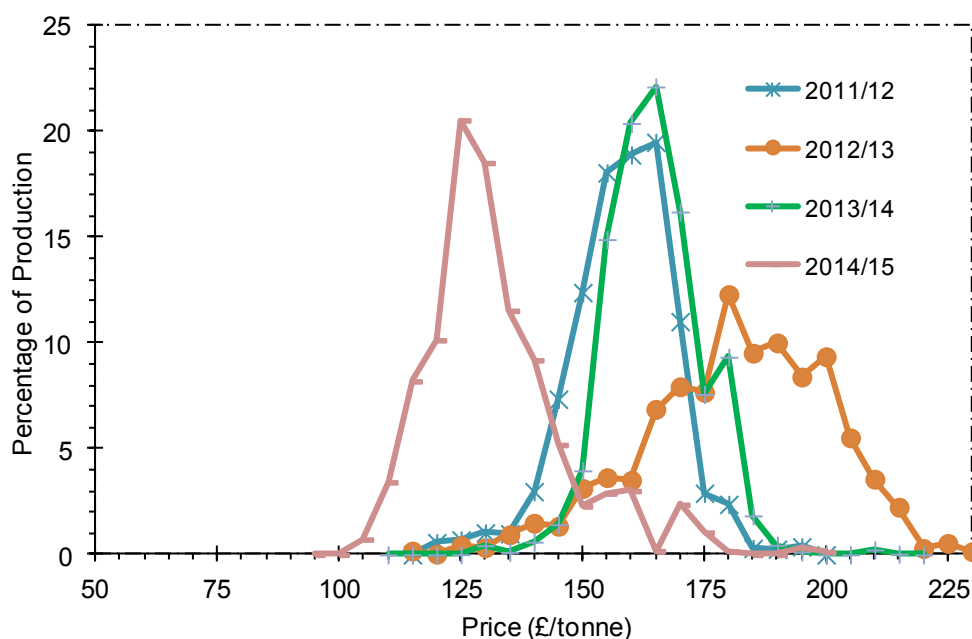
4 Crop Enterprise Performance

From an average of about £110 per tonne at harvest, the feed wheat price increased to £135 per tonne at the end of 2014. Demand from ethanol plants and compounders helped to raise the price, as did reports of concerns about potential yields in Russia in October². By November, weakening sterling further increased prices in the UK³. At the turn of the year, market conditions were determined by limited export success and reduced industrial usage of wheat, partially offset by news of Black Sea export restrictions from February 2015⁴. Prices then weakened, due to high stocks and the relatively strong pound, with wheat trading for around £113 per tonne in March⁵. After falling to £109 per tonne in May, prices increased in June driven mainly by the International Grains Council report which suggested a lower global wheat harvest than originally expected⁶. The price finally rose to £117 per tonne in July.

Despite global oversupply of feed wheat, it soon became apparent that high quality milling wheat supply was scarce. Prices were helped by the reduced quality of the German wheat harvest⁷. The premium for milling wheat averaged around £30 per tonne at harvest and increased through the autumn, to a peak of about £40 per tonne in November. The premium then narrowed, falling eventually to about £20 per tonne ahead of the 2015 harvest. Hovis committed to using entirely British wheat in its loaves, conditional on the harvest meeting quality requirements⁸. The company had previously made this commitment, but the very poor quality wheat harvest of 2012 required them to source imported red wheat.

The figure below shows the distribution of average wheat prices achieved during the year.

Wheat Price Achieved - FBS



The average wheat price, calculated in the FBS, was £130 per tonne. The average for England and Wales, calculated from trade sale returns, was about £123 per tonne⁹.

¹ Farmers Weekly Interactive, www.fwi.co.uk, 12 October 2014

² Defra, 18 December 2014

³ Farmers Weekly Interactive, www.fwi.co.uk, 20 November 2014

⁴ Viewpoint, Gleadell, December 2014

⁵ Farmers Weekly Interactive, www.fwi.co.uk, 12 March 2014

⁶ Farmers Weekly Interactive, www.fwi.co.uk, 26 June 2014

⁷ Viewpoint, Gleadell, December 2014

⁸ Farmers Weekly Interactive, www.fwi.co.uk, 17 March 2014

⁹ Defra, www.gov.uk

4 Crop Enterprise Performance

Straw

The average value of straw grown on FBS farms was £56 per hectare, ten per cent lower than in 2013. The value of straw varies according to local demand. In our analysis of wheat performance by county, straw output ranged from £229 in Cornwall to £2 per hectare in Bedfordshire.

The price of big bale wheat straw averaged £39 per tonne in August 2015, about 11 per cent lower than the five year average price¹. By November, the price had fallen to around £35 per tonne where it remained for the rest of the year.

Group 1 Milling Wheat Performance

The 20 farms that grew only nabim Group 1 milling wheat received £138 per tonne for their crop, representing a premium of £13 per tonne. In comparison with farms that grew no milling wheat, their yield, of 8.9 tonnes per hectare and their variable costs were also similar. In this comparison, our estimate of the milling wheat gross margin is £742 per hectare.

Farm Performance

In 2014, the highest performance, by gross margin quartile, resulted from high yield performance and price, this group of farms also spent less on seeds, fertilisers and crop protection relative to farms in the other quartile groups. This variation is typical of previous years, although in 2013, farms in all quartile groups were more likely to receive the same average crop price.

In 2014, the highest yields and margins were achieved in the most favourable production regions and on land best suited to wheat production as detailed in the table below.

Top Five Counties by Winter Wheat Yield and Gross margin

		yield t /hectare			gross margin £ /hectare
1	Suffolk	10.4	1	Essex	834
2	Bedfordshire	10.1	2	Oxfordshire	790
3=	Hertfordshire	9.6	3	Bedfordshire	740
3=	Norfolk	9.6	4	Hertfordshire	738
5	Cambridgeshire	9.4	5	Cambridgeshire	736

Within the South Norfolk and High Suffolk Clayland JCA, the average yield was an exceptional 10.6 tonnes per hectare.

With yields of 9.2 tonnes per hectare, farmers in Essex received an average wheat price of £140 per tonne and therefore secured the greatest crop output. Their crops were grown with below average variable costs.

¹ Defra, www.gov.uk

4 Crop Enterprise Performance

Seed costs ranged from £56 per hectare in the Herefordshire Lowlands JCA to £81 per hectare in the East Riding of Yorkshire and Norfolk. Fertiliser expenditure was lowest in Lincolnshire, at £179 per hectare to £247 per hectare in Durham, which grew crops that yielded only 7.5 tonnes per hectare, giving a gross margin of only £505 per hectare. Crop protection expenditure ranged from £174 per hectare in Cheshire, the county with the lowest variable costs, to £277 per hectare in Wiltshire, which had the highest variable costs.

Farmers Weekly reported that Lincolnshire producer Tim Lamyman achieved a record UK yield of 14.5 tonnes per hectare, having achieved a previous record yield of 14.31 tonnes per hectare in 2013¹.

4.3 Spring Wheat

The spring wheat gross margin averaged £451 per hectare, and 27 per cent lower than in 2013. Although the yield of 5.6 tonnes per hectare was similar to the previous year (when it averaged 5.7 tonnes per hectare), the price of £144 per tonne was 18 per cent lower.

Growers produced spring wheat at less cost than in 2013 by reducing expenditure on seed to £84 per hectare (£103 per hectare in 2013) and fertiliser to £148 per hectare (£165 per hectare in 2013). Crop protection, at £131 per hectare was almost unchanged on the previous year.

NIAB negotiated the authorisation of Avadex Excel 15G (tri-alleate) for use on spring wheat². This development allows greater flexibility in the control of blackgrass by targeting weeds with this herbicide in the spring rather than solely in the autumn.

4.4 Winter Barley

The average gross margin was £523 per hectare and 15 per cent below the five year average.

Both the yield and quality of barley was high; the average yield, at 7.2 tonnes per hectare, exceeded the five year average by ten per cent. The average specific weight, of 66.3 kilograms per hectolitre was close to the three year average, and the levels of screenings were exceptionally low³. The average nitrogen content across the national winter barley sample was 1.61 per cent. The resulting average price was £120 per tonne, 14 per cent below the five year average.

At harvest, barley traded for around £102 per tonne in the absence of a clear market for the crop produced. With an exportable surplus estimated at two million tonnes, the UK benefitted from high Chinese demand for French barley, leaving European, middle Eastern and some Asian markets available to UK exporters⁴. In the 2014/2015 export season, 1.4 million tonnes of barley were exported from the UK, the highest since the 1999/2000 season.⁵

Variable costs, of £435 per hectare were very similar to the previous year. However, lower expenditure on seed and fertiliser was mitigated by increased expenditure on crop protection. There were reports of high disease pressure from brown rust, *Rhynchosporium* and net blotch⁶.

