UK farmer & grower research priorities

Full report

CEIA
CENTRE FOR EFFECTIVE
INNOVATION IN AGRICULTURE

NFU

UK Innovate UK

ELIZABETH CREAK
CHARITABLE TRUST

Contents

Figures and tables

Executive summary

Farmers and growers in the UK are facing rapid changes in policy and trade on top of the emerging pressures relating to climate, nature and public health. There is a need for strategic engagement to ensure that their needs]bÛi YbW¥ ¨I ? ˙fYg¥UfW\ ¨UbX ¨]bbcj Uh]cb ¨df]cf]h]¥Yg¨ ¨Hc ¨UXXfYgg¨h\]g¨[Ud žU˙[fci d ˙cZ Z Ufa]b[¨UbX ˙fYgYUfW\ ˙cf[Ub]gUh]cbg¨ have collaborated to understand research and innovation priorities for farmers and growers across the UK.

Insights were gathered from 92 farmers and growers, representing all major agricultural sectors across a wide diversity of farming systems, at 12 semi-structured workshops. There are also insights from businesses upstream

- Farmers also raised challenges associated with adapting to new regulations, climate change and public perception.

- Agricultural research conducted by universities has limited overlap with the priorities highlighted by farmers and growers.
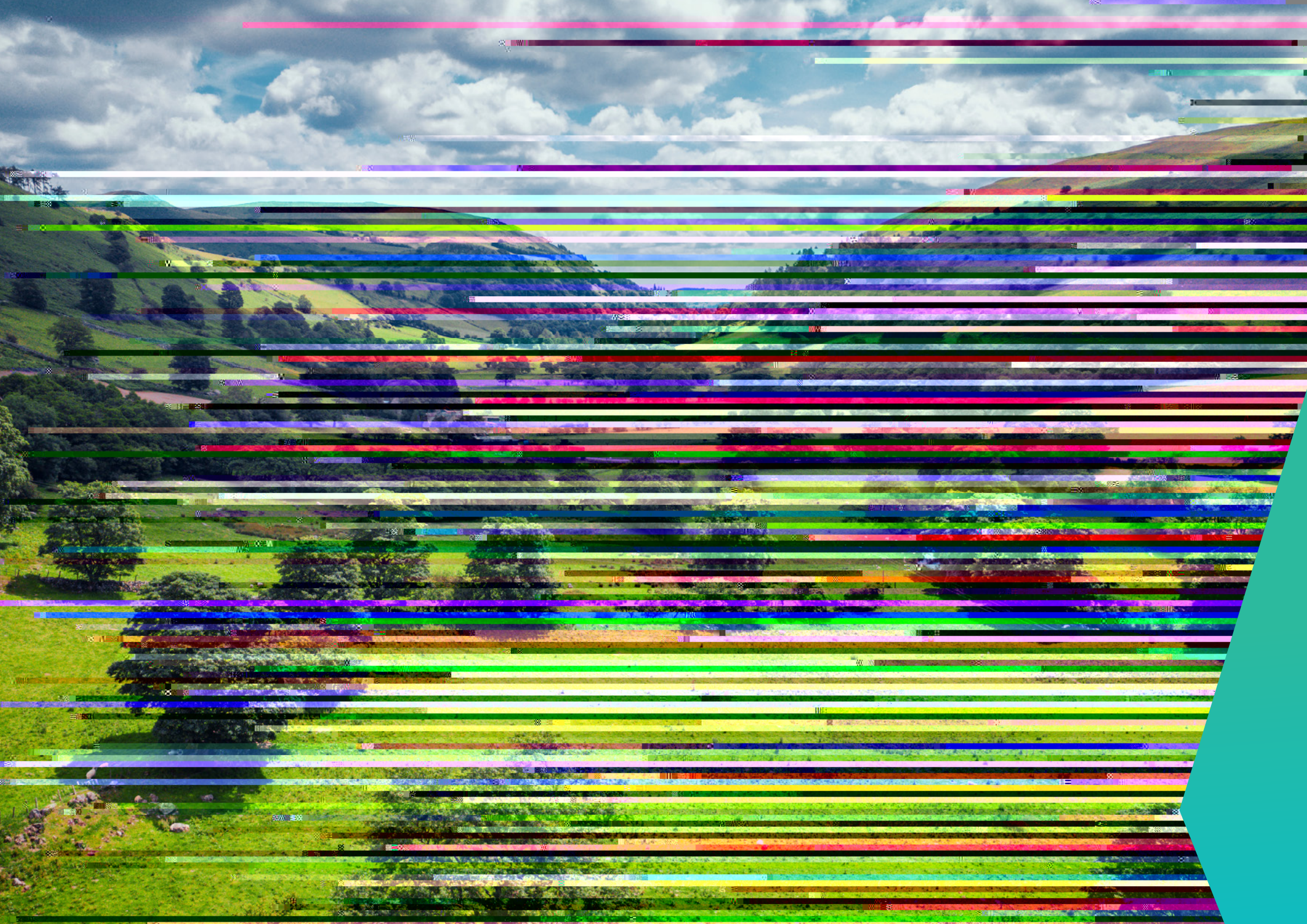
1.0 Background and rationale

