Department for Environment Food & Rural Affairs

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Greenhouse gas mitigation practices - England
Farm Practices Survey 2017

This release contains the results from the February 2017 Farm Practices Survey which focused on practices relating to greenhouse gas mitigation. The key results from the survey are given below.

Nutrient management (section 1)

Nutrient Management Plans help farmers and growers to plan the use of fertilisers and manures, meet regulatory demands and protect the environment. The proportion of holdings with a nutrient management plan has remained almost unchanged at 56% in 2017. Those holdings with nutrient management plans in 2017 accounted for 75% of the farmed area.

In 2017, the majority of nutrient management plans were created by farmers themselves either with the help of a professional (44%) or without advice (24%). Three quarters of plans are updated annually and almost all farmers (93%) refer to their plan at least once a year.

Anaerobic digestion (section 2)

Anaerobic digestion is a treatment that composts waste in the absence of oxygen, producing a biogas that can be used to generate electricity and heat. Currently 5.5% of holdings process slurries, crops or other feedstocks by anaerobic digestion either on their farm or elsewhere. Although this is a small proportion of farms, this has increased steadily from just 1.4% in 2011.

Emissions (section 3)

In 2017, just under half of farmers (49%) attached some importance to considering greenhouse gases (GHGs) when taking decisions about their land, crops and livestock. This shows little change from 48% of holdings in 2016. Of the holdings currently taking action to reduce GHG emissions from their farm, recycling waste materials (86%) was the most frequently selected action followed by improving energy efficiency (75%).

Fertiliser, manure and slurry spreaders (section 4)

In 2017, 76% of farmers spread manure or slurry on their grassland or arable crops either themselves or hiring a contractor to do so and 85% spread fertiliser. Of those farmers spreading some or all of the manure or slurry themselves, over half (54%) never calibrate their spreader.

Note: The results in sections 5 to 9 relate only to holdings with livestock.

Farming Ammonia Reduction Grant (section 5)

The Farming and Ammonia Reduction Grant scheme is available to dairy and beef farmers in England. The aim of the scheme is to reduce ammonia emissions from farms by funding covers for existing slurry stores. In 2017, 41% of farmers with cattle were aware of the scheme.

Enquiries on this publication to: Farm Practices Survey – Janine Horsfall, Farming Statistics, Department for Environment, Food and Rural Affairs. Tel: 020 802 66279 email: farming-statistics@defra.gsi.gov.uk.

Manure and slurry storage (section 6)

In 2017, just over two thirds of holdings (67%) with livestock had storage facilities for solid manure in temporary heaps in fields. Almost a quarter of farmers store their slurry in a tank, whilst 16% store slurry in lagoons (without a strainer). Most farmers (58%) have 4 to 6 month storage capacity for slurry on their farms.

Farm health planning and biosecurity (section 7)

In 2017, 65% of livestock holdings had a farm health plan. Of those holdings with a plan, 75% completed it with the assistance of a vet or adviser and 84% use their plan either routinely or when possible during the year to inform decisions on disease management. Just under half (48%) of livestock farmers undertake training for animal health and welfare and disease management.

Grassland and grazing (section 8)

In some situations sowing grassland with a clover mix or high sugar grasses can be a cost-effective method of increasing production and improving environmental protection. In 2017, 70% of livestock holdings had sown some or all of their temporary grassland with a clover mix and 61% have sown their temporary grassland with high sugar grasses.

Just under three quarters of farmers (70%) always take action to reduce stocking rates when fields are excessively wet and almost two thirds routinely try to keep livestock out of water courses.

Livestock feeding regimes and breeding practices (section 9)

In 2017, 53% of livestock farmers indicated they use a ration formulation programme or expert nutritional advice when planning the feeding regime of their cattle and sheep at least some of the time. This has remained unchanged since 2013.

Just over a quarter of livestock holdings offered alternative forages (other than grazed or conserved grass) to their livestock. Whole-crop silage and maize were the most common forages offered by 15% and 11% of farmers respectively.

Estimated Breeding Values (EBV) provide an estimate of the genetic worth of animals using desirable traits such as meat production. The proportion of holdings using bulls or rams with a high EBV when breeding beef cattle or lambs in 2017 is 56% and 53% respectively.

Survey methodology (pages 34 – 35)

Details on how the survey is run, availability of results and data uses can be found in the methodology section as the end of this document.

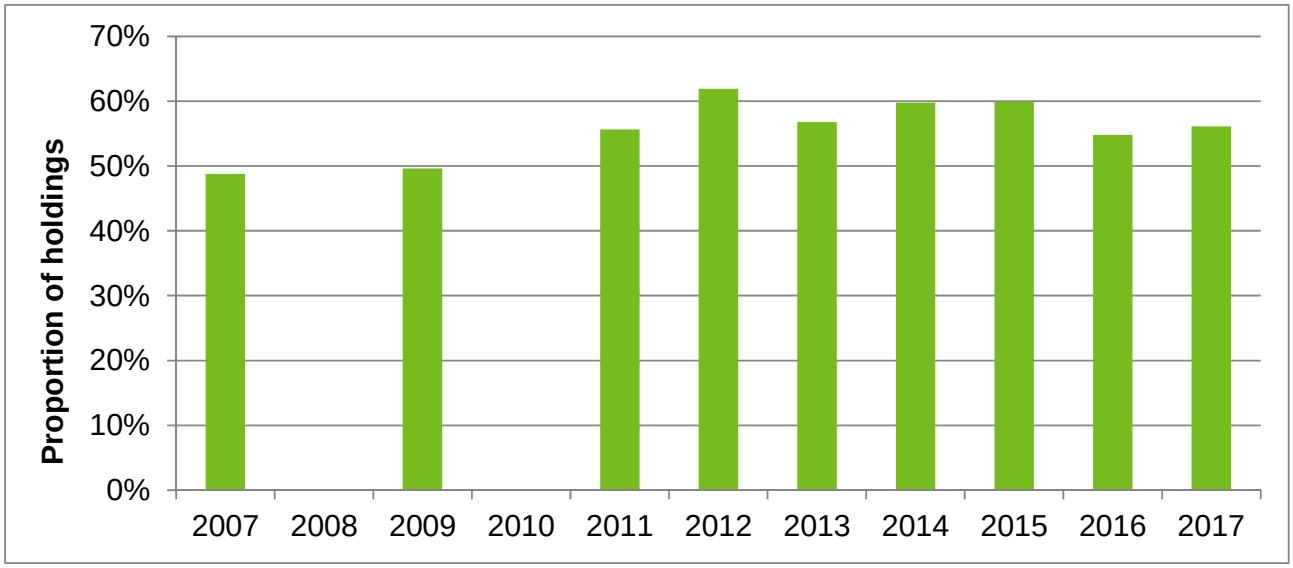
Section 1. Nutrient management

Effective nutrient management provides sufficient nutrients to meet the growth requirements of crops and grassland whilst managing environmental impacts; it can help minimise GHG emissions, reduce the incidence of diffuse water pollution and increase productivity by reducing input costs. Here we consider how farmers manage the application of fertilisers and manures, the use of nutrient management plans and how nutrient requirements are calculated and monitored.

Key findings

- In 2017, 56% of holdings had a nutrient management plan which showed little change from 2016. These holdings accounted for 75% of the farmed area covered by this survey.
- The largest proportion of nutrient management plans were created by farmers themselves either with the help of a professional (44%) or without advice (24%). The remaining 32% were created by an adviser or contractor.
- In 2017, 69% of farmers have a programme of soil testing for nutrient indices and 73% for pH. Of these holdings almost all were testing at least some of their fields every five years.
- Some 62% of holdings have a manure management plan for their farm, unchanged from 2016
- 35% of farmers keep track of soil organic matter and 73% of farmers know the soil types for each field on their farm.

Figure 1.1: Proportion of holdings with a nutrient management plan: 2007 – 2017



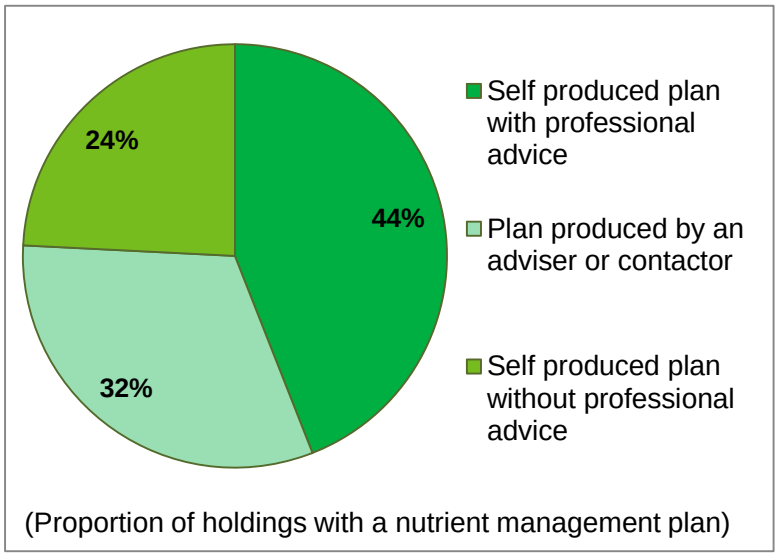
This question was not asked in 2008 and 2010, therefore results are not available for these years.

The proportion of farms with a nutrient management plan (NMP) was 56% in 2017, almost unchanged since 2016 (Figure 1.1). In 2017, those holdings with nutrient management plans accounted for 75% of the farmed area.