¹ Farmers Weekly Interactive, www.fwi.co.uk, 14 November 2014

² NIAB TAG

³ AHDB /HGCA Cereal Quality Survey 2014 Final Results

⁴ Farmers Weekly Interactive, www.fwi.co.uk, 29 January 2015

⁵ HGCA, Market Report, 13 July 2015

⁶ HGCA, www.hgca.com, 28 March 2014

4 Crop Enterprise Performance

Performance by Natural England Joint Character Area and County

In our analysis by county; at 8.0 tonnes per hectare, the highest yielding winter barley crops were grown in the East Riding of Yorkshire. They gave the highest gross margin of £659 per hectare despite incurring the highest crop protection expenditure of £175 per hectare. Straw comprised 13 per cent of the output, which was also the highest of all counties.

The average crop price ranged between £110 per tonne in Cornwall to £130 per tonne in Norfolk.

Variable cost expenditure ranged from £364 per hectare in Essex, a county growing the national average yield, to £533 per hectare in the Cornish Killas JCA, where the yield was lower than average.

4.5 Spring Barley

At £526 per hectare, the spring barley gross margin was just five per cent below the five year average.

It yielded 6.3 tonnes per hectare, exceeding the five year average by 15 per cent.

The average price was £126 per tonne and £6 per tonne higher than the winter barley price. This was 14 per cent below the five year average, and the net effect was that spring barley output was close to average levels. The average nitrogen content for spring barley was exceptionally low at 1.51 per cent¹. In the knowledge that farmers would be seeking to maximise their winter cereal area for harvest 2014, maltsters offered contracts of £175 per tonne for spring barley.

Good progress was made with drilling of spring barley into good quality seedbeds in the Eastern side of England². The crop developed rapidly, but *Rhynchosporium* developed on some crops³.

However, variable cost expenditure was nine per cent above the five year average, at £349 per hectare. In common with other crops, lower seed and fertiliser prices were mitigated by higher crop protection expenditure.

Performance by Natural England Joint Character Area and County

Farmers in Norfolk achieved the highest spring barley gross margin, of £697 per hectare, with a yield of 7.2 tonnes per hectare, and price of £140 per tonne.

In Shropshire, the combined value of spring barley fed on the farm, together with straw comprised 48 per cent of the crop output indicating the importance of the crop in mixed farming systems in this part of England.

Variable costs ranged from £253 per hectare in the Eden Valley JCA, where crop protection costs were exceptionally low at £65 per hectare, to £433 per hectare in Wiltshire, the county with the highest expenditure on fertiliser and crop protection.

¹ AHDB /HGCA Cereal Quality Survey 2014 Final Results

² HGCA, www.hgca.com, 28 March 2014

³ HGCA, www.hgca.com, 27 June 2014

4 Crop Enterprise Performance

4.6 Winter Oats

At £568 per hectare, the winter oat gross margin was the second highest cereal gross margin after winter wheat. Nevertheless, this was 13 per cent below the five year average.

The yield, of 6.9 tonnes per hectare, was nine per cent higher than the five year average and equal to the exceptional yield of 2006.

The average price was £121 per tonne and 14 per cent below the five year average. Driven by consumer interest in the health and nutritional characteristics of oats, the market for this crop is reported to be increasing by four per cent per year, and has doubled in the last 20 years¹. Supply of oats was similar to the previous year as higher yields compensated for reduced plantings. The crop was of reasonable quality.

As a less intensive crop, winter oats, with a variable cost spend of £360 per hectare, have seen the lowest increase, of only six per cent, in variable cost expenditure over the last five years.

4.7 Spring Oats

At £436 per hectare and 21 per cent lower than the five year average, the spring oat gross margin was the lowest achieved by a cereal crop in 2014, and in any year since 2009.

At 6.1 tonnes per hectare, the yield was 13 per cent above the five year average and possibly a national record.

The price averaged £112 per tonne, 22 per cent below the five year average, and £9 per tonne less than the winter oat price.

Variable expenditure averaged £310 per tonne (£321 in 2013).

4.8 Winter Oilseed Rape

At £514 per hectare, the winter oilseed rape gross margin was little changed on 2013 but 30 per cent below the five year average.

The driver of the less favourable performance of the oilseed rape crop was the lower price, of £278 per tonne, which 16 per cent below the five year average.

At 3.7 tonnes per hectare, the yield was four per cent higher than the five year average. The net effect of the higher yield and lower price was that the crop output was similar to 2013.

At the time of drilling there were indications of reduced prices, resulting from increased global supply of oilseeds, which included increased soya plantings and additional Australian exports². By May 2014, less than ten per cent of the oilseed rape had been sold and harvest prices were quoted at around £264 per tonne³. At harvest, oilseed rape typically achieved a price of £215 per tonne, although the receipt to the farmer at this price would be around £20 per tonne higher due to the oil bonus. At the end of July, the price had risen to over £225 per tonne. The weakening value of sterling relative to the euro increased oilseed rape prices to around £241 per tonne in October 2014. Increased demand for soya resulted in a further

¹ Crops, 19 December 2015

² Crops, 24 May 2014

³ Farmers Weekly, 23 May 2014

increase in the oilseed rape price to £249 per tonne in November¹. The lack of farmer selling resulted in prices of around £263 per tonne in January 2015. By March 2015, there were indications that the crop would sell out prior to harvest².

The variable cost expenditure, of £507 per hectare, was 11 per cent above the five year average. Although expenditure on seed and fertiliser was little changed, farmers increased expenditure on crop protection by ten per cent to £201 per hectare.

Wet conditions in May led to the development of *Sclerotinia*. Light leaf spot developed rapidly and was a threat to yield in some crops³. Light leaf spot was the most prevalent disease and present at its highest level since 1989, *Phoma* leaf spot was the second most prevalent disease⁴. The trend is towards increasing annual use of fungicide. In the CropMonitor survey, crops received an average of 3.5 fungicide applications, ranging from 3.7 applications in the east of England to 3.1 applications in the North⁵.

As the 2014 oilseed rape crop was drilled, growers were aware of the two year imposition of a ban on the use of neonicotinoid seed dressing for the 2015 harvest crop. In addition to insecticide seed treatments, the CropMonitor survey shows that crops typically received 2.1 applications of insecticide, ranging from 2.3 applications in the East of England to 1.5 in the South West⁶.

Oilseed rape crops were in generally good condition in June with little lodging and good pod depth⁷.

Performance by Natural England Joint Character Area and County

Crops yielded in excess of four tonnes per hectare in Lincolnshire, Norfolk and Suffolk, and in The Fens JCA. The highest gross margin, of £703 per hectare, was achieved in Warwickshire, where the average price was 13 per cent above the national average at £313 per tonne.

Variable costs ranged from £424 per hectare in Essex, the county with the lowest expenditure on crop protection, to £573 per hectare in South Norfolk and High Suffolk Clayland JCA, which had the greatest expenditure on crop protection. Seed expenditure varied widely from £45 per hectare in Cambridgeshire to £79 per hectare in Northumberland.

Farmers Weekly reported that the farmer responsible for the record wheat yield also set a record of 6.14 tonnes per hectare for oilseed rape on the Lincolnshire Wolds⁸.

4.9 Spring Oilseed Rape

The spring oilseed rape gross margin should be treated with caution as the sample size is of only 11 farms. The crop achieved an average gross margin of £0 per hectare. The poor crop performance was due to the low yield of only 1.2 tonnes per hectare. It is possible that some crops in this sample were redrilled after failed winter oilseed rape crops in unfavourable conditions.

¹ Farmers Weekly, 21 November 2014

² Farmers Weekly, 27 March 2014

³ HGCA, www.hgca.com, 27 June 2014

⁴ CropMonitor, Oilseed Rape Survey 2014

⁵ CropMonitor, Oilseed Rape Survey 2014

⁶ CropMonitor, Oilseed Rape Survey 2014

⁷ Farmers Weekly, 13 June 2014

⁸ Farmers Weekly, 8 August 2014

4 Crop Enterprise Performance

4.10 Linseed

The linseed gross margin averaged £361 per hectare (£329 in 2013).

The crop yielded 1.8 tonnes per hectare (1.7 tonnes per hectare in 2013).

The average price received was £342 per tonne although we understand that fixed price contracts for linseed for October delivery of £400 and £360 per tonne were available from some merchants in 2014¹. Food markets in France and crushing in Belgium are the main markets for UK grown linseed².

The variable cost expenditure averaged £284 per hectare (£329 in 2013).

4.11 Peas for Combining

At £704 per hectare, the 2014 pea gross margin was four per cent higher than the five year average and £6 above the winter wheat gross margin.

Despite promising growing conditions for spring crops, in terms of rainfall, at 3.3 tonne per hectare, the pea yield was eight per cent below the five year average. Footrot conditions were prevalent in peas in 2014³. Aphids and thrips were present in crops in April 2014⁴.