The agricultural industry is grappling with changes in policy and trade, heightened volatility, and climate, nature and public health crises. Research and innovation are important to help understand these challenges and ÚbX˙k Umg˙hc˙UXXfYgg˙h\Ya ˙"˙Hc˙a U_Y˙h\Y˙a cg˙hc Z\Y˙YZZcfh˙UbX˙a cbYm˙h\Uh˙fYgY UfW\˙Zi bXYfg\UbX˙dfcj]XYfg˙UfY˙ investing, they need to understand the industry's priorities on the ground. Most have established relationships with agri-tech, input, food processing and retail businesses, partnering with start-ups or larger businesses that are active in research. While many also work closely with farmers and growers, there is no routine strategic engagement to ensure their needs shape UK research priorities.

A diverse group of farming and research organisations have collaborated to address this gap. The aim was to understand research and innovation priorities for farmers and growers across the UK. Insights were gathered from across these organisations' networks, and other farmer and grower groups were invited to take part. Views have been collated and analysed from a range of agricultural sectors, across a wide diversity of farming systems.

The project looked to gather input from farmers and growers as people with practical experience in their sector. ‡h˙Vi ˙]Xg˙cb ˙dfYj ˙]ci g˙UbX˙]b[˙g˙ci h˙]bYX˙]b˙U ˙Wc˙`˙UVcfUh˙j˙Y ˙fYdcfh˙%\$ ˙m˙YUfg˙U[ c ˙Vm˙h\Y ˙B˙Uh˙cbU`˙: Ufa Yfg˙I b]cb ˙fB˙I ˙Łž h\Y ˙5 [f]W˙ ˙h˙i fU``˙UbX ˙<cfh˙W ˙h˙i fU``˙ ˙8Yj Y˙cda Ybh˙6cUfX ˙f5 < 8 6Ł˙UbX ˙h\Y ˙5 [f]W˙ ˙h˙i fU``˙ ˙ÐXi g\f]Yg˙7 cbŽYX YfUh\]cb ˙f5 =7 Ł" That report, Feeding the Future,[1] was updated in 2017.[2] These reports had informed government research and innovation funding, principally the UK Agri-Tech Strategy

2.0 Method

2.1 Recruitment

Participating organisations were provided with invitations to circulate with their farmer and grower networks, and encouraged to ꘏꘏꘏꘏꘏꘏꘏꘏꘏꘏꘏ (see Figure 1).

The organisations recruited participants in a range of ways. Some circulated the invitation via email to their networks and sent calendar invitations for the appropriate workshop. Others created online booking systems ꘏꘏꘏꘏꘏꘏꘏꘏. Some workshops took place in pre-scheduled meetings where organisations were meeting farmers and growers routinely.
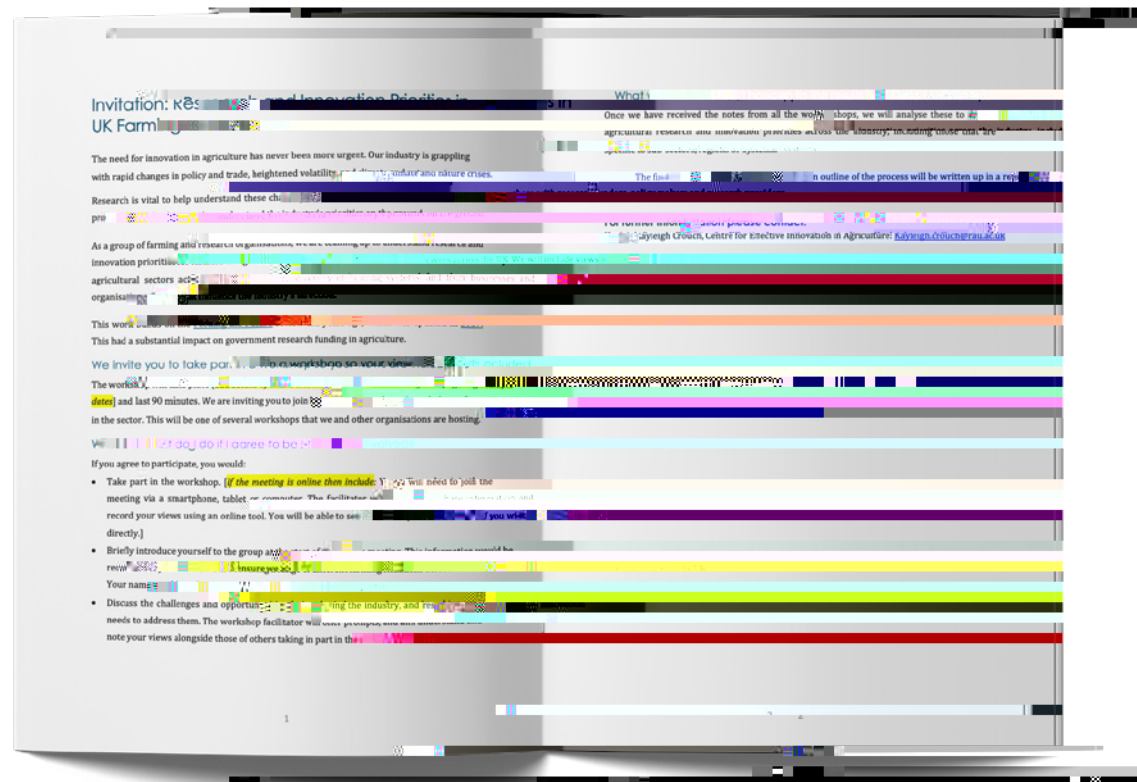
2.2 Participants