Around 10% of holdings (accounting for 4% of the farmed area) indicated that a NMP is not applicable. This figure varied by farm type with 32% of pig/poultry farms, 17% of lowland grazing

livestock farms and 14% of LFA grazing livestock farms indicating that a NMP was not applicable compared to 5% of other general cropping farms, 3% of dairy farms and 2% of cereal farms.

Figure 1.2: Preparation of nutrient management plans: 2017

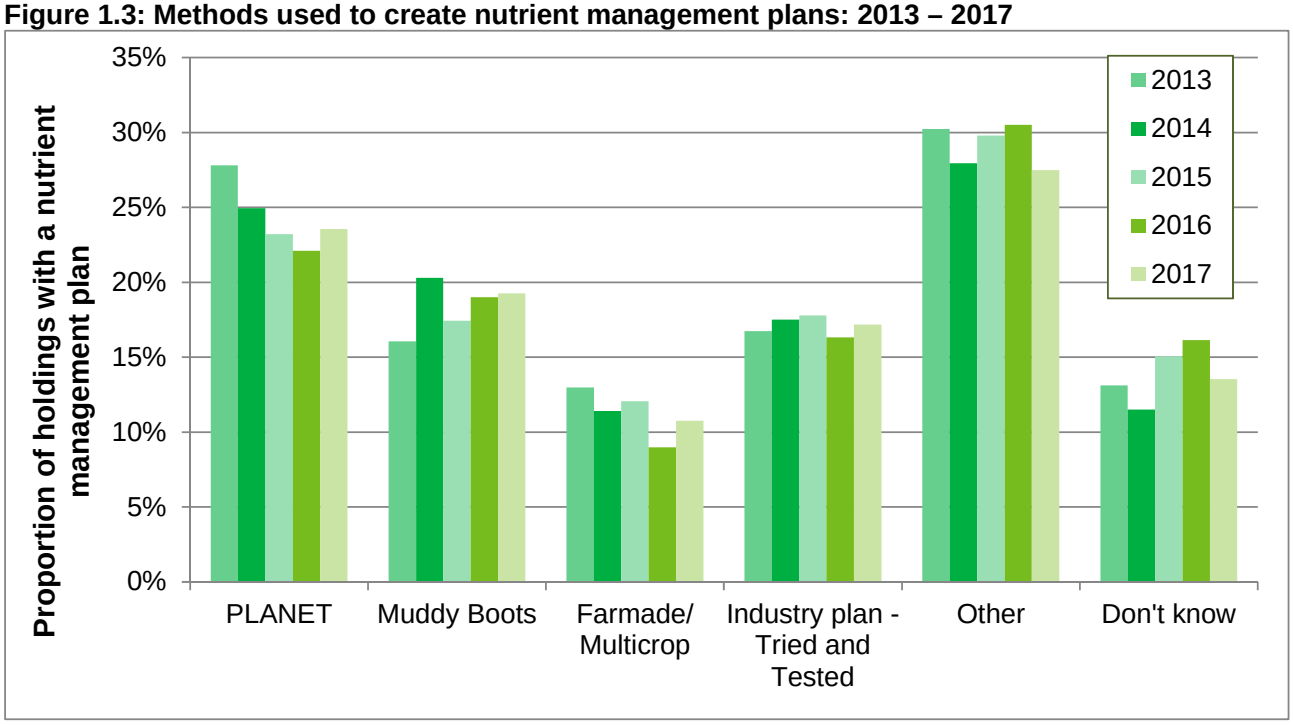


(Proportion of holdings with a nutrient management plan)

In 2017, 24% of those with a nutrient management plan completed the plan on their own without advice, whilst a further 44% created it themselves with the help of an adviser (Figure 1.2). The remaining 32% had the plan produced by a contractor or adviser.

Of those that sought professional advice, the majority (83%) did so from fertiliser advisers or agronomists (Table 1.3). Most of those with a nutrient management plan update it every year (75%) and almost all (93%) refer to it at least once each year (Tables 1.4 and 1.5).

Figure 1.3: Methods used to create nutrient management plans: 2013 – 2017



PLANET, Muddy Boots, Farmade/Multicrop and Tried & Tested are methods for creating nutrient management plans. PLANET has been the most popular of these four methods (Figure 1.3), although in each of the last five years the largest proportion of farmers (27% in 2017) have used other methods not listed on the survey form to create their plans (Table 1.6). 'Defra recommendations (RB209) was the most commonly reported source of nutrient recommendations for plans (Table 1.7).

The percentage of farmers undertaking some form of nutrient testing on soil has remained similar between 2009 and 2017. Results for the past three years can be found in table 1.8. Approximately 62% of farms have a manure management plan in 2017, unchanged from 2016. The majority of farmers (90%) use nutrient recommendations for manure management plans from Defra recommendations (RB209, CoGAP).

Soil Monitoring looks at the use of soil organic matter and whether this is being recorded. Organic matter helps to retain nutrients and water in soil. Benefits include reduced compaction and surface crusting, plus improved water infiltration into the soil.

In 2017, 35% of farmers kept track of soil organic matter on their farm. Of those not keeping track 38% provided the main reason as not important enough to test for. (Table 1.13 and 1.14)

Figure 1.4: Reasons preventing monitoring soil organic matter: 2016 - 2017

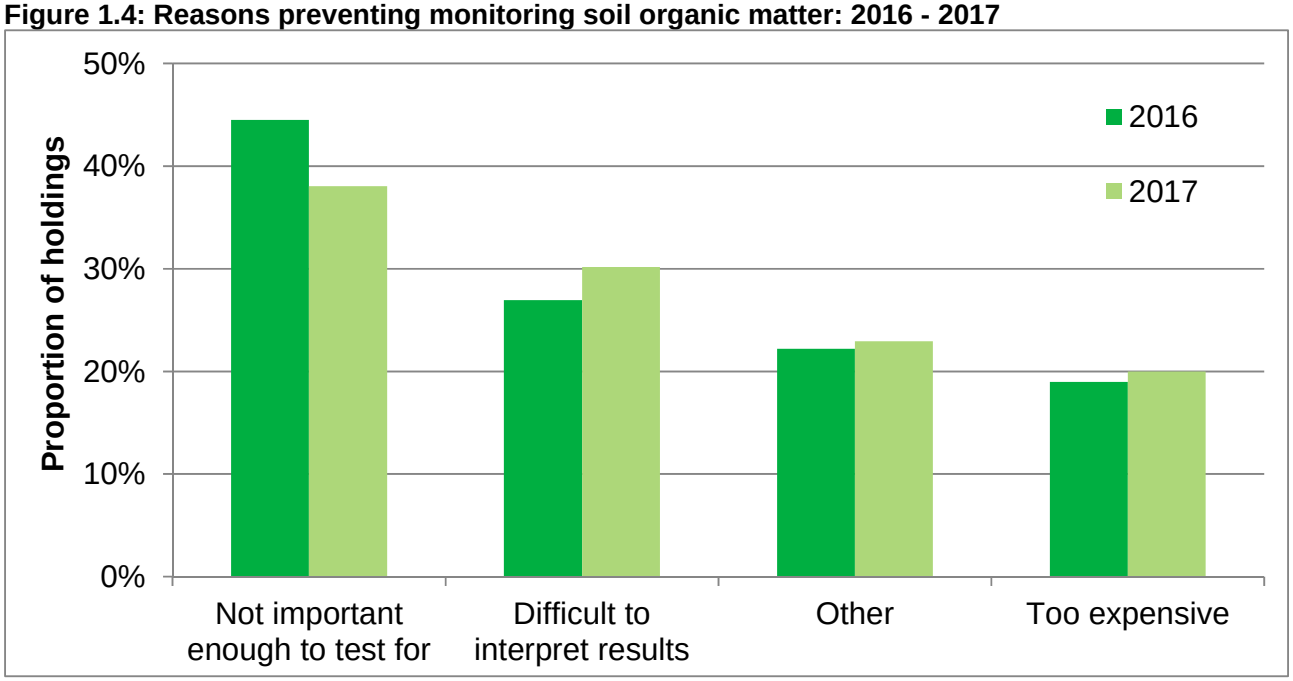


Table 1.1: Uptake of nutrient management plans: 2013 – 2017 (proportion of holdings and farmed area)

	2013		2014		2015		2016		2017	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
% of holdings										
Yes	57	*±2*	60	*±2*	60	*±2*	55	*±2*	56	*±2*
No	33	*±2*	32	*±2*	29	*±2*	32	*±2*	34	*±2*
Not applicable	10	*±2*	8	*±1*	11	*±1*	13	*±2*	10	*±1*
% of farmed area										
Yes	73	*±2*	74	*±2*	76	*±2*	72	±2	75	*±2*
No	21	*±2*	22	*±2*	19	*±2*	20	*±2*	21	*±2*
Not applicable	6	*±1*	4	*±1*	6	*±1*	8	±2	4	*±1*

Based on 2 058 responses in 2013, 2 481 in 2014, 2 635 in 2015, 2 206 in 2016 and 2 304 in 2017 from holdings with a nutrient management plan.

Table 1.2: Use of advisers/professional advice to create nutrient management plans: 2014 – 2017 (proportion of farmers with nutrient management plans)

	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Self-produced plan without professional advice	22	*±2*	25	*±2*	23	±2	24	±2
Self-produced plan with professional advice	43	*±3*	45	*±3*	46	±3	44	±3
Plan produced by an adviser or contractor	35	*±3*	30	*±2*	31	±3	32	±3

Based on 1 651 responses in 2014, 1 782 in 2015, 1 432 in 2016 and 1 486 in 2017 from holdings with a nutrient management plan.