The average price for all peas was £314 per tonne. This included a mixture of premium quality and feed peas. At August, blue peas sold for around £280 per tonne and marrowfats for £325 to £350 per tonne⁵. At October, typical prices for blue peas were £220 per tonne and around £350 per tonne for marrowfats⁶. Meanwhile, feed peas reached a price of £177 per tonne in November, buoyed by weakening sterling and increased demand for competitor product soya meal⁷.

At £303 per hectare, overall variable costs were similar to the previous year, but crop protection costs increased by nine per cent.

Of the 48 pea crops in the 2014 FBS sample we identified higher value and lower value crops; 20 sold their crop for less than £250 per tonne (averaging £224 per tonne). The lower value peas were grown at a cost of £128 and £134 respectively for seed and fertiliser. The average gross margin for this group was £477 per hectare.

A further 25 sold their crop for more than £250 per tonne (average £344 per tonne) implying that they achieved a premium for their crop. It is likely that premium priced blue peas and marrowfats were among the higher priced crops. The average scale of the high value pea production was larger at 44 hectares, in comparison with 14 hectares for the lower value crops. The high value crops were grown with expected higher expenditure on seed and crop protection at £156 and £128 per hectare, reflecting seed quality and the market requirement for undamaged and unblemished peas. This group achieved an average gross margin of £772 per hectare.

¹ Farmers Weekly Interactive, www.fwi.co.uk, 3 January 2014

² Crops, 19 December 2015

³ PGRO Crop Update, 7 July 2014

⁴ PGRO Crop Update, 30 April 2014

⁵ Pulse Market Update, 8 August 2014

⁶ Pulse Market Update, 2 October 2014

⁷ Farmers Weekly, 21 November 2014

4.12 Winter and Spring Beans

To provide more detailed information about bean gross margins ahead of the 2015 CAP reform, we calculated gross margins for winter beans and spring beans in the 2014/2015 Farm Business Survey. Of the 127 farms with beans in the FBS (excluding organic crops), 36 grew winter beans and 91 grew spring beans. We previously reported gross margins for beans for stockfeed, whether they were winter or spring crops.

In 2014, winter and spring bean crops showed very similar gross margins, of £629 and £625 per hectare respectively. Their yields, prices and overall variable costs were all similar.

Both winter and spring beans yielded an average of 4.5 tonnes per hectare.

The winter bean sold for an average price of £207 per tonne and the spring crop for £208 per tonne. The quality of the crop at harvest was generally poor with regular observations of staining, bruchid damage, small seed size and splitting¹. In June, harvest prices of £220 were expected for feed beans and about £245 per tonne for human consumption beans². At harvest, prices were around £185 per tonne for feed crops and £200 per tonne for human consumption beans. The price was unchanged in September and by November, the bean price was around £183 per tonne³.

In common with other crops, expenditure on seed and fertiliser was lower than in recent years, whilst expenditure on crop protection was higher. The year proved to bring a series of agronomic challenges. Warm dry weather led to the emergence of large numbers of pea and bean weevils in April⁴. Downy mildew developed actively in cool humid weather. The pea and bean weevil continued to be active through April and bruchid beetles were also present in crops⁵. *Botrytis* (chocolate spot) developed in bean crops in overcast humid weather in June⁶. Rust developed in some crops in July⁷.

4.13 Sugar Beet

The sugar beet gross margin averaged an exceptional £1,719 per hectare, and 20 per cent above the five year average. The main driver of this exceptional performance was the record yield of 77.3 clean tonnes per hectare. This record yield exceeded the five year average by 20 per cent.

The price, which averaged £34 per tonne was nine per cent higher than the five year average.

The variable cost expenditure of £944 per hectare was also at record levels, 14 per cent above the five year average.

Contract and Price

The average price achieved, of £34 per tonne, includes haulage allowance and bonuses as received by the farmer.

¹ Farmers Weekly Interactive, www.fwi.co.uk, 5 September 2014

² Pulse Market Update, 3 June 2014

³ Farmers weekly, 21 November 2014

⁴ PGRO Crop Update, 4 April 2014

⁵ PGRO Crop Update, 30 April 2014

⁶ PGRO Crop Update, 6 June 2014

⁷ PGRO Crop Update, 7 July 2014

4 Crop Enterprise Performance

Price negotiations for the 2014 sugar beet crop were made in the context of an extension to the EU Sugar Regime to 30 September 2016¹. Whilst the NFU had lobbied for this extension, the UK government had argued in favour of immediate cessation of the Sugar Regime². Agricultural consultant Brown and Co called a grower meeting in April 2013 to challenge the previously agreed price formula for calculation of sugar beet prices in 2014. British Sugar initially proposed a price of £30.67 per tonne for the base price for the 2014 crop and for Industrial Contract Entitlement (ICE) beet³. The price finally agreed was £31.67 per tonne⁴.

During 2015, world white sugar prices fell to a long term low value of €295 per tonne, having previously reached a plateau at around €340 per tonne from early 2014⁵.

Agronomy and Crop Development

Drilling progress was initially easy due to an early dry spring and much of the crop was drilled by mid March, but later drilling into clay soils was more difficult as a result of a wet late May⁶. The average expenditure on seed was £200 per hectare (£183 in 2013). Seed costs were higher for some growers who increased seed rates to achieve a target population of 100,000 plants per hectare. The average achieved plant populations were 95,000 per hectare compared with the 90,000 plants per hectare achieved over the preceding five years⁷.

Fertiliser expenditure averaged £228 per hectare (£240 in 2013).

The crop developed well, with high plant populations. Warm conditions in the preceding autumn and winter allowed the carry over of a number of pests and diseases including aphids which were later successfully controlled by beneficial insects⁸. Only one new case of Rhizomania was identified because the entire crop was planted with partially resistant varieties⁹.

Rain during August contributed to root growth¹⁰. Aphid populations were high in the early season. Brown rust developed on crops in August requiring fungicide applications. Warm winter conditions allowed the crop to continue to develop into the winter and sugar contents were as high as 18 per cent¹¹.

The resulting expenditure on crop protection averaged £226 per hectare (£300 in 2013).

Harvest, Yield, Quality and Gross Margin Performance

The 2014 adjusted yield was 80 adjusted tonnes per hectare, breaking the previous record of 75.6 adjusted tonnes per hectare set in 2011. The average sugar content was 17.24 per cent¹².

¹ Farmers Weekly Interactive, www.fwi.co.uk, 6 September 2011

² Crops, 10 March 2012

³ Farmers Weekly Interactive, www.fwi.co.uk, 12 June 2013

⁴ Farmers Weekly Interactive, www.fwi.co.uk, 23 September 2013

⁵ Committee for the Common Organisation of Agricultural Markets, European Commission, www.europa.eu, 28 January 2016

⁶ BBRO, British Sugar Beet Review, Summer 2014

⁷ BBRO, British Sugar Beet Review, Summer 2015

⁸ BBRO, British Sugar Beet Review, Spring 2015

⁹ BBRO, British Sugar Beet Review, Spring 2015

¹⁰ BBRO, British Sugar Beet Review, Autumn 2014

¹¹ BBRO, British Sugar Beet Review, Winter 2014

¹² Defra, Agriculture in the United Kingdom, 28 May 2015

In 2014, 81 per cent of the crop was harvested by a contractor, including farms using the British Sugar harvest and haulage scheme.

At the close of the 2014 campaign, British Sugar revealed that they had achieved particularly favourable extraction rates with the result that production was 1.44 million tonnes¹. A similar pattern of high crop yields as well as high rates of sugar extraction was observed in most EU member states². Ultimately, the larger than expected crop in 2014 contributed to oversupply and an eventual considerable price reduction for the 2015 harvest crop of £24 per tonne for CTE and ICE³. British Sugar incurred the cost of storing surplus sugar into the following marketing season⁴.

The top quartile group of farms, by gross margin performance, grew high yielding crops (of 87 tonnes per hectare) with below average expenditure on seed. At £36 per tonne, their average price was high, suggesting high sugar yields. These farms made close to average expenditure on fertiliser and seed. The bottom quartile crop averaged 63 tonnes per hectare in yield and made above average expenditure on crop protection.

In our analysis by county, the highest yields, averaging 79.7 tonnes per hectare were grown in Norfolk giving rise to highest gross margin of £1,811 per hectare.

The lowest yields, of 69.1 tonnes per hectare were grown in Cambridgeshire and their resulting gross margin averaged £1,474 per hectare. Despite having the highest crop protection cost, the Cambridgeshire farms spent least on seed, fertiliser and on variable costs overall.

The highest variable costs, including the highest 'other crop costs' of £397 per tonne (which includes haulage) were incurred by farms in Lincolnshire. At £255 per hectare, the lowest 'other crop costs' were on farms in South Suffolk and North Essex Clayland JCA.

