

# Highlights Briefing – Breeding, Forage and Nutrient Plans



## Introduction

The Testing Actions for Sustainable Farming [Phase One survey](#) was established to provide initial insight into:

- current awareness and experience of sustainable and regenerative agriculture
- the current state of uptake of sustainable farming practices
- the motivations and barriers for farmers and crofters to adopt those practices.

Participants were recruited using two different approaches:

- Random selection using a stratification methodology
- Volunteers from previous surveys and reactive volunteers.

## Scope of this briefing

Following the [main highlights briefing](#), which focussed on Carbon Audits, Biodiversity Audits and Animal Health and Welfare plans, this briefing has been written to provide analysis on the remaining plans asked within the survey. These are specifically:

- Soil testing
- Manure analysis
- Forage analysis
- Nutrient management plan
- Feed ration plan
- Breeding plan

As with the initial highlights briefing, this briefing only considers the main farm types which are supported under the Basic Payment Scheme. All figures represented in the briefing are based on responses only from the following sectors:

- Cereal
- General cropping
- Lowland Cattle & Sheep
- Other Cattle & Sheep (LFA)
- Specialist Sheep (LFA)
- Dairy
- General cropping - forage
- Mixed
- Specialist Cattle (LFA)

For the sectors listed above, the survey received 947 valid responses. For a breakdown of these, please see the [main highlights briefing](#).

### Overview

Table 1 shows uptake of each plan/analysis considered in this briefing, broken down by farm size and type. Key points include:

- Not every respondent was asked questions on every management plan, and so base responses differ for each plan. Percentages are calculated as those responding to the question. See individual sections within the report for base responses.
- As shown in Table 1, in general, larger farms were more likely to have plans in place.
- The same kind of generalisation cannot be made for farm types; the plans in place appear contingent on the type of farm.

Table 1. Uptake of management plans by farm size and type

Size	Soil testing	Nutrient management plan	Manure analysis	Forage analysis	Feed ration plan	Breeding plan
0 - <0.25 FTE (Very Small)	33%	8%	2%	10%	24%	32%
0.25 - <1 FTE (Very Small)	64%	30%	6%	26%	48%	48%
1 to <2 FTE (Small)	74%	33%	9%	43%	52%	45%
2 to <3 FTE (Medium)	87%	51%	16%	69%	65%	45%
3 to <5 FTE (Large)	92%	47%	12%	77%	71%	54%
5 or more FTE (Very large)	91%	55%	18%	75%	71%	62%
Farm type	Soil testing	Nutrient management plan	Manure analysis	Forage analysis	Feed ration plan	Breeding plan
Cereal	94%	65%	20%	30%	33%	21%
Dairy	88%	70%	30%	98%	88%	79%
General Cropping	98%	70%	16%	31%	44%	31%
General cropping - forage	44%	21%	3%	6%	6%	11%
Lowland Cattle & Sheep	78%	33%	9%	50%	53%	57%
Mixed	85%	57%	17%	70%	72%	54%
Other Cattle & Sheep (LFA)	73%	28%	6%	55%	55%	50%
Specialist Cattle (LFA)	80%	39%	11%	72%	67%	54%
Specialist Sheep (LFA)	48%	9%	4%	17%	39%	45%
<b>TOTAL</b>	<b>74%</b>	<b>38%</b>	<b>11%</b>	<b>51%</b>	<b>55%</b>	<b>49%</b>

## Soil testing

- Soil testing is a process to determine the nutrient content and structure of the soil. It is integral to good soil management and healthy soils can prevent diffuse water pollution and benefit biodiversity. It helps to understand soil conditions, enabling land owners to make informed decisions on fertiliser needs to maximise crop yields and quality and potentially save costs.
- 74% of respondents stated they had undertaken soil testing on their holding.
- Cereal and General Cropping farms were most likely to have undertaken soil testing. General cropping-forage types were least likely to have done so.
- Large and very large farms were also more likely than others sizes to have undertaken soil testing (both over 90%).
- Of those that had undertaken soil testing, the measurements that were most commonly recorded were pH and phosphate/potassium.
- All measurements taken by those who conduct soil testing (pH, organic matter, phosphate/potassium, and trace elements) were commonly recorded across a proportion of fields over a 4-5 year cycle. This is the recommended testing cycle favoured by organisations such as [SRUC](#).
- However, despite choosing the 4-5 year cycle option, some respondents stated that their cycle could be longer (between 6 and 10 years) to fit with their crop/grass rotations. Others commented that rotations were shorter, approximately 3 years.