Table 1.3: Use of advisers and contractors for completion of nutrient management plans: 2017

	Those who sought an adviser's help to create the plan themselves [(a)]		Those whose plan was created by an adviser or contractor[(b)]	
Type of adviser	% of holdings	95% CI	% of holdings	95% CI
Fertiliser adviser / agronomist	83	*±3*	85	*±3*
Animal nutritionist	5	*±2*	2	*±1*
FWAG [(c)]	3	*±2*	1	*±1*
Other	12	*±3*	13	*±3*

(a) Based on 679 responses from those who created the nutrient management plan themselves with advice.
(b) Based on 473 responses from those whose nutrient management plan was created by an adviser or contractor.
(c) FWAG: Farming and Wildlife Advisory Group.

Table 1.4: Frequency with which the nutrient management plan is updated: 2014 – 2017

	2014		2015		2016		2017	
Frequency of update	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Every year	76	*±2*	75	*±2*	77	±2	75	±2
Every 2 years	10	*±2*	11	*±2*	9	±2	12	±2
Every 3 years or longer	13	*±2*	14	*±2*	14	±2	13	±2

Based on 1 647 responses in 2014, 1 780 in 2015, 1 430 in 2016 and 1 485 in 2017 from holdings with a nutrient management plan.

Table 1.5: Frequency with which the nutrient management plan is referred to in a year: 2014 – 2017

Frequency of use	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
More than 10 times	9	*±1*	9	*±1*	8	±1	8	±1
5 to 10 times	18	*±2*	16	*±2*	16	±2	17	±2
Less than 5 times	68	*±2*	68	*±2*	70	±3	68	±3
Never	6	*±1*	6	*±1*	7	±2	7	*±1*

Based on 1 649 in 2014, 1 778 in 2015, 1 428 in 2016 and 1 485 in 2017 from holdings with a nutrient management plan.

Table 1.6: Methods used to create nutrient management plans: 2014 – 2017

Method	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
PLANET	25	*±2*	23	*±2*	22	±2	24	*±2*
Muddy Boots	20	*±2*	17	*±2*	19	±2	19	*±2*
Farmade / Multicrop	11	*±2*	12	*±2*	9	±1	11	*±2*
Industry plan – 'Tried and Tested'	18	*±2*	18	*±2*	16	±2	17	*±2*
Other	28	*±2*	30	*±2*	31	±3	27	*±2*
Don't know	12	*±2*	15	*±2*	16	±2	14	*±2*

Based on 1 643 responses in 2014, 1 775 in 2015, 1 421 in 2016 and 1 485 in 2017 from holdings with a nutrient management plan.

Table 1.7: Sources of nutrient recommendations for nutrient management plans: 2014 – 2017

Source	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Defra recommendations / manual (RB209)	68	*±3*	68	*±2*	65	±3	65	±3
An adviser's or industry note	36	*±3*	36	*±2*	36	±3	35	±3
Personal experience	41	*±3*	40	*±3*	40	±3	41	±3
Other	3	*±1*	4	*±1*	3	±1	4	±1
Don't know	2	*±1*	3	*±1*	4	±1	4	±1

Based on, 1 651 responses in 2014, 1 780 in 2015, 1 430 in 2016 and 1 485 in 2017 from holdings with a nutrient management plan.

Table 1.8: Nutrient testing of soil: 2015 – 2017

		2015		2016		2017	
		Proportion	95% CI	Proportion	95% CI	Proportion	95% CI
Testing the nutrient content (indices) of soil	% of holdings	71	*±2*	69	±2	69	±2
	% of farmed area	85	*±1*	84	*±2*	83	±2
Testing the pH of soil	% of holdings	75	*±2*	74	*±2*	73	±2
	% of farmed area	87	*±1*	86	*±2*	86	±2

Based on responses from holdings considering the questions applicable. Minimum numbers of responses used: 2 477 in 2015, 2 079 in 2016 and 2 195 in 2017.

Table 1.9: Nutrient testing of soil by proportion of fields: 2017

		All fields		Some fields		None of the fields	
		Proportion	95% CI	Proportion	95% CI	Proportion	95% CI
Testing the nutrient content (indices) of soil at least every 5 years	% of holdings	57	*±3*	43	*±3*	0.6	*±0.4*
	% of farmed area	62	*±3*	38	*±3*	0.4	*±0.3*
Testing the pH of soil at least every 5 years	% of holdings	55	*±2*	45	*±2*	0.6	*±0.4*
	% of farmed area	60	*±3*	40	*±3*	0.5	*±0.4*

Based on responses from holdings with a programme of soil testing for either nutrient indices or pH. Minimum numbers of responses used: 1 668 in 2017.

Table 1.10: Nutrient testing of manure: 2016 - 2017

Methods of testing/assessing/calculating nutrient content of manure	2016		2017	
	% of holdings	95% CI	% of holdings	95% CI
Sampling and lab analysis	13	±2	13	±1
Sampling and on-farm testing	3	*±1*	3	±1
Based on published tables	33	±2	33	±2
No testing done	50	±2	53	±2

Based on 1 756 responses in 2016 and 1 901 in 2017 from holdings without a manure management plan.

Table 1.11: Uptake of manure management plans: 2014 – 2017

	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
% of holdings	64	*±2*	63	*±2*	62	±2	62	±2
% of farmed area	77	*±2*	76	*±2*	77	±3	78	±2

Based on 2 134 responses in 2014, 2 299 in 2015, 1 871 in 2016 and 2 032 in 2017 from holdings for which the question was applicable.

Table 1.12: Source of nutrient recommendations for manure management plans: 2014 – 2017

	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Defra recommendations / manual (RB209), CoGAP	90	*±2*	89	*±2*	91	±2	90	±2
Other	12	*±2*	14	*±2*	11	±2	11	±2

Based on 1 537 responses in 2014, 1 622 in 2015, 1 320 in 2016 and 1 445 in 2017 from holdings with a manure management plan.

Table 1.13: Soil organic matter and awareness of soil types: 2016 - 2017

Methods of testing/assessing/calculating nutrient content of manure	2016		2017	
	% of holdings	95% CI	% of holdings	95% CI
Holdings keeping track of soil organic matter	36	*±3*	35	*±3*
Holdings who know the soil type[(a)] for each field on the farm	75	*±3*	73	*±3*

Based on no less than 1 465 responses in 2016 and 1 503 in 2017.
(a) as described in Appendix 1 of Defra Recommendations/Manual (RB209)

Table 1.14: Reasons preventing farmers keeping track of soil organic matter: 2016 - 2017

Methods of testing/assessing/calculating nutrient content of manure	2016		2017	
	% of holdings	95% CI	% of holdings	95% CI
Too expensive	19	*±3*	20	±3
Not important enough to test for	45	*±4*	38	*±3*
Difficult to interpret results	27	*±3*	30	±3
Other	22	*±3*	23	±3

Based on 923 responses in 2016 and 1 045 in 2017 from holdings that do not keep track of soil organic matter

Section 2. Anaerobic digestion

Anaerobic digestion is a natural process in which plant and animal materials are broken down by micro-organisms in the absence of oxygen, producing a biogas that can be used to generate electricity and heat. The process allows more efficient capture and treatment of the nutrients and greenhouse gas emissions from animal slurries and manures than can be achieved by spreading directly onto land. The remaining digestate is rich in nutrients and can be used as fertiliser. This section looks at the proportion of farmers who are currently processing any waste or crop feedstocks in this way.

Key findings

- In 2017, 5.5% of farmers said they process waste by anaerobic digestion. This is a small increase compared to 4.7% in 2016.
- Crops were the most common material type being processed, with 3.9% of farmers choosing this option. Slurries were the next most popular option processed by 2.9% of farmers.

The majority of farms do not currently process slurries, crops or other feedstocks by anaerobic digestion, with just 5.5% of holdings doing so in 2017. However this is an increase when compared to the 1.3% of farmers using anaerobic digestion in 2013. Prior to 2015, the number of farmers processing by anaerobic digestion had previously remained stable at approximately 1.5% or below (Table 2.1).

Table 2.1: Proportion of holdings processing waste by anaerobic digestion: 2013 – 2017

				% of holdings		95% CI
Waste type	2013	2014	2015	2016	2017	2017
Slurries	0.6	0.9	2.4	2.6	2.9	± *0.7*
Crops	0.6	0.8	3.2	3.0	3.9	± *0.8*
Other feedstocks from the holding	0.5	0.2	0.8	0.5	0.9	± *0.4*
Other feedstocks from outside the holding	0.1	0.3	0.5	0.7	0.9	± *0.4*
Any of the above	1.3	1.5	5.0	4.7	5.5	± *1.0*

Based on 2 051 in 2013 from holdings who had heard of anaerobic digestion and 2 470 in 2014, 2 641 in 2015, 2 235 in 2016 and 2 311 in 2017 from all holdings.