4.14 Ware Potatoes

The potato gross margin averaged £2,535 per hectare (£3,525 in 2013), 29 per cent lower than the five year average.

The yield of 42.8 tonnes per hectare is believed to be a record. It exceeded the five year yield by 12 per cent.

The low crop price, of £116 per tonne, was 23 per cent below the five year average. Low prices in 2014 resulted from carryover of an estimated 800,000 tonnes from the 2013 crop, an early harvest and good growing conditions⁵. The Russian ban on produce imports displaced sales from continental Europe and increased the supply of potatoes in Europe. About 80 per cent of growers had a contractual agreement for at least part of their production. About 18,000 hectares were harvested by 30 August when the average price was £140 per tonne, although the free buy price averaged only £101 per tonne⁶. By 27 September, 60,000 hectares had been harvested. The price fell to £119 per tonne and the free buy price to £91 per tonne⁷. In March 2015, stored free buy potatoes sold for £110 per tonne⁸. News of lower 2015 planting supported improved crop prices and free but Maris Piper reached £170 per tonne in April.

¹ Farmers Weekly Interactive, www.fwi.co.uk, 23 February 2015

² Inside Track, March 2015

³ NFU, www.nfuonline.com, 23 July 2014

⁴ Farmers Weekly, 30 January 2015

⁵ Farmers Weekly, 8 August 2014

⁶ Farmers Weekly Interactive, www.fwi.co.uk, 3 September 2014

⁷ Farmers Weekly Interactive, www.fwi.co.uk, 3 October 2014

⁸ www.agrimoney.co.uk, 19 March 2015

4 Crop Enterprise Performance

At £2,430, the variable cost expenditure was 17 per cent above the five year average. In comparison with 2013, fertiliser and crop protection expenditure was similar, but seed prices, of £834 per hectare, were seven per cent higher.

Gross Margin Performance by Crop Irrigation Practice

In our sample, 16 farms were wholly irrigated and 46 farms were not irrigated. Any comparison should be made with care as the crops grown in each group were not necessarily destined for the same market and the irrigated crops would also be expected to carry the higher fixed costs of irrigation. The irrigated crop produced an average gross margin of £3,729 per hectare, in comparison with the £1,755 of the crops that were not irrigated. The main difference between the two groups was the higher price of the irrigated crops of £137 per tonne in comparison with £102 per tonne for the crops without irrigation.

4.15 Vining Peas

In 2014, 32,844 hectares of vining peas grown in the UK. Of these, only a minimal area was bypassed and 32,820 hectares were vined to give an average yield of 4.35 tonnes per hectare¹.

The vining pea gross margin averaged £825 per hectare and exceeded the gross margin of all combinable crops. The average crop output was £1,232 per hectare.

The variable cost expenditure totalled £407 per hectare, including seed at £181 per hectare, fertiliser at £35 per hectare and crop protection at £138 per hectare. Vining peas were established in good conditions although some crops later suffered waterlogging. In general, middle and late drilled crops fared better than the early crops. The pea harvest in east Yorkshire was one of the longest on record.

¹ PGRO Vining Pea Growers Guide, PGRO, 2016

5 Net Margin and Cost of Production Estimation

5.1 Introduction

Following the Introduction of net margins to this report in 2013/2014, we have added additional crops this year. The methodology for calculation of FBS net margins and cost of production is on a full economic basis and includes imputed costs for unpaid labour and owner occupied land. The details are described in Appendix 3. Organic crops are excluded from the analysis.

5.2 Results for 2014 (excluding organic crops)

The 2014 harvest year was characterised by high yields, with the result that costs were relatively low on a cost per tonne basis. However, combinable crop prices were also low, resulting in disappointing net margins.

For all of the combinable crops, the net margin was negative and the cost of production exceeded the value of the crop sold.

Please note that the costs are determined by a combination of the inherent demand for inputs of all types, together with the characteristics of the farms that produce them. This explains the observation that land and property costs vary with land quality from an average of £204 per hectare for land producing winter oats to £323 for land producing potatoes. Similarly, contract use appears to be greater on average on farms that grow winter oats than on farms that grow winter barley or winter wheat, even though these crops follow similar production systems.

In 2014, the combinable crop with the most competitive net margin, of -£196 per hectare, was the pea crop. Among the cereal crops, the best performing crop, on the basis of net margin was winter oats at -£213 per hectare.

With a net margin of -£253 per hectare, the winter wheat crop outperformed the lower yielding barley and spring wheat crops, despite their lower production costs.

As a cereal with relatively high costs, but a low yield, spring wheat had the lowest net margin in this analysis and the highest production cost per tonne, but also had the highest sale price.

Both root crops in the analysis were profitable. The net margin of sugar beet averaged £385 per hectare, and yielding 77 tonnes per hectare, the cost of production was a competitive £29 per tonne and reassuringly below the £34 per tonne average crop price. Production costs varied between farms, so many will have achieved lower production costs and others higher.

The average potato cost of production, of £114 per tonne, suggests break even performance for a crop with a price of £116 per tonne. With the very wide variation in potato growing systems, there was considerable variation around this average performance level.

5.3 Comparison with 2013

In comparison, with 2013, only sugar beet showed an improved net margin performance in 2014. All other crops experienced a reduction in net margin due to lower crop prices.

However, using the metric of cost of production, the higher crop yields of 2014 resulted in improved performance. Winter wheat, spring barley and oilseed rape were produced at 11, 7 and 12 per cent less cost respectively. Although their total production costs were similar to the previous year, these were divided over higher crop yields.

6 Weather, Economic Context and Policy

6.0 Weather, Economic Context and Policy Summary

- The 2014 harvest year was exceptionally warm and wet
- In 2014, interest rates remained low but sterling strengthened against the euro and weakened against the US dollar
- There was considerable activity in the supply chain. This was possibly a consequence of falling commodity prices
- New renewable energy capacity came on stream in 2014, but reduced support through Feed in Tariffs was announced
- Details of the 2014 to 2020 Rural development Programme for England were announced

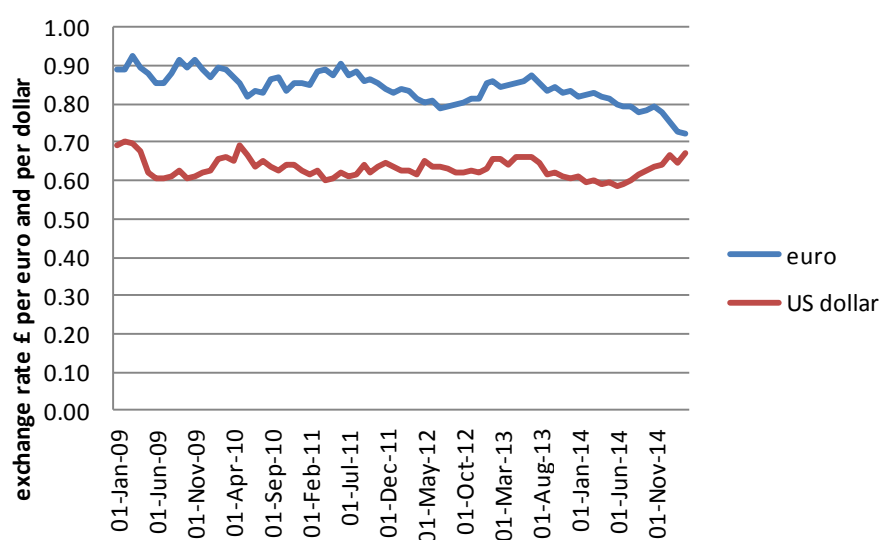
6.1 Economic Environment

Interest and Exchange Rates

During the year to April 2015, the average UK bank base rate was 0.5 per cent and unchanged since March 2009¹.

The figure below shows exchange rates from January 2009 to March 2015. In 2014/2015, sterling strengthened against the euro and weakened against the US dollar. At the end of March 2015, one euro was worth 72 pence and one US dollar was worth 67 pence.

Euro/Sterling Exchange Rate 2009 to 2015



Source: Bank of England

¹ Bank of England, www.bankofengland.co.uk

Crop Input Prices and Product Regulation

Reduced demand and favourable exchange rates ensured that fertiliser could be purchased at relatively low cost in autumn 2013. Ammonium nitrate was available for around £270 per tonne in September 2013¹ compared to about £300 per tonne in September 2012. Similar prices were available in January 2014².

The break up of two substantial cartels, the Phosphate Chemicals Association in North America and of Uralkali in Belarus was a further driver of lower world process for phosphate and potash³.

The supply of seed treatment Redigo Deter, which contains clothianidin, was disrupted following a factory fire at Bayer's manufacturing facility near Dusseldorf in July 2013⁴. Bayer later reported a shortage of triazole fungicide Proline, containing prothioconazole, used on barley and oilseed rape⁵.

The EU banned the use of methiocarb slug pellets, so the 2014 harvest year was the last in which they could be used⁶.