## Motivations<sup>1</sup>

- Selecting from a predefined list, the most common reason for undertaking soil testing was to reduce input costs, followed closely by targeting the use of inorganic fertiliser. This demonstrates a good understanding by respondents that the (relatively small) costs of soil testing outweigh the benefits of saving money in the long-term.
- No respondents stated they had done soil testing as a result of advice from a statutory body.

## Nutrient management plans<sup>2</sup>

- Nutrient management is the process of ensuring the right amount of nutrients are present in the soils. A nutrient management plan (NMP) is a requirement for farms located within a Nitrate Vulnerable Zone (NVZ).
- 38% of respondents had completed an NMP. In comparison, [Defra reported](#) that 54% of holdings in England had an NMP in 2022. This is most likely because a higher proportion of England's land area sit in an NVZ.
- All of these respondents were located in an NVZ. No one outside of an NVZ had completed the NMP. The plan was most commonly completed by General Cropping farms, and least commonly undertaken by Specialist Sheep LFA farms.

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<sup>1</sup> No questions were asked about the barriers to soil testing. Questions on further actions from soil testing are captured below as part of Nutrient Management plans

<sup>2</sup> No questions were asked about the motivations for, or barriers to, completing a nutrient management plan.

- Only 8% of very small (0-0.25FTE) farms had completed a nutrient management plan.
- 51% of nutrient management plans were completed by an advisor, whilst 49% were completed by the respondents themselves.
- The majority of nutrient management plans were completed using paper plan/records. The next most popular system was SRUC Technical Notes.
  - It is arguable that more work needs to be done to encourage the use of electronic software/plans that would benefit the producer. This should include both communicating the benefits of switching from paper to electronic systems, as well as training on how to use a new system. However, although upskilling is critical for just transition, lack of staff and lone owner-occupiers will affect uptake of new systems and training.

### Further actions

- 38% of respondents had both completed an NMP plan and a corresponding action. A far higher proportion (56%) did not have an NMP but had done corresponding actions. Only 2 respondents had a plan but implemented no further actions as a result.
- The most common action undertaken overall by respondents was 'Keeping pH at an optimum level' (80%).
- The actions most regularly undertaken by respondents with an NMP were 'Keeping pH at an optimum level', 'Targeted use for organic manure', and 'Targeted use of inorganic fertiliser'. This is in keeping with the most common measurements taken in soil testing (pH).
- Interestingly, the most common action undertaken by those **without** an NMP was 'Continuous soil cover' (42% regularly implementing), although uptake of this action was still lower than of those with an NMP in place (53% regularly implementing). Continuous soil cover is considered a potential large contributor to mitigation in recent research published by [ClimateXChange and SRUC](#).
- Of those with an NMP, 'Use of nitrification inhibitors' was the least common action implemented. Of those without an NMP, 'Integrate pulses/legumes into cropping' was the least common action.
- 'Use of nitrification inhibitors' was also highlighted as the action that respondents knew the least about, regardless of having an NMP in place.

### Manure analysis

- Testing manure for nutrient content helps to meet crop nutrients needs efficiently which relates to business efficiency/profit and decrease risk of pollution.
- Only 11% of respondents had undertaken manure analysis on their holding (9% indicated they held livestock, 2% had no livestock).
- Analysis was most commonly undertaken on farm yard manure, followed by slurry. Only 2 respondents had undertaken analysis on sewage.

### Motivations and barriers

- The most common reason for respondents to have done manure analysis was to target use of applications, followed by reducing fertiliser use.

- For those who had not undertaken any manure analysis, 36% said it was because they did not recognise a need for it. 27% also said it was not relevant for their business.

### Further actions

- Of those who had undertaken manure analysis, nearly 85% had implemented a change.
- The most common change made to their business was to reduce chemical fertiliser applications, followed by changing organic manure application rates.

### Forage analysis

- Forage analysis assesses the quality of forage for livestock feeding. It allows farmers to schedule more efficient feeding through calculating how much dry matter they have available, and potential short falls for winter feed.
- 877 farmers answered questions on forage analysis, with 51% having undertaken it.<sup>3</sup>
- 91% of those who had undertaken forage analysis had conducted it on silage. Straw was the least commonly analysed substance.