12 workshops were conducted by 7 partner organisations with their own farmer and grower networks. A total of

beef, sheep and dairy	1	9	2	National Farmers' Union	Grassland, SSSI, dairy, sheep, arable, cheese production, dairy, arable, carrots, bio recycling.
Beef & Dairy	1	10	4	Innovative Farmers	Suckler herd, sheep, beef, dairy, organic beef, arable and regenerative farming, PFLA, organic dairy, agronomist, farm advisor, curriculum leader for agriculture.
Mixed Farming	5	6		Agri-Tech Centre	Arable, grass, fruit, woodland, sheep, cattle, agroforestry, market garden, mixed farming.
		9	7	Landworkers' Alliance	Market gardening, dairy, fruit & veg rare types, goat dairy and meat, organic mixed farming, growing and composting agronomy and farmers markets.
		3		Innovation for Agriculture	Wheat, AB15, AB9, beef, sheep, biogas, red deer, calf rearing, cereals, kale.
		15	2	National Farmers' Union Cymru	Livestock, grass, forage, soils.
		12	6	Agricultural Industries Council	Mixed sectors workshop.
Combinable crops & sugar	1	7	2	National Farmers' Union	Combinable crops, sugar beet, dairy, potatoes and vegetables/ combinable crops advisors.
Totals	**12**	**92**	**25**	**7**	

2.3 Workshops

A facilitation guide was circulated to host organisations. This comprised practical information on how to use the]bžcfa Uh]cb![Uh\Yf]b[˙d˙Uhžcfa ˙fA]fc ˙J]gj U˙`K cf_gdUW̋ ˙Zcf˙ɖbcj Uh]cbž&$&' ɫžUbX ˙\ck ˙hc ˙bUj][UhY ˙h\Y ˙VcUfXg˙ designed for these workshops. Each organisation was sent a bespoke link for their workshop. The facilitation

3.0

3.2 Farmer and grower priorities 10 years on

The farmer and grower research priorities were compared with the broad themes outlined in the 2013 *Feeding the Future* report, to explore if and how their priorities had evolved over the last decade. The challenges and needs ci h]bYX Vm Ufa Yfg Ulh Y fYUX]mk]h]b h Y a Ucf h Y Ya Yg XYbh UX]b &$% fl][i fY Ł H Y a c gh dYfg]gh Ybh h Ya Yg relate to agricultural systems, social science, and training and communications. There was less focus on animal health]b h Y W ffYbh fci bX c Zk cf g cdgh Ub h YfY \UX VYYb]b &$% ž XYgd]h Y g][b]UWUbh]bjc j Ya YbhVm]j YghcW_ Ufa Yfg'