Lower world oil prices resulted in a reduction in the cost of red diesel, which fell to typical prices of between 47 and 50 pence per litre in December 2014⁷. It fell further to £0.44 to £0.47 in February 2015⁸.



¹ Farmers Weekly, 23 August 2013

² Farmers Weekly, 10 January 2014

³ Financial Times, www.ft.com, 2 October 2013

⁴ Farmers Weekly Interactive, www.fwi.co.uk, 8 July 2013

⁵ Farmers Weekly, 4 April 2014

⁶ Farmers Weekly Interactive, www.fwi.co.uk, 22 January 2014

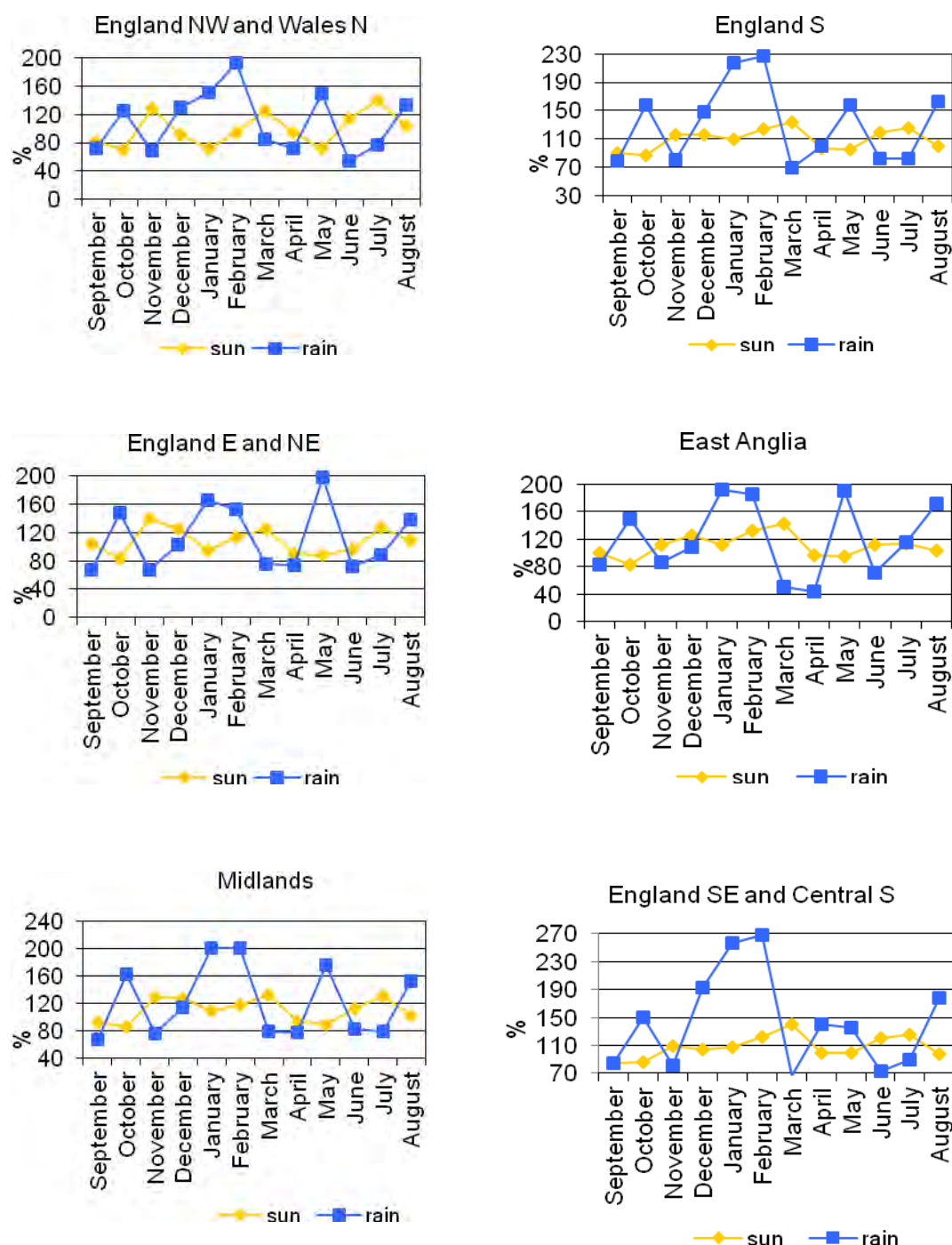
⁷ Farmers Weekly Interactive, www.fwi.co.uk, 16 December 2014

⁸ Farmers Weekly Interactive, www.fwi.co.uk, 5 February 2015

6 Weather, Economic Context and Policy

6.2 Weather and the Exceptional Rainfall Leading to 2013 harvest

Monthly Sunshine and Rainfall Expressed as a Percentage of Average of 1981 to 2010



The UK experienced its warmest year on record in 2014. The year was characterised by consistent warmth rather than peaks of excessive temperatures and no individual month reached record temperatures. It was also the wettest year on record.

In Yorkshire, strong winds caused a tidal surge which flooded arable farmland and farm buildings from Bridlington to Hull. About 2,400 hectares were flooded¹.

6.3 Business

In recent years, there has been limited change within the supply chain. Possibly as a result of falling commodity prices, the sector experienced an increase in merger and acquisition activity in 2014/2015.

For Farmers (formerly BOCM Pauls) bought Cheshire based HST feeds in February 2014 and Countrywide Farmers feed business for £15.2 million in December.

Camgrain appointed Frontier Agriculture as its main marketing partner from July 2015, having previously used Openfield in this role².

Openfield completed its acquisition of the Grain Business of Countrywide Farmers at the end of December 2014³.

In October 2014, Associated British Foods completed its acquisition of Dorset Cereals, based in Poundbury, Dorset.

Two grain businesses added haulage activities to their portfolio. Wessex Grain purchased the assets of John Budge Haulage in Somerset⁴. Archer Daniels Midland (ADM) added a fleet of 17 vehicles operated from its Erith, Purfleet and Corby sites⁵.

East of England based Produce World Group acquired TIO Ltd of Forres, Morayshire, a business specialising in the supply of organic root vegetables to retail and food service customers in July 2014⁶. In October, Produce World Group acquired Fenmarc roots division, based at Swinderby, Lincolnshire⁷. However, in February 2015, Produce World announced the closure of its Swinderby and Butterwick sites with 340 job losses⁸. It also entered a joint venture with Lincolnshire Field Products, creating 60 jobs at Wykeham, near Spalding, to grow, process and pack brassicas. Produce World Group acquired organic grower Taylorgrown in March 2015.

Produce Investments, the parent company of Greenvale, acquired The Jersey Royal Company in July 2014⁹.

In January 2015, Tesco announced plans to change its relationship with suppliers, emphasising more transparent negotiation of prices with reduced reliance on later price reductions to suppliers¹⁰. Later in the same month, the Government appointed Groceries Code Adjudicator was given the power to fine supermarkets up to one per cent of their UK turnover for breaches in compliance with the

¹ East Riding of Yorkshire Council, 24 June 2014

² Farmers Weekly Interactive, www.fwi.co.uk, 6 November 2014

³ Farm Business, FarmBusiness.cc, 16 January 2015

⁴ Farm Business, FarmBusiness.cc, 11 March 2014

⁵ Farm Business, FarmBusiness.cc, 25 February 2015

⁶ Produce World Group, News Release, July 2014

⁷ Produce World Group, News Release, 31 October 2014

⁸ Produce World Group, News Release, 23 February 2015

⁹ News Release, greenvale.co.uk, 10 July 2014

¹⁰ Farmers Weekly Interactive, www.fwi.co.uk, 9 January 2015

6 Weather, Economic Context and Policy

Groceries Supply Code of Practice. In February 2015 the Groceries Code Adjudicator launched an investigation into the procurement practices of Tesco¹.

Seed breeders led the change in business structure within the farm supply trade.

Bayer Cropscience, ventured into seed breeding activity in the UK in autumn 2014².

Swedish company Lantmannen sold its German and Polish winter wheat and winter oilseed rape breeding and seed business to Syngenta³. Elsoms later confirmed that they would continue to market market varieties from the Swalof Weibull Oilseeds programme⁴.

SES VanderHave invested £8 million in a new research facility in Belgium to enhance their breeding activity and in particular to develop seed traits including higher yield, improved disease resistance and reduced dependence on inputs⁵.

TCl, a US speciality crop business, acquired Premium Crops Ltd of Hampshire⁶. The business is involved with the production of high erucic acid rapeseed, high omega-3 linseed, naked oats, borage and Ahiflower.

Boothmans Agriculture of Bourne, Lincolnshire was acquired by Frontier to form an individually managed division of Frontier Agriculture⁷.

The team behind the Pipers Crisps brand made a majority investment in Yorkshire based machinery manufacturer Sumo in April 2015⁸.