### Barriers<sup>4</sup>

- The most common reason for not undertaking forage analysis was that respondents did not consider it relevant for their business (33%), despite most (75%) indicating that they held livestock on their holdings.
- 19% indicated that cost had been a barrier to them undertaking forage analysis.

### Further actions

- As a result of their forage analysis, the most common action was to decrease the volume of concentrates per head (54%). Other respondents, who had not chosen increase or decrease concentrates as options, also stated that they were recommended to 'vary or alter' concentrates based on the analysis.
- 20% of respondents had done no action as a result of their forage analysis. However, this could mean that no actions were needed or recommended as a result of the analysis.

### Feed ration plan

- Feed ration planning is essential for effectively managing feeding of livestock. It ensures maximum profitability by ensuring only required feed is bought, and accurately estimating the nutritional requirements of their herds (optimising their health and ultimately production).

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<sup>3</sup> Only farms with livestock were asked about forage analysis (arable only farms were automatically routed out of this section).

<sup>4</sup> No questions were asked about the motivations for undertaking forage analysis.

- 876 farmers answered questions on their feed ration plans, with 55% having undertaken a plan.<sup>5</sup> In comparison, [Defra \(2022\)](#) reported that 67% of holdings in England used a ration formulation programme or nutritional advice.
- Dairy farms were most likely to have a feed ration plan compared with other farm types.
- Of those who had a plan in place, 72% had one for beef, and 52% for sheep. One respondent had a feed ration plan for goats, and another had a plan for bees!
- Feed ration plans were most likely to have been conducted solely by the respondent, followed solely by feed representatives. Nearly 10% of plans were created by producers in conjunction with feed representatives.
- Feed ration plans were most commonly updated on an annual basis.

### Barriers<sup>6</sup>

- The most common reason for relevant respondents not having a feed ration plan was that it was not relevant to their business, followed closely by not seeing a need for it on their farm/croft.

### Further actions

- Of the 485 respondents with a feed ration plan, 96% had undertaken actions under the plan. Only 4% had a plan and undertaken no further actions.
- The most common actions undertaken were 'continual monitoring' and 'reduced concentrate usage per head'.

### Breeding plan

- Breeding plans are important for optimising performance from livestock, particularly by identifying beneficial genetic traits. Breeding planning can aim to increase offspring survival, improve ease of birth, and boost growth rates.
- 873 farmers answered questions on their breeding plan, with 49% having created a plan.<sup>7</sup>
- Dairy farms were most likely to have a breeding plan than any other farm type.
- Breeding plans were most commonly updated on an annual basis.
- 92% of those with a breeding plan had created it themselves.

### Motivations and barriers

- The most common reason for creating a breeding plan was to improve livestock performance, followed by business efficiency.
- A large proportion of those without plans stated it was because they were not relevant to their business. However, the most common reason for not having a

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<sup>5</sup> Only farms with livestock were asked about feed ration plans (arable only farms were automatically routed out of this section).

<sup>6</sup> No questions were asked about why respondents had created a feed ration plan.

<sup>7</sup> Two respondents indicated they had no plan, but went on to fill in the remaining questions on their plan. Their answers have been removed from this analysis.

breeding plan was due to respondents carrying out actions which they did not officially document as part of a plan.

### Further actions

- The most common actions carried out under a breeding plan were to 'breed own replacement', followed by having a 'stricter culling regime' and 'pregnancy scanning'.
- These were also the most common for those who carried out undocumented actions, without a plan in place.

## Conclusions

The aims of this survey was to provide insights on:

- the current awareness and experience of sustainable and regenerative agriculture
- the current state of uptake of sustainable farming practices
- the motivations and barriers for farmers and crofters to adopt those practices.

Here, the conclusions are set out under each of these aims.

### Awareness and experiences

- The experiences of respondents to actions and plans within the survey are varied, particularly between farm sizes.
- In general, larger farms were more likely to have plans in place. Given that large livestock farms have a higher proportion of livestock, targeting large farms to continue planning and uptake of sustainable changes may aid long-term GHG emissions mitigation.

### Uptake of farming practices

- Following animal health and welfare plans (covered in the [main highlights briefing](#)), soil testing was the most widespread plan/audit to have been undertaken by respondents. As soil testing is an integral component of regenerative agriculture, this is an encouraging finding.<sup>8</sup>
- Manure analysis was the least implemented plan, with only 11% of respondents having completed one.
- Of those with livestock<sup>9</sup>, around 50% had either a breeding, forage, or feed ration plan. 26% had all three in place.
- Further actions were routinely implemented by those who had plans in place, with few producers taking no actions as a result of their plans.