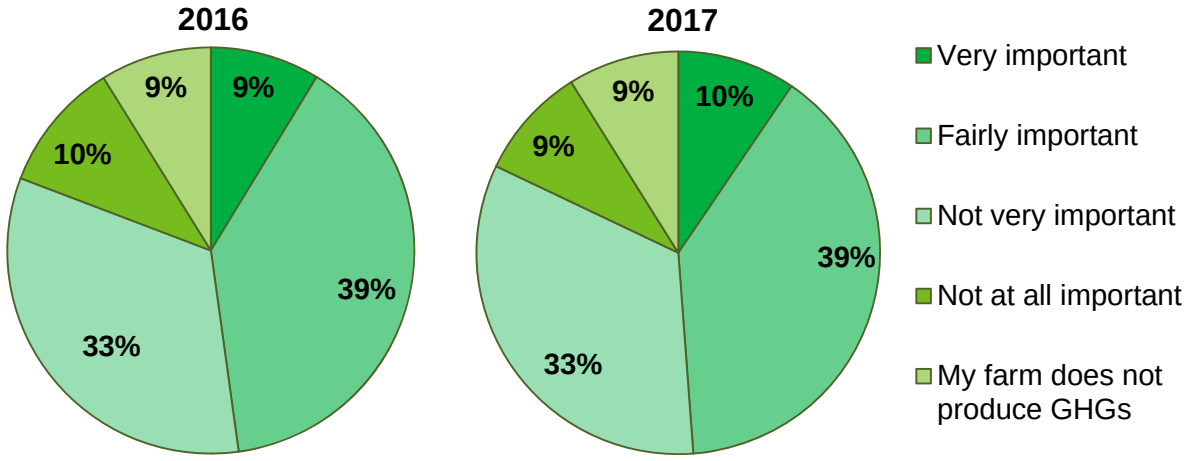
Section 3. Emissions

This section looks at the importance farmers place on greenhouse gas (GHG) emissions when making decisions about their farms. It also focuses on the actions that farmers are currently taking to reduce emissions and their motivations for doing so. In contrast we also look at the reasons that prevent farmers from taking action.

Key findings

- Almost half of farmers (49%) in 2017 considered it fairly or very important to consider greenhouse gases (GHG) when taking decisions about their land, crops and livestock. This shows little change from 48% in 2016.
- In 2017, 56% of farmers reported that they were currently taking action to reduce greenhouse gas emissions from their farm. The most common actions taken by this group were recycling of waste materials from the farm (86%), improving energy efficiency (75%) and improving nitrogen fertiliser application accuracy (72%).
- The most common motivation for taking any action was that it was considered to be good business practice to do so. This has been the case for the past five years.
- For those not taking action to reduce GHG emissions, the most common reason given was that it was not necessary because their farm did not produce many emissions.

Figure 3.1: Importance placed on GHGs by farmers when taking decisions about their land, crops and livestock: 2016 – 2017

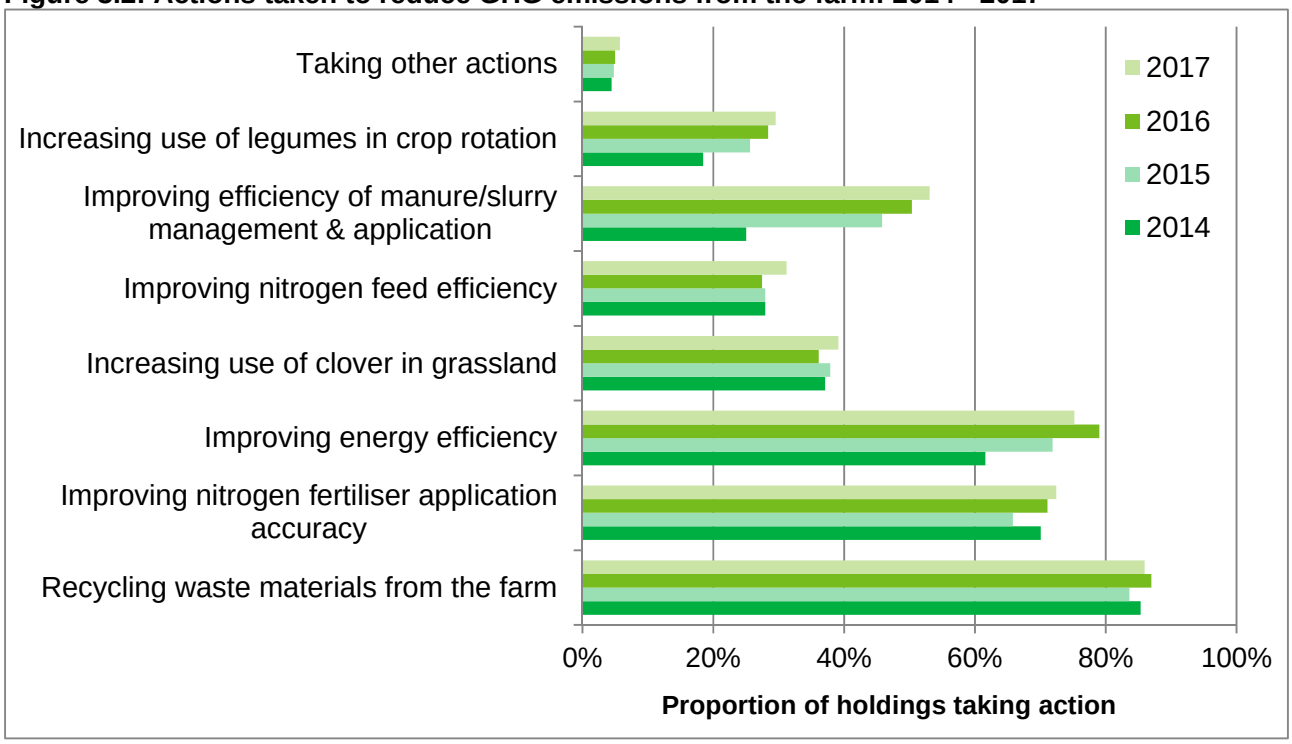


Almost half of farms (49%) considered it fairly or very important to consider greenhouse gases (GHG) when taking decisions about their land, crops and livestock in 2017. This shows little change from 48% in 2016 (Figure 3.1). There were 9% of farms that believed that their farm did not produce any GHGs.

56% of farmers said that they were currently taking action to reduce GHG emissions from their farm. Of those taking action (Figure 3.2 and Table 3.3) the three most common actions are recycling waste materials from the farm (86%), improving energy efficiency (75%) and improving nitrogen fertiliser application accuracy (72%). The largest change in actions seen between 2013 when these questions were first asked and 2017 was an increase in the number of farmers

improving efficiency of their manure & slurry management and application. This has risen steadily from 28% of holdings in 2013 to 53% in 2017.

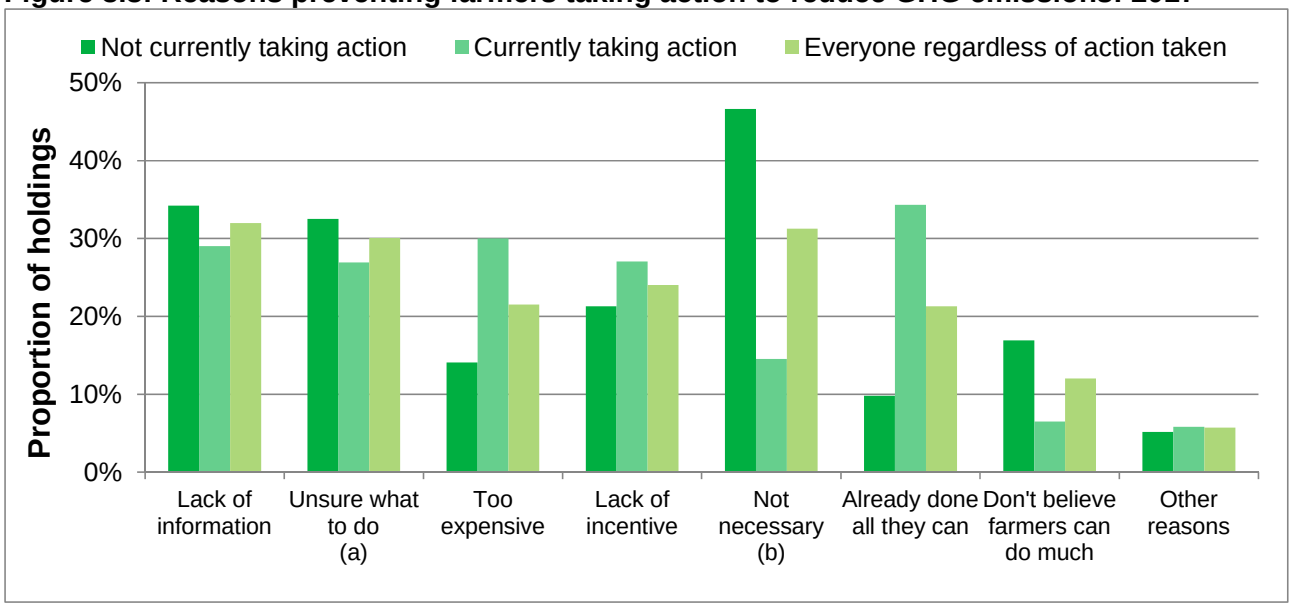
Figure 3.2: Actions taken to reduce GHG emissions from the farm: 2014 - 2017[(a)]



(a) Figures relate only to those holdings currently taking action to reduce GHG emissions from their farm.

For those farmers currently taking action to reduce their farm's GHG emissions the most common motivation for doing so was that it was considered to be good business practice (selected by 84% of holdings) followed by concern for the environment (selected by 64%) (Table 3.4).