Surveyors Savills acquired Smiths Gore in April 2015 to form Savills Smiths Gore⁹.

The Agriculture and Horticulture Development Board (AHDB) consolidated the activities of its constituent organisations, including HGCA, into a single levy body during 2014.

The Co-operative Group sold its farming business following a strategic review of all of its businesses¹⁰. At the time of the sale, the group farmed 15,997 hectares of which 7,166 hectares were owned¹¹. The buyer was Gower Place Investments, a wholly owned subsidiary of the Wellcome Trust which paid £249 million for the business as a going concern.

Innovation for Agriculture (IfA) is a consortium of 14 English Agricultural Societies which communicates new science and innovation to farmers via its website, publications, conferences, seminars, workshops, on farm demonstrations and new media. The initiative prioritises Precision Livestock and Animal Health and Welfare, Soil and Water, Renewable Energy and The Uplands¹².

¹ Groceries Code Adjudicator Press Release, www.gov.uk/government 5 February 2015

² Farmers Weekly, 3 October 2014

³ www.swseed.com, June 2014

⁴ Farm Business, FarmBusiness.cc, 17 June 2014

⁵ Farm Business, FarmBusiness.cc, 29 April 2014

⁶ Premium Crops Ltd, 21 March 2014

⁷ Farm Business, FarmBusiness.cc, 30 March 2015

⁸ Sumo UK, <http://www.sumo1.com> 21 April 2015

⁹ Savills Smiths Gore, www.smithsgore.co.uk 21 April 2015

¹⁰ Farmers Weekly Interactive, www.fwi.co.uk, 13 March 2014

¹¹ Farmers Weekly Interactive, www.fwi.co.uk, 4 August 2014

¹² Innovation for Agriculture, www.innovationforagriculture.org.uk

6.4 Renewable Energy

Bioethanol and Road Fuel

In the year to 14 April 2015, 1.67 million litres of renewable fuel were consumed under the Renewable Transport Fuel Obligation (RTFO), this was 3.28 per cent of all fuel¹. A total of 16 per cent of this renewable fuel was sourced from crops produced in the UK including wheat (9.8 per cent), sugar beet (4.17 per cent), oilseed rape and barley. With five of the EU's 99 Ethanol plants, the UK has the third largest production capacity for ethanol in the EU².

Renewable Generation Policy

Nationally, renewable generation capacity increased by 2.4GW and the total sum of power generated reached 64.4 terawatt hours³.

In some regions, grid capacity has been a constraint to the development of on farm electricity generation. Regen SW report that an 82 km stretch of the grid had reached capacity impacting new renewables installations in Cornwall, Devon, Dorset and Somerset⁴.

However, the degressive nature of the support has necessarily triggered reductions in support which were designed on the basis that an established supply and installation industry would be able to achieve cost reductions, for example through economies of scale in manufacturing.

Anaerobic Digestion (AD) Plant

At the end of February 2015, there were 27 farm fed AD plants in England that used crops in their feedstocks, although some of these also used slurry⁵. Of the 27, 24 generated electricity with a combined capacity of 22,000kW and three supplied gas to grid.

2014 was the fifth year of the Feed in Tariff (FiT) scheme. In April 2014, the FiT for installations of <500kW reduced by ten per cent with a further ten per cent reduction announced for April 2015. From October 2014 to March 2015, AD installations of over 500kW carried a FiT of 9.2 pence per kilowatt hour reducing by five per cent.

Willow, *Miscanthus* and Straw

ECO2 commenced construction of its 44.2MW straw fuelled power station at Snetterton, Norfolk in January 2015⁶. The plant will be managed by Burmeister & Wain Scandinavian Contractor A/S⁷. The plant was expected to be commissioned in 2017.

The Brigg Renewable Energy Plant is a 40MW sister plant to the Snetterton installation.

Drax group plc confirmed in 2012 that it intended to transform itself into a predominantly biomass fuelled generator burning sustainable biomass in place of coal. Of its six generating units, one was

¹ Department for Transport, Renewable Transport Fuel Obligation statistics: obligation period 7, 2014/15, report 5.

² Renewable Ethanol: driving jobs, growth and innovation throughout Europe, State of the Industry Report, PURE European renewable ethanol

³ Farmers Weekly Interactive, www.fwi.co.uk, 7 April 2015

⁴ Farmers Weekly, 3 April 2015

⁵ WRAP, www.wrap.org, 2015

⁶ Farmers Weekly, 16 January 2015

⁷ Biomassmagazine.com, 21 January 2015

6 Weather, Economic Context and Policy

converted to biomass in 2013 and a second unit used biomass at an 85 per cent inclusion rate until final conversion in autumn 2014¹. Of the 4 million tonnes of biomass consumed in 2014 (1.6 million in 2013), 113,345 tonnes, or 2.7 per cent was sourced from the UK. Of this total, some 72,463 tonnes of straw were consumed. UK grown crops accounted for *Miscanthus* and Willow use of 25,058 tonnes and 6,155 tonnes respectively whilst 4,589 tonnes of oat husk were also used. The balance was supplied as wood pellets.

Renewable Heat Incentive

New biomass sustainability criteria were introduced for existing and new RHI installations from Spring 2015². DECC revealed that there had been 9,000 RHI applications between November 2011 and November 2014 of which a quarter related to agriculture.

6.5 Policy

Common Agricultural Policy (CAP) Reform

Ahead of the implementation of the Basic Payment Scheme (BPS) from January 2015, farmers made cropping plans that ensured full receipt of the BPS by meeting the crop diversification rule and the Greening payment through a points based system requiring the introduction of leguminous crops, fallow or hedges.

Rural Development Programme for England (RDPE) including Agri Environment Schemes

Defra launched the revised Rural Development Programme for England which runs from 2014 to 2020 and comprises of agri environment schemes (Countryside Stewardship), and several development schemes.

In November 2014, Defra introduced the Countryside Stewardship that opened for new applications in summer 2015. Under the scheme, applications for Water Capital Grants opened in March 2015³. These replaced the Catchment Sensitive Farming Scheme grants that were offered from 2011 to 2014.

Under the RDPE, the Farming and Forestry Production Scheme (FFPS) replaced the Farm and Forestry Improvement Scheme from spring 2015⁴. The scheme is intended to support initiatives which include managing the environment, growing the rural economy and increasing farming and forestry productivity.

The Countryside Productivity Scheme was launched in March 2015 and offered funding of £2,500 to £35,000 to help farmers to buy equipment to improve productivity⁵.

¹ Biomass Supply, Drax, February 2015

² Farmers Weekly, 14 November 2014

³ Farmers Weekly Interactive, www.fwi.co.uk, 25 February 2015

⁴ Farmers Weekly, 20 February 2015

⁵ Farmers Weekly Interactive, www.fwi.co.uk, 26 February 2015

Further RDPE schemes include the Energy Crops Scheme, grants for the rural economy within the Growth Programme and LEADER funding.

Fruit and Veg Aid Package

The European Commission announced aid of €165 million to support growers of perishable produce for the loss of product sales following the Russian ban on imports¹. In the UK, some 3,000 tonnes of produce were lost as an indirect impact of the ban (because the UK did not trade with Russia directly). However, Defra did not take up its share of the funding, considering that it was not an acceptable use of public money².

Defra Plan

At the NFU Conference in 2015, the Secretary of State for the Environment, Liz Truss, unveiled a four point plan for agriculture, comprising³:

- Improving farming resilience in the face of volatility
- Opening up new markets at home and abroad
- Simplifying EU rules and regulations
- Protecting the country from plant and animal disease

Water Abstraction

Some 400 time limited water abstraction licences expired on 31 March 2015 in the Cam and Ely catchment⁴. The Environment Agency stated that reductions in water abstracted would have to be limited under the UK's commitment to the EU Water Framework Directive.

Agri Tech

Agri Tech East launched the £3.2 million Agri Tech Growth Initiative in June 2014⁵.

Budget 2015

In the 2015 budget, the Chancellor of the Exchequer, George Osborne, introduced the opportunity for farm businesses to average profits over five years instead of two.

¹ Europa, www.europa.eu , 29 September 2014

² Farmers Weekly Interactive, www.fwi.co.uk , 27 October 2014

³ Farmers Weekly Interactive, www.fwi.co.uk , 24 February 2015

⁴ Farmers Weekly Interactive, www.fwi.co.uk , 10 June 2014

⁵ New Anglia LEP, www.newanglia.co.uk , 5 June 2014

7 Ten Year Review of Wheat Performance in England

7.0 Ten Year Review of Yield and Gross Margin of Wheat in England

- The yield of winter wheat varies annually, ranging from 6.9 to 8.9 tonnes per hectare in the previous ten years
- Krige maps show especially high wheat yields in Kent, Cambridgeshire and Essex
- Krige gross margin maps highlight strong performance in Kent, Northumberland and Hampshire
- Across counties in England, there is considerable variation in input use when measured as cost per tonne of production
- There may be opportunities to reduce expenditure crop inputs on farms with lower yields

7.1 Introduction

National crop and livestock gross margins have been collected within the Farm Business Survey, using a consistent format, for ten years. Analysis of this data allows us to report on the distribution of yield and gross margin performance across England.

