

AHDB Farm Resilience Review and Action Plan for farmers in England

Final Report

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Executive Summary

With the phasing out of the Basic Payment Scheme (BPS) in England by 2027, and the indication that the majority of English beef, sheep and arable farming businesses may not be proactively adjusting their businesses, Defra established the Future Farming Resilience Fund (FFRF). This fund was established to help farmers adapt to agricultural policy changes. To identify options for more targeted support and advice for English farmers, this study reports the quantitative and qualitative analysis of three sets of aggregated data from the FBR service project that was collected during September 2021 to May 2022. The aims of the study are to define the current status of farms in regards to BPS payments, performance and resilience; understand how farmers feel about the future of farming; identify future action plans to be implemented; and explore if different farmer typologies can be identified to aid in the targeting of future support.

Participation in the project was voluntary and eligible farmers included those in the beef, sheep, cereals and dairy sectors. Data collected from farmers in England included farm attributes, farmer attributes, farm business review items (outputs from the BPS calculator, Resilience Survey/self-assessment, and KPI identification) and a personalised agreed action plan written by the visiting consultant (free text). The quantitative data analysis provided descriptives of attributes and farm business resilience self-assessment results and farm business key performance indicators (KPIs), farmer's feelings about the future of farming, their action plans and their current and future use of business management tools. Comparisons and associations were analysed using paired samples t test, correlation, ANOVA test and linear regression. A typology of farmers was identified using two-step cluster analysis. Qualitative thematic content analysis was used to analyse the free text of personalised action plans. Using IBM SPSS Modeler Text Analytics, a supervised text mining approach was applied. The accuracy and coverage of the text mining was incrementally improved through the co-development of a project-specific language library within categories (themes) and subcategories agreed between the HAU and AHDB research teams.

This report is based on responses from 1769 farmers. Most farmer responses were from the South West (32%) and North of England (34%), with the remainder largely evenly distributed across the rest of England. Most farmers were full-time (81.4%), owner-occupiers (64%) and male (84%). The most represented ages were the 55-64 (31%) and 45-54 (25%) age groups, with the average farmer having 31 years in farming. Mixed farms (cereals and livestock) (34%) and lowland grazing farms (21%) were the predominant farming systems, and the distribution of farm type was very much region related with an overall average farm size of 221ha.

The findings indicate that most farms will be negatively affected by the reduction although the majority will remain profitable with the reduction of direct payments. The KPI review showed that nearly half of the farms were under-performing. Farms scoring highly on KPI's tended to also score highly on business resilience with the exception of dairy and LFA livestock farms. Of all farming types and regions, more dairy farms and more farms in the North West were under-performing compared to other farm types or regions. On average, dairy farms scored the lowest on KPI assessment whilst cereals and mixed farms scored the highest. When regions were considered, cereal farmers in the North West had the lowest KPI score, whilst LFA farms in the South East and West Midlands reported the highest score on KPI. In general, larger farms were more likely to have scored higher on KPI assessment and on business resilience, however, there were some nuances across different farm groups.

Regarding farm business resilience, nearly 40% of the farmers were "resilient" or "very resilient". Younger farmers, tenant farmers, and full-time farmers reported a higher level of business resilience than other groups. The 65 and over age group, farmers with mixed ownership status or part-time farmers reported the lowest level of business resilience. Dairy and cereal farmers reported the highest level of resilience, whilst livestock farmers, particularly LFA livestock farmers reported the lowest level of resilience on average.

The feeling of farmers about the future of farming and their confidence in responding to changes also varied across different groups. Younger farmers (under 45 years of age), tenant farmers and farmers in the East Midlands felt more positive about the future of farming. A larger proportion of younger farmers or full-time farmers expressed confidence in responding to the changes needed, than older farmers or part-time farmers. Slightly more full-time farmers (81%) indicated that they will need to make changes to their business compared to 76% of part-time farmers. More mixed, cereal and dairy farmers indicated the need to change than any other farm type. Livestock farmers (LFA and Lowland) had the lowest percentage of farmers (76%) indicating a need to change over the next 3-5 years. More full-time farmers and younger farmers (age group 25-44) were already

making changes, whilst more older farmers and part-time farmers were not planning on making changes. Alarming, up to 21% of the farmers were either unsure about the future of farming or “don’t know” what changes they need to make.

The analysis of action plans developed by farmers with consultants generated 118 specific actions for 1,607 farmers. The actions were grouped into one or more of three top-level categories: actions to mitigate losses of BPS (for 96% of farmers), actions to improve business resilience (for 97% of farmers) and actions to improve KPIs (for 77% of farmers). The most identified actions were Government schemes engagement (88% of farmers), long-term planning (86%), comparing with others (including benchmarking and tracking performance) (68%), and reviewing costs and income (60%). Diversifying income sources, improving efficiency and cost reduction, increasing income from current and new farm enterprises, and focusing on details were also identified as actions for over 50% of farmers. The dairy sector had the highest percentage of farmers with actions to improve business resilience and KPIs, whilst the Lowland grazing sector had the highest percentage of farmers with actions to mitigate BPS loss.

Regarding lower-level specific actions the dairy sector had the highest percentage of farmers planning to adopt actions such as improving efficiency and cost reduction, increasing income from current and new farm enterprises, long-term planning, reviewing costs and income, focusing on details, understanding the market, and improving profitability and productivity. Lowland grazing had the highest percentage of farmers planning actions of ‘schemes engagement’, changing business models or farming system, and reducing environmental impact. Cereal farms had the higher percentage of farmers with actions of diversifying income sources, knowledge and innovation management, and conducting carbon audits. The highest Mixed farms actions included comparing with others. Interestingly, younger farmers were more likely to expand the business, diversify, stay in farming but focus on increasing productivity, whilst older farmers were more likely to consolidate the business or, unsurprisingly, plan successions or retirement.

Therefore, with the original conclusion that the majority of farms will be affected by the reduction of direct payments, the combination of the actions they propose to take to mitigate this will help them remain profitable. However, farmers proposing to engage with the new Environmental Schemes were still in the minority, with more farmers working towards making their businesses more productive and efficient.

The analysis generated three clusters from 881 valid responses, based on their planned actions, business resilience assessment, feelings about the future, current performance (KPI scores) and their future actions. Attributes that were statistically significantly different across the three clusters included farm size, farmers’ main occupation, age, farm type and engagement with environmental schemes. Type 1 farmers, *Forward-facing Adventurers* (23%), reported the lowest KPI performance but the highest level of business resilience of all three clusters. They were positive about the future of farming, very confident about responding to changes needed and the majority have already been making changes. This group of farmers tend to be larger in size, mixed farms, are more likely to be full-time and younger (below 45) farmers, and have or will engage with the Farm Investment Fund and Farming Innovation Fund. In contrast, Type 2 farmers, *Conservative Performers* (27%), reported the highest KPI performance and the lowest level of business resilience of all three clusters. More farmers in this group were not positive about the future, didn’t know how they felt about the future of farming, were not feeling confident about responding to the changes needed, were less likely to make changes and did not know what changes to make. These farmers tended to have smaller farms, were 45 or older, included more part-time farmers, more lowland grazing farmers, less mixed farm types and had the lowest percentages of engagement with environmental schemes. Type 3 farmers, *Adaptable Pragmatists* (50%), largely sit between Type 1 and 2 farmers in terms of performance, resilience, actions and attributes. It is hoped that this typology may complement typologies previously developed by DEFRA and other UK researchers by bringing in fresh perspectives of farm business resilience, adaptability and future orientation.

1. Introduction

Direct payments under the Basic Payment Scheme (BPS) will be phased out in England by 2027, with some 38% of farm businesses having costs that exceed revenue when direct payments are excluded (AHDB, 2021). Furthermore, 48% of farmers indicate that the loss of BPS will have biggest impact on business going forwards (DEFRA, 2021). Studies have indicated that 76% of beef and sheep and 67% of cereal farmers are either not planning on making changes to their businesses or are adopting a wait and see approach to current policy changes (AHDB, 2021)

Defra provided funding for business support, through the Future Farming Resilience Fund (FFRF) for organisations to bid into and provide support to farmers to help adapt to the policy changes. AHDB won a bid in July 2021 to provide such support, which was delivered through the AHDB Farm Business Review (FBR) service Project. This report presents the results of three sets of data based on the resilience survey, KPI survey and action plans conducted during September 2021 to May 2022 with farmers in England.

This report aims to answer the following key questions:

- 1) What are the key attributes of the interviewed farmers?
- 2) What is the current situation of the interviewed farmers, including
 - a. How much BPS payment each responding farm will receive?
 - b. How well has each farm performed (KPI assessment) and which type of farm performed better?
 - c. How resilient are the responding farms and which type of farms are more resilient?
- 3) How do farmers feel about the future of farming?
- 4) What are the future action plans?
- 5) What are the actions recommended by the consultant?
- 6) Is there a typology of farmers and, if yes, what are the key characteristics of each type?

It is hoped that, by answering the above questions, more targeted support/advice can be provided to English farmers.

2. Methodology

2.1 Sampling and data collection methods

Cereal, beef, sheep and dairy farmers across England registered for the FBR service through a variety of methods including direct mail, emails, 3rd party promotion (through milk companies/feed suppliers), articles in farming press and social media. Any farmer with an SBI number and in one of these sectors have been eligible. Any mixed farmer within one of these farming sectors and another one not listed, such as pork, was also eligible to partake. Participation was voluntary.

Consultants were appointed by AHDB to deliver half-day consultancy sessions across England with farmers eligible and willing to take part in this project. Farmers could either sign up directly to a consultancy company or were allocated to a company who supported their farm type (e.g. allocation to specialist dairy consultants). Consultants used the AHDB Farm Business Review tools (i.e. BPS Calculator, Farm Review Assessment Tool and Key Performance Indicator (KPI) calculator) to gather farm businesses data, assess the strengths of the business and identify priorities moving forward.

As part of this session each aspect of the tools were introduced and minimum requirements set. Each farm had to complete the three sections of the tool, BPS calculation, Resilience survey, and a minimum of one KPI (if one only, AHDB highly encouraged this to be net profit to give a view of business financial performance). The resilience assessment is a self-assessment which the consultant can suggest amendments to if the farmer had been too harsh on themselves or over confident. The farmer either completed these themselves separately to the consultant or the consultant completed them for the farmer (especially when some farmers lacked the necessary technical IT skills) during the consultation session.

The action plan was a summary of the one-to-one discussion consultants had with the farmers. There was a 2000-character limit to keep reports succinct. The farmer has to agree with and approve the consultants' report.

2.2 Data specification

Data collected from English farmers included farm attributes, farmer attributes, farm business review items and a personalised agreed action plan written by the visiting consultant (free text), outlining the key themes discussed with the respondent during the farm visit and areas for farmers to prioritise next. An outline of the variables is listed in Table 1 below.

Table 1 Variables and type of data

Variables	Type of data
<ul style="list-style-type: none">• Attributes including farmers' age, gender, farmer status, main occupation, farmer status, farm location, farm type and farm size	Scale and Categorical
<ul style="list-style-type: none">• Farm business review- BPS payment received in December 2020	Scale
<ul style="list-style-type: none">• Farm business review- Resilience assessment (20 items within 8 sub themes. Details are provided in Appendix 2)	Ordinal (1-5)
<ul style="list-style-type: none">• Farm business review- KPIs (See Appendix 3 for details of the thresholds for KPI range descriptors)	5-point ordinal (transformed mean score as scale measure)
<ul style="list-style-type: none">• Future plans	Binary
<ul style="list-style-type: none">• Environmental and prosperity Schemes engagement (current and/or future)	Binary
<ul style="list-style-type: none">• Business management tools - currently using and planning to use in the next 12 months	Binary
<ul style="list-style-type: none">• Farmer's feel about future of farming	3-point ordinal (plus "I don't know")
<ul style="list-style-type: none">• Farmers' confidence in making changes and Change orientation (3 questions)	3-point ordinal (plus "I don't know")
<ul style="list-style-type: none">• Actions identified through consultation	Qualitative free text data

(For detailed variables go to Appendix 1)

2.3 Methods of data analysis

Quantitative data analysis included standard descriptives such as frequencies, mean, range, minimum and maximum, standard deviation. Factor analysis was conducted on farm resilience scores which suggested a single factor could represent overall farm resilience. A Reliability test showed that the eight sub-themes had a high level of internal coherence with a Cronbach Alpha score of 0.82. This led to the combining of the 8 items into one farm resilience score by using the average of the 8 items. Other techniques used to identify trends and associations included: paired samples t test, correlation, ANOVA test, two-step cluster analysis and linear regression¹.

Qualitative data analysis on the free text of personalised action plans. For unstructured data with certain pre-defined topics, a supervised text mining approach was adopted. This study used IBM SPSS Modeler Text Analytics which "offers powerful text analytic capabilities, using advanced linguistic technologies and Natural Language Processing (NLP) to rapidly process a large variety of unstructured text data and, from this text, extract and organise the key concepts". The Text Analytics software includes a set of core libraries and it also allows the addition of a bespoke library.

However, it should be noted that AI text analytics will not be 100% accurate and may not pick up themes from all responses. The accuracy and coverage of the analytics can be incrementally improved through identification and addition of key concepts to the library or categories. This limitation is well explained by Jarlarth (2021), "despite the fact that text analytics technology is considerably more sophisticated and ubiquitous than 20 or 30 years ago, it's important to understand that ultimately these applications are focussed on making sense of language, and for even the most advanced AI systems, extracting meaning from language is hard. A language such as English contains over 170,000 words with most adult English speakers able to identify

¹ For categorical variables used as predictors in linear regression, each category was transformed into a dummy variable.

between 20,000 and 30,000 words. Moreover, the context in which a word is used makes a huge difference to the meaning of a sentence. Words such as ‘break’ ‘cut’, or ‘play’ have multiple definitions. Even entire phrases such as “he made her duck” have more than one interpretation. This means that extracting terms and assigning the correct contextual meaning to them is an extremely difficult exercise for computer programs to perform accurately. Indeed, this is a task that humans find hard as well. It is unlikely that two people given the job of categorising the responses from a single open-ended question in a survey of 100 people, will do so with complete agreement or in a completely consistent manner. However, this is something that text mining software program does well: so much so, that when it makes errors, it at least makes them in a very predictable manner.”

To enhance the accuracy of the text mining, the HAU and AHDB teams co-developed a project-specific library within agreed categories (themes) and sub categories. Key terms and synonyms were added to each sub category. The key terms and synonyms were identified by reading a large sample set of around 300 action plans. New categories and key terms were added during the preliminary analysis of the free text. All concepts with a frequency of more than 1 were manually reviewed. Any relevant new concepts were manually added to the categories. Appendix 4 provides some examples of the bespoke categories and alternative terms used for this analysis.

3. Findings

3.1 Socio-demographic characteristics of the respondents

This report is based on responses from 1769 farmers². The farmers were asked to complete a resilience survey, and information on KPIs in addition to the consultation interviews. Of the total, 39.3% (n=696) completed the online resilience survey questionnaires only at the start of the consultation, 8.3% (n=146) completed the survey only at the end of the consultation, 31.1% (n=550) completed it twice, both at the start and end of the consultation. There were 377 farmers who completed consultations but did not complete the online surveys.

In terms of the location of the sampled farms, 1 was in Scotland. Of the remaining 1769 farmers, the largest number of sampled farms were located in the South West (n= 561), followed by the North East (n=383), North West (n=213), West Midlands (n=158), East Midlands (n=157), East Anglia (n=153) and South East (n=143). Three farmers did not specify their location. Figure 1 shows the distribution by region in both frequency and percentage.

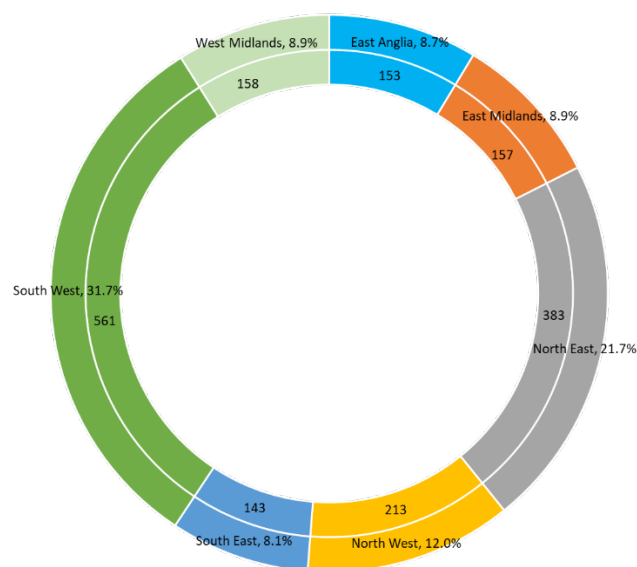


Figure 1 Distribution of respondents by region

² As of writing the service had not closed and data was still trickling in, as such there will be gaps in data / missing data / incomplete data. Any missing data will be followed up before the close of the project in August 2022.

In terms of farming as a main occupation, 18 farmers did not provide information. Of the remaining 1751 farmers, 81.4% were full-time farmers (n=1425) and 18.6% part-time farmers (n=326). This sample had higher than national average proportion of full-time farmers which was around 52.5% (94/179k according to DEFRA's data³)

Majority of the farmers were owner occupiers (n=1122), 77.7% of which were full-time farmers (n=872) and 22.3% were part-time farmers (n=250). There were 292 tenant farmers with 36 of those being part-time. Farmers who were both owner-occupiers and tenant farmers at the same time were labelled as "Mixed" farmers, which included 297 full time and 40 part-time farmers. Fig. 2 shows the details of the break down by occupation and farmer status.

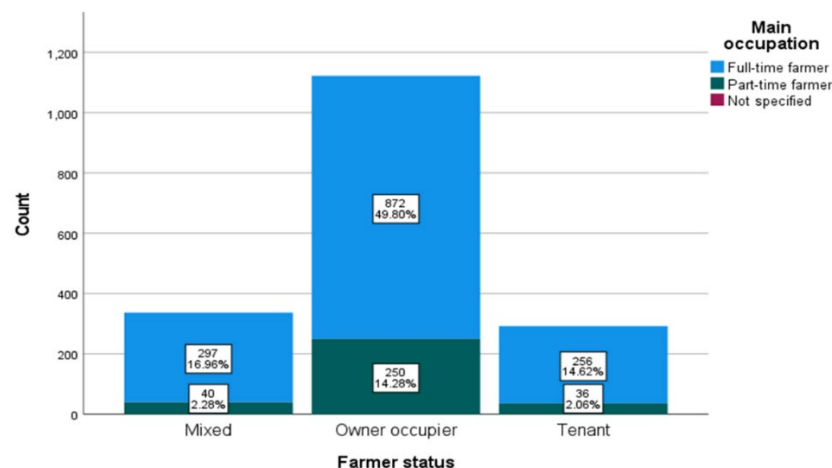


Figure 2 Distribution of respondents by farmer status and main occupation

In terms of age and gender of the respondents, the responding farmers were largely male (n=1472, 84.1%). Nearly half of the respondents were over 55 years or above (n=863) and 888 were 18 to 54 years old. Farmers in the age group of '55-64' were the largest group (n=538, 30.7%) and those aged between 45-54 were the second largest group (n=430, 24.3%). The smallest group is age group of 18-24 (n=13). Fig. 4 shows the breakdown of farmers by age group and gender.

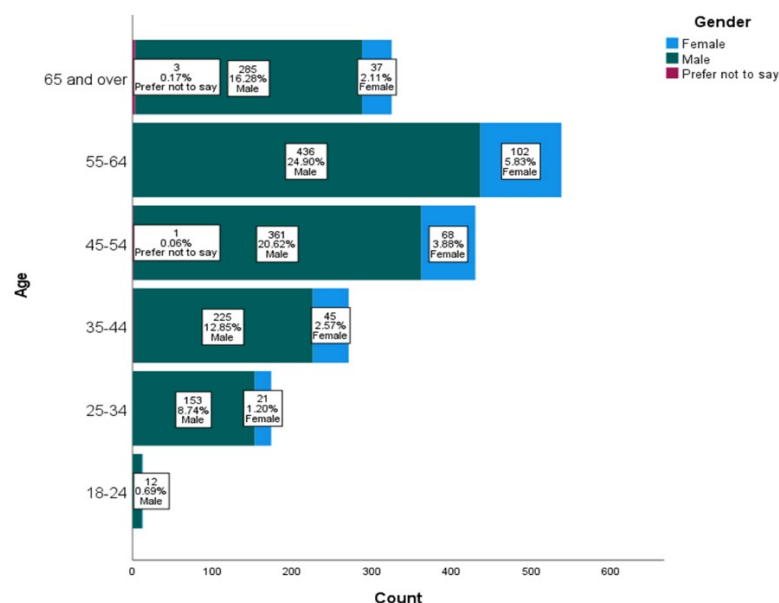


Figure 3 Distribution of respondents by age and gender

³ Farming statistics - land use, livestock populations and agricultural workforce as at 1 June 2021, England

<https://www.gov.uk/government/statistics/farming-statistics-land-use-livestock-populations-and-agricultural-workforce-as-at-1-june-2021-england>

In terms of farm type, Fig. 4 shows the distribution. Mixed farms (including cereals and livestock) were the largest group (n=596, 33.7%), lowland grazing farms were the second largest group (n=368, 20.8%). There were fewest LFA Grazing livestock farms (n=161, 9.1%).

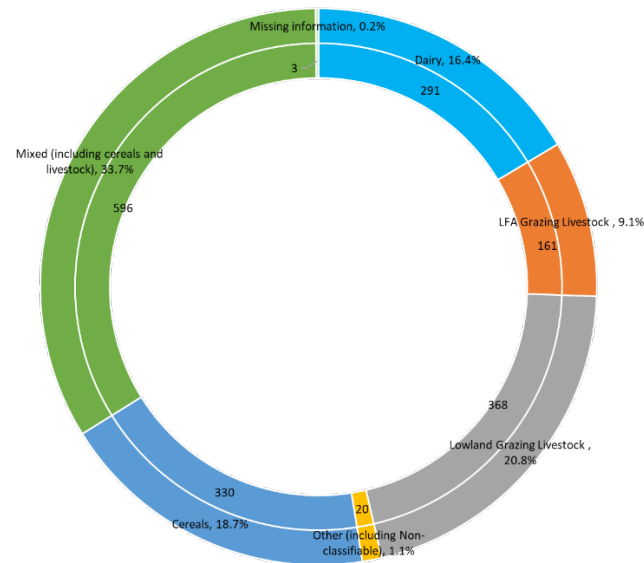


Figure 4 Distribution of respondents by farm type

Farm type is very much region related as shown in the heat maps (Fig. 5). Fig. 6 shows that over 57.7% of dairy farmers were located in the South West (n=168) and 25.4% in the North West (n=74). No dairy or LFA grazing livestock farms were in East Anglia which was dominated by cereal farms with 58.6% of its respondents being Cereal farmers (n= 89). 35.3% of LFA livestock farms were located mainly in the North West (n=53), North East (n=50) and South West (n=33). Most lowland livestock farms and mixed farms were in the South West (n=157 and 158 respectively, 42.7% and 28.7% within respective farm type).

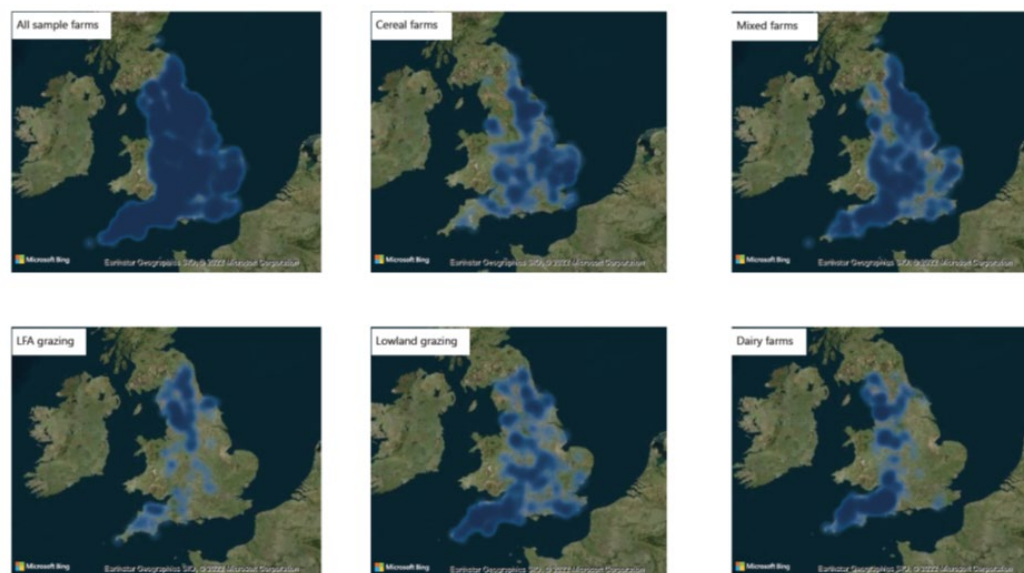


Figure 5 Distribution of respondents by region and farm type in heat maps

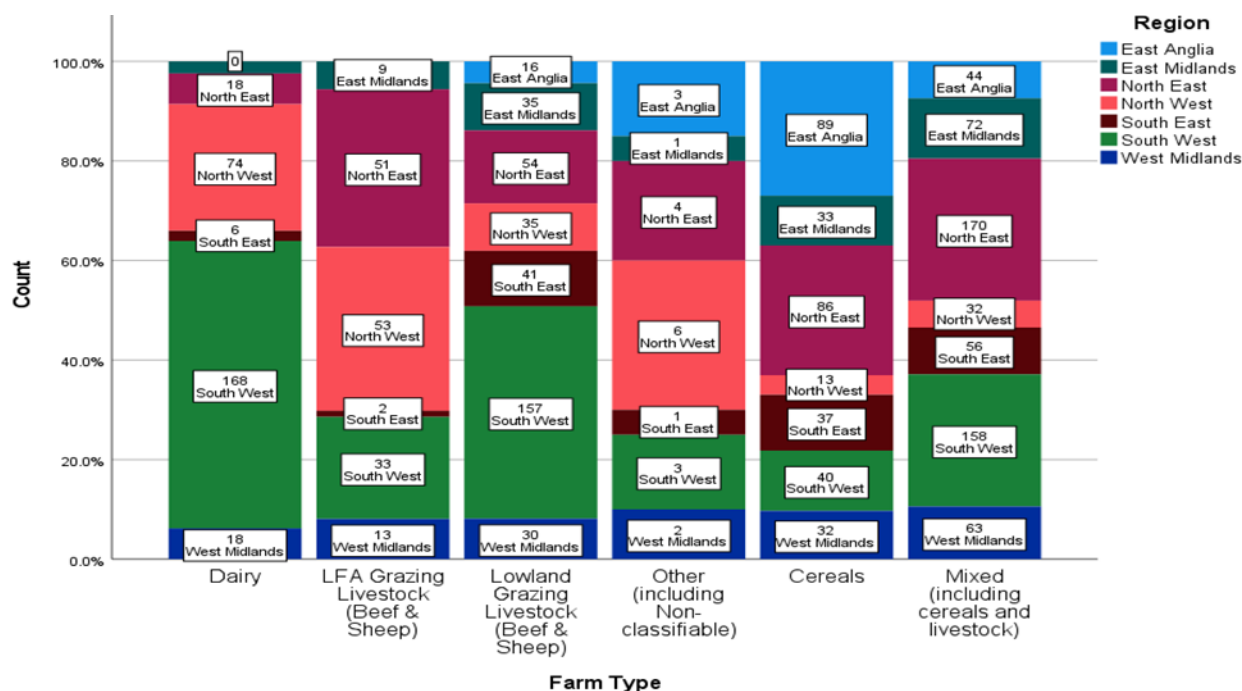


Figure 6 Distribution of respondents by farm type and region

Table 2⁴ shows other characteristics of the sample. Years in farming ranged from 1 year to 80. The mean years of farming were 31.1.