While the overarching themes remained largely consistent, the emphasis within them had evolved. Table 2 shows which issues remained in focus, which were no longer raised as priorities, and what new aspects had come to the fore 10 years on.
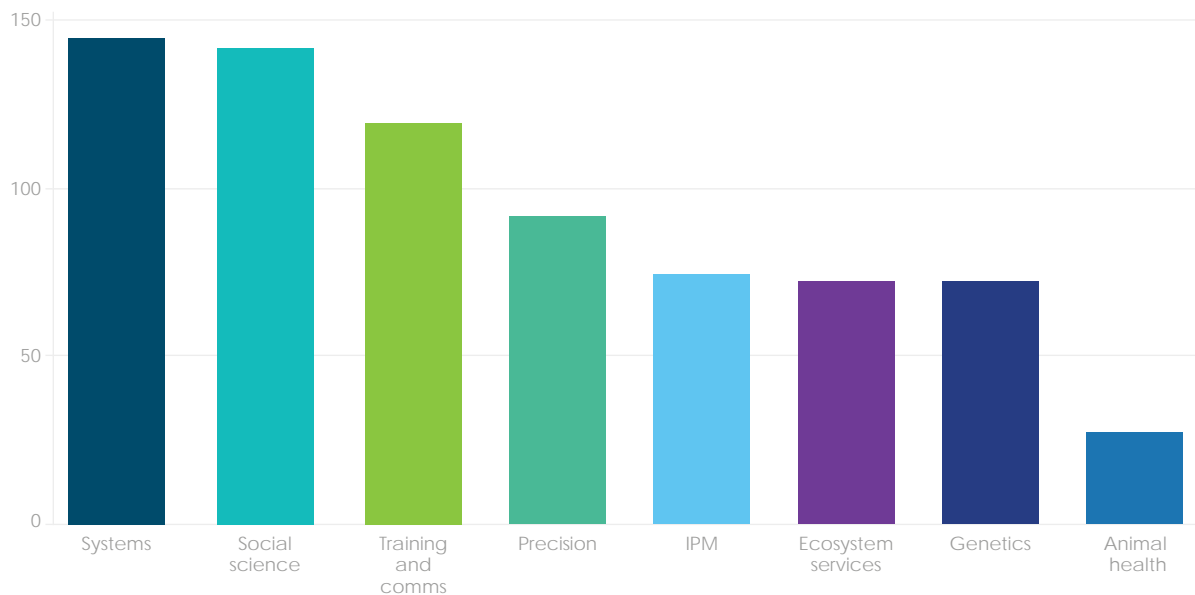
2013 *Feeding the Futhe32fc459 0.3 rg3,3(Animal)0ja7950 0 81.8 54.36 r9f-3.61rg34cching tmc2 Tm(os)TjET0.28 e12nim4cIsmbhatofaini3/54 36 Tm(15)tmc2 .28 18.251 r0131*

Theme	Theme description	2013	2023/24
Systems	Use systems-based approaches to better understand and manage interactions between soil, water and crop/ animal processes.	Soil health, Nutrient management and	

Research priorities

IPM	Develop integrated approaches to the effective management of crop weeds, pests and diseases within farming systems.	Breeding resilience and Responding to regulation	
			Disease detection, Biologicals, Plant health, and Adaptation
Ecosystem services	Develop evidence-based approaches to valuing ecosystem service delivery by land users, and incorporate these approaches into effective decision-support systems at the enterprise or grouped enterprise level.	Functional biodiversity, Digital tools, Circular economy and Optimisation strategies	
			Adaptation and Agri-business
Genetics	Apply modern genetic and breeding approaches to improve the quality, sustainability, resilience and yield-led d f c ÚHJV]]hmcZWfcdg'UbX¨ZUfa¨Ub]a¨U¨g''	New breeding techniques, Breeding for climate change and Traits over breeds	
			One health
Animal health	Develop integrated approaches to the management of animal disease within farming systems.	Disease control and One health	
			Functional biodiversity, Consumers, AMR, Disease detection and Infrastructure

3.3 Comparison with the researchers' priorities

How do farmers' and growers' priorities compare with a strategic perspective from the research community?

[garbled text line]

[garbled text line]

[garbled text line]

Famer and grower priorities most commonly aligned with four main AFN+ themes, as shown in Figure 4, which

[garbled text line]

The most aligned themes were:

- Food security and trade, particularly optimising UK land use under changing climate conditions and

Research priorities

Research priorities

Similarly, farmer and grower priorities were compared with 800 current AUC PhD topics, which represents
U goUdg chcZh Y bh YfYgh cZYa Yf[b YgYUfW Yfg I i fY +Ł H Yg Úh a cfY Wcg Y mk h Ufa YfgÑUbX fck YfgÑ
research priorities. Farmers and growers appear to want relatively more research effort on applied soil science,
agri-tech and, in particular, social science.

Figure 7: Comparison with AUC PhD research projects.