In this chapter, grouped data is shown in map format, based on ten kilometre grid squares. Although we do not disclose results on the basis of these 10 kilometre grid squares, the resulting map provides an indication of the spatial distribution of performance that does not follow administrative boundaries, such as county or natural area.

For this analysis, we have chosen the non organic winter wheat crop, for which there is the greatest amount of data. National wheat gross margin data is available for the ten years from the 2004 harvest to the 2013 harvest.

Production Summary 2004 to 2014

description of year		number of observations	yield t/ha	gross margin £ per hectare
2004	Unusually wet conditions at harvest	575	7.8	307*
2005	Poor crop establishment in 2004	652	8.2	324
2006	Good growing and harvest conditions	629	8.5	488
2007	Wet harvest and dull summer	631	7.7	809
2008	Delayed drilling and wet harvest	687	8.9	679
2009	Late drilled crop, very dry June	634	8.6	477
2010	Improved crop prices	666	8.4	916
2011	Good season, drought at harvest	674	8.4	922
2012	Yield reduced in dull wet June	688	6.9	765
2013	Reduced area of winter crops	613	8.0	834

*2004 was the final year of the Arable Area Payment so the gross margin is shown after deduction of the £229 per hectare payment

7 Ten Year Review of Wheat Performance in England

7.2 Method

We used two methods of analysis to understand the economics of wheat production across England. In the first, we developed Krigé maps of yield and gross margin for the non organic winter wheat crop.

The maps show the average annual variation from the national average yield and the average annual variation from the national average gross margin, both averaged over ten years.

The krigé maps are designed to estimate the best unbiased linear interpolation. So the value for an individual pixel in the map depends on the local grid square (number of farms and number of years) as well as its neighbours, with the effect of neighbours trailing off depending on the “number of nearest neighbours”, as well as on an adjustment known as the “nugget” coefficient. Hence even areas without data are also modelled with very much higher standard errors there. Great care is needed when interpreting areas of the map with no data.

Because it is possible that not all data points were sampled in every year, the data will be less reliable for areas with fewer observations. As an extreme example, if an area was only sampled in 2012, the year of low crop yields, this could reduce the value of mapped yield in the figure (although many neighbouring cells, with many years, will also affect the figure).

We also looked at the average expenditure on seed, fertiliser and crop protection over ten years in selected counties of England.

7.3 Crop Yield Mapping

The ten year average crop yield was 8.1 tonnes per hectare. Map 1 shows the ten year average local deviation from annual average yield. The blue vertical lines represent yields. Care is needed when interpreting areas of the map with no yield data. These areas, which include London, the Pennines and much of Cumbria are largely unsuitable for wheat production, but the kriging exercise nevertheless estimates yields.

Three areas of especially high yield (typically at least 1.4 tonnes per hectare higher than the average) can be seen in East Kent, South Cambridgeshire and the border of South Wiltshire and North East Dorset. Within these high yielding areas; in Kent, the predominant soil series are Coombe 2 and Batcombe, the Cambridgeshire soils are Hanslope series and the Wiltshire and Dorset soils are Andover series¹.

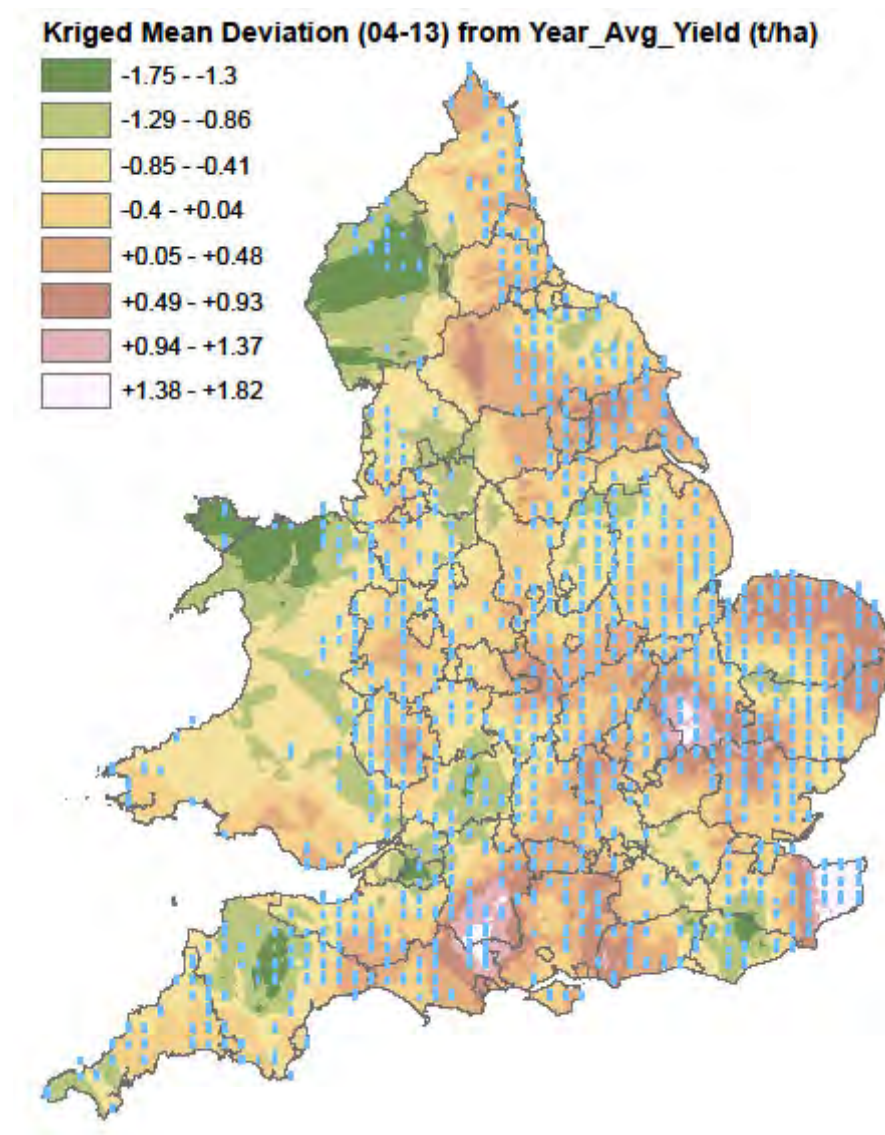
High yields, (typically 0.5 to 0.9 tonnes per hectare above average) were also grown in East Yorkshire, North Norfolk and the Eastern part of Hampshire and Western part of West Sussex.

The lower yielding areas of the map should be treated with caution, because fewer farms grow wheat in areas less suited to its production. Low yielding areas (with yields of 0.86 tonnes per hectare below the national average) are found in Gloucestershire and East Sussex.

¹ Sheet 4 and Sheet 6, Soils of England and Wales, Soil Survey of England and Wales, 1983