Farm sizes ranged from 1.8 hectare to 4,000 hectares with the mean being 221 hectares. In terms of number of employees for each farm, this ranged from 0.2 to 250 with the average being 2.88⁵.

Table 2 Farming experience, farm size and BPS

	Number of responses	Mean	Minimum	Maximum	Std. Deviation
Years in farming	1,755	31.10	1.0	80	15.979
Farm size in ha	1,747	221.686	1.8	4000.0	313.215
Number of employees	1,073	2.8880	0.2	250.00	8.87672

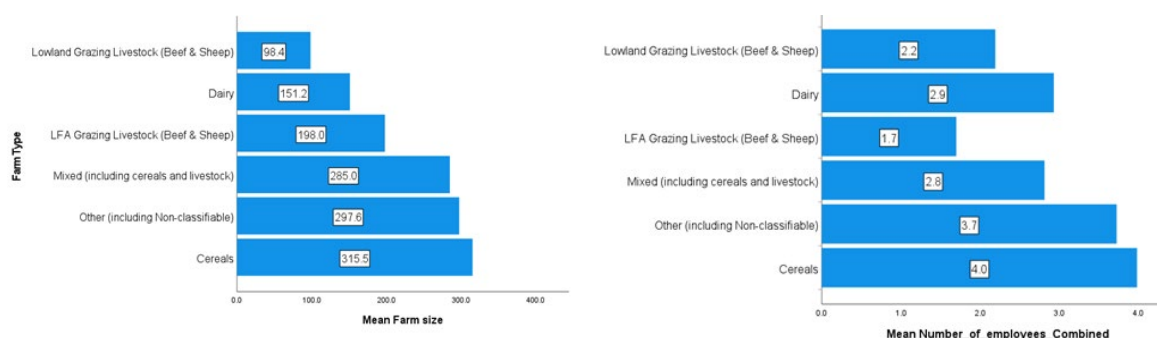
Fig. 7 shows the farm size (in hectare and in number of employees) by farm type. In terms of area, cereals (mean = 315.5 ha), mixed farms (mean = 285 ha) were larger than the sample average. LFA grazing (mean = 198 ha), dairy (mean = 152 ha) and Lowland grazing farms (mean = 98.4 ha) were smaller than the sample average, reflecting the nature of this farming sector⁶.

When counting the number of employees (FTE but excluding unpaid family labour), LFA grazing and lowland grazing farms were the smallest groups employing 1.7 and 2.2 FTE's on average per farm with Cereals and Dairy farms employing 4 and 2.9 FTE's on average per farm.

⁴ The outliers were excluded. This included 3 over 80 years in farming and the farm size being either 1 ha or 26700.

⁵ excluding unpaid (family) labour

⁶ There was no data on national average farm size for all sectors apart from for arable farms.



a. Farm size in hectare by farm type

b. Farm size in number of employees by farm type

Figure 7 Distribution of respondents by farm type and farm size in hectare (a) and in number of employees (b)

Data from Defra's national farming statistics indicates that cereal cropping and lowland grazing are the two predominant farm types with the average size of an agricultural commercial holding being around 83 ha. A slight majority are full-time farmers (53%), with around 1.16 employees per farm and most of the commercial agricultural holdings operating on owned land (70%). In summary, the farm types sampled are consistent with national statistics, although the sample is skewed towards larger and owner-occupier farmers.

3.2 Current situation of the interviewed farmers

3.2.1 BPS received in December 2020

In the responses, farmers provided the actual amounts of direct payments received in December 2020. The valid sample size for this question was 1,247⁷ and on average, farmers' BPS was £44,833 (ranging from £1,194 to £1,973,716).

When comparing the BPS calculation by farming sector (Fig. 8), it is not surprising to see that cereal farms and mixed farms received much higher direct payments than other farm types, as they were on average much larger than other sectors. Similarly, lowland grazing livestock farms received the least payment due to them having the smallest farming areas group.

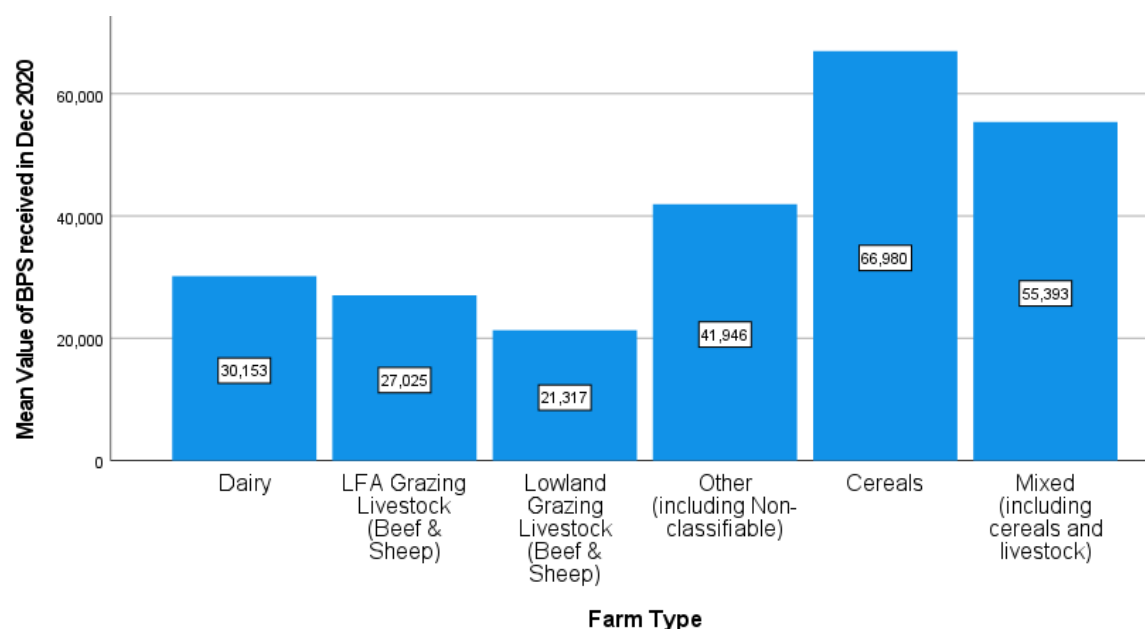


Figure 8 Distribution of respondents by farm type and BPS calculation

⁷ Four responses were excluded as outliers. They were three "£1" and one receiving £45,480,024.

When compared with the latest DEFRA report on farm business income⁸, dairy (£30,153) and LFA (£27,025) farmers were very much in line with the national averages (£30,000 and £26,700 respectively). Lowland Grazing (£21,317) and cereal (£66,980) farmers in this sample received more direct payments than the national averages (£15,100 and £41,800 respectively).

3.2.2 KPI assessment

KPI assessment includes two categories : one category related to economic and business indicators such as net profit, and the other was about production (See Appendix 4). There were 230 missing data sets. For those who provided KPIs, the number of KPIs provided varied from 1 to 15. There were 569 farmers who only provided one KPI either in business profitability or in production KPI. Production KPI's for each farm type vary.

To enable a meaningful comparison across sectors, it is therefore necessary to obtain one KPI score for each farmer (who completed at least one KPI). This was obtained by assigning a 5-point ranking order based on the benchmarking thresholds of each KPI, with 1 being “Out of range lowest”, 2 being “review performance”, 3 being “room to improve”, 4 being “performing well” and 5 being “Out of range highest”. The thresholds for each category⁹ are shown in Appendix 4. An average score of KPI (with 0 decimal) was therefore calculated based on all relevant KPIs rankings. This leads to the ONE ordinal KPI variable for each farmer. Figure 9 below shows the distribution of the rankings of KPI for the 1,148 farmers who completed at least one KPI.

Of the 1,148 farmers, 51.9% (n=596) were in the top two categories, i.e. “performing well” or “Out of range highest” range whilst 17.6% had poor performance (either to “review performance” or “out of range lowest”). 30.5% (n=350) were in the middle with “room to improve”.

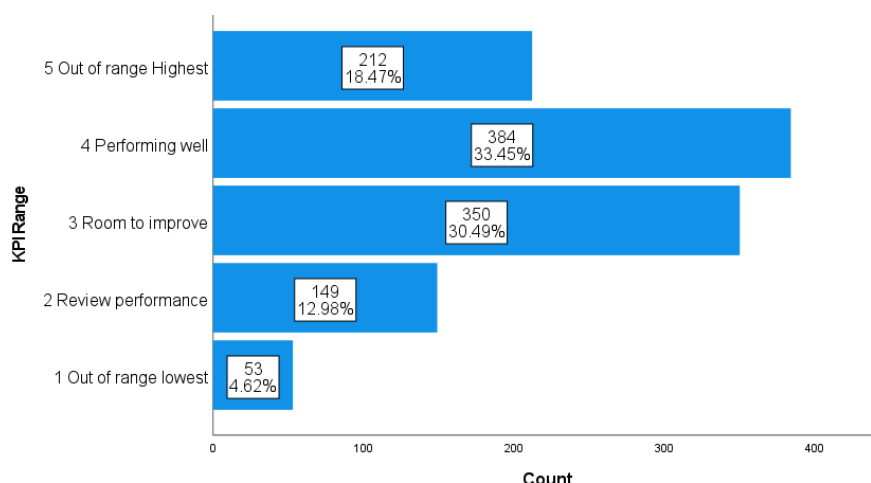


Figure 9 Distribution of respondents by average KPI range score

A chi-square test was performed on the KPI performance by farm characteristics. No significance was found based on key characteristics such as age, gender, main occupation, or farmer status. Therefore, no breakdown of KPI by those characteristics were provided.

However, a statistically significant difference was found across the farming sectors ($p < .01$) and regions ($p < .01$). The key difference existed between dairy farmers and other farm types. Only 39% of dairy farmers ranked themselves as performing well” or “highest” whilst all other farm types had over 50% rating themselves as “performing well” or “highest”. Cereal farms had the smallest percentage of “out of range (lowest)” (2%) and LFA farms had the highest percentage of “out of range lowest” category (9%) (Fig. 10).

⁸ <https://www.gov.uk/government/statistics/farm-business-income/farm-business-income-by-type-of-farm-england-202021>

⁹ The thresholds were provided by AHDB. Each range had a definition and rationale for the allocation. Details can be made available on request. However, DEFRA’s farm business survey results on farming performance used different financial indicators (e.g. liabilities, net worth but not net worth trends, gearing, liquidity and return on capital employed). [Balance sheet analysis and farming performance, England 2020/21 - statistics notice - GOV.UK \(www.gov.uk\)](#) and [Farm accounts in England](#) (Defra, 2022)

Although there was no direct comparison, using farm business income as a proxy when comparing to the national average for each farm type (Defra, 2022), LFA and lowland livestock farms in this sample were very much in line with the findings of Farm Business Survey which showed that Lowland and LFA livestock were the two lowest performing sectors. The sampled dairy farms reported lower performance than the national average in financial terms, whilst this sample had higher percentages of well-performing cereals and mixed farms.

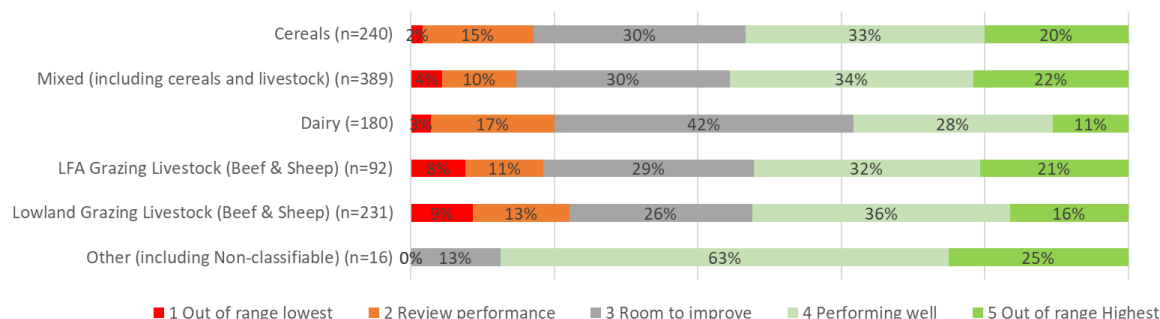


Figure 10 Distribution of respondents by farm type and average KPI range score

In terms of regions, farmers in the North West (28%) had more low performers (i.e. “out of Range Lowest” or “review performance”) than other regions (Fig. 11). At the other end of the spectrum, East Anglia, East Midlands, South East and West Midlands farmers reported higher KPI performances than other regions, with over 50% of farmers in those regions being in the top 2 categories (“performing well” or “Out of range Highest”). However, it is worth noting that the regional variations may be skewed by the predominate farm type, i.e. cereals in East Anglia and dairy in South West.

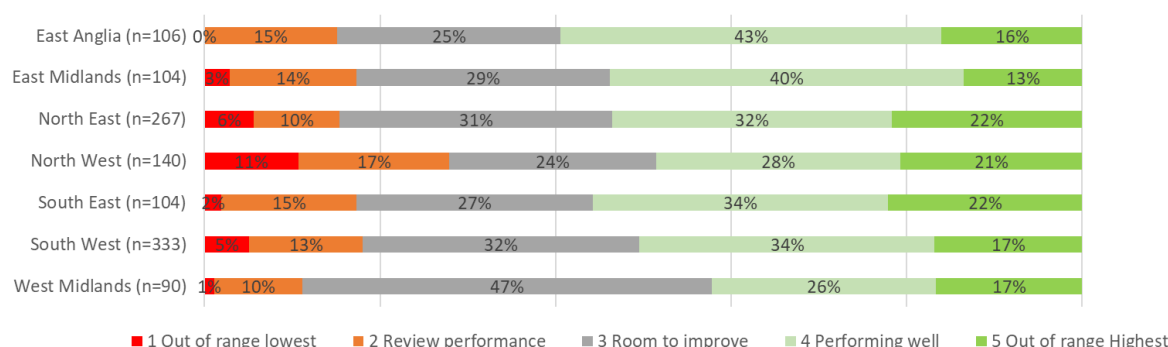
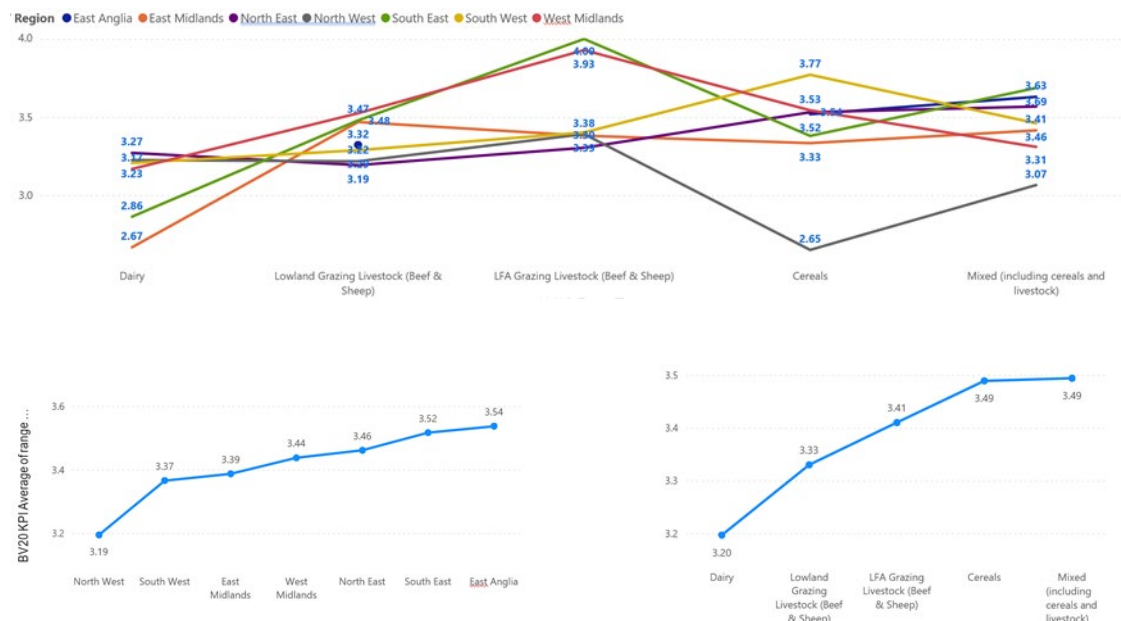


Figure 11 Distribution of respondents by region and average KPI range score

The mean scores of KPI assessment confirmed the earlier observation by range categories that dairy farmers or farmers in the North West had the lowest KPI scores whilst mixed farms or farmers in East Anglia had the highest KPI performance (Fig. 12).



a. KPI by farm type and region combined

b. Means score of KPI by region

c. Mean score of KPI by farm type

Figure 12 Mean score of KPI by region & farm type combined (a), by region (b) and by farm type (c)

When combining farm type and region as shown in the figure 13, cereal farmers in the North West, and dairy farmers in East Midlands scored the lowest (2.65 and 2.67 out of 5 respectively) whilst LFA livestock farmers in South East and West Midlands had the highest average score of KPIs (4/5 and 3.93/5 respectively).

3.2.3 Resilience assessment of farmers

Farmers were also asked to complete a self-assessment of business resilience questionnaire which comprised of 20 items under 8 sub-themes (5-point ordinal measures). The 8 sub-themes were:

- 1) Minimise overheads (2 items)
- 2) Set goals and budgets (3 items)
- 3) Compare to others (4 items)
- 4) Understand the market (2 items)
- 5) Focus on detail (2 items)
- 6) Mindset for change (3 items)
- 7) People management (2 items)
- 8) Specialise (2 items)

In total, 1663 farmers completed the survey. An average score was calculated for each sub-theme. As shown in Table 3 below, overall, responding farmers had the highest score on “understanding the market” (mean = 3.686) and lowest on “Focus on details” (mean = 2.937).

Table 3 Descriptives of resilience assessment and Reliability statistics of business resilience items

	Mean	Std. Deviation	N (Listwise valid)
Minimise overheads	3.131	1.0256	1633
Set goals and budgets	3.213	0.9432	1633
Compare to others	3.281	0.9243	1633
Understand the market	3.686	0.9748	1633
Focus on detail	2.937	1.0497	1633
Mindset for change	3.085	1.0159	1633
People management	3.099	1.1258	1633
Specialise	3.506	1.0155	1633

The Cronbach Alpha score for the 8 items was 0.857 (threshold level being 0.70), indicating a high internal consistency. It was, therefore, decided to combine the eight items into a single farm business resilience score using the average of the eight items. This generated a new variable ranging from 1 to 5. The mean score of the average business resilience was 3.236 (N=1,663, standard deviation = 0.722). This enabled comparisons across farm and farmer sub groups. ANOVA tests of variance showed that the “mean score of business resilience” varied significantly across different age groups, farmer status, farmer occupation, regions, and farm types ($p < .01$) (Fig. 13).

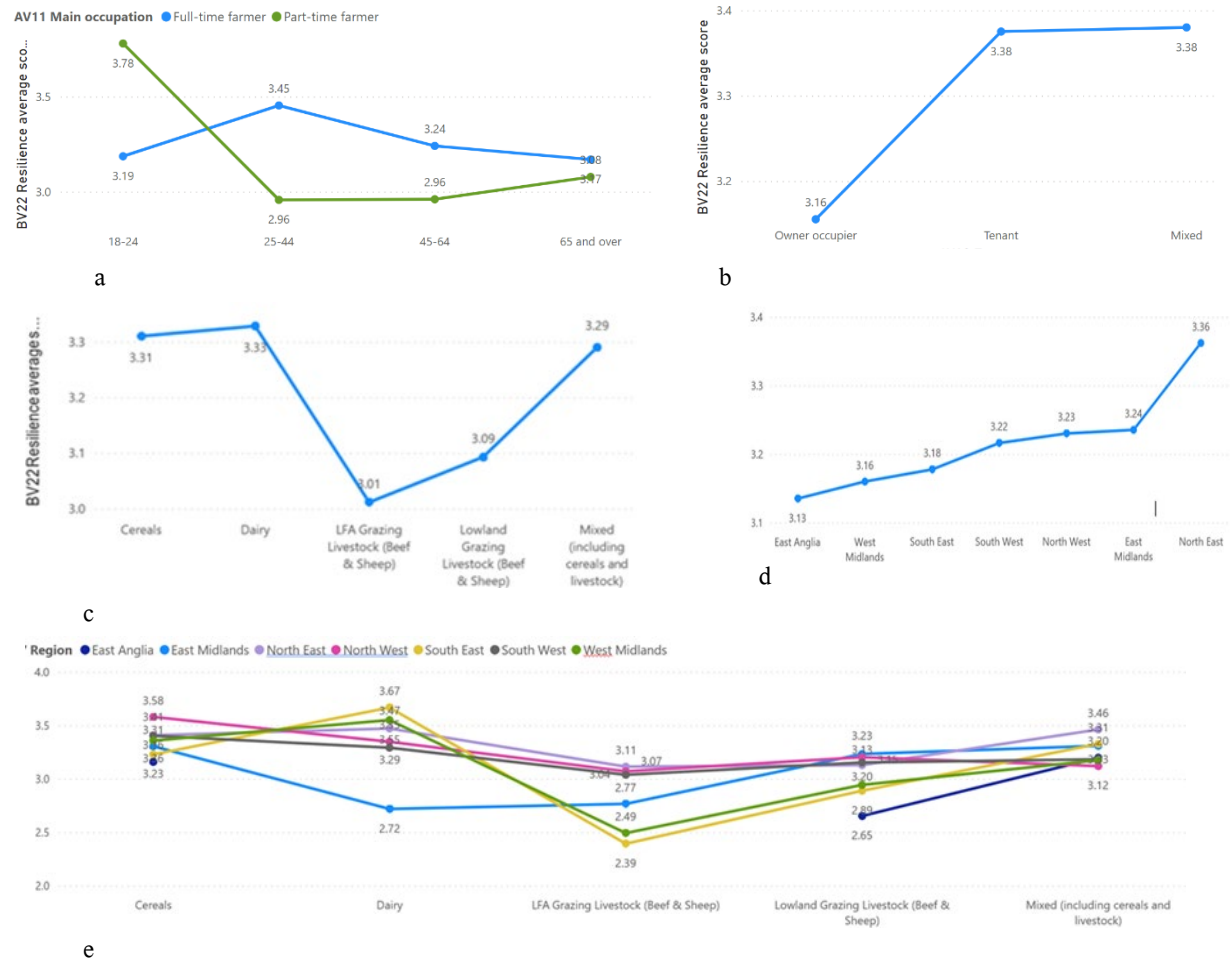


Figure 13 Mean score of self-reported farm business resilience by age group and, farmer occupation (a), farmer status (b), farm type (c), region (d) and farm type and region combined (e)

The above figures showed that with the exception of 18-24 age group, full-time farmers reported higher levels of resilience. More specifically, full-time farmers within the age range of 25-44 years old reported the highest level of business resilience. Owner occupiers reported the lowest level of resilience (perhaps they do not feel as much pressure as tenanted farmers?). Farmers in North East or dairy farmers reported the highest business resilience (3.36/4 and 3.33/4 respectively whilst farmers in East Anglia or LFA livestock farmers reported the lowest level of resilience. When combining the farm type and region together, it was the LFA livestock farmers in South East who reported the lowest business resilience (2.72/4) whilst dairy farmers in South East reported the highest resilience (3.67/4).