30

20

10

0
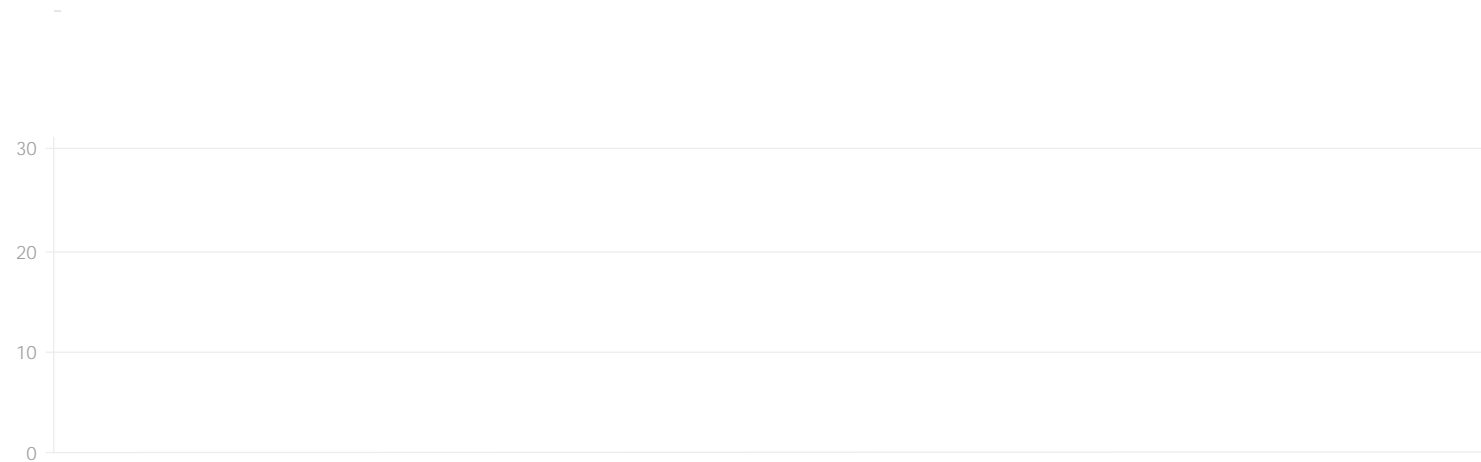
3.6 Regenerative agriculture

Given the prominent current interest in regenerative agriculture, the farmer and grower priorities were mapped U[U]bg¨ghgifUh¨Y[ ]Wdf]cf]h]Yg]Zcf¨fY[YbYfUh]j Y¨Wfcd¨UbX¨gc]`¨fYgYUfW\¨]XYbh]ÚYX¨h\Y¨C f[Ub]WFYgYUfW\¨7YbhfYžB=56¨ and Agri-tech-E.[9]

4.0   Conclusion

This report provides an overview of farmers' and growers' evolving research and innovation needs, highlighting

Appendices

Appendix 1: Workshop flow

Opening the session (1) involved a short presentation to introduce the project, and why it is important, and introducing each participant to the group. This section also included reminding participants of their right to withdraw, anonymity, and to gain consent to participate.

Populating challenges and opportunities (2) involved discussing key challenges faced by participants as the dYcd`Y`k`\c`Zufm `UbX`[fck `Yj YfmXUmfhY``ck `gh]W_mbchYg". Dfca dhg`k YfY`dfcj ]XYX`hc`gj ddcfhh\Y`ZUW]jhUhcf`hc` encourage discussion and a second person was recording these directly onto the Miro board. Prompts for this stage included: *'On a day-to-day basis what are your main challenges or concerns which infuence your farming/ growing practices? What do you see as the big issues on the horizon? Do you think your business model or way of farming/growing will face any systematic/fundamental challenges in the foreseeable future? Are these shared challenges for your sector or specifc to your business? What do you see as the biggest shared challenges?'*

Organising challenges and opportunities into an approximate timeframe and level of priority (3) hc`fYÛYWh\k \Yb` h\YgY`W\U`Yb[Yga][\hVY`a cghdfca ]bYbh`H\Y`bUk `mdcdi `UhYX`gh]W_mbchYgfhY``ck `gh]W_mbchYgdžhc[ YYh\Yf`k]h` h\Y`dfY!dcdi `UhYX`gh]W_mbchYgfV`i Y`gh]W_mbchYg`i bXYf`h\Y`\YUX]b[ `ÐVV\U`Yb[Yg'Q A

Populating research and innovation needs (4) h\Uh'fYÛYWh'h\Y'j]Yk g'cZdUfh]W]dUbhg'k Ug'h\Y'bYl h'ghU[Y'f[fYYb'
gh]W_mbch\Yg'L"G]a]'Ufm'z'hc'd\UgY'&z'h\Y'Zc`ck]b[·dfca dhg'k YfY·dfcj]XYX·]b·h\Y·Wcbh`l h'c'ZUXXfYgg]b[·h\Y·dfYj]cigm'
discussed challenges and opportunities: 'What research is required to help tackle these challenges? What areas
Xc'mci·ZYY`k ci·X·VYbYÛha cgh'Zfca·VYhhYf]i bXYfghUbX]b[·3·K\Uh'gi ddcfh]gbYYXYX'hc'YbgifY'h\Uh'mci·f'Ufm·]b[·
YbhYfdf]gY#gYWhcf'Wcbh]bi Ygg·WWYgg'f]mUbX·gi ghU]bUV`m'3·6Yg]XYg·Ubm]bcWfa YbhU``a dfcjYm Ybhg'UbX'YZ'WW]YbWygz·
is there anywhere you see a need for more systemic changes in your business or sector? What areas of research
Xc'mci·ZYY`k ci·X·VY·VYbYÛW]U`hc·h\Y·]bXi ghfm#gYWhcf3Ñ