7 Ten Year Review of Wheat Performance in England

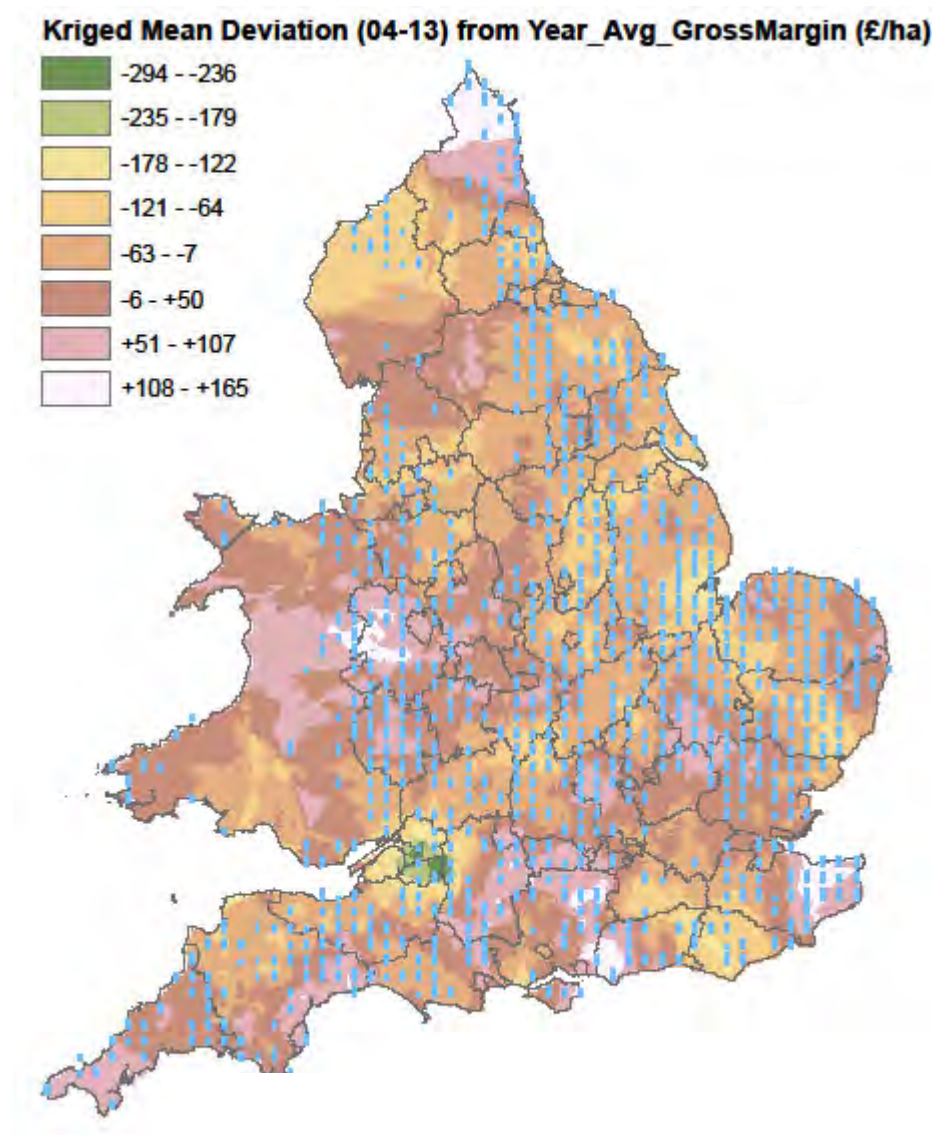
Map 1



7.4 Crop Gross Margin Mapping

We adjusted all values for inflation on the basis of 2013 prices. The ten year average wheat gross margin was £724 per hectare. Map 2 shows the average annual variation in gross margin from the ten year average. The blue columns represent gross margins. Again, care is needed when interpreting data for areas with no sample observations

Map 2



The gross margin exceeds the national average, by over £108 per hectare, in North East Northumberland, Kent and North East Hampshire. This is partly due to the relatively high yielding crops grown in these areas, but also to the price achieved for the crop and its straw, as well as low growing costs.

The winter wheat gross margin exceeded the ten year national average in parts of Norfolk, Suffolk, Cambridgeshire, Essex, Wiltshire, Devon and Cornwall.

Some areas undoubtedly achieved considerably lower gross margins than the national average, but uncertainty is quite great and in other studies most of the variation was observed to be “between farms” (as opposed to geospatial variation we analyse here).

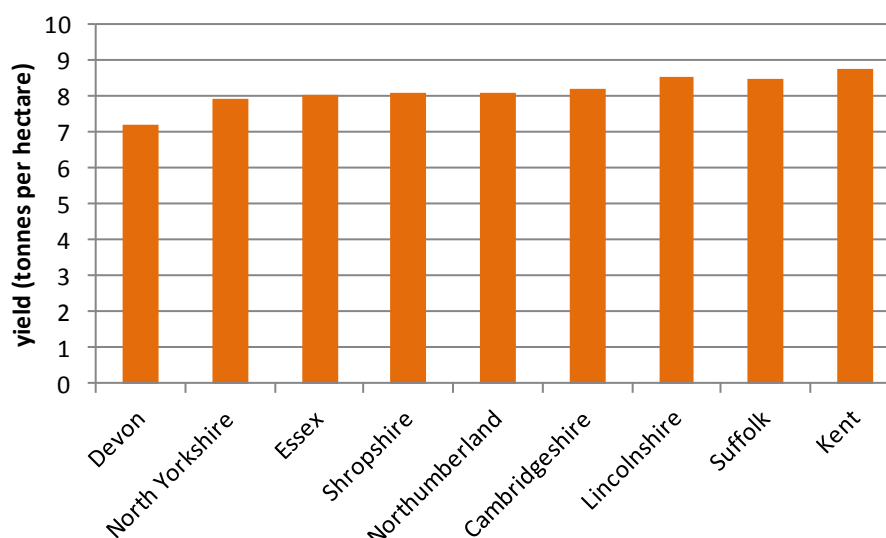
7.5 Analysis by County

The figure below shows the long term average yield of nine selected counties in England. This was calculated as county averages from Crop Production in England. Where these

7 Ten Year Review of Wheat Performance in England

results appear to differ from the Krige maps above, these counties typically include productive and less productive land and we are presenting results from fewer years.

Wheat Yield, by County 2007 to 2013, ordered by increasing yield



Within this group of counties, the highest yield, averaging 8.76 tonnes per hectare, was achieved in Kent. The lowest yield was in Devon at 7.19 tonnes per hectare.

These provide a valuable indication of crop performance, but are also used in the exercise to calculate crop costs on the basis of crop yield.

The following table shows crop input use per tonne of wheat produced. The nine counties are ordered from lowest to highest yielding. The nine counties were selected because the sample size was at least ten farms for the seven years to 2013.

Average Seed, Fertiliser and Crop Protection Costs per hectare and per tonne, by County 2007 to 2013, ordered by increasing yield

	yield tonnes per hectare	seed £ per tonne	fertiliser £ per tonne	crop protection £ per tonne
Devon	7.1	8.62	30.75	22.95
North Yorkshire	8.0	8.09	24.09	18.54
Essex	8.1	7.11	21.23	20.45
Northumberland	8.2	7.83	26.05	18.14
Cambridgeshire	8.3	6.92	17.94	21.02
Lincolnshire	8.4	6.58	18.68	20.08
Suffolk	8.6	6.85	21.95	19.30
Kent	8.8	7.07	21.57	18.84

Using this calculation, seed costs ranged from £6.6 per tonne in Lincolnshire to £8.6 per tonne in Devon.

7 Ten Year Review of Wheat Performance in England

Fertiliser costs ranged from £30.8 per tonne in Devon to £17.9 per tonne in Cambridgeshire. The reduced fertiliser requirement of the black organic soils of Cambridgeshire is likely to be the main reason for the low unit cost in this county.

Crop protection costs were again highest in Devon at £23.0 per tonne. The lowest crop protection costs, at £18.5 per tonne, were recorded in Northumberland. Pest and disease pressure tends to be lower in the North East than in other regions of England. In Northumberland, pest pressure can be relatively low, but disease is more specific to the season.

7.6 Discussion

Yield, price and input costs are the drivers of crop gross margins.

Crop yield is determined mainly by soil conditions, including drainage, weather conditions, including light and rainfall, pest and disease incidence and the standard of management. Inevitably, location is very important to a number of these factors. However, the variation between seasons is important too. For example, drainage limitations may not limit yield in a dry year and drought prone soils will produce acceptable yields in a year of regular rainfall. By looking at results over ten years, it is possible to identify the locations that will reliably provide favourable growing conditions. A previous study, carried out by Steve Langton in 2011, was only able to account for 11 per cent of variation in arable farm performance on the basis of the spatial component, in this case modelled at the National Character Area¹. About 60 per cent of variation between businesses was due to local factors such as the quality of management.

Whilst important price differences arise across England, growers can often mitigate these by growing for an appropriate market, e.g. export wheat for farms near a deep sea port, milling wheat near mills, feed near mills and intensive livestock production areas. Our gross margin calculations take account of the value of straw, which tends to be in demand near areas of grazing livestock production.

Input costs vary across England. For example, crop protection costs tend to be lower in the North of England where pest burdens are lower and disease profiles differ from those found further South.

Although growers generally spend less on inputs in areas with lower yield expectation, it is apparent that the cost of seed, fertiliser and crop protection inputs, when measured as cost per tonne, is lowest on farms with the highest yield. One explanation is that the unit costs of seed fertiliser and crop protection may be higher outside the main arable production areas.

It is therefore likely that growers of wheat, especially in counties with below average crop yields, could contemplate lower expenditure on seed, fertiliser and crop protection.

These findings are consistent with further research at the Rural Business Unit into marginal use of seed, fertiliser and crop protection in wheat². The marginal return is the financial return from the last unit of input, in this case the last pound of expenditure. The research indicated that farmers tend to show a negative return from this marginal spending on seed, fertiliser and crop protection. However, corresponding marginal yields are generally small but bigger than zero suggesting that farmers effectively optimise yields.

¹ Steve Langton, Cereals Farms: Economic Performance and Links with Environmental Performance, Defra Agricultural Change and Environment Observatory Research Report No. 25, May 2011

² Mark Reader, RBR Research Day, http://www.fbpartnership.co.uk/documents/Seminar_Programme_Sept_2015/Reader.pdf

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