A further categorical variable was created with 5 categories with any scores below 1.5 being ‘not resilient’, 1.5-2.49 being ‘slight resilient’, 2.5 – 3.49 being ‘somewhat resilient’, 3.5-4.45 being ‘resilient’ and 4.5-5 being ‘very resilient’. Fig. 14 shows the distribution of the 1,663 farmers who had the score ranges.

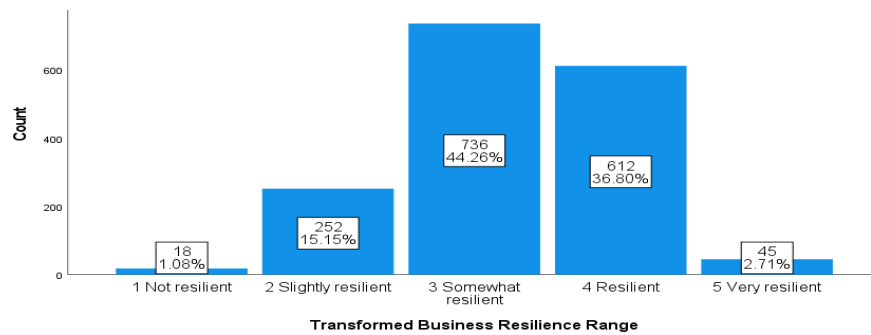


Figure 14 Distribution of the transformed business resilience score (n=1663 valid listwise)

The sample was normally distributed across the five categories. Just above 44% were in the middle being “somewhat resilient”. Nearly 40% of the farmers were in the ranges of being “resilient” or “very resilient” whilst about 16% in the lower two categories.

The next part of this section presents the business resilient assessment results in more detail by age groups, age groups, farmer status, farmer occupation, regions, and farm types.

Business resilience by Age groups

Younger farmers reported a slightly higher level of business resilience. A closer look at the eight sub-themes showed that younger farmers (those aged from 25-44) scored higher levels of resilience on nearly all areas than older farmers as shown in Fig. 15 below. The 18-24 age group scored higher than the 25-44 groups apart from “minimise overheads”, “understand the market” and “compare to others”. It was therefore decided to regroup the age groups from 6 to 4 groups, namely, 18-24, 25-44, 45-64 and 65 and over.

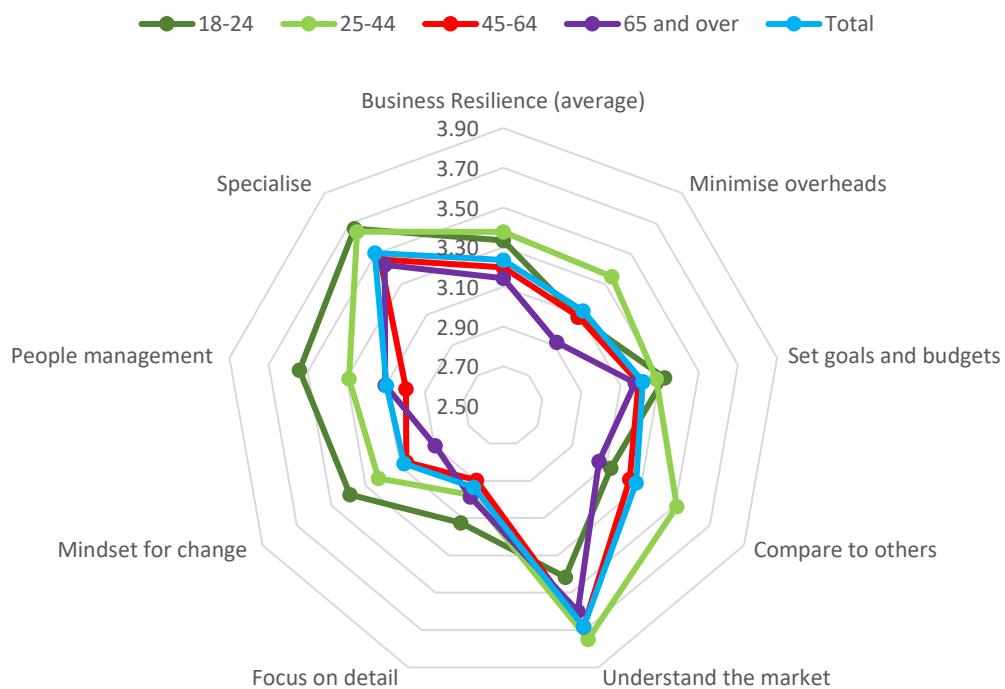


Figure 15 Mean score of each business resilience item by age group (Total = mean score for the total sample)

Farmer status also showed a significant difference (Fig. 16). Mixed-ownership farmers (n=321, mean = 3.16) reported a much lower level of resilience than tenant farmers (n=276, mean = 3.38) and owner occupiers (n=1053, mean = 3.38). Tenant farmers

scored the highest on “specialise”, “people management” and “set goals and budgets” whilst “owner occupier” group scored the highest on “minimise overheads”, “compare to others” and “understand the market”.

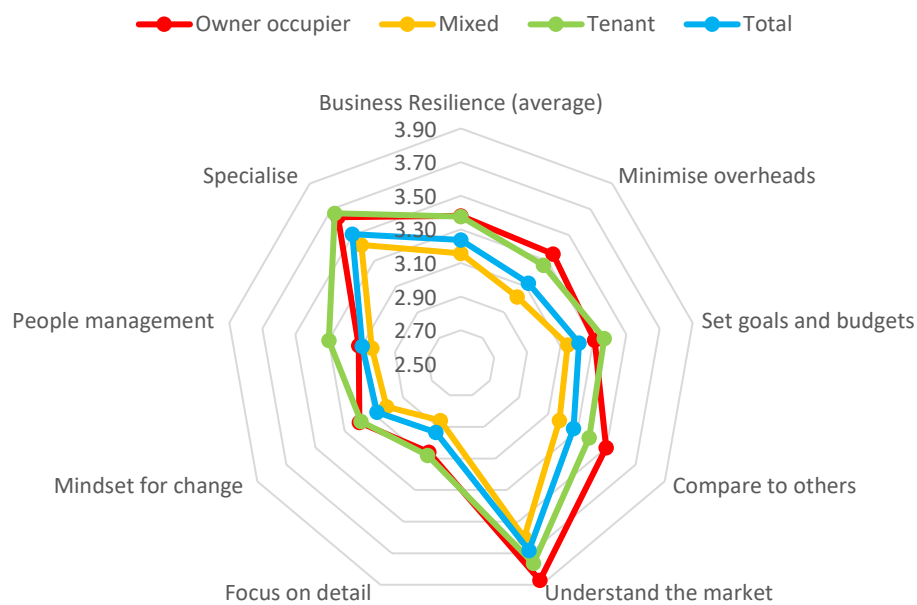


Figure 16 Distribution of respondents by average business resilience score and farmer status (left) and Mean score of each business resilience item by farmer status (right)

In terms of farmer occupation, full time farmers reported a higher level of resilience than part-time farmers with mean score being 3.29 and 3.02 respectively (Fig. 17). Full-time farmers scored higher on all dimensions of the business resilience assessment. A suggestion for this could be that full-time farmers have more capacity to pay a greater level of attention to farm management, and are more motivated to increase business resilience as they are totally reliant on their farming business for their income.

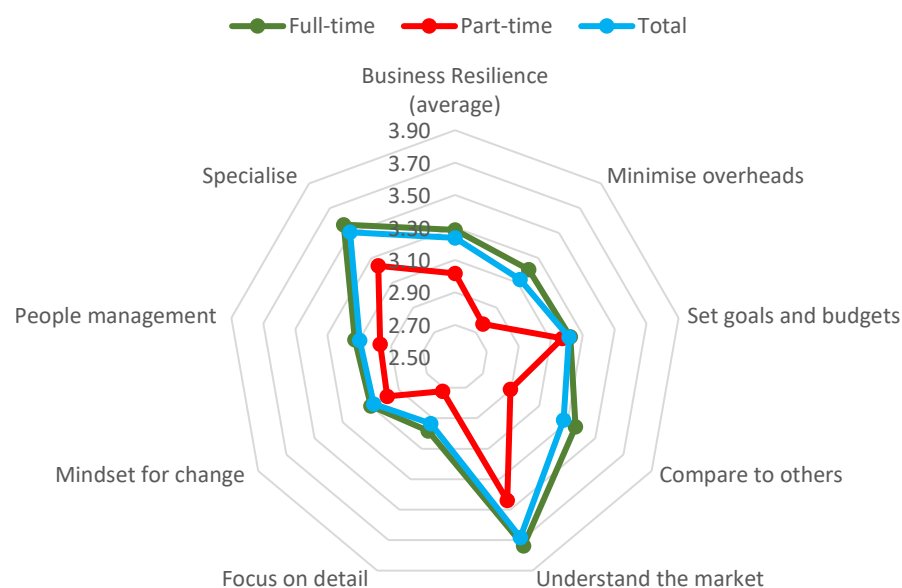


Figure 17 Mean score of each business resilience item by farming status (Fulltime v Part-time)

When looking at the regional differences (Fig. 18), North East farmers reported the highest level of business resilience (mean = 3.36). East Midlands and North West farmers were just about on the combined average, and East Anglian farmers reported the lowest level of resilience (mean = 3.13). Detailed comparisons of the eight dimensions showed that farmers in the North East scored higher on “focus on details” and “set goals and budgets”, “minimise overheads” and “people management” than all other regions. South East farmers scored the highest on “specialise” whilst North West farmers scored slightly higher on “understand the market”.

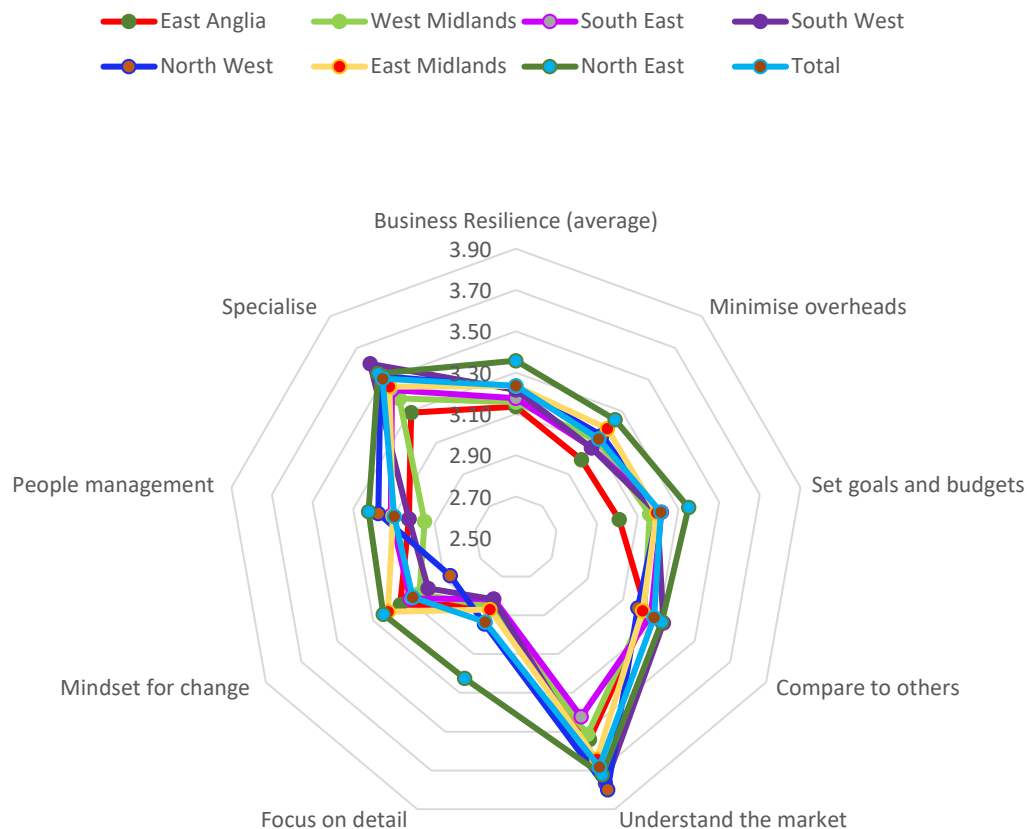


Figure 18 Mean score of each business resilience item by region

Farming sectors also reported significant differences between their levels of business resilience. Dairy and cereal farmers reported the highest level of resilience whilst livestock farmers, particularly LFA livestock farmers reported the lowest level of resilience on average. as shown in Fig. 14c earlier.

Taking a closer look at the sub dimensions (Fig. 19), dairy farmers scored the highest on “specialise”, “understand the market” and “compare to others” whilst cereal farms scored the highest on “mindset for change”.

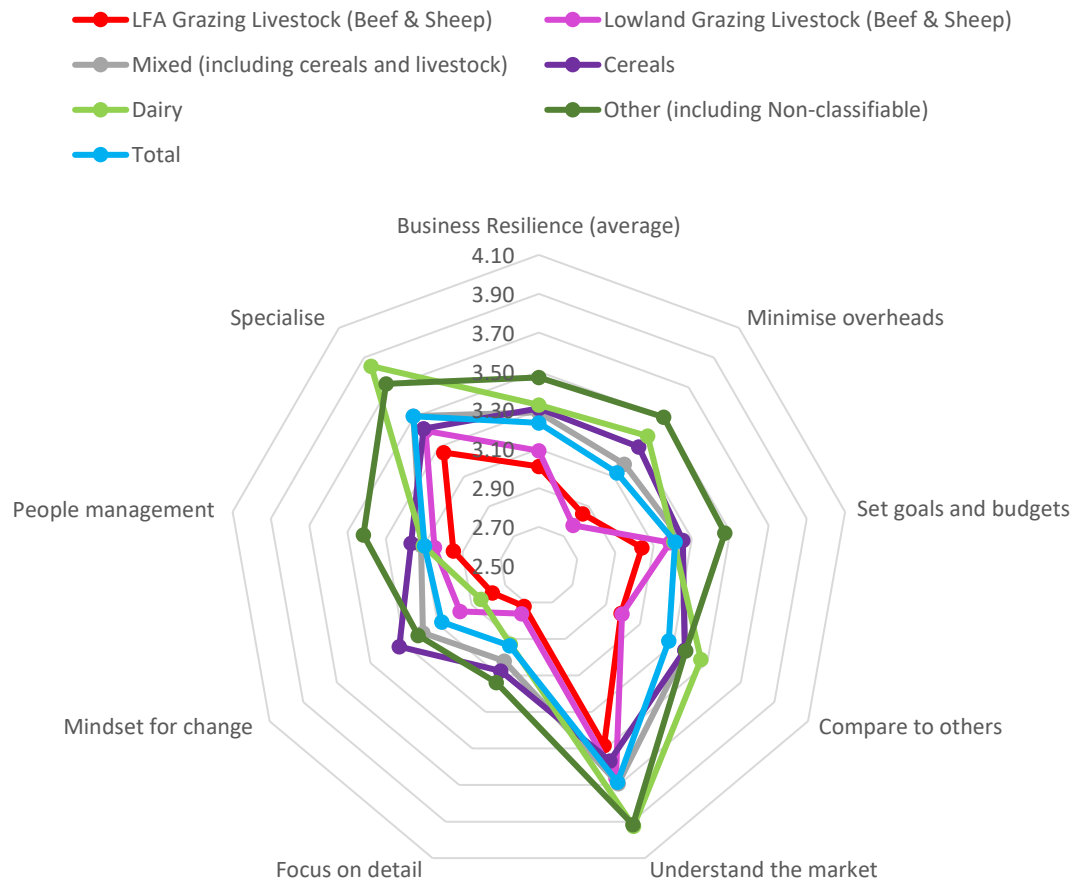


Figure 19 Mean score of each business resilience item by farm type

Business resilience average score was also tested against farm size and KPI average score using Pearson's correlation. The results (Table 4) showed significant positive but weak correlations between the three variables. This means that the bigger farms were more likely to have scored higher on KPI assessment and on business resilience ($p < .001$). Farms scoring highly on KPI tended to also score highly on business resilience.

Table 4 Correlation between farm size, KPI mean score and mean score of business resilience

		Farm size	Resilience average score	KPI average of range score
Farm size	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	1747		
Resilience average score	Pearson Correlation	.169**	1	
	Sig. (2-tailed)	0.000		
	N	1646	1663	
KPI average of range score	Pearson Correlation	.071*	.145**	1
	Sig. (2-tailed)	0.016	0.000	
	N	1136	1131	1148

The graphs below (Fig. 20) further demonstrate the positive correlation between business resilience and farm size, and business resilience and average KPI scores.

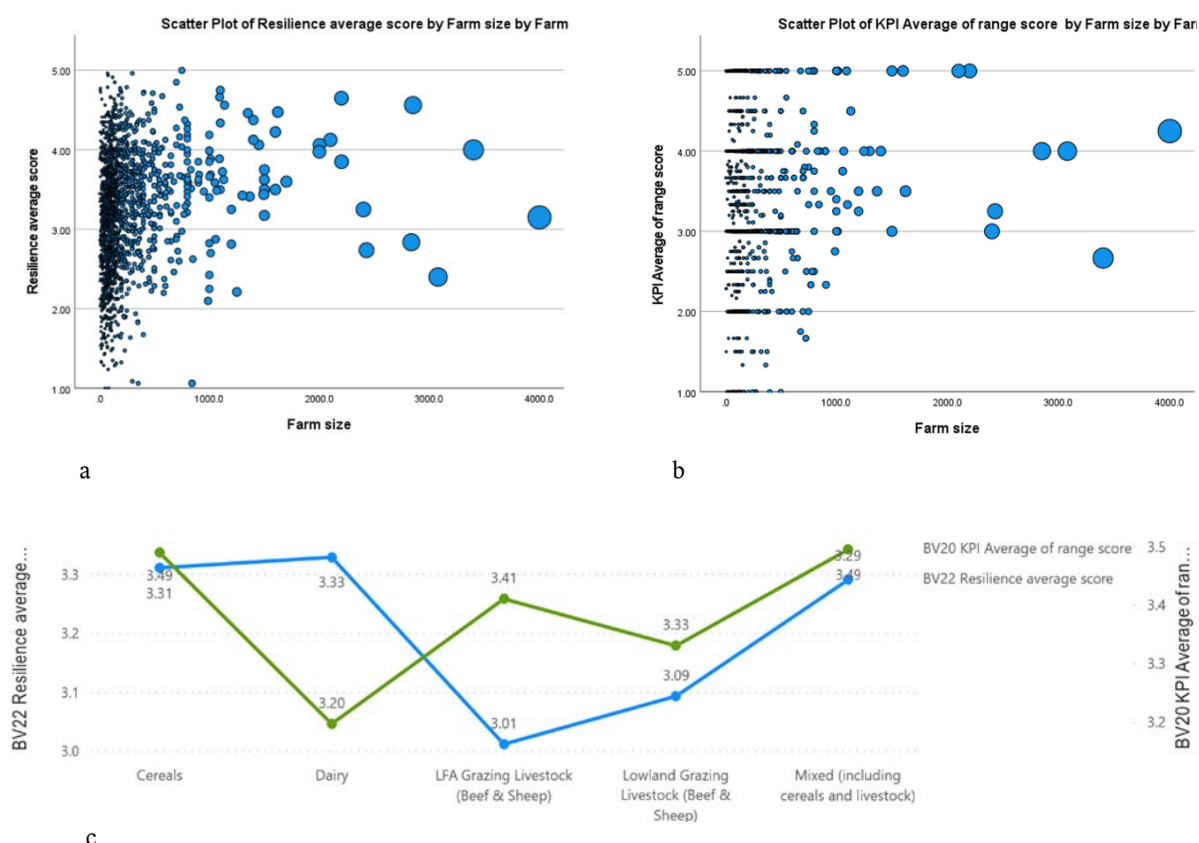


Figure 20 Correlation between farm size and business resilience(a) and farm size and average KPI scores (b), business resilience and KPI by farm type (c)

Fig. 20 shows that a largely positive correlation between self-reported farm business resilience and KPI performance existed for cereal farms, lowland grazing and mixed farms. But dairy farms and LFA livestock farms showed the opposite trends. Dairy farms reported higher level of farm business resilience and lower KPI performance whilst LFA livestock farms scored the other way round (i.e. higher on KPI performance but lower on business resilience assessment).

In summary, just under 40% of the responding farms reported as being resilient or very resilient. In general, younger farmers, tenant or owner-occupier farmers, full time farmers, Dairy or Cereal farms, farms in the North East, or farms with higher KPI scores were more likely to have reported higher levels of business resilience.

3.3 How farmers feel about future

Farmers were asked about how they felt about the future of farming on a 3-point scale with 1 being “not all positive” and 3 being “very positive”. The mean score for the total sample was 1.89. Chi-square test showed significant differences across “age groups”, “region” and “farmer status”.

As shown in Fig. 21, younger farmers were more positive about future in farming.



Figure 21 Distribution of respondents feelings about the future of farming by age groups

Fig. 223 also shows that more farmers in the East Midlands were the most positive about the future in farming, whilst more farmers in East Anglia were not positive or unsure.

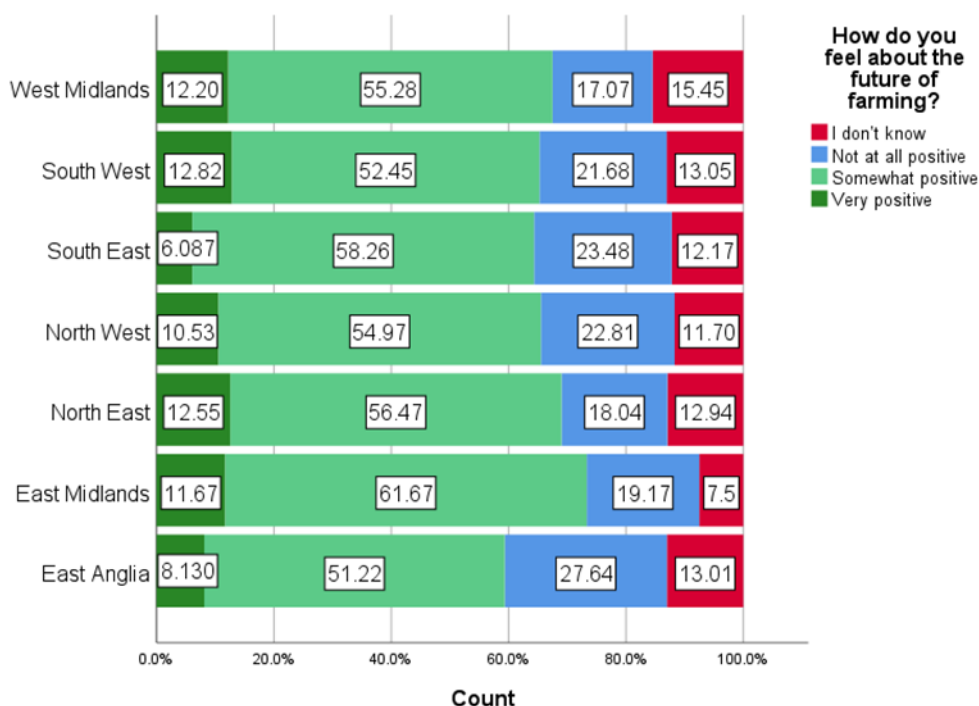


Figure 22 Distribution of respondents feelings about the future of farming by region

Slightly more farmers with “Mixed” status or tenant farmers were more positive than owner occupiers (Fig. 23).

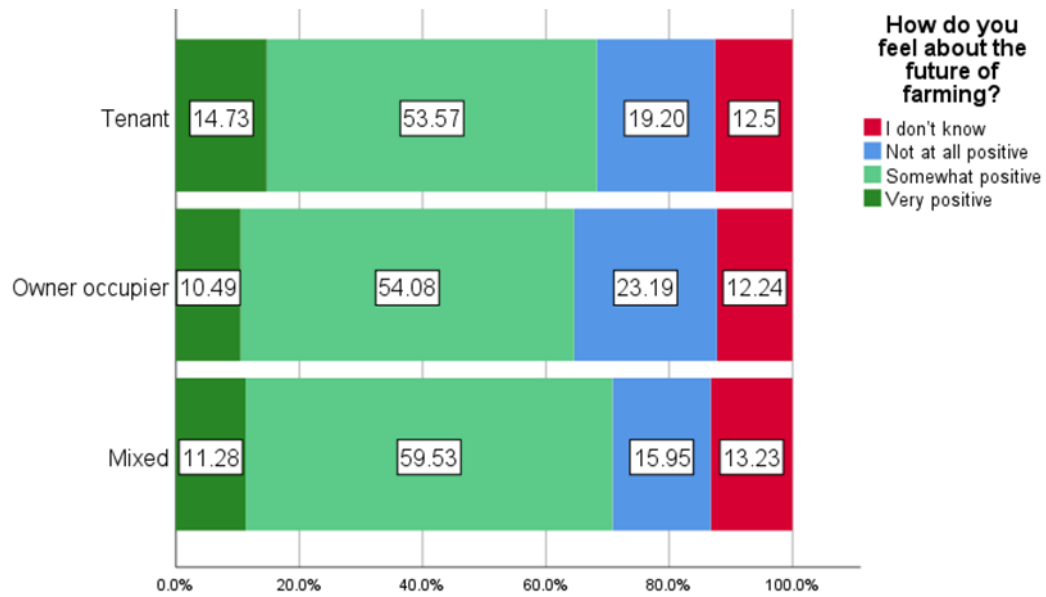


Figure 23 Distribution of respondents feelings about the future of farming by farmer status

Regarding “confidence in responding to any changes needed”, the mean score for the total sample was 2.19 out of 3 (1 being “not at all confident” and 3 being “very confident”). Again, more younger farmers or full-time farmers expressed confidence than older farmers or part-time farmers (Fig. 24).