Organising research and innovation priorities into an approximate timeframe and level of importance (5).
H\Y·bYk `m'dcdi·UhYX'gh]W_mbch\Yg'f[fYYb'gh]W_mbch\Yg'z'hc[Yh\Yf'k]h'h\Y·dfY!dcdi·UhYX'gh]W_mbch\Yg'fdl]b_'gh]W_m·
bch\Yg'z·i bXYf'h\Y·\YUX]b[·ÐfYg'YUfWW·UbX·]bbcj Uh]cb·df]cf]h]Yg'Ñk YfY·hc·VY·Wcbg]XYfYX·]b·h\Y·Wcbhl h'cZh]a Y·UbX·
priority. The following prompts were provided: 'How important is this [research and innovation priority] to ensure
that you can continue to farm successfully? Is this research likely going to impact your practices or sector? Does
this [challenge or opportunity] need to be considered in the next 0-5, 6-10 or 11-20 years? Is this research need
going to be pressing within the next 0-5 or 6-10 years or is it likely to become more of a challenge in the next
11-20 years?'

Closing the session (6)]bj c'j YX'g'Ybg'g'WWYWk_]b[·h\Y·ÚbU·hUV`Y·hc·Ybgi fY·]h'Z]··mfYÛYWhYX'h\Y·j]Yk g'cZh\Y·
participants. Sticky notes that spanned across multiple cells were duplicated in each one for analysis purposes,
ensuring that they were captured across the correct timeframes and priorities. Finally, facilitators provided an
opportunity for any other contributions that were not captured in the workshop so far and these were added
to the Miro board.

Appendix 2: Data analysis

Thematic analysis is a research method used to identify, analyse and report patterns within data. Literature has]XYbh]ÚÝX `h\Uh`h\Y`i g`cZ`5=`f7`\Uh``DH‑`WUb`VY`U`VYbYÚW]U``UXX]h]cb`hc`h\]g`UbU`mg]g`a Yh\cXc`c[`mVmdfcj]X]b[`

A similar approach was therefore employed for the current workshop data sets as follows.

Context: Multiple workshops with farmers and growers from [sector] enterprises met to discuss the challenges and opportunities and research and innovation priorities for farmers and growers in UK agriculture. These workshops will contribute to research strategies and research funding priorities in future work. The following data were listed as areas which need consideration in the next [0-5, 6-10, 11-20] years.

Instruction [merged prompt]: Help me perform qualitative, inductive, thematic analysis on the provided data by each workshop, identify appropriate themes derived from within the data, in the following categories: high priority WʌU˙Yb[YgˈUbX ˈcddcfħi b]ħ]Ygfʺłž\][\ ˈdf]cfħmfYgˈYUfWʌ ˈUbX ˈ]bbcj Uħ]cb ˈbYYXgfⅈžˈck ˈdf]cfħ]YgWʌU˙Yb[YgˈUbX ˈcddcfħi b]ħ]Ygfl łž`ck ˈdf]cfħmfYgˈYUfWʌ ˈUbX ˈ]bbcj Uħ]cb ˈbYYXgf(łʺl bXYfˈYUWʌ ˈcZħ\cgY ˈ\YUX]b[gžˈdˈYUgYˈdfcj]XY ˈ summarized themes and subthemes that are discussed across all workshops.

Please merge the data from all workshops to provide an overall summary of these themes. I would like one ci ħdi ħˈfbchˈgi a a UfⅉYgˈcẐħk c ˈk cf_g\cdgⱠk \ W WˈcjˈYfgˈ\][\ ˈdf]cfħmWʌU˙Yb[YgˈUbX ˈcddcfħi b]ħ]Ygfʺłž\][\ ˈdf]cfħm fYgˈYUfWʌ ˈUbX ˈ]bbcj Uħ]cb ˈbYYXgfⅈžˈck ˈdf]cfħⅉYgWʌU˙Yb[YgˈUbX ˈcddcfħi b]ħ]Ygfl łž`ck ˈdf]cfħmfYgˈYUfWʌ ˈUbX ˈ]bbcj Uħ]cb ˈbYYXgf(łⱠXYbⅉˈYX ˈẐca ˈU˙k cf_g\cdgˈ

Text input: Data from each workshop was clearly labelled so that GPT could identify individual workshops and bring together the cross-cutting themes from each.

Table 3: An example of the data input table

		0-5 years	6-10 years	11-20 years
High Priority	**Challenges & opportunities**			
	Research & innovation needs	*Data*	*Data*	*Data*
Low Priority	**Challenges & opportunities**	*Data*	*Data*	*Data*
	Research & innovation needs	*Data*	*Data*	*Data*

Note: All data was input to ChatGPT in a list format with the categories shown below at the start of each section. Where the input was too long, analysis was run on a cell by cell basis, e.g. High priority challenges.