### Motivations and barriers

- As with the audits in the main highlights briefing, the reasons behind undertaking a plan on farm were dependent on the type of plan, and the type of farm.

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<sup>8</sup> It should be noted the term 'regenerative agriculture' has not been recommended as an official term within the Agricultural Reform Programme, as a result of confusion around its definition.

<sup>9</sup> Approximately 877 respondents, although questions on each plan were answered by a different number of respondents.



- Broadly, the main reason for not taking up a plan, or implementing subsequent changes, was because the producer did not see it as necessary for their business.
- If this is the case for plans which will help efficiency on farms, then more needs to be done to communicate the benefits of the plan and any subsequent actions that can be implemented. It is more than likely that those benefits would lie outwith GHG emissions mitigation. Whilst it is obviously important for farmers to understand how specific actions can reduce their contribution to climate change, the more immediate benefits of business efficiency, and profitability, are more likely to induce long-term change.
- It is also likely that farmers are implementing actions outside of a plan, and therefore not officially documenting the change. This was a regular occurrence when asked about breeding improvement actions for livestock. As such, positive actions may be undertaken more readily than has been previously predicted because of a lack of official documentation.
  - It should be noted that although documentation is not necessary for positive behaviour change, a lack of documentation may make it difficult to verify these actions should they form part of a conditional payment system. As such, the barriers to undertaking documented actions must be better understood, so that solutions can be found.

## Notes on this briefing

### Representation and quality of data

It is important to understand the framing of these results. The responses have given a good cross-section of farm types across the survey. Separate analyses was also undertaken on groups of participants by recruitment (i.e. volunteers and random sample); no significant differences were found between these groups.

Therefore, responses for the entire farming sector can be said to be broadly representative. However, care must be taken when interpreting average responses, as some types (e.g. dairy) are underrepresented whereas others (e.g. Specialist Sheep LFA) are overrepresented. This creates some bias in the averages used to represent the entire farming sector.

Direct comparison can also be made between farm types. Responses cannot be said to be conclusively representative for any further breakdowns (e.g. at size, region or other demographic).

Table 1. Proportions of farm types in sample and in Scotland

Farm type	Count of Sample (BRNs)	Proportion of sample	Target	Proportion of target achieved	Count of Scotland (BRNs)	Proportion of farming in Scotland
Cereal	51	5.39%	83	61.45%	1541	5.09%
Dairy	43	4.54%	122	35.25%	621	2.05%
General Cropping	81	8.55%	154	52.60%	1318	4.35%
General cropping - forage	39	4.12%	15	260.00%	8606	28.43%
Lowland Cattle & Sheep	58	6.12%	106	54.72%	1954	6.45%
Mixed	115	12.14%	181	63.54%	2960	9.78%
Other Cattle & Sheep (LFA)	95	10.03%	168	56.55%	1482	4.89%
Specialist Cattle (LFA)	255	26.93%	403	63.28%	4885	16.13%
Specialist Sheep (LFA)	210	22.18%	267	78.65%	6909	22.82%
<b>Grand Total</b>	<b>947</b>	<b>100.00%</b>	<b>1499</b>	<b>63.18%</b>	<b>30276</b>	<b>100.00%</b>

### Comparability and standardisation

Questions across plans and audit sections were not standardised in the survey. Some plans did not have a question on the motivations or barriers for creating a plan or undertaking actions. These have been identified in the main text.

### **Sample**

Horticulture, pigs, poultry, and 'unknown' farm types, have been removed from the overall sample. Therefore, the base for any total average is 947 responses (unless specified).

Not all farm types were asked every question. Arable-only farms (i.e. farms that did not select any livestock) were not asked questions on plans which require/are most relevant to those with livestock, including Feed Ration Plans, Breeding Plans, and Forage Analysis Plans. Therefore, the base response for each of these plans were below the overall 947. The base response for each plan differed, as indicated in the main text.

### **Authorship**

This briefing was written by RESAS in conjunction with RPID Area Office colleagues and feed-in from the wider Testing Actions for Sustainable Farming board. Quality control was undertaken by RESAS statisticians and economists.