Figure 3.3: Reasons preventing farmers taking action to reduce GHG emissions: 2017



(a) Unsure what to do - too many conflicting views on the issue
(b) Not necessary - don't believe farm produces many emissions

As might be expected, the reasons given that prevent people from taking action to reduce GHG emissions varied depending on whether farmers were currently taking action or not (Figure 3.3). For those not currently taking action, the most commonly quoted reason was that farmers did not think it was necessary to do so as the farm did not produce many emissions. For those who were

already taking action the most commonly quoted reason was that farmers had already done all they can (34%), followed by expense (30%) and lack of information (29%).

Table 3.1: Importance placed on GHGs by farmers when taking decisions about their land, crops and livestock: 2015 - 2017

	% of holdings			95% CI
	2015	2016	2017	2017
Very important	10	9	9	*±1*
Fairly important	42	39	39	*±2*
Not very important	30	33	33	*±2*
Not at all important	10	10	9	*±1*
Do not believe farm produces GHGs	8	9	9	*±1*

Based on responses from 2 616 holdings in 2015, 2 203 in 2016 and 2 301 in 2017.

Table 3.2: Belief that reducing GHG emissions from the farm will contribute to improving the overall profitability: 2015 - 2017

	% of holdings			95% CI
	2015	2016	2017	2017
Strongly agree	4	3	4	*±1*
Agree	41	38	37	*±2*
Disagree	48	51	51	*±2*
Strongly disagree	7	8	8	*±1*

Based on responses from 2 586 holdings in 2015, 2 187 in 2016 and 2 299 in 2017.

Table 3.3: Actions being taken to reduce GHG emissions from farms: 2015 - 2017

	% of holdings			95% CI
	2015	2016	2017	2017
Taking action[(a)]	61	57	56	*±2*
Of those taking action, the actions were[(b)]:				
Recycling of waste materials from the farm (e.g. tyres, plastics)	84	87	86	*±2*
Improving nitrogen fertiliser application accuracy	66	71	72	*±3*
Improving energy efficiency (e.g. reducing electricity use, using reduced tillage)	72	79	75	*±3*
Increasing use of clover in grassland	38	36	39	*±3*
Improving nitrogen feed efficiency, livestock diets	28	27	31	*±3*
Improving efficiency in manure and slurry management and application	46	50	53	*±3*
Increasing use of legumes in arable rotation	26	28	30	*±3*
Other actions	5	5	6	*±1*

(a) Based on responses from 2 613 holdings in 2015, 2 198 in 2016 and 2 273 in 2017.
(b) Based on responses from 1 731 holdings in 2015, 1 405 in 2016 and 1 389 in 2017 who are taking action to reduce GHG emissions.

Table 3.4: Main motivations for those taking action to reduce GHG emissions: 2015 - 2017

Motivations	% of holdings			95% CI
	2015	2016	2017	2017
Consider it good business practice	80	85	84	*±2*
Concern for the environment	62	63	64	*±3*
To improve profitability	55	55	52	*±3*
Regulation	46	45	41	*±3*
To meet market demands	19	19	20	*±2*
Other motivation	3	2	3	*±1*

Based on 1 727 responses in 2015, 1 397 in 2016 and 1 388 in 2017 from holdings who are taking action to reduce GHG emissions.

Table 3.5: Reasons preventing farmers from taking action to reduce GHG emissions from their farm: 2016 - 2017

	For those not taking action[(a)]			For those already taking action[(b)]			For all holdings[(c)]		
	% of holdings			% of holdings			% of holdings		
	2016	2017	95% CI	2016	2017	95% CI	2016	2017	95% CI
Lack of information	35	34	*±3*	26	29	*±3*	30	32	*±2*
Too expensive	16	14	*±2*	29	30	*±3*	22	22	*±2*
Lack of incentive	25	21	*±3*	25	27	*±3*	25	24	*±2*
Already done all they can	11	10	*±2*	37	34	*±3*	23	21	*±2*
Don't believe farmers can do much	18	17	*±3*	6	6	*±2*	12	12	*±2*
Not necessary – don't believe farm produces many emissions	47	47	*±4*	17	15	*±3*	32	31	*±2*
Unsure what to do - too many conflicting views on the issue	29	33	*±3*	26	27	*±3*	28	30	*±2*
Other reasons	5	5	*±2*	5	6	*±2*	5	6	*±1*

(a) Based on responses from 777 holdings in 2016 and 867 holdings in 2017 who are not taking action to reduce GHG emissions.
(b) Based on responses from 927 holdings in 2016 and 907 holdings in 2017 who are currently taking action to reduce GHG emissions.
(c) Based on responses from 1 712 holdings in 2016 and 1 786 holdings in 2017 regardless of whether or not they are taking action to reduce GHG emissions.

Section 4. Fertiliser, manure and slurry spreaders

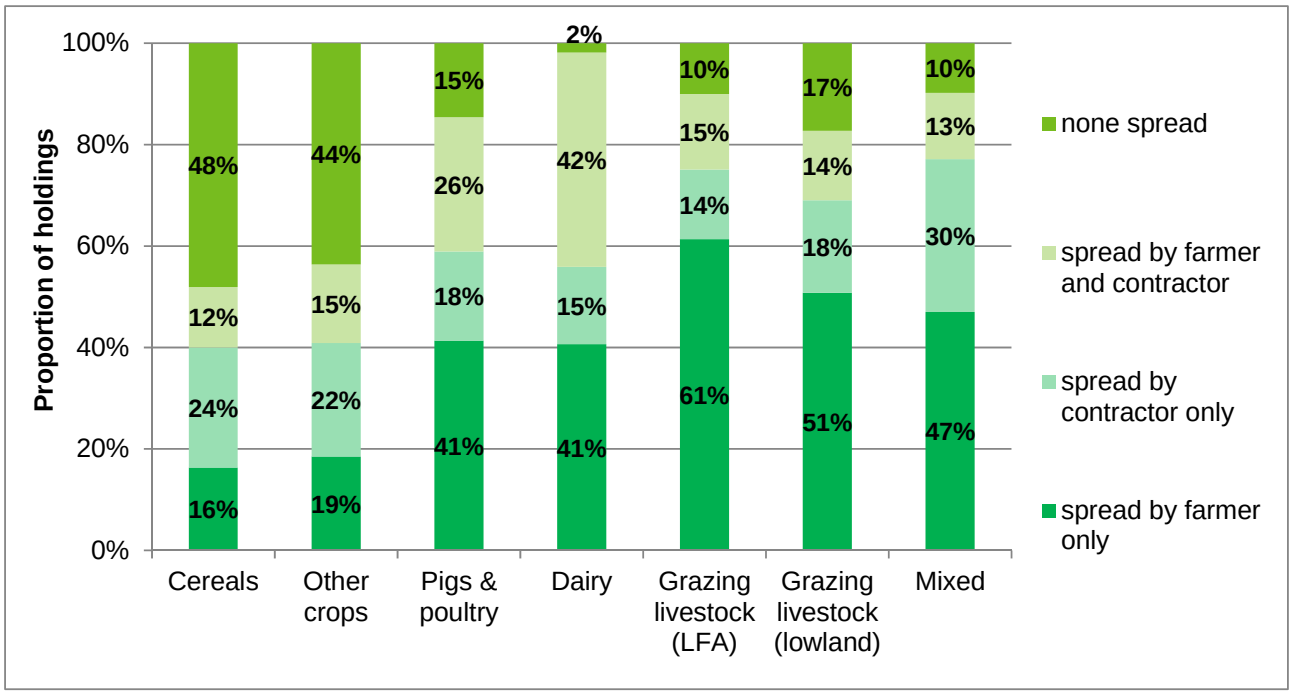
Calibrating fertiliser, manure and slurry spreaders can help to improve input efficiency and reduce GHG emissions. This section focuses specifically on farmers who spread manure, slurry and fertiliser.

More details on nitrogen fertiliser spreading practices are available in the British Survey of Fertiliser Practice at: https://www.gov.uk/government/collections/fertiliser-usage.

Key findings

- Just over three quarters of holdings (76%) spread manure or slurry on their grass or arable land in 2017 and 85% spread fertilisers.
- On 54% of holdings where the farmer spreads at least some manure or slurry themselves, the manure or slurry spreader is never calibrated.

Figure 4.1: Proportion of holdings spreading manure and slurry on grassland and arable land by farm type: 2017



In 2017, 76% of holdings spread manure or slurry on their grass and arable land. As might be expected there was considerable variation between farm types. Almost all dairy farms spread manures or slurries and these farms are more likely to use contractors to spread at least some of the manure and slurry than other farm types. The majority (61%) of LFA grazing livestock farmers spread manure/slurry themselves only (Figure 4.1).

Fertiliser was spread either by the farmer or a contractor on 97% of cereal farms, 94% of other cropping farms and 91% of dairy farms. On all three of these farm types the largest proportion of holdings said the fertiliser was spread solely by the farmer, however cereal and other cropping farms were more likely to use a contractor than dairy farms (Figure 4.2).