Appendix 3: Strengths and limitations

Overarching themes were developed to provide an accessible summary to research funders and providers. This therefore meant that more discrete challenges were not necessarily captured in the overall workshop output summary. Whilst this approach enabled the presentation of clear and succinct research and innovation ⬛⬛ ⬛⬛⬛ on farm-level concerns.

Discussion and workshop outputs were often focused on immediate challenges faced on farm at the present ⬛⬛⬛ challenges and needs are not yet perceptible to farmers, given the plethora of challenges and research needs outlined in the more immediate future. However, there was some acknowledgement within workshops that longer term research planning warrants further consideration to secure a sustainable and positive future for ⬛⬛ is warranted.

Some workshop organisers required changes to be made to the Miro Board layout to enhance usability during workshops. Those who had access to multiple screens during workshops were mostly able to navigate the board and capture the information live during the workshops. Others who were working from one screen or on a tablet required adjustments of frames to allow a full screen view of all sticky notes. This was easily adapted to meet the needs of each workshop organiser but does highlight the need to consider how best to run workshops in a more standardised way in the future.

Some organisations did not utilise the Miro board, and instead provided comprehensive summaries in a summary ⬛⬛⬛ by other workshops, they could not be clearly linked to the time frames and priority levels, which this work aimed to provide. A more standardised approach and engagement from organisations with the Miro board/or other ⬛⬛ attributed to farmer and grower challenges and research priorities.

Appendix 4: Feedback from organisations convening workshops

Some workshop facilitators noted that despite using clear and accessible language, it was still challenging to identify relevant information from participants. Ordering participant thoughts, within the workshop discussion,]bhɔ˙h\Y˙ƶ̌Ua˙Yk˙cf_˙dfcj]X̌YXƶ̌k˙Ug˙X]ƶ̌ÚŴí˙ȟcb˙c˙ẂẂUǧcbǧVYŴUi˙ǧY˙˙ẂƲU˙˙Yb[˙YǧUbX˙fYǧYUfẀ̌˙bYYXǧẀɔi˙˙X˙bcȟ always be clearly attributed to discussion points. As such, further consideration of how to capture individual lived experiences, challenges and priorities may be warranted.

Connecting what participants understood to be the rationale of this work with the immediate issues faced on

Authors and acknowledgements

Authors

Kayleigh Crouch, Tom MacMillan and Kate Pressland
Centre for Effective Innovation in Agriculture, Royal Agricultural University, Cirencester, GL7 6JS

Acknowledgements

We are grateful to the following people and organisations for their invaluable help, without which this work would have not been possible. Their participation implies no endorsement of this report.

Members of the project commissioning group

<Y`Yb`:Yff]Yf`fB:I£`UbX`7U`i a `A i ffUmfH₂bbcj UHY`I ?ž`I ?F±žZcf`h\Y]f`]b]h]U``]a dYh i g`UbX`cb[c]b[`g]ddcfhžd`i g`5b[ Y`U` ?Ufd`fFch\Ua g]YUX`FYg]YUfW\±ž7 \f]g; ccXYf\Ua `f5 [f]W.`h i fY`UbX`<cfh]W.`h i fY`8Yj Y`cda Ybh`6cUfXž`8Uj]X` A ]W.]Y`fB:I G£ž`9X`6Uf_Yf`f5 [ f]W.`h i fU`´b₂bXi ghf]Yg`7 cbZYXYfUh]cb±ž`<Y`Yb`Gk YYbYmfH₂bbcj UHY`I ?ž`I ?F±ž>Ua Yg`D\]`dg` f₂66GF7 £ž?UHY`Gh]``fGc]`5 gg₂cW]Uh]cb±ž?Uhf]bU`<Umh`Yf`fh\Yb`±bbcj UHY`I ?ž`I ?F±ž@!W₂:cg]Yf`fB YZ£U£ž`A Ufh]b`@b`Yg`fB`Uh i fY` :f]YbX`m`:Ufa `]b[ `BYk cf`±ž`A Y`Ub`K \Uh₂m`ff@95:£ž`DYbbm`A ]XX`Yhcb`fB:I G£ž`FcVYfh`G\YUg`Vmf5 [ f]W.`h i fU``b₂bXi ghf]Yg` 7 cbZYXYfUh]cb±ž`GU``6i f[ YggfB YZ£U£ž`GUfU\`9j YfYX`fB YZ£U£ž`G]a cb`H`\Y`k Y``fk`UfdYf`5 XUa g`±`b]j Yfg]hm±ž`H`Ygg`<ck Y` fH`\Y`₂bgh]hi hY`Zcf`5 [f]W.`h i fY`UbX`<cfh]W.`h i fY£"