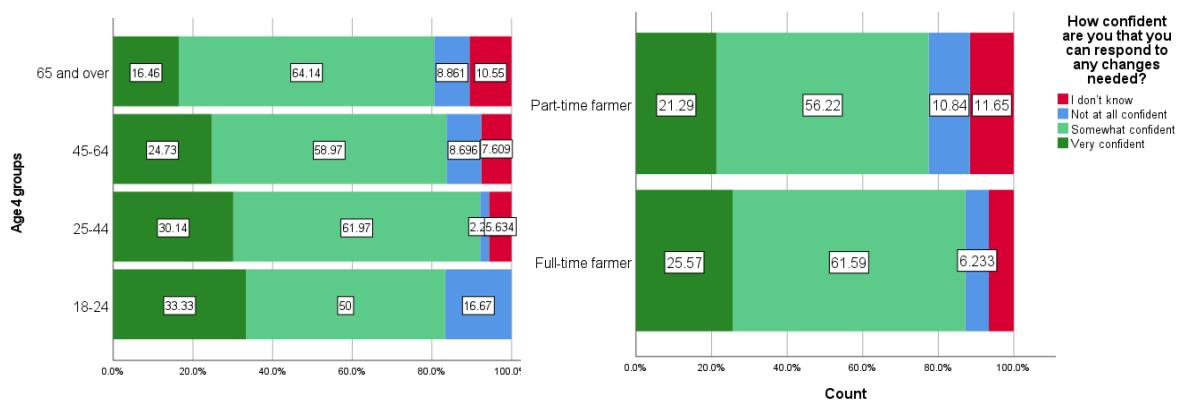


Figure 24 Distribution of respondents by confidence in responding to any changes needed and main occupation

In terms of whether farmers “feel the need to make changes to business in the next 3-5 years”, significant differences existed amongst full-time and part-time farmers and farm types (Fig. 25). Slightly more full-time farmers (80.68%) indicated that they will need to make changes to their business compared to 76.11% of part-time farmers.

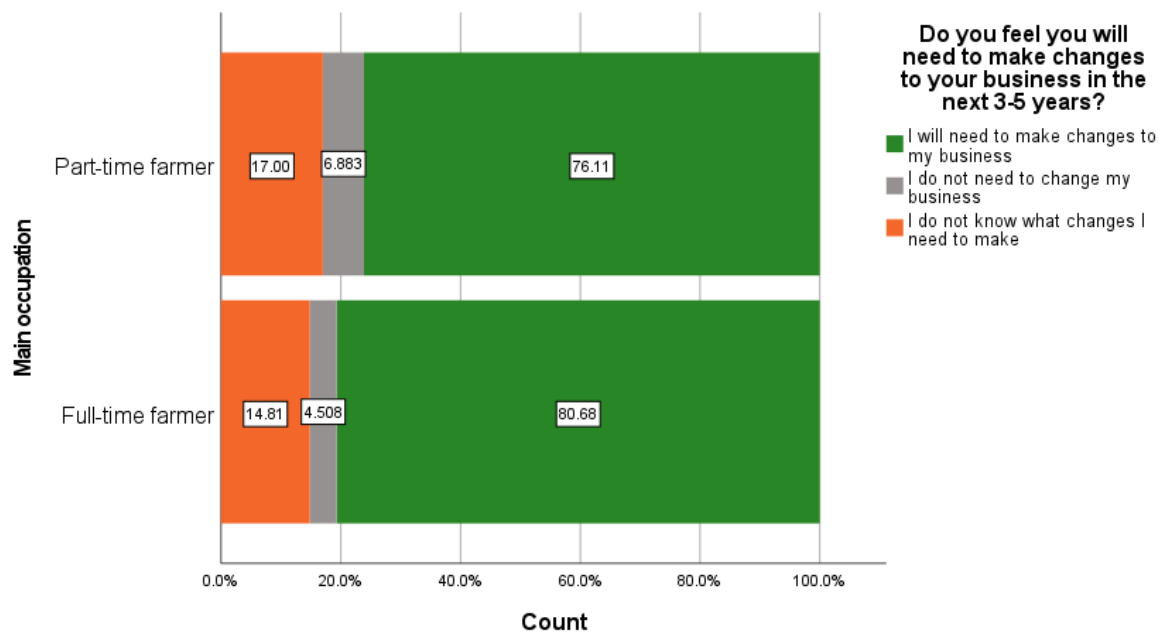


Figure 25 Distribution of respondents need to make a change by main occupation

More mixed, cereal and dairy farmers indicated the need to change than other farm types. Livestock farmers (LFA and Lowland) had the lowest percentage of farmers (75.6%) indicating a need to change in the next 3-5 years (Fig. 26).

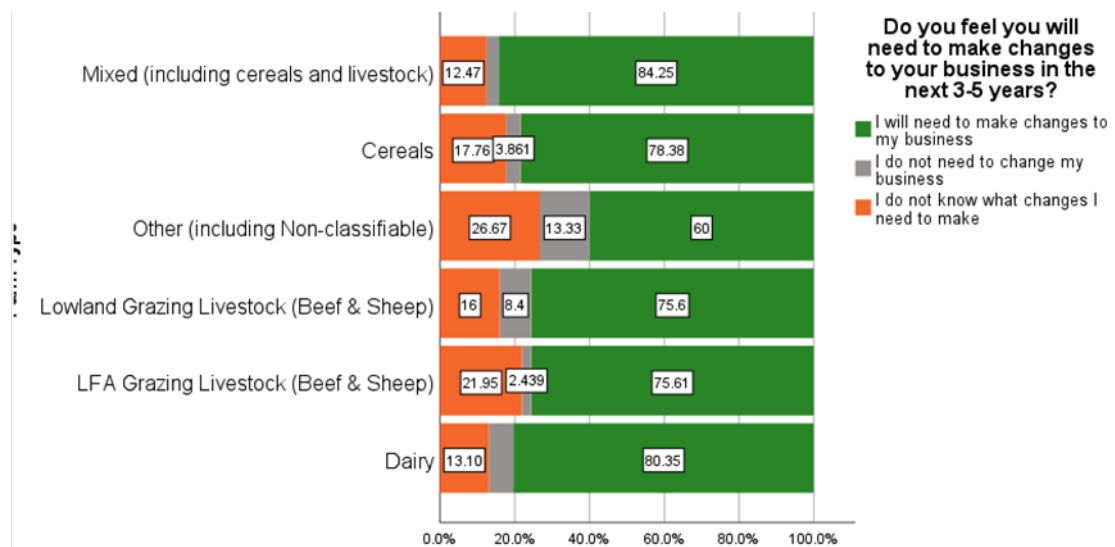


Figure 26 Distribution of respondents on need to make a change by farm type

In terms of “To what extent are you planning on making changes to your business to become more productive and/or profitable”, again, full-time farmers and younger farmers (age group 25-44) were already making changes as shown in Fig. 27 and Fig. 28. More older farmers and part-time farmers indicated “I am not planning on making changes”. This very much reflects stage of life and farming not being the primary source of income, perhaps.

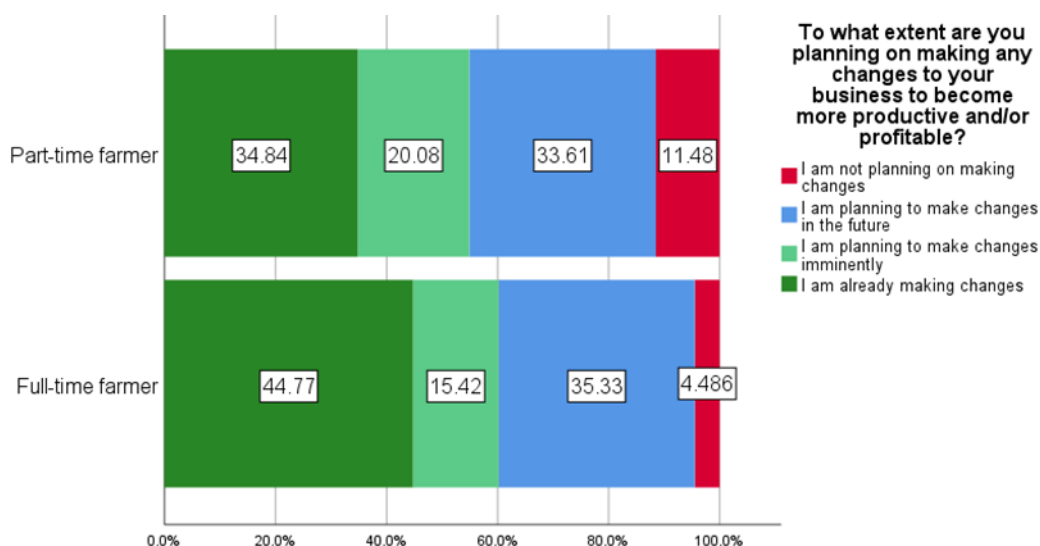


Figure 27 Distribution of respondents by planning on making changes to your business to become more productive and/or profitable against main occupation

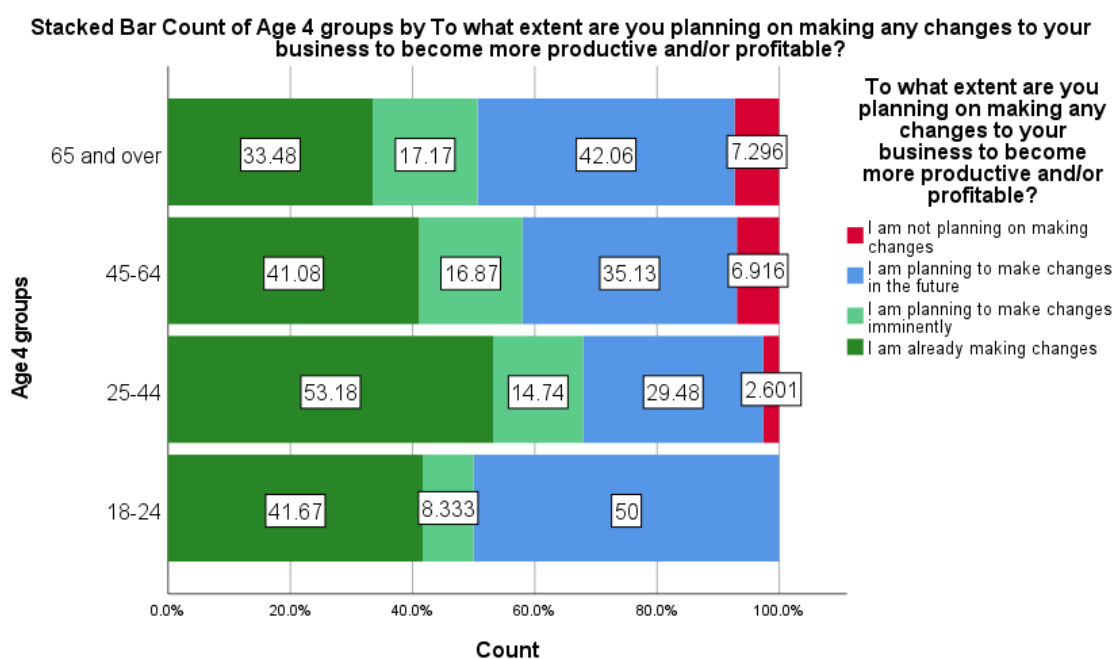


Figure 28 Distribution of respondents by planning on making changes to your business to become more productive and/or profitable against age group

For farmers who completed the surveys both at the start and at the end of the consultation, paired samples t-tests indicated differences in two aspects: feel about future of farming ($p < 0.05$) and planning on making changes ($p < 0.001$). Farmers showed slightly higher positivity about the future in farming (mean difference being 0.03) and much stronger change orientation (mean difference being 1.5 out of 4 on planning on making changes to business) at the end of consultation.

3.4 Factors affecting farm business resilience

To understand the factors contributing to farm business resilience, a linear regression was run against the following factors: farmers age (under 45, dummy), farmer status (dummy variable for each category), farm size in area, farm size by number of employees, farm type (dummy variable for each type), region (dummy variable for each region), KPI score, and items related to farmers' feel about the future. The regression results (Table 6) showed seven factors made statistically significant contributions to the self-reported farm business resilience.

Table 5 Summary of regression model on factors affecting farm business resilience

	Type of measure	Standardized Beta	t	Sig.
(Constant)			32.740	.000
Under 45 Years	dummy	0.078	2.397	.017
Farm size	scale	0.117	3.539	<.001
Mixed status	dummy	0.088	2.614	.009
Tenant	dummy	0.087	2.641	.008
KPI Average of range score	scale	0.138	4.272	<.001
Confidence in responding to any changes needed	ordinal	0.167	4.660	<.001
Having information to inform business planning	ordinal	.098	2.936	.003

R =0.325; R Square = 0.106

Model Sig. <.001

Dependent variable: Farm Business Resilience mean score

Regression analysis showed that farmers under 45 years of age, larger farms, mixed tenant and owner-occupier status, tenant farmers, KPI mean scores, confidence in responding to changes needed and the extent of having information to inform business planning. Together, they explained 10.6% (R=32.5%) of the variance of the self-reported level of farm business resilience.

3.5 Farmers' future plans

3.5.1 Actions planned

Farmers were asked about their future plans with 'yes' or 'no' responses to nine action plan questions. Fig. 29 shows the distribution of number of valid answers and percentages. The highest percentage of farmers planned to stay in farming but increase productivity (50.7%). The second most popular plan was to diversify the business (39.3%). Planning to consolidate the business and to expand the business were the 3rd and 4th most popular actions. Planning to pass over to a successor was very much age related. It is worth noting that these were still minority (less than 40% of selections). There was little appetite for changing core agricultural enterprises (15.9%) and even less for reducing the size or completely exiting farming. This corroborates with the findings of previous interviews with farmers (Huang et al., 2022) that most farmers see farming as their lifestyle and older farmers were very reluctant to completely retire from farming.

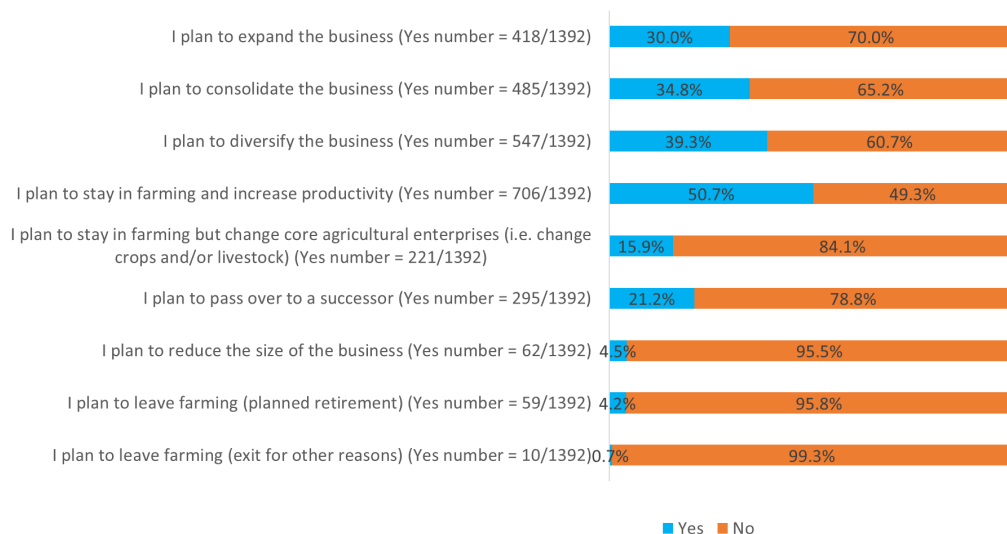


Figure 29 Distribution of actions planned

Chi-square tests on farm and farmer characteristics against answers to each of the nine statements showed some significant differences across different types of farmers and farms (indicated by the sign value less than 0.5 and shaded in green) (Table 7). Where the sign value was greater than 0.05 (with no green shades), no further details will be provided below.

Table 6 Distribution of actions planned and significance level of chi-square tests for key attributes

		I plan to expand the business		Consolidate the business		Diversify		Increase productivity		Change core agri enterprise		Pass over to successor	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Total	N	418	974	485	907	547	845	706	686	221	1171	295	1097
	%	30.0%	70.0%	34.8%	65.2%	39.3%	60.7%	50.7%	49.3%	15.9%	84.1%	21.2%	78.8%
Age	18-24	N	10	2	1	11	6	8	4	1	11	0	12
		%	83.3%	16.7%	8.3%	91.7%	50.0%	66.7%	33.3%	8.3%	91.7%	0.0%	100.0%
	25-44	N	188	177	100	265	176	189	237	54	311	28	337
		%	51.5%	48.5%	27.4%	72.6%	48.2%	51.8%	64.9%	14.8%	85.2%	7.7%	92.3%
	45-64	N	190	581	283	488	285	486	364	126	645	164	607
		%	24.6%	75.4%	36.7%	63.3%	37.0%	63.0%	47.2%	16.3%	83.7%	21.3%	78.7%
	65 and over	N	29	213	100	142	79	163	97	40	202	102	140
		%	12.0%	88.0%	41.3%	58.7%	32.6%	67.4%	40.1%	16.5%	83.5%	42.1%	57.9%
Sig value of Chi-square test		p<.001***		p<.001***		p<.001***		p<.001***		p=.794		p<.001***	
Farmer status	Mixed	N	113	150	82	181	124	139	165	98	45	218	55
		%	43.0%	57.0%	31.2%	68.8%	47.1%	52.9%	62.7%	37.3%	17.1%	82.9%	20.9%
	Owner occupier	N	226	666	325	567	352	540	416	476	148	744	204
		%	25.3%	74.7%	36.4%	63.6%	39.5%	60.5%	46.6%	53.4%	16.6%	83.4%	22.9%
	Tenant	N	78	157	77	158	70	165	125	110	28	207	35
		%	33.2%	66.8%	32.8%	67.2%	29.8%	70.2%	53.2%	46.8%	11.9%	88.1%	14.9%
	Sig value of Chi-square test	p<.001***		p=.223		p<.001***		p<.001***		p=.183		p=.028**	
Main occupation	Full-time farmer	N	358	778	407	729	435	701	599	537	184	952	233
		%	31.5%	68.5%	35.8%	64.2%	38.3%	61.7%	52.7%	47.3%	16.2%	83.8%	20.5%
	Part-time farmer	N	59	195	77	177	111	143	107	147	37	217	61
		%	23.2%	76.8%	30.3%	69.7%	43.7%	56.3%	42.1%	57.9%	14.6%	85.4%	24.0%
Sig value of Chi-square test		p=.009		p=.095		p=.111		p=.002***		p=.521		p=.216	
Farm Type	Cereals	N	87	180	102	165	139	128	142	125	45	222	53
		%	32.6%	67.4%	38.2%	61.8%	52.1%	47.9%	53.2%	46.8%	16.9%	83.1%	19.9%
	Mixed (including cereals and livestock)	N	153	321	147	327	210	264	262	212	104	370	98
		%	32.3%	67.7%	31.0%	69.0%	44.3%	55.7%	55.3%	44.7%	21.9%	78.1%	20.7%
	Dairy	N	69	174	97	146	47	196	128	115	19	224	54
		%	28.4%	71.6%	39.9%	60.1%	19.3%	80.7%	52.7%	47.3%	7.8%	92.2%	22.2%
	LFA Grazing Livestock (Beef & Sheep)	N	37	90	40	87	43	84	62	65	17	110	23
		%	29.1%	70.9%	31.5%	68.5%	33.9%	66.1%	48.8%	51.2%	13.4%	86.6%	18.1%
	Lowland Grazing Livestock (Beef & Sheep)	N	67	196	93	170	98	165	102	161	34	229	62
		%	25.5%	74.5%	35.4%	64.6%	37.3%	62.7%	38.8%	61.2%	12.9%	87.1%	23.6%
Other (including Non-classifiable)	N	3	12	4	11	8	7	7	7	8	2	13	5
	%	20.0%	80.0%	26.7%	73.3%	53.3%	46.7%	46.7%	53.3%	53.3%	13.3%	86.7%	33.3%
Sig value of Chi-square test		p=.342		p=.143		p<.001***		p=.001***		p=.001***		p=.631	
Region	East Anglia	N	43	82	41	84	75	50	63	62	22	103	27
		%	34.4%	65.6%	32.8%	67.2%	60.0%	40.0%	50.4%	49.6%	17.6%	82.4%	21.6%
	East Midlands	N	36	87	38	85	53	70	60	63	29	94	30
		%	29.3%	70.7%	30.9%	69.1%	43.1%	56.9%	48.8%	51.2%	23.6%	76.4%	24.4%
	North East	N	104	167	80	191	81	190	158	113	40	231	43
		%	38.4%	61.6%	29.5%	70.5%	29.9%	70.1%	58.3%	41.7%	14.8%	85.2%	15.9%
	North West	N	45	129	66	108	54	120	99	75	20	154	37
		%	25.9%	74.1%	37.9%	62.1%	31.0%	69.0%	56.9%	43.1%	11.5%	88.5%	21.3%
	South East	N	35	86	46	75	54	67	58	63	19	102	23
		%	28.9%	71.1%	38.0%	62.0%	44.6%	55.4%	47.9%	52.1%	15.7%	84.3%	19.0%
	South West	N	118	326	175	269	173	271	201	243	68	376	110
		%	26.6%	73.4%	39.4%	60.6%	39.0%	61.0%	45.3%	54.7%	15.3%	84.7%	24.8%
	West Midlands	N	35	94	39	90	57	72	64	65	23	106	25
		%	27.1%	72.9%	30.2%	69.8%	44.2%	55.8%	49.6%	50.4%	17.8%	82.2%	19.4%
Sig value of Chi-square test		p=.23		p=.089		p<.001***		p=.022**		p=.177		p=.155	

In terms of “**I plan to expand the business**”, it is very evident that the younger the farmers are the most likely they fall into this category. Only around 12% of farmers 65 years and over said they planned business expansion, whilst 51.5% of farmers in the age group of 25-34 and 83.3% of those under 25 years old indicated that they planned to expand. More full-time than part-time farmers planned to expand. Farmers’ status also made a significant difference with farmers with “mixed” status were more likely to expand. Another area of difference was between full-time and part-time farmers with more full-time farmers planning to expand the business. It is possible that farmers with mixed status of ownership and tenant have a mindset and appetite for expansion.

“**Plans to consolidate the business**” varied amongst the different age groups. Older farmers (36.7%) were more likely to consolidate than younger farmers (less than 8.3% for those below the age of 25).

As for “**future plans to diversify**”, again, younger farmers, and farmers with “mixed” status were more likely to plan to diversify. Region-wise, a much higher percentage of farmers in East Anglia (60%) indicated they plan to diversify than farmers in other regions. Those in the North East and North West were much less likely to diversify (29.9% and 31% respectively).

Farming type also made a difference in planning to diversify. Dairy farmers were least likely to diversify (19.3%) whilst cereal, mixed and non-classified farmers were most likely to diversity (52.1%, 44.3% and 53.3% respectively).

When asked about planning to “**stay in farming but increase productivity**”, again, more younger farmers (below 55 years old), full-time farmers, farmers with “mixed” status responded “yes” than older farmers (55 and over groups), or part-time farmers or owner occupiers. Farm type also made a difference. More mixed (55.3%) and cereal farmers (53.2%) answered “yes” whilst Lowland livestock farmers were least likely (38.8%) to have answered “yes” regarding “increasing productivity” than other types of farmers.

In terms of “**planning to stay in farming but change core agricultural enterprises**” (i.e. change crops and/or livestock), more mixed (21.9%) and cereal farmers (16.9%) held this intention than dairy and livestock farmers. However, the percentages were low overall (i.e. lower than 22% for all farm types).

The significant differences on “**planning to pass over to successors**” or “**retire**” obviously mainly came from those aged 55 or over. However, planning to retire was only indicated by a very low percentage (4.1% of the total sample) and even for the group aged “65 and over”, only 9.23% indicated that they plan to retire.

Farmers were also asked about their “**current or future engagement with various Defra schemes**”. As shown in the Table 12, 377 farmers did not provide an answer. Of those who responded, 69.8% have engaged or planned to engage with the Countryside Stewardship Scheme, 22.9% with SFI and 22.1% with the Farming Investment Fund (Fig. 30).

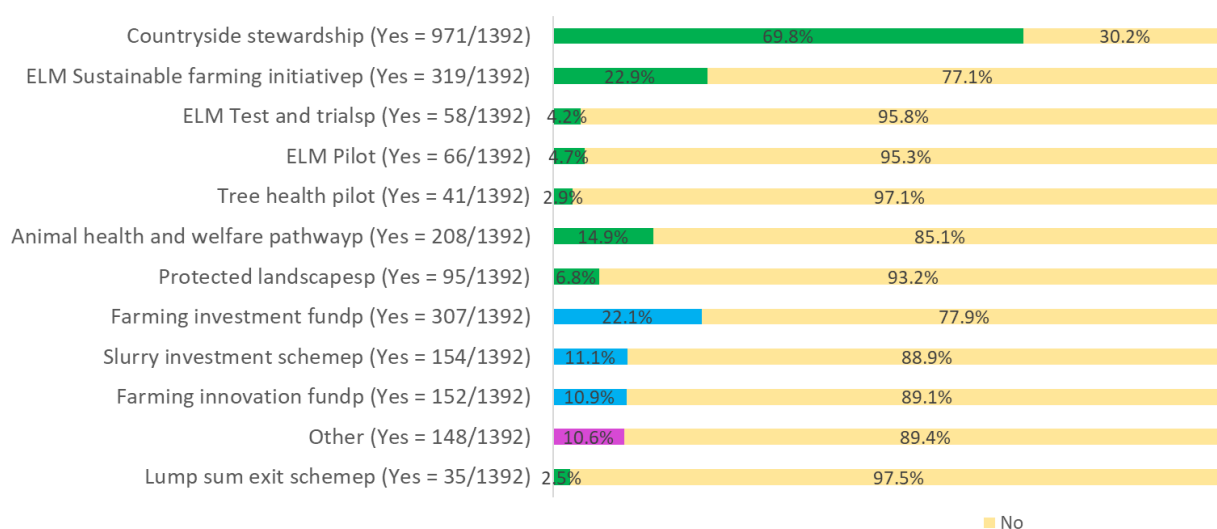


Figure 30 Distribution of current or future engagement with government schemes

The number of schemes engaged or to be engaged by each farmer ranged from 0 to 12 schemes. There were 153 farmers who have not engaged and will not engage with any schemes at all. Of those who have engaged or will engage with schemes, the breakdown by sector is presented in Fig. 32.