Figure 4.2: Proportion of holdings spreading fertiliser on grassland and arable land by farm type: 2017

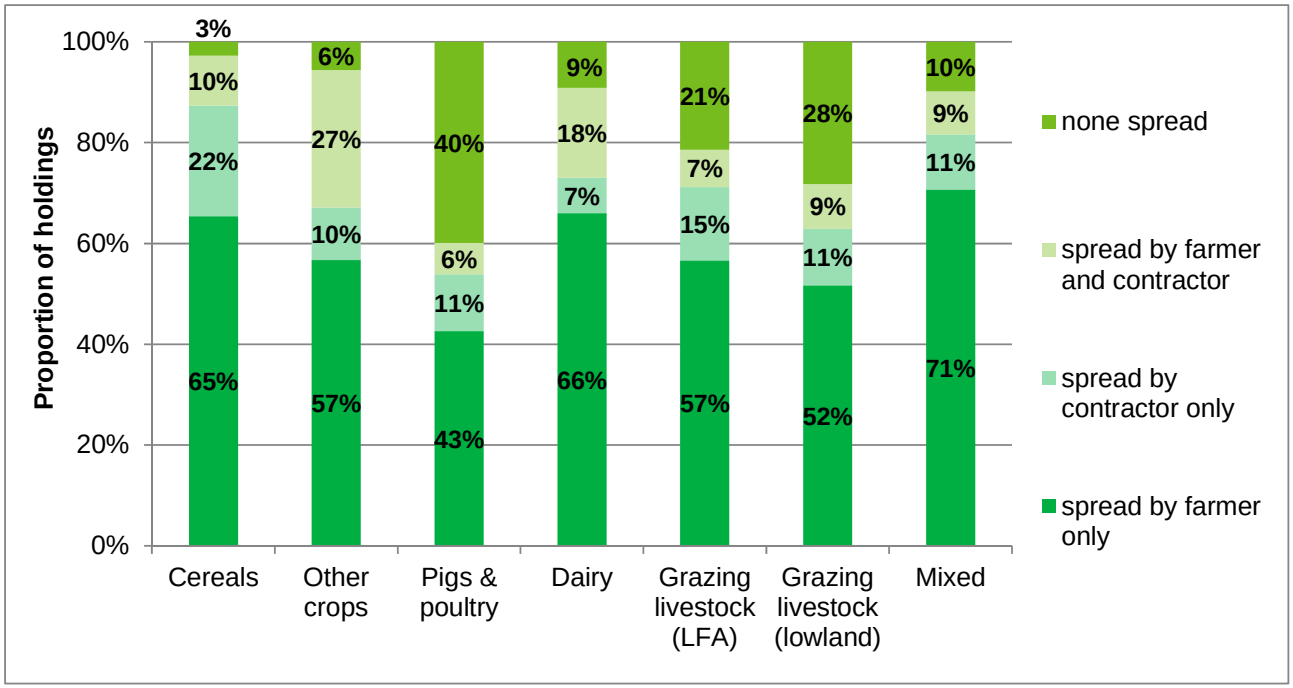


Table 4.1: Spreading of manure and slurry on grassland or arable land: 2015 - 2017

	2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Spread by farmer only	40	*±2*	39	*±3*	38	*±2*
Spread by farmer and also contractor	15	*±2*	16	*±2*	17	*±1*
Spread by contractor only	22	*±2*	21	*±2*	20	*±2*
None spread	23	*±2*	24	*±2*	24	*±2*

Based on 2 297 responses in 2015, 1 911 in 2016 and 2 025 in 2017.

Table 4.2: Spreading of fertiliser on grassland or arable land: 2015 - 2017

	2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Spread by farmer only	60	±2	58	±2	59	±2
Spread by farmer and also contractor	11	±1	11	*±1*	11	*±1*
Spread by contractor only	15	±2	16	±2	14	±2
None spread	14	±2	15	±2	15	±2

Based on 2 315 response in 2015, 1 951 in 2016 and 2 029 in 2017.

Table 4.3: Frequency with which farmers calibrate their manure or slurry spreader(s): 2015 - 2017

Frequency of check	2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Never	51	*±3*	46	±3	54	±3
Whenever there is significant change in manure or slurry characteristics	18	*±2*	18	±3	17	*±2*
Whenever manure or slurry is tested	2	*±1*	1	±1	1	±1
Every year	19	*±3*	21	*±3*	18	*±2*
Less often than every year	7	*±2*	9	*±2*	7	*±2*
Other frequency	3	*±1*	6	±2	3	±1

Based on 1 100 responses in 2015, 938 in 2016 and 1002 in 2017 on holdings where the farmer spreads some or all of the manure/slurry.

Note: **The results in sections 5 to 9 relate only to holdings with livestock.**

Section 5. Farming Ammonia Reduction Grant

Natural England launched the Farming Ammonia Reduction Grant scheme in late 2016 with applications closing 31 January 2017. The scheme was open to beef and dairy farmers in England and aims to reduce ammonia emissions from farms by funding covers for existing slurry stores. Ammonia is a key pollutant that can have significant effects on human health and on ecosystems. In addition to reducing ammonia emissions, the covers can help protect the slurry store from rainwater and reduce storage and field application costs. They can also reduce the loss of nitrogen and increase the quality of slurry as a fertiliser. This section looks at awareness of the scheme across the livestock sector.

Key findings

- In 2017, farmers on 33% of holdings with livestock and 41% of holdings with cattle had heard of the Farming Ammonia Reduction Grant Scheme.
- The majority of farmers learnt of the scheme in the Farming Press.

In 2017, 33% of holdings with livestock and 41% of holdings with cattle were aware of the Farming Ammonia Grant scheme (Table 5.1). Most holdings heard about the scheme via the Farming Press with 67% of livestock farmers and 68% of cattle farmers choosing this as their source of information (Table 5.2).

Table 5.1: Proportion of holdings with livestock and cattle that were aware of the Farming Ammonia Reduction Grant scheme: 2017

	Holdings with livestock		Holdings with cattle	
	% of holdings	95% CI	% of holdings	95% CI
Awareness of Farming Ammonia Grant Scheme	33	*±2*	41	*±3*

Based on 1 933 responses from holdings with livestock and 1 264 holdings with cattle.

Table 5.2: Source of information about the Farming Ammonia Reduction Grant scheme: 2017

	Holdings with livestock		Holdings with cattle	
Source of Information	% of holdings	95% CI	% of holdings	95% CI
Defra	14	*±3*	12	*±3*
Catchment Sensitive Farming officer	22	*±3*	25	*±4*
National Farmers union	21	*±3*	21	*±4*
Farming Press	67	±4	68	±4
Other	8	±2	8	±2

Based on 718 responses from holdings with livestock and 582 holdings with cattle.

Section 6. Manure and slurry storage

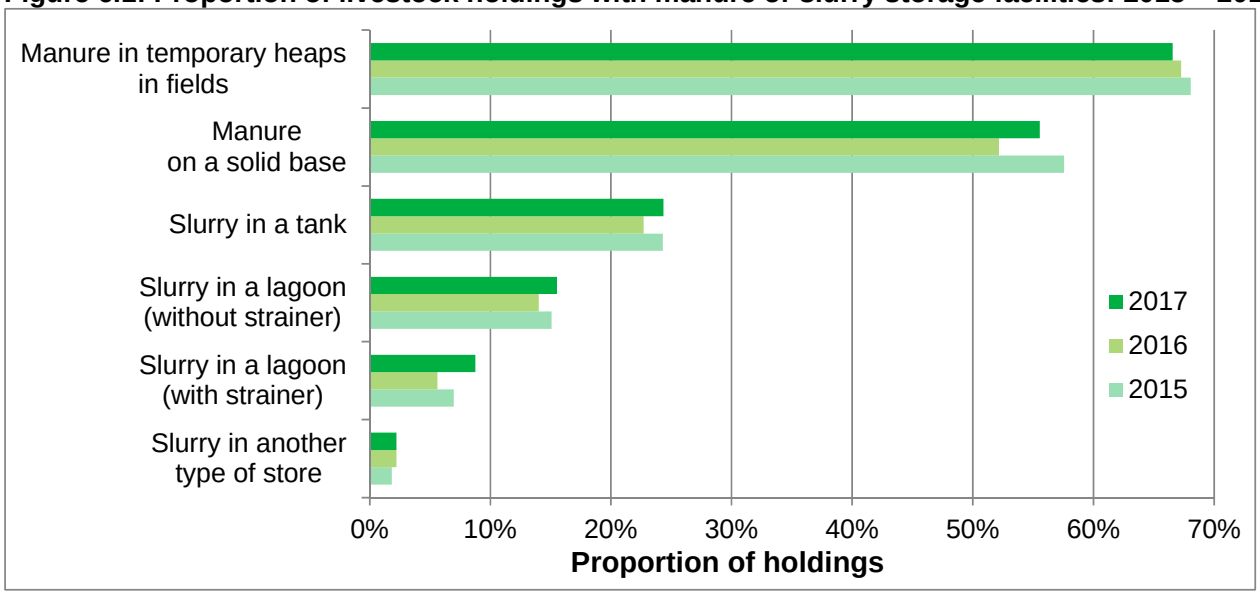
The system of manure and slurry management is relevant to the control of environmental risks to water and air. It prevents the loss of ammonia to the air, at the same time retaining the nitrogen for use as an organic fertiliser, reducing the need for manufactured nitrogen fertiliser inputs.

This section looks at the types of stores that livestock farmers have, whether or not they are covered, and whether the farmer has any plans to upgrade their current facilities. It also looks at whether the farmer has a slurry separator. Separating the suspended solids from slurry allows the two manure streams to be handled separately. The solid fraction can be stored on a concrete pad or in a field heap, while the liquid fraction can be stored and transported/pumped to fields for land application. Separation can reduce storage space and improve the efficiency with which nitrogen is applied to land which has the potential to reduce emissions.