Workshop hosts

8UⱫmXX`>UffYh`fB:I`7ma fi Ɫž8YVcfU\`7 fcggⱭUb`fⱧbbcj Uh|cb`Zc f5[f]W ìi fYⱢž9X`6Uf_Yf f5[f]W ìi fU``ⱭXi ghf]Yg`
7 cbⱫYXYfUh|cbⱢž<Y`Yb`:Yff]Yf f B:I Ⱡž<c|`mG\YUfa Ub`fⱧbbcj Uh|cb`Zc f5[f]W ìi fYⱢž?UhY`Gh]``fⱦc]`5 ggcW|Uh|cbⱢž`
@Ui fU`DU`Whmbg_]`fⱧbbcj Uh|cb`Zc f5[f]W ìi fYⱢžA UXY`GYⱭeY`Gk YYhf B:I ⱢžFYVYYWWU`Gk ]bb`fⱧbbcj Uh]Y`:Ufa YfgⱢž`
FYVYYWWU`@Ui[\hcb`fⱦⱭXkc f_YfgⱧ5``]UbWⱢžFu ì h`ⱦⱭUghcㅤk`f5[f]!ㅤHㅤYㅤㄸ`7YbhfYⱠž`HUfㅤK][\hfⱦⱭXkc f_YfgⱧ`
5``]UbWⱢžJ|W_mFcV]bgcb`f5[f]W ìi fY`ⱭXi ghf]Yg`7 cbⱫYXYfUh|cbⱢžK YbXm`<Yk]ㅤgcb`f5[f]!ㅤHㅤYㅤㄸ`7YbhfYⱢ"

Farmers

Last but not least, all the participating farmers for providing helpful insights and frank discussion about their farm businesses. Thank you to all the farmers and growers who gave up their time to participate in the workshops and for providing helpful discussion and comments.

Funding

References

[9] 7 c c d Y fž >" Ghc W_X U ˙ Yž 9 "˙ Ub X ˙ 7 ˙ Uf_Yž 6 "˙ f&$&(Ł 7 fc d ˙ Ub X ˙ Gc] ˙ GW]Yb W ˙ FYgY Uf W\ ˙ Df]c f]h ˙ Yg ˙ Ub X ˙ ?b c k ˙ YX [˙ Y ˙ ; ˙ Ud g ˙ k]h ˙ U ˙ FY [Yb Yf U h]j Y ˙ 5 [f W ˙ ˙ h ˙ fY ˙ : c W ˙ g ˙ f]b ˙ X f U Zh Ł

[10] N\ Ub [ž < "˙ K i ž 7 "˙ L]Yž >"˙ @mi žM ˙ 7 U]ž >"˙ Ub X ˙ 7 Uffc ˙ ž >"A "˙ f&$&' Ł "˙ FYX Y Úb]b [˙ e i U]Uh]j Y ˙ Ub U ˙ m g g]b ˙ h\Y ˙ 5 = YfU ˙ I h]˙ g]b [˙ 7 \ Uh ˙ DH Zc f YZ ÚW]Yb h ˙ h\ Ya Uh ˙ W Ub U ˙ m g g ˙ UfL]j ˙ d fY d f]b ˙ UfL]j . &' $ - "%$ ++%

[11] ˙ N\ a Úf Yg W! !DYfY]fUž >" 8 "˙K Y]ž < "˙ L]Ucž 5 "; ˙ i ž ?" ˙ > ˙ b [ž ; ˙ "˙ @YYžA "˙ < Ufha Ubbž 6 "˙ Ub X ˙ N\Ub [žE "˙ f&$&' Ł ˙ < YfX]b [˙ AI Cats: Lessons from Designing a Chatbot by Prompting GPT-3. In Proceedings of the 2023 ACM Designing ЉhYfU Wh]j Y ˙ GmghYa g ˙ 7 cbZYfYbWY ˙ fD]hg Vi f[\ ˙ž D5 ž I G5 Ł fB 4 G Ñ &' Ł "˙ 5 g g c W]Uh]cb ˙Zc f ˙ 7 ca d i h]b [˙ A UW\]bYfmž BYk ˙ Mcf_ž NY, USA, 2206–2220. https://doi.org/10.1145/3563657.3596138

[12] ˙ DYf_]b g žA "˙ Ub X ˙ FcYž >"˙ f&$&' Ł "˙ 5 WUX Ya]W di V]g \Yf [i]X Y]b Yg c b ˙ 5 =i g U [Y. ˙ 5 ˙ 7 \ Uh ˙ DH g i d d c f hYX ˙ h\ Ya Uh]W analysis. F1000Research. 12, p.1398

UK farmer & grower research priorities

Detailed report

7 fc i VV ž?"žA UWA]`Ubž H7 "žDfYggUbXž?"`f&$&(Ł"l ? ˙ZUfa Yf˙
and grower research priorities. August 2024.