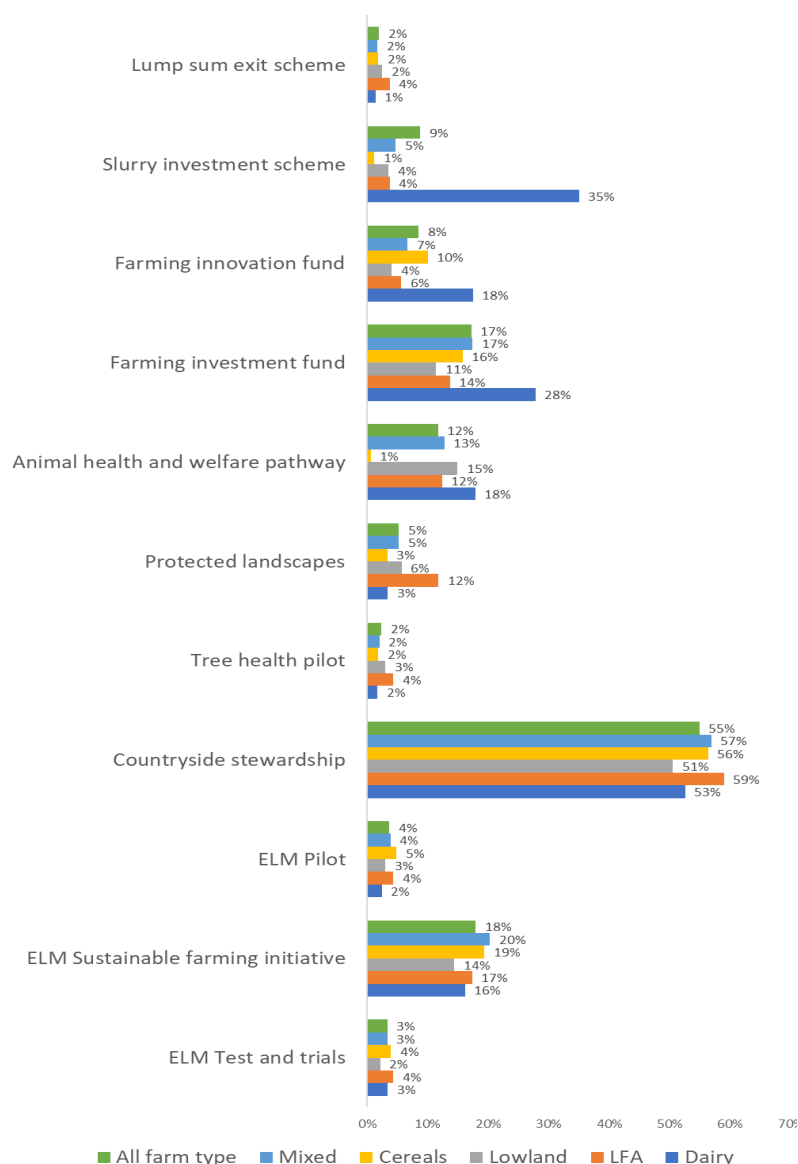


Figure 31 Distribution of farmers' current or future engagement with Defra schemes by farm type

Over half of farmers in each farm type have engaged or will engage with Countryside Stewardship Scheme (CSS) which is not surprising considering that the scheme can nearly apply to all farming sectors and has been in operation for many years. Farming prosperity related schemes such as investment fund and innovation fund were less popular overall which may be a good sign that farmers may be less reliant on subsidies for long-term investment. Dairy farms stood out of all farm types in this respect, perhaps due to the nature of the sector and the maturity of technology development (e.g. automatic milking system). The level of engagement with ELMS (lump sum exit scheme, test and trials, pilots and SFI) was very low in general, reflecting the uncertainties farmers felt about the new schemes perhaps as found in Huang et al (2022).

3.5.2 Use of Business Management Tools

Farmers were also asked about **management tools currently used and whether they will use in the next 12 months** with binary answers (yes or no choice). Currently, “accessing advice” (n=880, 70.3% of valid responses) and “management accounting practices” (n=701, 55.5%) were the top 2 most used whilst “benchmarking” (n=390, 31.8%) and “risk management” (n=426, 34.8%) were the least used currently (Fig. 32).



Figure 32 Distribution of farmers' use of management tools (current and future use)

Many farmers did not provide answer the question about planning to use in the next 12 months as shown in Fig. 32. It is possible that many of them saw the questions as repetitions and decided to skip those questions. Therefore, it was decided to combine the answers to both sets of answers as shown in Fig. 33.

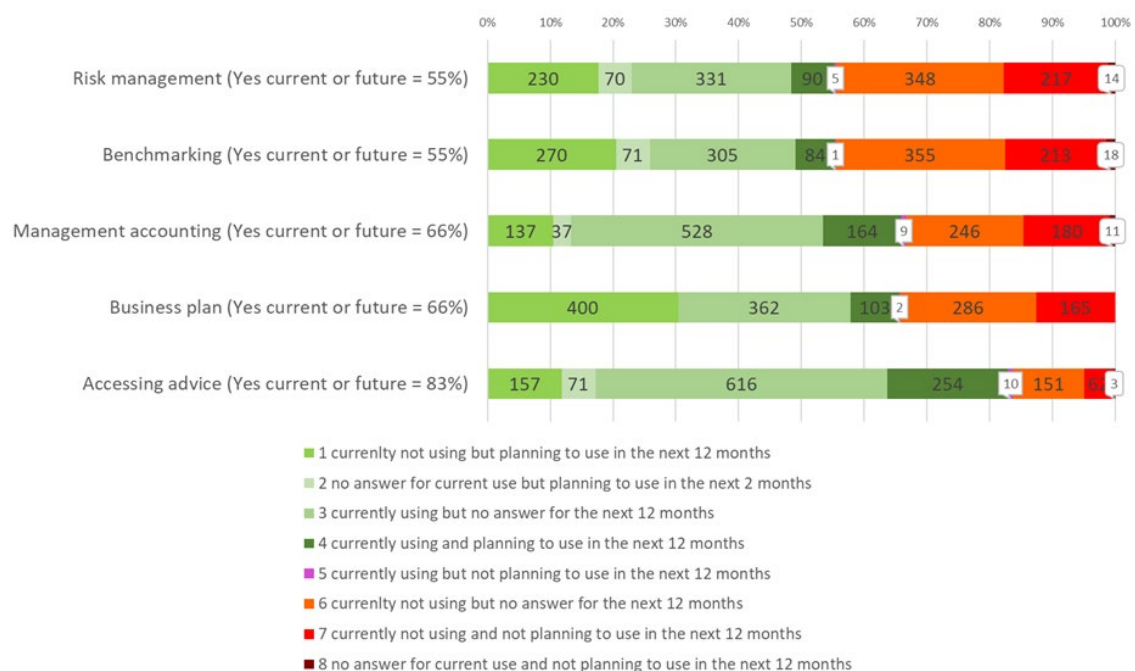


Figure 33 Distribution of farmers' use of management tools (current and/or future use)

Fig. 33 shows eight combinations of answers with the top four combinations indicating currently using and/or will use in the next 12 months. When combining the top four combinations together, 'accessing advice' was or will be used by 83% of farmers (n=1098), 'business planning' and 'management accounting' by 66% of farmers (n=865 and 866 respectively). 'Benchmarking' by 730 farmers (55.4%) and 'risk management' by 730 farmers (55.2%).

Table 8 shows the frequencies and Chi-square test of differences among the key characteristics (indicated by the sign value of less than 0.5 and shaded in blue). Where the sig value was greater than 0.05 (with no shade), no further details will be discussed below.

Table 7 Distribution of current use of management tools and significance level of chi-square tests on key attributes

			currently using: Business plan		currently using: Benchmarking		Management accounting practices		currently using: Risk management		currently using: Accessing advice		
			Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
Total			N	464	759	389	836	700	562	425	794	878	370
			%	37.9%	62.1%	31.8%	68.2%	55.5%	44.5%	34.8%	65.2%	70.3%	29.7%
Age	18-24	N	7	4	2	9	9	3	5	6	7	4	
		%	63.6%	36.4%	18.2%	81.8%	75.0%	25.0%	45.5%	54.5%	63.6%	36.4%	
	25-44	N	142	176	138	178	203	127	117	199	229	90	
		%	44.7%	55.3%	43.7%	56.3%	61.5%	38.5%	37.0%	63.0%	71.8%	28.2%	
	45-64	N	242	442	206	474	375	320	228	445	485	208	
		%	35.4%	64.6%	30.3%	69.7%	54.0%	46.0%	33.9%	66.1%	70.0%	30.0%	
	65 and over	N	75	136	43	176	113	112	75	144	157	68	
		%	35.5%	64.5%	19.6%	80.4%	50.2%	49.8%	34.2%	65.8%	69.8%	30.2%	
	Sig value of Chi-square test			p=.009		p<.001		p=.020		p=.678		p=.889	
Farmer status	Mixed	N	99	135	96	141	157	87	95	140	177	64	
		%	42.3%	57.7%	40.5%	59.5%	64.3%	35.7%	40.4%	59.6%	73.4%	26.6%	
	Owner occupier	N	275	506	233	555	429	379	265	516	542	255	
		%	35.2%	64.8%	29.6%	70.4%	53.1%	46.9%	33.9%	66.1%	68.0%	32.0%	
	Tenant	N	92	117	60	141	114	96	65	138	159	51	
		%	44.0%	56.0%	29.9%	70.1%	54.3%	45.7%	32.0%	68.0%	75.7%	24.3%	
Sig value of Chi-square test			p=.022		p=.005		p=.008		p=.121		p=.047		
Main occupation	Full-time farmer	N	392	603	348	653	587	443	367	623	718	301	
		%	39.4%	60.6%	34.8%	65.2%	57.0%	43.0%	37.1%	62.9%	70.5%	29.5%	
	Part-time farmer	N	74	155	41	184	113	119	58	171	160	69	
		%	32.3%	67.7%	18.2%	81.8%	48.7%	51.3%	25.3%	74.7%	69.9%	30.1%	
Sig value of Chi-square test			p=.047		p<.001		p=.022		p<.001		p=.859		
Farm Type	Dairy	N	91	129	118	102	149	78	71	144	160	58	
		%	41.4%	58.6%	53.6%	46.4%	65.6%	34.4%	33.0%	67.0%	73.4%	26.6%	
	LFA Grazing Livestock (Beef & Sheep)	N	32	79	19	89	42	71	24	84	68	45	
		%	28.8%	71.2%	17.6%	82.4%	37.2%	62.8%	22.2%	77.8%	60.2%	39.8%	
	Lowland Grazing Livestock (Beef & Sheep)	N	70	156	42	184	94	136	62	165	157	72	
		%	31.0%	69.0%	18.6%	81.4%	40.9%	59.1%	27.3%	72.7%	68.6%	31.4%	
	Other (including Non-classifiable)	N	7	7	3	9	8	6	6	8	9	5	
		%	50.0%	50.0%	25.0%	75.0%	57.1%	42.9%	42.9%	57.1%	64.3%	35.7%	
	Cereals	N	104	134	82	159	157	88	113	130	175	71	
		%	43.7%	56.3%	34.0%	66.0%	64.1%	35.9%	46.5%	53.5%	71.1%	28.9%	
Mixed (including cereals and livestock)	N	160	254	125	293	250	182	148	263	308	119		
	%	38.6%	61.4%	29.9%	70.1%	57.9%	42.1%	36.0%	64.0%	72.1%	27.9%		
Sig value of Chi-square test			p=.016		p<.001		p<.001		p<.001		p=.162		
Region	East Anglia	N	54	59	39	74	79	40	49	66	89	28	
		%	47.8%	52.2%	34.5%	65.5%	66.4%	33.6%	42.6%	57.4%	76.1%	23.9%	
	East Midlands	N	41	69	29	83	59	54	39	71	82	32	
		%	37.3%	62.7%	25.9%	74.1%	52.2%	47.8%	35.5%	64.5%	71.9%	28.1%	
	North East	N	105	131	69	165	140	102	89	143	172	65	
		%	44.5%	55.5%	29.5%	70.5%	57.9%	42.1%	38.4%	61.6%	72.6%	27.4%	
	North West	N	46	109	38	113	78	83	39	113	94	62	
		%	29.7%	70.3%	25.2%	74.8%	48.4%	51.6%	25.7%	74.3%	60.3%	39.7%	
	South East	N	39	67	37	73	56	51	48	57	77	33	
		%	36.8%	63.2%	33.6%	66.4%	52.3%	47.7%	45.7%	54.3%	70.0%	30.0%	
	South West	N	140	250	142	250	223	182	126	264	293	107	
		%	35.9%	64.1%	36.2%	63.8%	55.1%	44.9%	32.3%	67.7%	73.3%	26.8%	
	West Midlands	N	39	73	35	77	64	49	36	77	71	41	
		%	34.8%	65.2%	31.3%	68.8%	56.6%	43.4%	31.9%	68.1%	63.4%	36.6%	
Sig value of Chi-square test			p=.023		p=.145		p=.105		p=.009		p=.026		

In terms of using “**business planning**”, the 18-24 age group, tenant farmers, full-time farmers, and cereal farmers and East Anglia farmers had the highest percentage of current use. Farmers aged 65 and over, owner-occupiers, part-time farmers, LFA grazing livestock farmers or North West farmers had the lowest number of users currently.

As regards “**benchmarking**”, no significant regional differences were found. Farmers in the age groups of 25-44, or full-time farmers, farmers with “mixed” status or dairy farmers were among the highest percentage of users of benchmarking.

“**Management accounting**” was used by 55.5% of farmers (n=568). Significant differences were found between age groups, farmer status, full-time (58%) and part-time (45.79%) farmers and farm type. Younger age groups, mixed-farm status, full time

farmers and dairy and cereal farmers reported the highest percentage of users. LFA and lowland livestock farmers reported the lowest percentage of users (37.2% and 40.9% respectively).

“**Risk management**” was used by 34.8% in the total sample. Significant differences were found by, occupation, farm type and region. Full-time farmers or cereals farmers or South East farmers, reported the highest percentage of use of “risk management”.

“**Accessing advice**” was used by 70.3% of farmers (n=878) in the total sample. Farmers in the North West (60.3%) and West Midlands (63.4%) or owner-occupier farmers (68%) reported the lowest percentages of seeking advice.

Of the farmers who provided answers to both “**current use**” and “**plan to start using in the next 12 months**”, a chi-square test was conducted on each pair. This showed significant movement from “no” to “yes” for all five management tools. For example, 71.7% of those who were currently not seeking advice planned to start seeking advice and 66.2% of those who were currently not using “**Business plan**” reported that they planned to start using it in the next 12 months. Details of the changes can be found in Table 9.

Table 8 Crosstabulation of current use of management tools by planning to use in the next 12 months

				Planning to start using in the next 12 months	Total who answered "To start using in the next 12 months"	Total who answered "currently using"	Total who answered "currently using" but missing in "To start using in the next 12 months"
				No			
Business plan (currently using)	No	N	160	313	473	759	286
		%	33.8%	66.2%	100.0%		37.7%
	Yes	N	2	103	105	467	362
		%	1.9%	98.1%	100.0%		77.5%
Total		N	162	416	578		
		%	28.0%	72.0%	100.0%		
Benchmarking (currently using)	No	N	213	270	483	838	355
		%	44.1%	55.9%	100.0%		42.4%
	Yes	N	1	84	85	390	305
		%	1.2%	98.8%	100.0%		78.2%
Total		N	214	354	568		
		%	37.7%	62.3%	100.0%		
Management accounting practices (currently using)	No	N	180	137	317	563	246
		%	56.8%	43.2%	100.0%		43.7%
	Yes	N	9	164	173	701	528
		%	5.2%	94.8%	100.0%		75.3%
Total		N	189	301	490		
		%	38.6%	61.4%	100.0%		
Risk management (currently using)	No	N	217	230	447	795	348
		%	48.5%	51.5%	100.0%		43.8%
	Yes	N	5	90	95	426	331
		%	5.3%	94.7%	100.0%		77.7%
Total		N	222	320	542		
		%	41.0%	59.0%	100.0%		
Accessing advice (currently using)	No	N	62	157	219	370	151
		%	28.3%	71.7%	100.0%		40.8%
	Yes	N	10	254	264	880	616
		%	3.8%	96.2%	100.0%		70.0%
Total		N	72	411	483		
		%	14.9%	85.1%	100.0%		

As explained at the start of the results section, some farmers completed the survey at the start of consultation period whilst others at the end. A comparison between those who completed the survey at the start (n = 1246 with up to 86 missing data) and those completed at the end (n=146 with up to 6 missing data) of the consultation period can be found in Fig. 34. Chi-square tests of the “**use of business management tools (either currently or planning to start using in the next 12 months)**” showed a significant higher number of “Yes” to using all five management tools amongst those who completed at the end of consultation period.

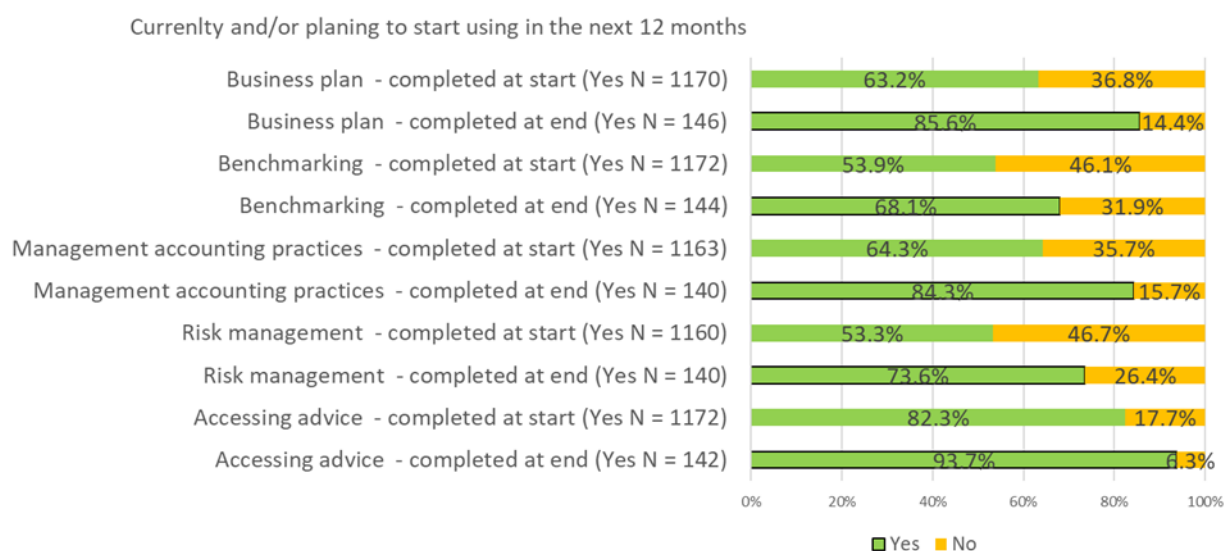


Figure 34 Distribution of responses of farmers' use of management tools (current and/or future use) who completed the survey at the start compared with those completed at the end of consultation (completed the survey once only)

Another group of farmers completed the survey twice (both at the start and at the end of the consultation period). A comparison of their responses at the start and at the end also showed significant increases of “yes” to using all five management tools at the end (Fig. 36).

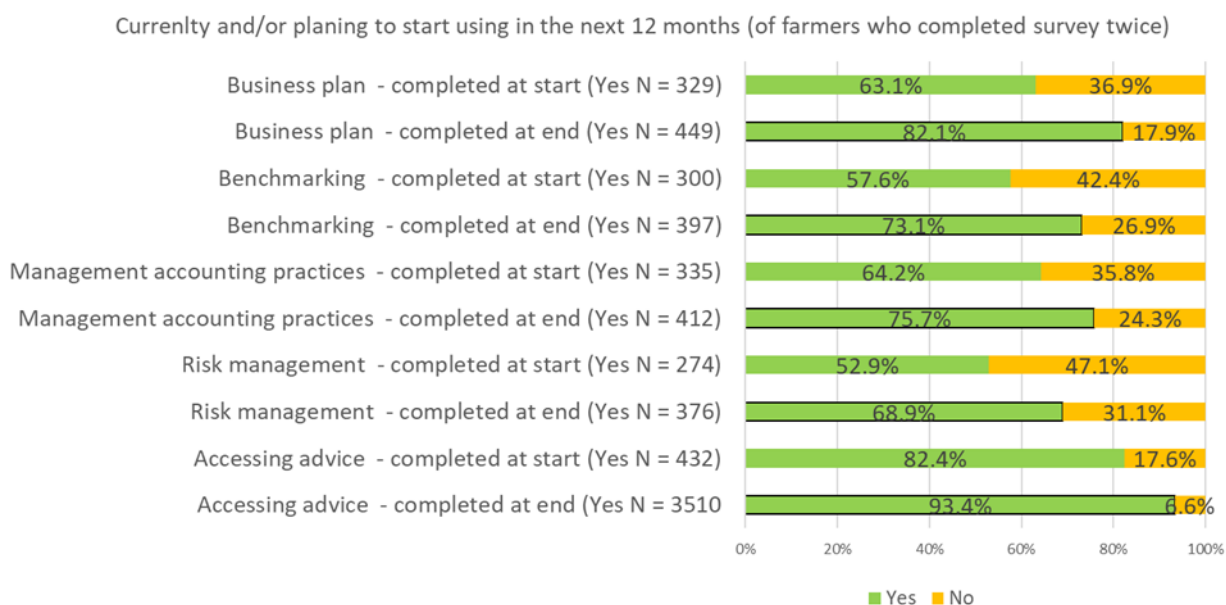


Figure 35 Distribution of responses at the start and at the end of consultation on use of management tools (current and/or future use) by farmers who completed the survey twice

3.6 Summary of the action plans from the free text

Action plans for each farmer discussed and agreed by the farmer but inputted by the consultants, were analysed using SPSS Modeller Premium software as described earlier in the methods section. Details of methods used for analysis were provided in the Methods section. Three key themes were identified:

- 1) Actions to mitigate BPS losses
- 2) Actions to improve business resilience
- 3) Actions to improve KPIs

The three key themes and their respective top-level categories are shown in Table 10 below. Not all farmers would consider taking all actions. However, each farmer had at least one action identified. The coverage of action identification was 100% (n=1607)¹⁰.

Table 9 Level 1 and Level 2 categories of actions

Key actions categories	Total count (out of the total valid sample n=1607)	Valid %
All categories	1607	100%
Actions to mitigate BPS losses	1545	96.1%
● Schemes engagement (environment & prosperity)	1420	88.4%
● Diversifying income sources	861	53.6%
● Improving efficiency and cost reduction	846	52.6%
● Increasing income from current and new farm enterprises	814	50.7%
Actions to improve business resilience	1565	97.4%
● Long-term planning	1385	86.2%
● Comparing with others	1098	68.3%
● Costs and income review	965	60.0%
● Focusing on detail	814	50.7%
● Knowledge and innovation management	542	33.7%
● Changing business model and/or system	457	28.4%
● Understanding the market	274	17.1%
Actions to improve KPIs	1249	77.7%
● Improving productivity	586	36.5%
● Reducing environmental Impact	557	34.7%
● Improving profitability	282	17.5%

Note: Level 1 categories are in bold and level 2 categories are the child nodes under level 1, indicated by bullet points.

Figure 37 shows that no major differences existed across different age groups, farmer status or full-time farmers vs part-time farmers. Therefore, no detailed comparisons will be provided for those type of attributes. Regional differences existed. However, such differences may be closely related to the predominance of certain farm types in each region. Therefore, regional differences are not discussed in the main report, but can be found in Appendix 5.

¹⁰ The project is still ongoing and more actions will be available later. In this dataset, there were 162 farmers who had no action plans yet as of 6 June 2022.

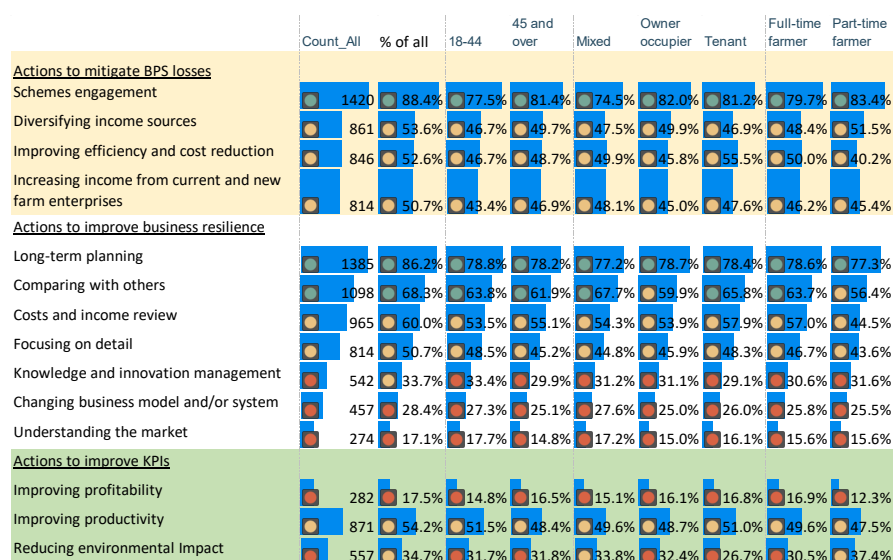


Figure 36 Comparison of level one and level 2 actions by age groups, farmer status and main occupation

Table 9 below shows that there were some differences across farm types. Cells highlighted in green indicate the highest percentage and cells in pink, the lowest percentage for each action category. For farm type, if 'other' farm type had the highest or lowest percentage, the next highest or lowest sector was also highlighted.