Key findings

- Solid manure in temporary heaps remains the most common form of storage, with approximately two thirds of the farmers having this kind of store.
- Almost a quarter of farmers store their slurry in a tank, whilst 16% store slurry in lagoons without a strainer.
- In 2017, 13% of livestock farmers with storage facilities intend to enlarge or upgrade their manure or slurry storage compared to 11% in 2016

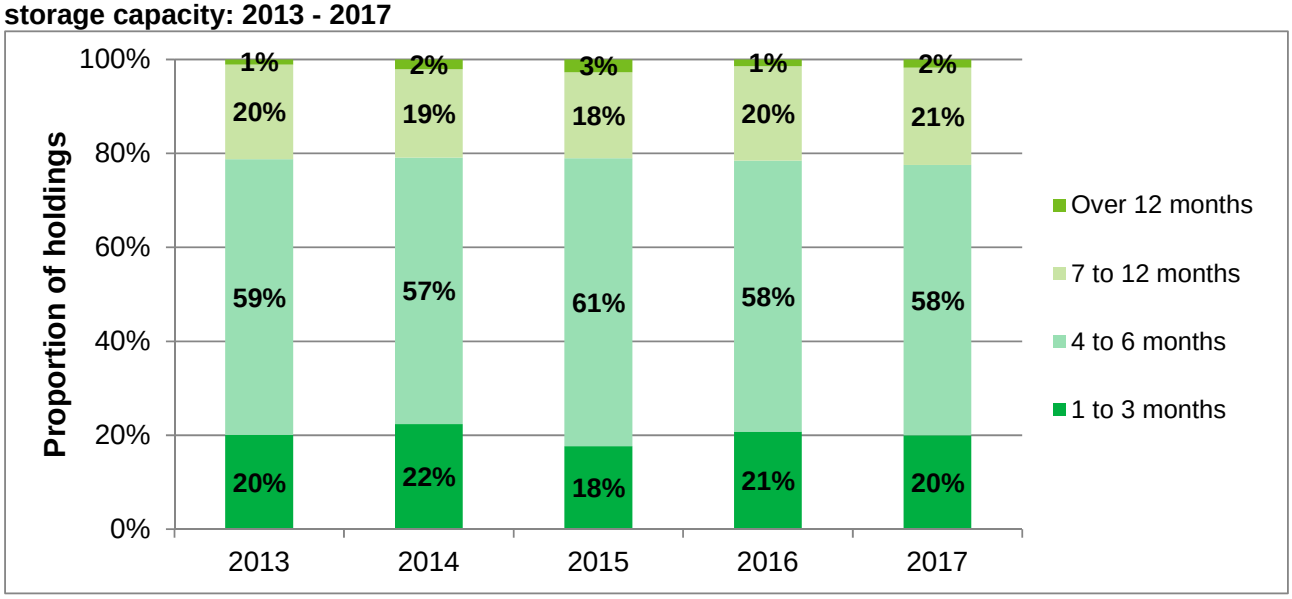
Figure 6.1: Proportion of livestock holdings with manure or slurry storage facilities: 2015 – 2017



The most common storage facility for solid manure continues to be temporary heaps in fields. The most common facilities for slurry storage are tanks (24% of farms) followed by lagoons without a strainer (16%). Slurry in a tank is far more likely to have a cover than any other type of store (Table 6.2).

In 2017, 13% of livestock farmers planned to make changes to their manure or slurry storage facilities. Of these, 19% planned to make the changes within the next year and a further 50% in the next 1 to 3 years (Table 6.3).

Figure 6.2: Proportion of holdings with storage facilities for slurry by number of months of storage capacity: 2013 - 2017



The proportion of holdings that have 6 months storage capacity or less for slurry remains almost unchanged at 78%. Almost all of the remaining holdings had between 7 and 12 months capacity with only very few people having more than 12 months storage (Figure 6.2 and Table 6.4).

Table 6.1: Proportion of holdings with storage facilities for manure and/or slurry: 2014 – 2017 storage

Storage facility	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Solid manure stored in heaps on a solid base	55	*±3*	58	*±3*	52	*±3*	56	*±3*
Solid manure stored in temporary heaps in fields	67	*±3*	68	*±2*	67	*±3*	67	*±3*
Slurry in a tank	20	*±2*	24	*±2*	23	*±3*	24	*±3*
Slurry in a lagoon without strainer	18	*±2*	15	*±2*	14	*±2*	16	*±2*
Storage with strainer facility [(a)]	:	*:*	7	*±1*	6	*±1*	9	*±2*
Slurry in another type of store	9	*±2*	2	*±1*	2	*±1*	2	*±1*

Based on no fewer than 1 533 responses in 2014, 1 679 in 2015, 1 450 in 2016 and 1 430 in 2017 from livestock holdings.
[(a)]This was a new option added to the survey in 2015 so some other categories may not be directly comparable with previous years.
: data not collected.

Table 6.2: Proportion of holdings having storage facilities for manure and/or slurry where the store is covered: 2014 - 2017

Storage facility	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Solid manure stored in heaps on a solid base	13	*±3*	15	*±3*	17	*±3*	17	*±3*
Solid manure stored in temporary heaps in fields	1	*±1*	1	*±1*	1	*±1*	1	*±1*
Slurry in a tank	26	*±5*	28	*±5*	27	*±6*	25	*±6*
Slurry in a lagoon without strainer	3	*±2*	2	*±2*	3	*±2*	4	*±2*
Storage with strainer facility [(a)]	:	*:*	3	*±3*	8	*±6*	2	*±2*
Slurry in another type of store	5	*±10*	1	*±1*	4	*±4*	1	*±1*

Based on no fewer than 165 responses in 2014, 116 in 2015, 82 in 2016 and 125 in 2017 from livestock holdings that have the storage facilities in question.
(a) This was a new option added to the survey in 2015 so other categories may not be directly comparable with previous years.
: data not collected.

Table 6.3: Proportion of holdings planning to enlarge, upgrade or reconstruct their manure and slurry storage facilities: 2014 - 2017

	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Holdings planning to make changes to their current facilities [(a)]	17	*±2*	13	*±2*	11	*±2*	13	*±2*
Of those planning to make changes, the changes will be made: [(b)]								
In 0 to 6 months	11	*±4*	13	*±5*	10	*±5*	10	*±4*
In 7 to 11 months	17	*±5*	14	*±5*	13	*±5*	9	*±4*
In 1 to less than 3 years	46	*±6*	49	*±7*	48	*±8*	50	*±7*
In 3 to less than 5 years	17	*±5*	14	*±5*	16	*±6*	18	*±6*
In 5 years or more	9	*±4*	10	*±4*	12	*±5*	13	*±5*

(a) Based on 1 518 responses in 2014, 1 678 in 2015, 1 446 in 2016 and 1 431 in 2017 from livestock holdings that have manure or slurry storage facilities.
(b) Based on 284 responses in 2014, 233 in 2015, 168 in 2016 and 202 in 2017 from livestock holdings that are planning to make changes.

Table 6.4: Proportion of holdings with slurry stores by storage capacity: 2014 - 2017

Storage capacity	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
1 to 3 months	22	*±4*	18	*±3*	21	*±4*	20	*±3*
4 to 6 months	57	*±4*	61	*±4*	58	*±4*	58	*±4*
7 to 12 months	19	*±3*	18	*±3*	20	*±4*	21	*±4*
Over 12 months	2	*±2*	3	*±1*	1	*±1*	2	*±1*

Based on 592 responses in 2014, 673 in 2015, 523 in 2016 and 576 in 2017 from livestock holdings that have slurry storage facilities.

Table 6.5: Proportion of holdings that have a slurry separator: 2014 - 2017

	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Holdings who have a slurry separator	4	*±1*	8	*±2*	8	*±2*	8	*±2*

Based on 701 responses in 2014, 685 in 2015, 552 in 2016 and 577 in 2017 from livestock holdings.

Section 7. Farm health planning and biosecurity

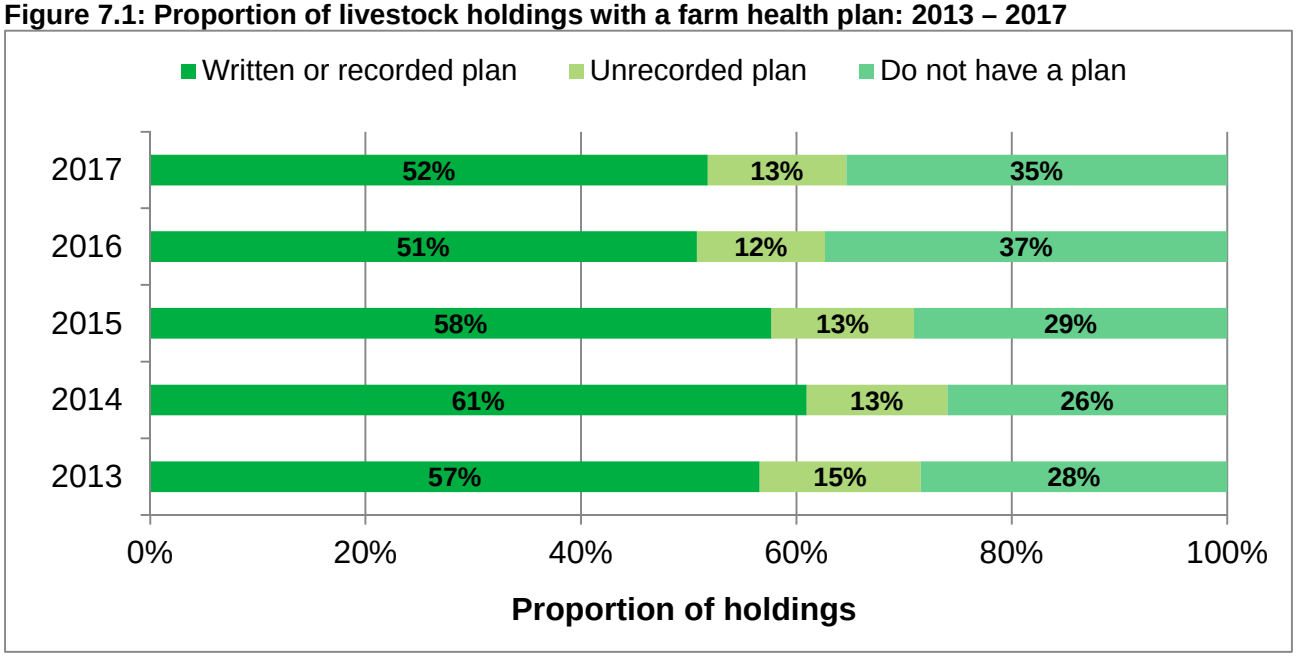
Farm health planning is a Defra initiative which benefits farmers by helping to prevent disease and improve the performance of their livestock. This can help to reduce GHG emissions over the course of an animal's lifetime by, for example, reaching finishing weights earlier and achieving higher feed conversion rates. Farm health planning is about farmers working closely with their vets or other advisers to set targets for their animals' health and welfare and take steps to measure, manage and monitor productivity.