Table 10 Level 1 and Level 2 categories of actions by farm type

	Count_All	% of all	LFA Lowland					
			Dairy	Grazing	Grazing	Other	Cereals	Mixed
Actions to mitigate BPS losses	1545	96.1%	89.0%	87.0%	90.2%	85.0%	83.6%	86.9%
Schemes engagement	1420	88.4%	80.1%	81.4%	86.1%	80.0%	75.2%	79.2%
Diversifying income sources	861	53.6%	36.1%	54.7%	49.7%	40.0%	56.1%	48.7%
Improving efficiency and cost	846	52.6%	55.7%	36.0%	43.2%	45.0%	52.4%	47.7%
Increasing income from current and new farm enterprises	814	50.7%	50.2%	44.7%	44.8%	40.0%	41.2%	48.0%
Actions to improve business resilience	1565	97.4%	92.1%	88.8%	89.1%	85.0%	84.8%	88.3%
Long-term planning	1385	86.2%	85.6%	84.5%	81.3%	65.0%	68.5%	77.0%
Comparing with others	1098	68.3%	62.2%	59.6%	58.4%	65.0%	61.2%	65.1%
Costs and income review	965	60.0%	58.4%	54.0%	50.5%	50.0%	51.5%	57.0%
Focusing on detail	814	50.7%	50.9%	39.1%	44.3%	30.0%	42.7%	48.8%
Knowledge and innovation	542	33.7%	32.0%	28.6%	28.0%	20.0%	32.1%	31.7%
Changing business model and/or	457	28.4%	21.0%	23.0%	27.7%	15.0%	27.0%	27.5%
Understanding the market	274	17.1%	10.0%	23.0%	20.7%	10.0%	12.4%	14.9%
Actions to improve KPIs	1249	77.7%	78.7%	71.4%	74.2%	65.0%	63.6%	68.3%
Improving profitability	282	17.5%	19.9%	17.4%	16.0%	10.0%	12.1%	15.9%
Improving productivity	871	54.2%	62.5%	51.6%	51.1%	35.0%	39.7%	46.6%
Reducing environmental Impact	557	34.7%	26.5%	23.6%	34.2%	35.0%	33.0%	33.4%
Carbon audit	214	13.3%	8.2%	10.6%	7.9%	20.0%	17.9%	13.4%

In principle, more actions identified means more areas for improvement for the farmer. As shown in Table 10, dairy sector had the highest number of actions identified to the highest percentage of farmers, followed by lowland livestock farmers. This may to some extent correlate with the structured survey findings on farm business KPIs that dairy and lowland livestock farmers scored the lowest on KPI assessment (Fig. 13).

3.6.1 Actions to mitigate BPS losses

Actions to mitigate loss of direct payments were identified for 96.1% of the farmers (n=1,545), and each category of actions were identified for more than 50% of the farmers. The four categories are presented below in descending order of frequency:

- Schemes engagement (n=1420, 88.4%)
- Diversifying income sources (n=861, 53.6%)
- Improving efficiency and cost reduction (n=846, 52.6%)
- Increasing income from current and new farm enterprises (n=814, 50.7%)

Table 11 shows the details of each category of actions to mitigate BPS losses. Unsurprisingly, **schemes engagement** was identified for 88.4% of farmers as the payment from the schemes was seen as a direct replacement for the loss of BPS. However, as reported in Section 3.4.1, the self-administered survey showed that apart from Countryside Stewardship Scheme, interests in other schemes, particularly in the new ELMs, were low, hence higher number of recommendations from the consultants perhaps in their discussions with farmers. Actions around the ELMs tended to be associated with “wait and see” type of language. This corroborates with the findings of Huang et al. (2022) which suggested that uncertainties around the payment rates and standards the ELMs as perceived by farmers were the key deterrents for engagement.

“ was another popular action identified for 53.6% of farmers, higher than the survey results (39.3%). The types of activities for diversification were largely in line with national trends as reported in 2020/21 Farm Accounts (DEFRA, 2022). Popular choices included letting farm premises for non-farm use, farm shop or direct selling, holiday and tourisms, events and hospitality and recreational activities. One choice not specified in the Farm Accounts report which stood out, was ‘carbon income’.

“ was identified by 52.6% of farmers although the specific areas for cost reduction varied, with no single item picked up by more than a quarter of the farmers. Reducing supply costs was the most common one (24.9%). This action was perhaps closely related to the increase of supply costs over the last few years, and more recently, the impact of the Ukraine war. Reduction of fertiliser use also aligns with the environmental schemes. Therefore, it has the potential of being low hanging triple wins.

Another interesting action is ‘**scaling up**’ which was picked up by 17% of the farmers in the consultation. This was lower than the survey results where 30% of farmers planned to expand the business, but still was one of the more popular actions to be taken by farmers.

Table 11 also shows the differences across farm type. Dairy farmers had the highest percentage in **actions to improve efficiency and cost reduction**. Lowland livestock farmers had the highest percentage in **schemes engagement** whilst cereal farmers had the highest percentage in diversifications (particularly on carbon income, contracting work and farm premise letting).

Table 11 Key themes of actions to mitigate the reduction of BPS for the total sample and by farm type

	Count	All % of all	Dairy	LFA Grazing	Lowland Grazing	Other	Cereals	Mixed
Actions to mitigate BPS losses	1545	96.1%	89.0%	87.0%	90.2%	85.0%	83.6%	86.9%
Diversifying income sources	861	53.6%	36.1%	54.7%	49.7%	40.0%	56.1%	48.7%
Alternative sources of income_Generic	514	32.0%	18.6%	31.7%	25.8%	25.0%	36.4%	31.5%
Carbon income	101	6.3%	1.7%	3.1%	4.1%	5.0%	10.6%	6.7%
Contracting work	20	1.2%	0.3%	1.2%	0.5%	0.0%	0.9%	2.0%
Events, education and hospitality	81	5.0%	5.5%	6.8%	4.3%	0.0%	4.2%	4.0%
Farm premises related alternative income	373	23.2%	17.5%	19.9%	19.8%	25.0%	24.8%	21.5%
Farm shop or direct selling	48	3.0%	4.5%	2.5%	3.0%	0.0%	0.9%	2.9%
Holiday and tourism	222	13.8%	7.6%	19.9%	16.8%	5.0%	8.5%	12.9%
Off-farm employment	75	4.7%	1.4%	8.1%	7.1%	0.0%	2.1%	4.2%
Recreational businesses	89	5.5%	1.0%	5.0%	6.0%	0.0%	4.8%	6.7%
Renewable energy	64	4.0%	4.5%	3.7%	2.7%	0.0%	3.6%	3.9%
Improving efficiency and cost reduction	846	52.6%	55.7%	36.0%	43.2%	45.0%	52.4%	47.7%
Improve efficiency	129	8.0%	8.6%	5.6%	7.3%	10.0%	5.5%	7.9%
Scaling down	15	0.9%	1.7%	0.0%	1.6%	0.0%	0.3%	0.5%
General cost reduction	185	11.5%	12.0%	3.7%	6.3%	20.0%	17.0%	10.1%
Capital cost reduction	40	2.5%	2.1%	1.2%	2.4%	0.0%	3.0%	2.2%
Labour costs reduction	21	1.3%	2.4%	0.0%	0.5%	10.0%	0.9%	1.2%
Machinery cost reduction	256	15.9%	15.8%	10.6%	10.1%	5.0%	18.5%	15.8%
Overheads cost reduction	98	6.1%	8.9%	4.3%	5.2%	0.0%	3.9%	5.5%
Production cost reduction	287	17.9%	19.2%	11.8%	15.8%	0.0%	17.0%	16.4%
Supply cost reduction	400	24.9%	29.2%	22.4%	23.9%	25.0%	18.5%	21.0%
Increasing income from current and new farm enterprises	814	50.7%	50.2%	44.7%	44.8%	40.0%	41.2%	48.0%
Increase Income_Generic	674	41.9%	42.3%	39.1%	37.5%	35.0%	33.3%	38.9%
Develop new markets	78	4.9%	2.7%	5.6%	3.8%	5.0%	4.2%	5.4%
Scaling up	273	17.0%	18.6%	10.6%	17.1%	10.0%	9.1%	18.0%
Schemes engagement	1420	88.4%	80.1%	81.4%	86.1%	80.0%	75.2%	79.2%
Join schemes_Non-specific	1040	64.7%	56.4%	62.7%	66.0%	65.0%	55.5%	56.0%
Join Named Schemes	1221	76.0%	69.8%	72.0%	73.1%	60.0%	63.6%	68.5%
Schemes related to environment	1285	80.0%	73.9%	74.5%	78.3%	60.0%	67.6%	71.1%
ELMs (SFI)	530	33.0%	24.4%	33.5%	30.4%	25.0%	31.8%	30.4%
ELMs (excl. SFI)	834	51.9%	45.0%	47.2%	50.3%	30.0%	47.9%	46.1%
Countryside Stewardship	982	61.1%	56.7%	55.3%	62.0%	50.0%	53.3%	52.2%
Environmental Stewardship	171	10.6%	4.5%	14.3%	10.3%	10.0%	9.4%	10.6%
Forestry Commission Incentives	16	1.0%	0.3%	2.5%	1.4%	0.0%	0.9%	0.5%
Farmers in Protected Landscape	66	4.1%	2.1%	14.3%	4.6%	0.0%	1.2%	2.7%
Catchment Sensitive Area	86	5.4%	8.9%	5.0%	4.6%	5.0%	3.3%	3.9%
AHWP	51	3.2%	3.8%	8.7%	3.3%	0.0%	0.6%	2.0%
Schemes related to prosperity	115	7.2%	12.0%	7.5%	5.2%	0.0%	5.8%	4.9%
Farm Investment Fund	61	3.8%	3.8%	2.5%	3.0%	0.0%	4.5%	3.4%
Slurry Investment Fund	23	1.4%	4.8%	2.5%	0.3%	0.0%	0.3%	0.3%
Innovation and Development Fund	19	1.2%	1.0%	0.0%	1.9%	0.0%	0.9%	1.0%
New Entrant Support	39	2.4%	4.5%	3.7%	2.2%	0.0%	0.9%	1.5%

Note: Cells highlighted in green indicate the highest percentage and cells in pink, the lowest percentage for each action category. For farm type, if 'other' farm type had the highest or lowest percentage, the next highest or lowest sector was also highlighted.

3.6.2 Actions to improve business resilience

Actions to improve business resilience fall into seven sub themes as listed below in order of popularity:

- 1) Long-term plan (86.2%)
- 2) Compare with others (68.3%)
- 3) Review of costs and income (60%)
- 4) Focus on details (50.7%)
- 5) Knowledge and innovation management (33.7%)
- 6) Changing business model and/or system (28.4%)
- 7) Understand the market (17.1%)

Sub themes under each of the categories and frequencies of mentioning can be found in Table 12.

Of all the actions identified to improve business resilience, **long-term planning** scored highest, particularly on succession of business. This was very much in line with the age profile of the farmers given that 73.8% of the respondents were 45 years or older and this action was identified by 78.5% of the farmers. Another action picked up in the discussions was **to monitor or track performance** (56.3%) which included benchmarking, selected by 31.8% of farmers in their questionnaire self-assessment. Other specific actions which were identified by more than 20% of the farmers included: reviewing costs, identifying profitable areas, managing details, focus, setting budgets, setting goals and visions and improving infrastructure.

Table 12 shows the differences across farm types and regions. Dairy sector had the highest percentages of farmers taking actions in reviewing costs, identifying profitable areas, budget setting and focus whilst more lowland livestock farmers picked up actions on collaboration, changing enterprise systems (e.g. organic conversion) and setting goals and visions. More cereal farmers were considering actions such as changing business model, benchmarking, financial management, risk assessment and adopting new technologies. Mixed farms were high on monitoring or tracking performance, managing details and employee management (perhaps due to more complexity than non-mixed farm types).

Table 12 Key themes of actions to improve business resilience for the total sample and by farm type

	Count	All % of all	Dairy	LFA Grazing	Lowland Grazing	Other	Cereals	Mixed
Actions to improve business resilience	1565	97.4%	92.1%	88.8%	89.1%	85.0%	84.8%	88.3%
Changing business model and/or system	457	28.4%	21.0%	23.0%	27.7%	15.0%	27.0%	27.5%
Changing Business model	233	14.5%	9.3%	9.9%	12.2%	5.0%	19.7%	13.3%
Change business model Generic	13	0.8%	0.3%	0.6%	0.8%	0.0%	0.9%	0.8%
Change borrowing	6	0.4%	1.0%	0.0%	0.3%	0.0%	0.3%	0.2%
Collaborations	102	6.3%	4.1%	6.2%	6.5%	5.0%	5.5%	6.2%
New marketing outlets	8	0.5%	0.0%	1.2%	0.3%	0.0%	0.3%	0.7%
Share farming	88	5.5%	3.1%	0.6%	3.0%	0.0%	11.8%	4.7%
Specialise	36	2.2%	2.1%	1.2%	1.9%	0.0%	2.7%	2.0%
Changing enterprise systems	219	13.6%	10.3%	12.4%	14.7%	10.0%	8.2%	14.3%
System change generic	100	6.2%	5.8%	9.3%	6.3%	10.0%	1.8%	6.2%
Change farming practices generic	32	2.0%	2.1%	0.6%	1.6%	0.0%	0.9%	2.5%
Crop rotation	18	1.1%	0.0%	0.6%	0.3%	0.0%	2.1%	1.5%
Organic conversion	58	3.6%	1.7%	0.6%	5.4%	0.0%	3.6%	3.4%
Entering new farming sector	32	2.0%	1.0%	2.5%	2.4%	0.0%	0.6%	2.3%
Mindset for change	91	5.7%	6.2%	5.0%	6.8%	0.0%	3.0%	5.0%
Comparing with others	1098	68.3%	62.2%	59.6%	58.4%	65.0%	61.2%	65.1%
Benchmarking	510	31.7%	28.9%	24.8%	25.0%	25.0%	31.5%	30.9%
Monitor or Tracking performance	904	56.3%	50.2%	49.1%	49.2%	50.0%	49.4%	54.2%
Costs and income review	965	60.0%	58.4%	54.0%	50.5%	50.0%	51.5%	57.0%
Compare multiple suppliers	55	3.4%	4.1%	2.5%	3.0%	10.0%	4.5%	1.8%
Financial management	192	11.9%	8.6%	8.1%	10.3%	10.0%	14.8%	10.7%
General review of costs	748	46.5%	44.7%	40.4%	40.2%	35.0%	39.4%	44.6%
Identify profitable areas	404	25.1%	25.4%	23.6%	18.5%	25.0%	22.1%	24.2%
Focusing on detail	814	50.7%	50.9%	39.1%	44.3%	30.0%	42.7%	48.8%
Employee management	314	19.5%	20.6%	16.1%	13.6%	10.0%	15.8%	20.8%
Focus	426	26.5%	29.9%	14.3%	24.7%	15.0%	22.7%	24.3%
Managing details	381	23.7%	20.3%	16.8%	18.2%	15.0%	23.9%	24.3%
Risk assessment	127	7.9%	4.8%	4.3%	4.3%	5.0%	14.2%	6.9%
Time management	42	2.6%	1.7%	3.7%	2.2%	0.0%	1.8%	2.9%
Knowledge and innovation management	542	33.7%	32.0%	28.6%	28.0%	20.0%	32.1%	31.7%
Adopting new technologies	282	17.5%	16.5%	12.4%	13.3%	10.0%	19.4%	16.4%
Knowledge exchange	23	1.4%	1.0%	0.6%	1.1%	0.0%	2.4%	1.2%
Seeking advice Generic	306	19.0%	17.5%	16.1%	17.7%	10.0%	15.5%	18.6%
Seeking advice AHDB	389	24.2%	19.2%	19.9%	20.4%	35.0%	24.2%	23.0%
Seeking advice Gov.UK & Defra	254	15.8%	13.4%	17.4%	13.0%	20.0%	18.2%	12.4%
Seeking advice Other websites	233	14.5%	13.7%	9.9%	14.9%	20.0%	13.6%	12.2%
Long-term planning	1385	86.2%	85.6%	84.5%	81.3%	65.0%	68.5%	77.0%
Budget setting	578	36.0%	38.5%	27.3%	29.1%	25.0%	32.1%	33.9%
Set goals and visions	463	28.8%	24.4%	19.3%	29.6%	30.0%	28.2%	25.5%
Improve infrastructure	370	23.0%	22.0%	25.5%	22.6%	15.0%	16.1%	21.0%
Succession plan	1262	78.5%	80.1%	78.3%	75.5%	55.0%	61.5%	68.8%
Other exit plan	184	11.4%	7.9%	14.3%	11.7%	5.0%	12.4%	8.7%
Exit plan generic	31	1.9%	2.7%	3.7%	2.2%	0.0%	0.9%	1.0%
LumpSum scheme	34	2.1%	1.0%	3.1%	2.7%	0.0%	2.4%	1.3%
Retire	131	8.2%	4.1%	11.2%	6.8%	5.0%	10.0%	6.9%
Selling property	22	1.4%	0.7%	2.5%	2.2%	0.0%	0.3%	1.2%
Understand the market	274	17.1%	10.0%	23.0%	20.7%	10.0%	12.4%	14.9%

Note: Cells highlighted in green indicate the highest percentage and cells in pink, the lowest percentage for each action category. For farm type, if 'other' farm type had the highest or lowest percentage, the next highest or lowest sector was also highlighted.

3.6.3 Actions related to KPIs

Actions related to KPIs fall into three main categories: performing well, reducing environmental impact and improving productivity. Any actions overlapping with BPS loss mitigation or business resilience improvement actions were grouped as such. In descending order, the key actions were:

- Improving productivity (36.5%), particularly for livestock farmers (23.1%)
- Reducing environmental impact (34.7%) through nutrient management (10.8%), grassland management and planting multispecies
- Improving profitability (17.5) particularly for those likely to have made a loss without BPS or reported negative profit margins.
- Carbon auditing (13.3%)

Table 13 shows the breakdown of the details under each category for the total sample and by farm type.

Table 13 Key themes of actions to improve KPIs for the total sample and by farm type

	Count	All % of all	Dairy	LFA Grazing	Lowland Grazing	Other	Cereals	Mixed
Actions to improve KPIs	1249	77.7%	78.7%	71.4%	74.2%	65.0%	63.6%	68.3%
Improving profitability	282	17.5%	19.9%	17.4%	16.0%	10.0%	12.1%	15.9%
Margin negative	145	9.0%	9.3%	8.1%	10.3%	5.0%	7.3%	7.0%
Not profitable without BPS	154	9.6%	11.0%	10.6%	7.3%	5.0%	5.2%	10.1%
Improving productivity	871	54.2%	62.5%	51.6%	51.1%	35.0%	39.7%	46.6%
General productivity improvement	586	36.5%	44.0%	28.6%	29.6%	30.0%	31.5%	32.0%
Improve animals productivity	497	30.9%	42.3%	34.8%	38.6%	5.0%	10.0%	23.8%
Animals generic productivity	372	23.1%	34.7%	22.4%	28.0%	5.0%	9.1%	16.9%
Dairy	109	6.8%	23.4%	2.5%	3.8%	0.0%	1.2%	3.2%
Production Beef	143	8.9%	1.0%	14.9%	15.8%	5.0%	0.3%	9.4%
Production Lamb	40	2.5%	0.0%	5.6%	5.2%	0.0%	0.0%	2.0%
Improve productivity Cereals	84	5.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Reducing environmental impact	557	34.7%	26.5%	23.6%	34.2%	35.0%	33.0%	33.4%
Generic environmental impact management	119	7.4%	8.2%	6.2%	5.2%	5.0%	8.8%	6.0%
Grassland management	137	8.5%	5.5%	6.8%	15.2%	10.0%	3.0%	7.0%
Mitigating drought	13	0.8%	0.3%	0.0%	0.3%	0.0%	1.2%	1.2%
Multispecies crops	124	7.7%	6.9%	8.1%	11.7%	0.0%	0.6%	7.7%
Nutrient management	174	10.8%	8.9%	7.5%	6.0%	5.0%	12.1%	12.2%
Carbon audit	214	13.3%	8.2%	10.6%	7.9%	20.0%	17.9%	13.4%

Note: Cells highlighted in green indicate the highest percentage and cells in pink, the lowest percentage for each action category. For farm type, if 'other' farm type had the highest or lowest percentage, the next highest or lowest sector was also highlighted.

Whilst **improving productivity** were picked by over half of the farmers, more livestock farmers, particularly beef and dairy farmers identified this as an action. As mentioned earlier, dairy farmers in this sample had lower than national average performance with 11% of dairy farmers identified as not profitable without BPS, and 62.5% of dairy farmers in this sample considered improving productivity. 10.3% of lowland farmers were identified as having negative profit margin and needing to improve productivity of beef production.

Just like actions to improve productivity, actions to reduce environmental impacts were very farm type-specific. Managing grassland and planting multispecies were identified to more lowland farmers than other farm types. Nutrient management was identified for more mixed farms and cereal farms. Mixed farming system by nature lends itself to this as one of the farmers interviewed by the team previously indicated that “a mixed farm is a massive recycling machine”. Carbon audit was identified for more cereal farmers (17.9%).

3.7 A typology of farmers

Typologies have been used for targeted policy making and communication with farmers. They have the distinct advantages of reducing multi-dimensionality and the complexity of farmers' decision making to manageable levels and enabling realistic comparisons. Typologies can also be helpful in identifying empirical examples.

This part of analysis aimed to explore whether there was a way to segment the responding farmers based on their business resilience assessment, their current performance (KPI scores), their feelings about the future and their change orientations. A two-step cluster analysis was conducted based on the following six items:

- Business resilience assessment (mean score)
- Current performance (KPI mean score)
- How do you feel about the future of farming?
- How confident are you that you can respond to any changes needed?
- Do you feel you will need to make changes to your business in the next 3-5 years?
- To what extent are you planning on making any changes to your business to become more productive and/or profitable?

This analysis generated three clusters with a fair model quality (Fig. 37), an acceptable measure as shown below. The clusters were based on 881 valid responses (888 missing in one or more scores).

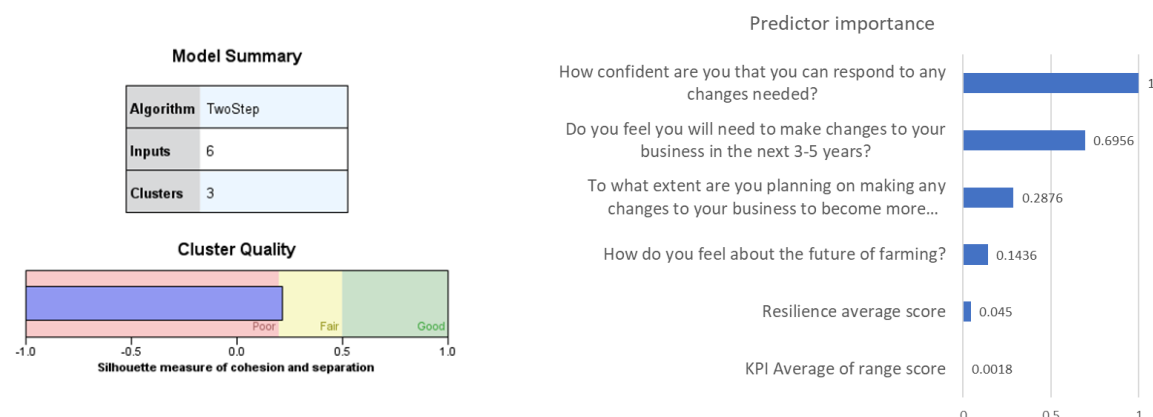


Figure 37 Model summary of two-step cluster analysis and predictor importance

The importance of the seven variables in determining the clusters is presented in Fig. 37 (right). Confidence in responding to changes needed has the highest power to distinguish different types of farmers. This was followed by recognition of the need to make changes in the next 3-5 years and the intention of making any changes to the farm business. This is a very interesting finding as the three items are closely related to the concept of resilience capacities: adaptability and transformability¹¹.

As in any segmentation analysis, the division of the segments was not entirely clear-cut. The interpretation of the key features of each type was based on whether the percentage in a particular type was higher than the other types. Therefore, readers are reminded that no assumptions should be made on the basis of "all type 1 members are". Instead, the approach taken in the following section was "There are more type 1 members who have displayed feature".

Table 14 shows the cluster membership of the analysis and the how each type differ from the others on the six key dimensions.

¹¹ Meuwissen, M. P. M., et al. (2019). "A framework to assess the resilience of farming systems." AGRICULTURAL SYSTEMS 176.

Table 14: Cluster membership of the two-step analysis and the KPI mean scores and farm business resilience mean scores for each cluster.

		Type 1 Forward- facing Adventurers	Type 2 Conservative Performers	Type 3 Adaptable Pragmatists	Total
Cluster distribution	N	207	238	436	881
	% within valid total	23.5%	27.0%	49.5%	100.0%
KPI assessment Mean score	Mean	3.36	3.48	3.41	3.42
Self-reported Resilience mean score	Mean	3.50	3.09	3.22	3.25
Feel about the future of farming					
● I don't know	Count	18	51	46	115
	% within Type	8.7%	21.4%	10.6%	13.1%
● Not at all positive	Count	21	63	96	180
	% within Type	10.1%	26.5%	22.0%	20.4%
● Somewhat positive	Count	102	109	272	483
	% within Type	49.3%	45.8%	62.4%	54.8%
● Very positive	Count	66	15	22	103
	% within Type	31.9%	6.3%	5.0%	11.7%
Responding to any changes needed					
● I don't know	Count	13	63	0	76
	% within Type	6.3%	26.5%	0.0%	8.6%
● Not at all confident	Count	1	31	28	60
	% within Type	0.5%	13.0%	6.4%	6.8%
● Somewhat confident	Count	0	114	408	522
	% within Type	0.0%	47.9%	93.6%	59.3%
● Very confident	Count	193	30	0	223
	% within Type	93.2%	12.6%	0.0%	25.3%
Changes to business in the next 3-5 years					
● will need to make changes to my business	Count	203	56	436	695
	% within Type	98.1%	23.5%	100.0%	78.9%
● I do not need to change my business	Count	2	42	0	44
	% within Type	1.0%	17.6%	0.0%	5.0%
● I do not know what changes I need to make	Count	2	140	0	142
	% within Type	1.0%	58.8%	0.0%	16.1%
Planning on making any changes					
● I am not planning on making changes	Count	0	52	0	52
	% within Type	0.0%	21.8%	0.0%	5.9%
● I am planning to make changes in the future	Count	32	120	149	301
	% within Type	15.5%	50.4%	34.2%	34.2%
● I am planning to make changes imminently	Count	39	16	83	138
	% within Type	18.8%	6.7%	19.0%	15.7%
● I am already making changes	Count	133	42	204	379
	% within Type	64.3%	17.6%	46.8%	43.0%
● no change needed	Count	3	8	0	11
	% within Type	1.4%	3.4%	0.0%	1.2%

The three clusters were then tested against their key characteristics such as farm size, farmers' main occupation, farmer status, age, region, farmer type and their current/future engagement with environmental schemes. Region, farmer status and some farm types (dairy, cereals, LFA grazing) did not show any statistically significant difference within the three clusters and will not be discussed further below.

Table 15 presents the attributes which showed statistically significant differences across the three clusters. They are farm size, farmers' main occupation (full-time vs. part-time farmers), age (under 45 vs 45 or above), farm type (lowland grazing and mixed farm) and engagement with environmental schemes such as Countryside Stewardship, Farmers in Protected Landscape, AHWP, as well as the Farm Investment Fund and the Farming Innovation Fund.

Table 155 Attributes of three types of farmers identified by two-step cluster analysis

		Type 1 Forward- facing Adventurers	Type 2 Conservative Performers	Type 3 Adaptable Pragmatists	Total	Sig.
Cluster distribution	N	207	238	436	881	
% within valid total		23.5%	27.0%	49.5%	100%	
Farm size	Mean	292	167	226	226	<.001*
Farmer's main occupation						.005
Full-time farmer	N	181	179	358	718	
% within type		87.4%	75.5%	82.1%	81.6%	
Part-time farmer	N	26	58	78	162	
% within type		12.6%	24.5%	17.9%	18.4%	
Farm Type (only significantly different types shown here)						
Mixed (Cereals and livestock)	N	83	61	153	297	.004
% within type		40.1%	25.6%	35.1%	33.7%	
Lowland Grazing	N	26	58	84	168	.007
% within type		12.6%	24.4%	19.3%	19.1%	
Age						<.001
45 or over	N	135	191	308	634	
% within type		65.2%	80.6%	70.6%	72.0%	
18-44	N	72	46	128	246	
% within type		34.8%	19.4%	29.4%	28.0%	
Engagement with environmental schemes (only significantly different ones shown here)						
Countryside stewardship	N	151	153	342	646	<.001
% within type		72.9%	64.3%	78.4%	73.3%	
Farm in protected landscapes	N	17	8	36	61	.040
% within type		8.2%	3.4%	8.3%	6.9%	
AHWP	N	27	18	80	125	<.001
% within type		13.0%	7.6%	18.3%	14.2%	
Farm Investment Fund	N	64	30	108	202	<.001
% within type		30.9%	12.6%	24.8%	22.9%	
Farming Innovation Fund	N	32	18	46	96	.027
% within type		15.5%	7.6%	10.6%	10.9%	

*ANOVA test for farm size and Chi-square test for all others.

Notes: Green shade indicate the highest of the three types and the downward arrow indicates the lowest of the three types.

Type 1 farmers – Forward-facing Adventurers

This type of farmers reported the lowest KPI performance but the highest level of business resilience of all three clusters. They were the most positive about the future of farming, and more confident about responding to the changes needed. They recognise that they will need to make changes to their business (possibly due to a need to improve performance) and the majority of this cluster have already been making changes. Based on those features, they were labelled as “**Forward-facing Adventurers**”

This group of farmers tend to be larger in size and more likely to be full-time farmers. There were more younger farmers (below 45) and more mixed farm types in this group than the other two clusters. More farmers in this group have engaged, or, will engage with the Farm Investment Fund and Farming Innovation Fund.

Type 2 farmers – Conservative Performers

Type 2 farmers seemed to be the opposite of Type 1 farmers. They reported the highest KPI performance but the lowest level of business resilience of all three clusters. There were more farmers in this group who were not positive about the future or don't know about how they feel about the future of farming, or not feeling confident about responding to changes needed. More farmers in Type 2 were less likely to make changes. More Type 2 farmers felt that they did not need to change their business or did not know what changes to make. There were also more Type 2 farmers than in the other two clusters who were not planning on making changes or planning on making changes in the future. Therefore, they were labelled as “**Conservative Performers**”. It is likely that this type of farmers liked focusing on what they were good at – farming and did not see any necessity for making changes.

Conservative Performers tend to have smaller farms than the other two types. There were more part-time farmers in this group. There were a higher percentage of lowland grazing farmers but a lower percentage of mixed farm types in this group than the other two types. More Conservative Performers were 45 or older and had the lowest percentages of farmers engaging with Government funding schemes.

Type 3 farmers – Adaptable Pragmatists

Type 3 farmers sit in the middle between Type 1 and Type 2 in terms of their KPI scores and self-reported business resilience. More type 3 farmers than the other two clusters selected “Somewhat positive” about the future of farming, “somewhat confident” about responding to changes needed, and “I am planning to make changes imminently”. All Type 3 farmers felt that they will need to make changes to their business. Therefore, they were labelled as “**Adaptable Pragmatists**”. These type of farmers are prepared to change as they identify opportunities to improve.

More Balanced Pragmatists have attributes sitting in the middle, between Type 1 and Type 2. This includes farm size (the same as the total mean) and main occupation. There were more 45 or older farmers in the Balanced Pragmatists group than in Type 1 (Forward Adventurers), but more younger farmers (below 45) than Type 2 group (Conservative Performers). However, Balanced Pragmatists had the highest percentage in engaging with Countryside Stewardship Scheme, Farm in Protected Landscapes and AHWP of all three farmer types.

4. Conclusion

In conclusion, the sampled farms and farmers were largely representative of the farming sector and regions in England. The majority of farms will remain profitable with the reduction of direct payments although most farms will be negatively affected by the reduction.

Farms scoring highly on KPI's tended to also score highly on business resilience. In general, larger farms were more likely to have scored higher on KPI assessment and on business resilience, however there were some nuances across different farm groups.

In terms of the farms' performance, **KPI review** showed that nearly half (48% of the valid sample) of the farms were under-performing, i.e. rated as “room to improve” or “review performance” or lower. Of all farming types and regions, more dairy farms and more farms in the North West were under-performing compared to other farm types or regions. On average, dairy farms scored the lowest on KPI assessment whilst cereals and mixed farms scored the highest on KPI. When regions were

considered, cereal farmers in the North West had the lowest KPI score, whilst LFA farms in the South East and West Midlands reported the highest score on KPI (excluding “other” type).

In regards to **farm business resilience**, significant differences existed across different age groups, farmer status, farmer occupation, regions, and farm types. Younger farmers, tenant farmers, full time farmers reported a higher level of business resilience than other groups. The 65 and over age group, farmers with mixed ownership status or part-time farmers reported the lowest level of business resilience. Dairy and cereal farmers reported the highest level of resilience, whilst livestock farmers, particularly LFA livestock farmers reported the lowest level of resilience on average.

The way farmers **feel about the future** and **confidence in responding to changes** also varied across different groups. Younger farmers (the under-45 group), tenant farmers and farmers in East Midlands felt more positive about the future of farming. More younger farmers or full-time farmers expressed confidence than older farmers or part-timer farmers in **responding to changes needed**.

Slightly more full-time farmers (80.68%) indicated that they will **need to make changes** to their business compared to 76.11% of part-time farmers. More mixed farmers, cereal farmers and dairy farmers indicated a **need to change** than any other farm type. Livestock farmers (LFA and Lowland) had the lowest percentage of farmers (75.6%) indicating a **need to change** in the next 3-5 years.

More full-time farmers and younger farmers (age group 25-44) **were already making changes** whilst more older farmers and part-time farmers were **not planning on making changes**.

As for **future actions**, younger farmers were more likely to **expand the business, diversify, stay in farming but increase productivity**, whilst older farmers were more likely to **consolidate the business** or, unsurprisingly, **plan successions or retirement**.

Of all the **schemes**, Countryside Stewardship was/will be engaged by most farmers, followed by SFI and the Farm Investment Fund.

Regarding the responses of **management tools currently used and will use in the next 12 months** with binary answers (yes or no). “Accessing advice” (70.3%) and “management accounting practices” (55.5%) were the top 2 most used and “benchmarking” (31.8%) and “risk management” (34.8%) were the least to be used in the next 12 months. Overall, the 18-24 age group, tenant farmers, full-time farmers, Cereal farmers or East Anglia farmers were more likely to use business planning. Younger farmers, or farmers with mixed ownership status, full time farmers or dairy farmers were more likely to use benchmarking and management accounting.

Actions discussed and agreed with consultants were analysed using IBM Text Analytics software with a developed bespoke library of terms, which generated 118 specific actions for 1,607 farmers. The actions were grouped into one or more of the three categories: **actions to mitigate losses of BPS** (for 96% of farmers), **actions to improve business resilience** (for 97% of farmers) and **actions to improve KPIs** (for 77% of farmers).

The **most commonly identified actions** were Government ‘schemes engagement’ (88% of farmers), long-term planning (86%), comparing with others (including benchmarking and tracking performance) (68%), and reviewing costs and income (60%). Diversifying income sources, improving efficiency and cost reduction, increasing income from current and new farm enterprises, and focusing on details were also identified as actions for over 50% of the farmers.

Significant differences in actions existed across farm type and regions but no significant differences were found across age groups, farmer status or between full-time and part-time farmers. Regarding the top-level three themes of actions, the dairy sector had the highest percentage of farmers with actions to **improve business resilience and KPIs**, whilst the lowland grazing sector had the highest percentage of farmers in **actions to mitigate BPS loss**. Regionally, the North West had the highest percentage of **farmers with actions to mitigate BPS losses and improving business resilience**, whilst East Anglia had the highest number of farmers with **actions to improve KPIs**.

The dairy sector had the highest percentage of farmers of all farm types considering actions such as ‘improving efficiency and cost reduction’, ‘increasing income from current and new farm enterprises’, ‘long-term planning’, ‘reviewing costs and income’,

‘focusing on details’, ‘understanding the market’ and ‘improving profitability and productivity’. Lowland grazing had the highest percentage of farmers in actions of ‘schemes engagement’ and ‘changing business models or farming system’ and ‘reducing environmental impact’ (except for ‘Other unclassified’ sector). Cereal farms had the higher percentage of farmers with actions of ‘diversifying income sources’, and ‘knowledge and innovation management’ and conducting ‘carbon audit’ (except for ‘Other unclassified’ sector). Mixed farms had the higher counts in ‘comparing with others’ whilst the ‘Other unclassified sector’ of farmers had the highest count in actions of ‘reducing environmental impact’ and ‘conducting carbon audit’.

Therefore, with the original conclusion that the majority of farms will be affected by the reduction of direct payments, the combination of the actions they propose to take to mitigate this will help them remain profitable. However, farmers proposing to engage with the new Environmental Schemes were still in the minority, with more farmers working towards making their businesses more productive and efficient. This finding is given greater significance given that the younger generation of farmers were more positive about the future of farming and were more change oriented.

Finally, the data suggests three types of farmers based on assessment of business resilience, farm KPIs farmers’ capacity for change and future orientation: *Forward-facing Adventurers* who were more positive about future and proactive in making changes, *Conservative Performers* who had less appetite for change but have performed well and *Adaptable Pragmatists* who were prepared to change. It is hoped that this typology may complement typologies previously developed by DEFRA and other UK researchers by bringing in fresh perspectives of farm business resilience, adaptability and future orientation. Typologies have been used for targeted policy making and communication with farmers. They have the distinct advantages of reducing multi-dimensionality and the complexity of farmers’ decision making to manageable levels and enabling realistic comparisons. It is hoped that this typology of three categories of farmers can also be helpful in identifying empirical examples for targeted support and advice for farmers in England.

AHDB Farm Resilience Review and Action Plan for farmers in England

Final Report Appendices

Appendix 1 Key variables and measures

Category of variables	Variables	Type of data
Attributes of farmer and farm	<ul style="list-style-type: none"> • Farm size in hectare • Farm size in number of employees 	Scale
	<ul style="list-style-type: none"> • Farm location • Farm type 	Categorical
	<ul style="list-style-type: none"> • Gender • Age • Farmer status (Tenant, owner occupier or mixed) • Occupation (full time or part-time farmer) 	Categorical
	<ul style="list-style-type: none"> • Farming experience in years 	Scale
	<ul style="list-style-type: none"> • BPS value 	Scale (in £)
Farm business review- Resilience assessment	<ul style="list-style-type: none"> • Minimise overheads (2 items) • Set goals and budgets (3 items) • Compare to others (4 items) • Understand the market (2 items) • Focus on detail (2 items) • Mindset for change (3 items) • People management (2 items) • Specialise (2 items) 	Ordinal (1-5)
Farm business review- KPIs	<ul style="list-style-type: none"> • Business - cost of production • Business - net margin • Business - net profit margin • Business - net worth trend • Business - overheads • Business - return on tenant's capital • Business - whole rotation gross margin 	Scale and 5-point ordinal
	<ul style="list-style-type: none"> • Production - Average daily lifetime yield • Production - Calves weaned • Production - Age at first calving • Production - Calves alive 24 hours after birth • Production - Cows/heifers calved in first six weeks • Production - Daily liveweight gain - Weaned calves • Production - Daily liveweight gain - Purchased lambs • Production - Daily liveweight gain - Reared lambs • Production - Ewe mortality • Production - Ewes sold • Production - Flock replacement rate • Production - Diesel use • Production - Genetic merit • Production - Herd efficiency • Production - Herd replacement rate • Production - Lamb losses from scanning to reared • Production - Milk solids output per hectare • Production - Milk yield from forage (kg MS) • Production - Milk yield from forage (litres) • Production - Mortality - Beef stores and finishing 	Scale and 5-point ordinal

	<ul style="list-style-type: none"> • Production - Mortality - Purchased lambs • Production - Pregnancy rate • Production - Yield 	
	<ul style="list-style-type: none"> • Other - £/ha • Other - £/tonne • Other - Beef finishing • Other - Beef stores • Other - Beef stores - Per animal sold • Other - Beef stores - Per liveweight kilo of animal sold • Other - Extensive Beef finishing - Per animal sold • Other - Extensive Beef finishing - Per deadweight kilo of animal sold • Other - Per calf weaned • Other - Per liveweight kilo of calves weaned • Other - Intensive Beef finishing - Per animal sold • Other - Intensive Beef finishing - Per deadweight kilo of animal sold • Other - Extensive production • Other - Intensive production • Other - Indoor lambing ewes and shearlings only • Other - Indoor lambing ewes, shearlings and ewe lambs • Other - Outdoor lambing ewes and shearlings only • Other - Outdoor lambing ewes, shearlings and ewe lambs • Other - Per deadweight kilo of lamb reared • Other - Per deadweight kilo of lamb sold • Other - Per lamb reared • Other - Per lamb sold • Other - Per liveweight kilo of lamb reared • Other - Yielding 9,000 to 11,000 litres/cow/yr • Other - Yielding more than 11,000 litres/cow/yr • Other - Yielding up to 9,000 litres/cow/yr 	Scale and 5-point ordinal
Future plans	<ul style="list-style-type: none"> • I plan to expand the business • I plan to consolidate the business • I plan to diversify the business • I plan to reduce the size of the business • I plan to stay in farming and increase productivity • I plan to stay in farming but change core agricultural enterprises (i.e. change crops and/or livestock) • I plan to pass over to a successor • I plan to leave farming (planned retirement) • I plan to leave farming (exit for other reasons) - How would you describe your future in farming? 	Binary
Environmental and prosperity Schemes engagement	<ul style="list-style-type: none"> • ELM Test and trials • ELM Sustainable farming initiative • ELM Pilot • Countryside stewardship • Tree health pilot • Protected landscapes • Animal health and welfare pathway • Farming investment fund • Slurry investment scheme 	Binary

	<ul style="list-style-type: none"> • Farming innovation fund • Lump sum exit scheme 	
Business management tools - currently using	<ul style="list-style-type: none"> • currently using: Business plan • currently using: Benchmarking • currently using: Management accounting practices • currently using: Risk management • currently using: Accessing advice 	Binary
Business management tools – planning to use in the next 12 months	<ul style="list-style-type: none"> • Business plan - planning to start using in the next 12 months • Benchmarking - planning to start using in the next 12 months • Management accounting practices - planning to start using in the next 12 months • Risk management - planning to start using in the next 12 months • Accessing advice - planning to start using in the next 12 months 	Binary
Feel about future of farming and confidence in making changes	<ul style="list-style-type: none"> • How do you feel about the future of farming? • How confident are you that you can respond to any changes needed? 	3-point ordinal (plus “I don’t know”)
Change orientation	<ul style="list-style-type: none"> • Do you feel you will need to make changes to your business in the next 3-5 years? • To what extent are you planning on making any changes to your business to become more productive and/or profitable? 	3-point ordinal (plus “I don’t know”)
Actions identified through consultation	<ul style="list-style-type: none"> • Actions to mitigate BPS losses • Actions to improve farm business resilience • Actions to improve KPI performance 	Qualitative free text data

Appendix 2 – Detailed items of business resilience assessments (5-point ordinal measures)

1.Minimise overhead costs

- Do you regularly review your overhead costs such as using benchmarking or comparable farm profit?
- Do you consider your machinery costs and identify areas to reduce cost through better maintenance, less machinery requirement or cheaper spares?

2.Set goals and budgets

- Do you have a clearly set out vision and objectives for the business?
- Do you routinely (every 3-6 months), with your partner/s or your team, take a hands off view of the business and discuss objectives, performance etc?
- Do you know what the impact to your business would be if Basic Payment Scheme (BPS) Payments are reduced/removed? Do you have a plan if this happens?

3.Compare yourself with others and gather information

- Do you know how your costs of production compared with others in your sector?
- How often do you shop around for inputs or collect prices from multiple suppliers?
- Do you shop around for inputs or stick to the same suppliers?
- Do you review and compare contracts for your outputs with other buyers in your area?

4.Understand the market

- Do you know the underlying consumer trends behind your produce?
- Do you regularly check/review if your outputs meet the requirements of your customers?

5.Focus on detail

- Do you pay close attention to the time management of day-to-day practices within your business?
- Have you conducted a risk assessment on each part of your business?

6.Have a mindset for change and innovation

- Have you made an assessment of additional or alternative farming and non-farming enterprises?
- Have you considered and explored collaboration with local businesses?
- Are you testing new technical innovations and ideas e.g. through split field comparisons and discussion groups?

7.Continually improve people management

- Is there a clear succession plan or exit plan and is this communicated to everyone involved either directly or indirectly with the business?
- Do you have regular staff meetings to discuss business objectives etc.? (at least weekly = 5, monthly =3, never = 1)

8.Specialise

- Have you taken steps to identify an area of your business which is the most profitable?
- Have you scoped out if there is more than one way of carrying out certain practices on your farm (e.g. block calving vs all year calving), and what would work best for you?

Appendix 3 KPI Range data points (examples). Full list is available from AHDB on request.

KPI	Out of range lowest	Review performance	Room to improve	Performing well	Out of Range highest
Business - Whole rotation gross margin	<200	200-499	500-699	700-899	>=900
Production - Diesel use	>=170	130 - 169	70-129	50-69	<50
Production - Pregnancy rate	<5	5-13	14-24	25-29	>=30
Production - Average daily lifetime yield	<8	8-12.4	12.5-18	19-21	>=22

Appendix 4 Examples of alternative terms used in bespoke local library for SPSS modeler text analytics (Using alternative diversification as an example). There are some misspellings which were picked up at testing stage. They were added to the library too. Some terms appeared in phrases. In principle, once the word is in the library, the phrase containing the term is not needed. However, our experience shows that adding the phrases may help the AI to identify the themes more thoroughly. Additional phrases do not do any harm.

Category	Terms
Generic alternative enterprises or diversification	additional source of income, additional sources of income, allowed extra income, alternative enterprises, alternative source of income, alternative sources of income, alternative income, alternative sources, business ventures, changes to business income streams, consider all options available to your business within the asset base, consider other options, different sources of income, diverse enterprises, diversification, diversified, diversify, extra sources of income, generate additional income, non-farming business ventures, other source of income, other sources of income, potential income streams, setup business, source of income, substitute, supplement current farm, supplement farm income, supplement income, viable business enterprises, wider business
Recreational	dog exercise, dog enclosure, dog walking, equestrian enterprises, horse gallops, horse racing, horse riding, livery, leisure enterprises, pick your own, pick-your-own, pyo, plans for the fishing pools, pony paddocks, pumpkin patch, new pumpkin enterprise, racing, shooting, stables, swimming pool,
Holiday and tourism businesses	air bnb, bed and breakfast, b&b, bell tents, bunkhouse/pod, camp site, camper, camping, camping/glamping, caravan, cabin diversifications, cottage rent, cottages, dutch barn, eco-tourism, furnished holiday, glamping, holiday, holidays, empty sheds, pod accommodation, safari tents, self-catering opportunities, shepherds huts, tourism, tourist, tourists, tour, yurts, wild camping,
Events and hospitality	children's parties, coffee hut, coffee shop, cafe, event, events business, farm events, farm tours, farm visits, hospitality, host events, hosting events, ice cream, ice-cream, hog roast, mini events, on-site café, restaurant, wedding,
Educational	craft courses, education event, education facility, educational access, educational centre, educational farm visits, flower arranging, flower foliage,
Farm premises related	accommodation, farm cottages, habitat, additional residential properties, farm buildings could have potential, available barn space, barn conversion, barn conversions, barns rented out, beneficial use of the farm buildings, building conversion, building space, commercial let, commercial lets, commercial property, commercial units, container, containers, conversion*, convert farm building*, diversified assets, diversifying some of the farm buildings, empty brick farm buildings, empty farm buildings, extensions, farm buildings may have potential, farm buildings, farmyard diversification projects, freed up for alternative uses, further barn space, future alternative uses, industrial storage/container storage, industrial, let buildings, let cottages, let the barns, letting the space, new residential developments, office let, office letting, on farm storage, permanent residential dwelling,

	possibility of residential development, plans to convert, potential income streams from any under-used asset*, promotion of the meeting rooms, property lettings, redundant barn, redundant buildings, redundant farm buildings, rental cottages, rental income, rental spaces, residential, self-storage, storage, studio, units rent, using its assets of high conservation value, utilise further barn space, workshops, workshop letting, workshop units, yacht storage, yacht storeage
Farm shop or direct selling	bar business, direct meat marketing, direct milk vending, direct sales, direct selling beef box, direct selling beef, farm shop, vending machines, vending of milk, adding more value to beef with more box sales, alternative beef markets, box scheme, conversations with the following outlets, direct marketing, meat boxes, outlets, sell stock through one of the online portals, selling farm meat
Other non-farming businesses	timber production, timber enterprise, timber felling income, add value to the produce, telephone masts,
renewable energy	new energy, renewable energy, renewable fuels, renewable heat options, renewables, solar farm, solar panels, wind turbine
off-farm employment	off farm, off-farm, other employment, other interests, other jobs, separated carpentry business
contracting work	comining contracts, combining contracts, contracting work, drilling contracts, forage contract, further contract work, harvest contract, silage contract, spraying contracts, contract work,
carbon income	carbon benefits, carbon capture, carbon capture income, carbon capture route, carbon credits, carbon figure, carbon market, carbon opportunities, carbon options, carbon payments, carbon prices, carbon schemes, carbon sequestration, carbon sink, carbon trading, carbon/agri-environment income, net carbon, selling carbon, sequesting carbon, sequestration, sequestration figures, surplus carbon, carbon offsetting, sell the carbon, carbon trading/environmental management

Appendix 5a - Additional information on regions for “Table 16 Level 1 and Level 2 categories of actions by farm type”

	Count All % of all		LFA Lowland						East		North		South		West	
			Dairy	Grazing	Grazing	Other	Cereals	Mixed	Anglia	East Midlands	East	West	East	West	Midlands	
Actions to mitigate BPS losses	1545	96.1%	89.0%	87.0%	90.2%	85.0%	83.6%	86.9%	86.3%	87.3%	83.8%	90.1%	83.9%	90.0%	87.3%	
Schemes engagement	1420	88.4%	80.1%	81.4%	86.1%	80.0%	75.2%	79.2%	83.7%	80.9%	71.3%	79.8%	78.3%	85.4%	82.9%	
Diversifying income sources	861	53.6%	36.1%	54.7%	49.7%	40.0%	56.1%	48.7%	72.5%	54.8%	35.2%	41.8%	46.2%	50.8%	56.3%	
Improving efficiency and cost	846	52.6%	55.7%	36.0%	43.2%	45.0%	52.4%	47.7%	64.1%	40.1%	42.3%	43.7%	37.1%	54.2%	46.2%	
Increasing income from current and new farm enterprises	814	50.7%	50.2%	44.7%	44.8%	40.0%	41.2%	48.0%	46.4%	50.3%	35.5%	53.1%	47.6%	47.8%	50.0%	
Actions to improve business resilience	1565	97.4%	92.1%	88.8%	89.1%	85.0%	84.8%	88.3%	86.3%	88.5%	88.3%	92.0%	78.3%	90.0%	90.5%	
Long-term planning	1385	86.2%	85.6%	84.5%	81.3%	65.0%	68.5%	77.0%	76.5%	80.9%	71.8%	85.4%	62.9%	82.2%	84.2%	
Comparing with others	1098	68.3%	62.2%	59.6%	58.4%	65.0%	61.2%	65.1%	63.4%	59.2%	67.6%	66.2%	50.3%	58.3%	69.0%	
Costs and income review	965	60.0%	58.4%	54.0%	50.5%	50.0%	51.5%	57.0%	63.4%	49.0%	50.9%	59.6%	48.3%	54.7%	58.9%	
Focusing on detail	814	50.7%	50.9%	39.1%	44.3%	30.0%	42.7%	48.8%	60.1%	51.6%	33.7%	43.7%	45.5%	48.1%	53.2%	
Knowledge and innovation	542	33.7%	32.0%	28.6%	28.0%	20.0%	32.1%	31.7%	42.5%	35.0%	21.9%	28.6%	29.4%	32.4%	33.5%	
Changing business model and/or	457	28.4%	21.0%	23.0%	27.7%	15.0%	27.0%	27.5%	22.9%	28.0%	23.0%	21.1%	21.0%	29.6%	31.0%	
Understanding the market	274	17.1%	10.0%	23.0%	20.7%	10.0%	12.4%	14.9%	9.2%	20.4%	11.7%	16.0%	15.4%	15.9%	24.1%	
Actions to improve KPIs	1249	77.7%	78.7%	71.4%	74.2%	65.0%	63.6%	68.3%	77.1%	72.0%	61.4%	77.0%	62.9%	74.2%	71.5%	
Improving profitability	282	17.5%	19.9%	17.4%	16.0%	10.0%	12.1%	15.9%	18.3%	6.4%	13.1%	22.1%	13.3%	19.1%	13.3%	
Improving productivity	871	54.2%	62.5%	51.6%	51.1%	35.0%	39.7%	46.6%	43.1%	54.1%	41.5%	52.1%	42.7%	53.7%	55.7%	
Reducing environmental Impact	557	34.7%	26.5%	23.6%	34.2%	35.0%	33.0%	33.4%	50.3%	38.2%	17.0%	22.5%	39.2%	36.0%	31.0%	
Carbon audit	214	13.3%	8.2%	10.6%	7.9%	20.0%	17.9%	13.4%	35.3%	21.0%	6.8%	13.6%	13.3%	7.0%	8.9%	

Appendix 5b - Additional information on regions for “Table 17 Key themes of actions to mitigate the reduction of BPS for the total sample and by farm type”

	Count	All % of all	Dairy	LFA Grazing	Lowland Grazing	Other	Cereals	Mixed	East Anglia	East Midlands	North East	North West	South East	South West	West Midlands
Actions to mitigate BPS losses	1545	96.1%	89.0%	87.0%	90.2%	85.0%	83.6%	86.9%	86.3%	87.3%	83.8%	90.1%	83.9%	90.0%	87.3%
Diversifying income sources	861	53.6%	36.1%	54.7%	49.7%	40.0%	56.1%	48.7%	72.5%	54.8%	35.2%	41.8%	46.2%	50.8%	56.3%
Alternative sources of income_Generic	514	32.0%	18.6%	31.7%	25.8%	25.0%	36.4%	31.5%	58.8%	27.4%	19.6%	26.8%	27.3%	29.1%	29.7%
Carbon income	101	6.3%	1.7%	3.1%	4.1%	5.0%	10.6%	6.7%	3.9%	12.7%	5.2%	2.8%	9.1%	4.5%	7.0%
Contracting work	20	1.2%	0.3%	1.2%	0.5%	0.0%	0.9%	2.0%	2.0%	3.8%	0.5%	0.0%	2.1%	1.1%	0.0%
Events, education and hospitality	81	5.0%	5.5%	6.8%	4.3%	0.0%	4.2%	4.0%	4.6%	5.1%	2.1%	5.6%	4.9%	5.2%	6.3%
Farm premises related alternative income	373	23.2%	17.5%	19.9%	19.8%	25.0%	24.8%	21.5%	42.5%	18.5%	10.4%	13.6%	22.4%	24.6%	25.3%
Farm shop or direct selling	48	3.0%	4.5%	2.5%	3.0%	0.0%	0.9%	2.9%	2.0%	3.8%	0.8%	1.9%	2.8%	4.1%	3.2%
Holiday and tourism	222	13.8%	7.6%	19.9%	16.8%	5.0%	8.5%	12.9%	12.4%	8.3%	7.8%	13.6%	10.5%	15.5%	18.4%
Off-farm employment	75	4.7%	1.4%	8.1%	7.1%	0.0%	2.1%	4.2%	4.6%	3.8%	3.4%	3.8%	4.9%	3.9%	7.6%
Recreational businesses	89	5.5%	1.0%	5.0%	6.0%	0.0%	4.8%	6.7%	7.2%	7.0%	3.1%	1.9%	4.2%	6.6%	5.1%
Renewable energy	64	4.0%	4.5%	3.7%	2.7%	0.0%	3.6%	3.9%	4.6%	3.8%	2.1%	3.8%	1.4%	3.6%	8.2%
Improving efficiency and cost reduction	846	52.6%	55.7%	36.0%	43.2%	45.0%	52.4%	47.7%	64.1%	40.1%	42.3%	43.7%	37.1%	54.2%	46.2%
Improve efficiency	129	8.0%	8.6%	5.6%	7.3%	10.0%	5.5%	7.9%	12.4%	7.0%	6.0%	5.6%	1.4%	9.1%	7.0%
Scaling down	15	0.9%	1.7%	0.0%	1.6%	0.0%	0.3%	0.5%	0.7%	0.0%	0.3%	1.9%	1.4%	1.2%	0.0%
General cost reduction	185	11.5%	12.0%	3.7%	6.3%	20.0%	17.0%	10.1%	34.6%	3.8%	9.4%	8.9%	11.2%	8.4%	5.1%
Capital cost reduction	40	2.5%	2.1%	1.2%	2.4%	0.0%	3.0%	2.2%	1.3%	1.9%	1.0%	2.3%	2.8%	3.7%	0.6%
Labour costs reduction	21	1.3%	2.4%	0.0%	0.5%	10.0%	0.9%	1.2%	0.7%	1.3%	0.5%	2.8%	1.4%	1.1%	1.3%
Machinery cost reduction	256	15.9%	15.8%	10.6%	10.1%	5.0%	18.5%	15.8%	16.3%	14.0%	10.2%	15.0%	14.7%	16.6%	15.2%
Overheads cost reduction	98	6.1%	8.9%	4.3%	5.2%	0.0%	3.9%	5.5%	3.9%	2.5%	3.4%	4.2%	4.9%	8.4%	7.6%
Production cost reduction	287	17.9%	19.2%	11.8%	15.8%	0.0%	17.0%	16.4%	20.3%	14.6%	12.5%	12.2%	13.3%	21.2%	13.3%
Supply cost reduction	400	24.9%	29.2%	22.4%	23.9%	25.0%	18.5%	21.0%	14.4%	17.2%	16.7%	20.7%	19.6%	31.7%	23.4%
Increasing income from current and new farm enterprises	814	50.7%	50.2%	44.7%	44.8%	40.0%	41.2%	48.0%	46.4%	50.3%	35.5%	53.1%	47.6%	47.8%	50.0%
Increase Income_Generic	674	41.9%	42.3%	39.1%	37.5%	35.0%	33.3%	38.9%	38.6%	38.9%	30.0%	47.4%	39.9%	38.5%	41.1%
Develop new markets	78	4.9%	2.7%	5.6%	3.8%	5.0%	4.2%	5.4%	2.6%	4.5%	3.9%	1.9%	7.7%	5.7%	3.2%
Scaling up	273	17.0%	18.6%	10.6%	17.1%	10.0%	9.1%	18.0%	11.8%	21.0%	10.4%	10.8%	12.6%	20.7%	15.8%
Schemes engagement	1420	88.4%	80.1%	81.4%	86.1%	80.0%	75.2%	79.2%	83.7%	80.9%	71.3%	79.8%	78.3%	85.4%	82.9%
Join schemes_Non-specific	1040	64.7%	56.4%	62.7%	66.0%	65.0%	55.5%	56.0%	70.6%	60.5%	47.8%	55.4%	51.0%	63.6%	67.1%
Join Named Schemes	1221	76.0%	69.8%	72.0%	73.1%	60.0%	63.6%	68.5%	75.2%	66.9%	56.7%	70.9%	70.6%	76.1%	66.5%
Schemes related to environment	1285	80.0%	73.9%	74.5%	78.3%	60.0%	67.6%	71.1%	78.4%	70.1%	59.8%	74.6%	75.5%	80.0%	69.6%
ELMs (SFI)	530	33.0%	24.4%	33.5%	30.4%	25.0%	31.8%	30.4%	45.8%	26.8%	24.8%	29.1%	28.7%	29.8%	33.5%
ELMs (excl. SFI)	834	51.9%	45.0%	47.2%	50.3%	30.0%	47.9%	46.1%	62.7%	39.5%	34.7%	38.5%	58.7%	53.7%	48.1%
Countryside Stewardship	982	61.1%	56.7%	55.3%	62.0%	50.0%	53.3%	52.2%	70.6%	45.2%	41.3%	55.9%	55.9%	65.4%	50.0%
Environmental Stewardship	171	10.6%	4.5%	14.3%	10.3%	10.0%	9.4%	10.6%	15.0%	10.2%	4.4%	11.7%	10.5%	11.2%	7.6%
Forestry Commission Incentives	16	1.0%	0.3%	2.5%	1.4%	0.0%	0.9%	0.5%	0.7%	1.9%	1.6%	0.5%	0.0%	0.7%	0.6%
Farmers in Protected Landscape	66	4.1%	2.1%	14.3%	4.6%	0.0%	1.2%	2.7%	2.0%	0.6%	1.8%	10.3%	4.9%	4.3%	1.3%
Catchment Sensitive Area	86	5.4%	8.9%	5.0%	4.6%	5.0%	3.3%	3.9%	6.5%	0.6%	2.3%	2.8%	4.2%	8.0%	5.7%
AHWP	51	3.2%	3.8%	8.7%	3.3%	0.0%	0.6%	2.0%	0.7%	0.0%	2.9%	8.5%	6.3%	2.0%	0.6%
Schemes related to prosperity	115	7.2%	12.0%	7.5%	5.2%	0.0%	5.8%	4.9%	7.2%	3.2%	2.9%	20.2%	4.9%	5.0%	6.3%
Farm Investment Fund	61	3.8%	3.8%	2.5%	3.0%	0.0%	4.5%	3.4%	5.9%	1.9%	1.8%	4.7%	3.5%	3.4%	5.1%
Slurry Investment Fund	23	1.4%	4.8%	2.5%	0.3%	0.0%	0.3%	0.3%	0.0%	0.6%	0.5%	5.2%	0.7%	1.2%	0.6%
Innovation and Development Fund	19	1.2%	1.0%	0.0%	1.9%	0.0%	0.9%	1.0%	0.7%	0.6%	0.5%	0.9%	1.4%	1.8%	0.6%
New Entrant Support	39	2.4%	4.5%	3.7%	2.2%	0.0%	0.9%	1.5%	2.0%	0.6%	0.8%	12.7%	1.4%	0.2%	1.3%

Appendix 5c - Additional information on regions for “Table 18 Key themes of actions to improve business resilience for the total sample and by farm type”

	Count	All % of all	Dairy	LFA Grazing	Lowland Grazing	Other	Cereals	Mixed	East Anglia	East Midlands	North East	North West	South East	South West	West Midlands
Actions to improve business resilience	1565	97.4%	92.1%	88.8%	89.1%	85.0%	84.8%	88.3%	86.3%	88.5%	88.3%	92.0%	78.3%	90.0%	90.5%
Changing business model and/or system	457	28.4%	21.0%	23.0%	27.7%	15.0%	27.0%	27.5%	22.9%	28.0%	23.0%	21.1%	21.0%	29.6%	31.0%
Changing Business model	233	14.5%	9.3%	9.9%	12.2%	5.0%	19.7%	13.3%	17.0%	17.8%	9.9%	11.3%	10.5%	13.9%	15.2%
Change business model Generic	13	0.8%	0.3%	0.6%	0.8%	0.0%	0.9%	0.8%	0.7%	2.5%	1.0%	0.5%	0.0%	0.4%	0.6%
Change borrowing	6	0.4%	1.0%	0.0%	0.3%	0.0%	0.3%	0.2%	0.0%	0.0%	0.5%	0.5%	0.0%	0.4%	0.6%
Collaborations	102	6.3%	4.1%	6.2%	6.5%	5.0%	5.5%	6.2%	7.8%	6.4%	5.0%	6.1%	4.2%	5.5%	7.0%
New marketing outlets	8	0.5%	0.0%	1.2%	0.3%	0.0%	0.3%	0.7%	0.0%	0.0%	0.8%	0.0%	0.0%	0.7%	0.6%
Share farming	88	5.5%	3.1%	0.6%	3.0%	0.0%	11.8%	4.7%	7.2%	7.6%	2.9%	1.4%	4.2%	5.9%	7.6%
Specialise	36	2.2%	2.1%	1.2%	1.9%	0.0%	2.7%	2.0%	1.3%	3.2%	1.0%	3.3%	2.1%	2.0%	2.5%
Changing enterprise systems	219	13.6%	10.3%	12.4%	14.7%	10.0%	8.2%	14.3%	6.5%	12.7%	13.1%	9.9%	9.8%	14.3%	15.2%
System change generic	100	6.2%	5.8%	9.3%	6.3%	10.0%	1.8%	6.2%	4.6%	4.5%	5.5%	4.7%	4.9%	6.6%	7.0%
Change farming practices generic	32	2.0%	2.1%	0.6%	1.6%	0.0%	0.9%	2.5%	0.0%	1.3%	1.6%	0.9%	0.0%	3.7%	0.6%
Crop rotation	18	1.1%	0.0%	0.6%	0.3%	0.0%	2.1%	1.5%	0.7%	1.9%	1.3%	0.9%	0.0%	0.4%	3.2%
Organic conversion	58	3.6%	1.7%	0.6%	5.4%	0.0%	3.6%	3.4%	3.3%	5.1%	3.4%	1.4%	3.5%	3.4%	3.2%
Entering new farming sector	32	2.0%	1.0%	2.5%	2.4%	0.0%	0.6%	2.3%	0.0%	1.3%	2.3%	2.3%	1.4%	2.0%	1.9%
Mindset for change	91	5.7%	6.2%	5.0%	6.8%	0.0%	3.0%	5.0%	2.0%	2.5%	3.1%	4.7%	2.8%	8.4%	7.0%
Comparing with others	1098	68.3%	62.2%	59.6%	58.4%	65.0%	61.2%	65.1%	63.4%	59.2%	67.6%	66.2%	50.3%	58.3%	69.0%
Benchmarking	510	31.7%	28.9%	24.8%	25.0%	25.0%	31.5%	30.9%	26.1%	33.8%	25.6%	31.0%	24.5%	30.5%	29.7%
Monitor or Tracking performance	904	56.3%	50.2%	49.1%	49.2%	50.0%	49.4%	54.2%	52.3%	47.1%	59.8%	52.1%	40.6%	45.6%	60.8%
Costs and income review	965	60.0%	58.4%	54.0%	50.5%	50.0%	51.5%	57.0%	63.4%	49.0%	50.9%	59.6%	48.3%	54.7%	58.9%
Compare multiple suppliers	55	3.4%	4.1%	2.5%	3.0%	10.0%	4.5%	1.8%	1.3%	2.5%	3.7%	3.3%	2.8%	2.9%	5.1%
Financial management	192	11.9%	8.6%	8.1%	10.3%	10.0%	14.8%	10.7%	34.0%	8.9%	6.8%	8.5%	11.2%	9.1%	9.5%
General review of costs	748	46.5%	44.7%	40.4%	40.2%	35.0%	39.4%	44.6%	51.0%	36.9%	37.3%	45.5%	39.2%	43.9%	44.3%
Identify profitable areas	404	25.1%	25.4%	23.6%	18.5%	25.0%	22.1%	24.2%	38.6%	16.6%	19.1%	29.1%	17.5%	19.8%	30.4%
Focusing on detail	814	50.7%	50.9%	39.1%	44.3%	30.0%	42.7%	48.8%	60.1%	51.6%	33.7%	43.7%	45.5%	48.1%	53.2%
Employee management	314	19.5%	20.6%	16.1%	13.6%	10.0%	15.8%	20.8%	13.1%	21.7%	12.8%	12.7%	15.4%	21.2%	27.2%
Focus	426	26.5%	29.9%	14.3%	24.7%	15.0%	22.7%	24.3%	38.6%	32.5%	13.6%	27.7%	26.6%	21.7%	28.5%
Managing details	381	23.7%	20.3%	16.8%	18.2%	15.0%	23.9%	24.3%	40.5%	17.2%	14.9%	16.9%	21.0%	24.6%	19.6%
Risk assessment	127	7.9%	4.8%	4.3%	4.3%	5.0%	14.2%	6.9%	30.7%	1.9%	4.4%	3.8%	8.4%	6.1%	3.8%
Time management	42	2.6%	1.7%	3.7%	2.2%	0.0%	1.8%	2.9%	1.3%	2.5%	1.8%	2.3%	3.5%	2.9%	1.9%
Knowledge and innovation management	542	33.7%	32.0%	28.6%	28.0%	20.0%	32.1%	31.7%	42.5%	35.0%	21.9%	28.6%	29.4%	32.4%	33.5%
Adopting new technologies	282	17.5%	16.5%	12.4%	13.3%	10.0%	19.4%	16.4%	30.7%	15.9%	11.0%	13.6%	12.6%	16.4%	18.4%
Knowledge exchange	23	1.4%	1.0%	0.6%	1.1%	0.0%	2.4%	1.2%	1.3%	3.2%	0.5%	1.4%	0.0%	1.1%	3.2%
Seeking advice Generic	306	19.0%	17.5%	16.1%	17.7%	10.0%	15.5%	18.6%	15.7%	18.5%	13.1%	14.1%	21.7%	20.1%	18.4%
Seeking advice AHDB	389	24.2%	19.2%	19.9%	20.4%	35.0%	24.2%	23.0%	45.8%	23.6%	16.2%	20.2%	16.8%	20.5%	24.1%
Seeking advice Gov.UK & Defra	254	15.8%	13.4%	17.4%	13.0%	20.0%	18.2%	12.4%	39.2%	7.0%	6.8%	8.5%	16.1%	16.2%	15.8%
Seeking advice Other websites	233	14.5%	13.7%	9.9%	14.9%	20.0%	13.6%	12.2%	33.3%	8.9%	6.5%	7.5%	13.3%	15.3%	13.9%
Long-term planning	1385	86.2%	85.6%	84.5%	81.3%	65.0%	68.5%	77.0%	76.5%	80.9%	71.8%	85.4%	62.9%	82.2%	84.2%
Budget setting	578	36.0%	38.5%	27.3%	29.1%	25.0%	32.1%	33.9%	51.6%	26.8%	24.0%	32.9%	32.9%	35.3%	31.6%
Set goals and visions	463	28.8%	24.4%	19.3%	29.6%	30.0%	28.2%	25.5%	45.1%	31.8%	18.3%	18.8%	23.1%	25.7%	36.1%
Improve infrastructure	370	23.0%	22.0%	25.5%	22.6%	15.0%	16.1%	21.0%	22.9%	23.6%	16.4%	25.8%	15.4%	22.5%	20.3%
Succession plan	1262	78.5%	80.1%	78.3%	75.5%	55.0%	61.5%	68.8%	72.5%	75.8%	62.7%	79.3%	58.0%	75.2%	74.7%
Other exit plan	184	11.4%	7.9%	14.3%	11.7%	5.0%	12.4%	8.7%	25.5%	3.8%	7.0%	13.6%	9.8%	10.0%	8.2%
Exit plan generic	31	1.9%	2.7%	3.7%	2.2%	0.0%	0.9%	1.0%	1.3%	0.0%	2.3%	2.3%	0.7%	2.3%	0.6%
LumpSum scheme	34	2.1%	1.0%	3.1%	2.7%	0.0%	2.4%	1.3%	0.7%	0.6%	2.3%	4.7%	0.7%	2.0%	0.6%
Retire	131	8.2%	4.1%	11.2%	6.8%	5.0%	10.0%	6.9%	22.9%	2.5%	5.0%	8.5%	7.7%	5.9%	7.0%
Selling property	22	1.4%	0.7%	2.5%	2.2%	0.0%	0.3%	1.2%	0.7%	0.6%	1.0%	0.9%	0.7%	2.0%	1.3%
Understand the market	274	17.1%	10.0%	23.0%	20.7%	10.0%	12.4%	14.9%	9.2%	20.4%	11.7%	16.0%	15.4%	15.9%	24.1%

Appendix 5d - Additional information on regions for “Table 3 Key themes of actions to improve KPIs for the total sample and by farm type”

	Count	All % of all	Dairy	LFA Grazing	Lowland Grazing	Other	Cereals	Mixed	East Anglia	East Midlands	North East	North West	South East	South West	West Midlands
Actions to improve KPIs	1249	77.7%	78.7%	71.4%	74.2%	65.0%	63.6%	68.3%	77.1%	72.0%	61.4%	77.0%	62.9%	74.2%	71.5%
Improving profitability	282	17.5%	19.9%	17.4%	16.0%	10.0%	12.1%	15.9%	18.3%	6.4%	13.1%	22.1%	13.3%	19.1%	13.3%
Margin negative	145	9.0%	9.3%	8.1%	10.3%	5.0%	7.3%	7.0%	13.7%	3.2%	5.5%	11.7%	7.7%	9.1%	7.0%
Not profitable without BPS	154	9.6%	11.0%	10.6%	7.3%	5.0%	5.2%	10.1%	4.6%	3.2%	7.8%	10.8%	7.7%	11.4%	8.9%
Improving productivity	871	54.2%	62.5%	51.6%	51.1%	35.0%	39.7%	46.6%	43.1%	54.1%	41.5%	52.1%	42.7%	53.7%	55.7%
General productivity improvement	586	36.5%	44.0%	28.6%	29.6%	30.0%	31.5%	32.0%	34.6%	37.6%	28.7%	33.8%	29.4%	33.9%	38.0%
Improve animals productivity	497	30.9%	42.3%	34.8%	38.6%	5.0%	10.0%	23.8%	15.7%	26.8%	18.8%	28.2%	25.9%	38.0%	31.0%
Animals generic productivity	372	23.1%	34.7%	22.4%	28.0%	5.0%	9.1%	16.9%	13.1%	18.5%	13.1%	23.9%	21.0%	28.5%	20.3%
Dairy	109	6.8%	23.4%	2.5%	3.8%	0.0%	1.2%	3.2%	2.0%	2.5%	0.5%	4.2%	3.5%	13.0%	8.2%
Production Beef	143	8.9%	1.0%	14.9%	15.8%	5.0%	0.3%	9.4%	3.3%	10.2%	8.4%	2.8%	7.0%	10.9%	8.2%
Production Lamb	40	2.5%	0.0%	5.6%	5.2%	0.0%	0.0%	2.0%	0.7%	3.2%	1.6%	2.3%	2.1%	2.5%	3.8%
Improve productivity Cereals	84	5.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Reducing environmental Impact	557	34.7%	26.5%	23.6%	34.2%	35.0%	33.0%	33.4%	50.3%	38.2%	17.0%	22.5%	39.2%	36.0%	31.0%
Generic environmental impact management	119	7.4%	8.2%	6.2%	5.2%	5.0%	8.8%	6.0%	8.5%	8.3%	3.9%	8.5%	4.2%	6.4%	11.4%
Grassland management	137	8.5%	5.5%	6.8%	15.2%	10.0%	3.0%	7.0%	6.5%	8.9%	3.7%	3.8%	11.9%	10.5%	9.5%
Mitigating drought	13	0.8%	0.3%	0.0%	0.3%	0.0%	1.2%	1.2%	2.0%	0.0%	0.3%	0.0%	2.8%	0.9%	0.0%
Multispecies crops	124	7.7%	6.9%	8.1%	11.7%	0.0%	0.6%	7.7%	4.6%	4.5%	2.6%	0.9%	6.3%	14.6%	4.4%
Nutrient management	174	10.8%	8.9%	7.5%	6.0%	5.0%	12.1%	12.2%	7.8%	8.3%	7.0%	4.2%	14.0%	14.3%	8.2%
Carbon audit	214	13.3%	8.2%	10.6%	7.9%	20.0%	17.9%	13.4%	35.3%	21.0%	6.8%	13.6%	13.3%	7.0%	8.9%