Key findings

- Approximately 65% of farmers had a Farm Health Plan in 2017, showing little change from 2016.
- In 2017, just under half (48%) of farmers with a FHP used it on a routine basis to inform disease management decisions.
- The number of FHPs completed with the help of a vet or adviser has increased steadily from 60% in 2009 to 75% in 2017.

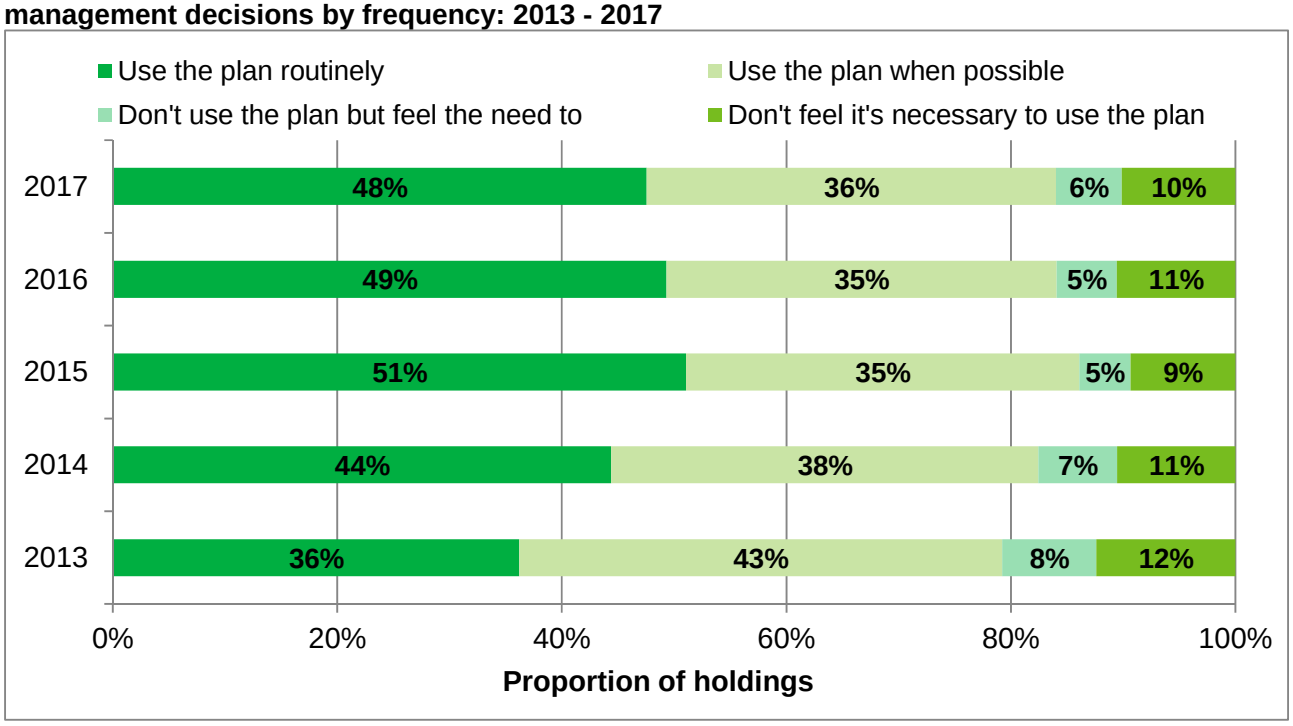
In 2017, 65% of livestock farms had a Farm Health Plan. The majority of livestock farmers have a written or recorded plan (52%) and 13% had a plan that was not recorded (Figure 7.1). Of those holdings with a FHP in 2017, 75% had created the plan with assistance from a vet or advisor (Table 7.2).

Figure 7.1: Proportion of livestock holdings with a farm health plan: 2013 – 2017



Of those with a Farm Health Plan in 2017, 84% were using it either routinely or when they could to inform disease management decisions and a further 6% felt that they should be doing so. The remaining 10% did not feel it was necessary to use the plan (Figure 7.2).

Figure 7.2: Proportion of livestock holdings using their farm health plan to inform disease management decisions by frequency: 2013 - 2017



Under half (48%) of livestock farmers undertake training for animal health and welfare and disease management either routinely or when they can. A further 14% said that although they did not undertake training they felt that they should and the remaining 38% did not feel training was necessary (Table 7.4).

Table 7.1: Proportion of livestock holdings with a farm health plan: 2013 - 2017

	% of holdings					95% CI
	2013	2014	2015	2016	2017	2017
Written or recorded plan	57	61	58	51	52	*±2*
Unrecorded plan	15	13	13	12	13	*±2*
No plan	28	26	29	37	35	*±2*

Based on 1 588 responses in 2013, 1 942 in 2014, 2 152 in 2015, 1 905 in 2016 and 1 934 in 2017 from livestock holdings.

Table 7.2: Proportion of holdings who completed their farm health plan with the assistance of a vet or adviser: 2013 – 2017

	% of holdings					95% CI
	2013	2014	2015	2016	2017	2017
Assistance from vet / adviser	63	70	72	74	75	*±3*

Based on 1 230 responses in 2013, 1 548 in 2014, 1 631 in 2015, 1 295 in 2016 and 1 353 in 2017 from holdings with livestock.

Table 7.3: Proportion of holdings using their farm health plan to inform disease management decisions by frequency of use: 2014 - 2017

Frequency of use	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Use plan routinely	44	*±3*	51	*±3*	49	*±3*	48	*±3*
Use plan when possible	38	*±3*	35	*±3*	35	*±3*	36	*±3*
Don't use plan but feel the need to	7	*±1*	5	*±1*	5	*±1*	6	*±1*
Don't feel it's necessary to use plan	11	*±2*	9	*±2*	11	*±2*	10	*±2*

Based on 1 553 responses in 2014, 1 632 in 2015, 1 305 in 2016 and 1 353 in 2017 from livestock holdings with a farm health plan.

Table 7.4: Proportion of holdings undertaking animal health and welfare and disease management training by frequency of training: 2014 - 2017

Frequency of training	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Undertake training routinely	14	*±2*	18	*±2*	13	*±2*	15	*±2*
Undertake training when possible	37	*±2*	37	*±2*	33	*±2*	33	*±2*
Don't undertake training but feel the need to	14	*±2*	10	*±1*	12	*±2*	14	*±2*
Don't feel training is necessary	35	*±2*	35	*±2*	41	*±2*	38	*±2*

Based on 1 934 responses in 2014, 2 142 in 2015, 1 867 in 2016 and 1 929 in 2017 from livestock holdings.

Section 8. Grassland and grazing

In some situations sowing temporary grassland with a clover mix or high sugar grasses can be a cost effective method of increasing production and improving environmental protection. For example, clover's nitrogen fixing properties (although not suitable for all soil types) can reduce the amount of nitrogen applied and improve grassland yields. High sugar grasses can help to improve the efficiency of animal production (for example, improved milk yields and faster live weight gain) which can in turn reduce GHG emissions.

Land and soil management mitigation methods can help to preserve good soil structure preventing erosion and compaction, both of which can lead to GHG emissions. Mitigation methods relating to this include keeping livestock away from water courses and reducing stocking rates when conditions are excessively wet.

Key findings

- In 2017, 70% of livestock holdings indicated that a proportion of their temporary grassland had been sown with a clover mix: 29% had sown all of their temporary grassland with a clover mix. This is unchanged since 2015.
- High sugar grasses were sown on 61% of livestock holdings with temporary grassland.
- The most common frequency for reseeding clover or high sugar grass swards in 2017 was 3 to 5 years.
- Almost three quarters (70%) of livestock farmers always take action to reduce stocking rates when fields are excessively wet.
- 63% of livestock farmers routinely try to keep livestock out of water courses.

Table 8.1: Proportion of livestock holdings that have sown their temporary grassland with a clover mix by proportion of grassland: 2014 - 2017

Proportion of temporary grassland (%)	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
100	35	±3	29	±3	29	±3	29	±3
81-99	7	±2	5	±1	4	±2	6	±2
61-80	7	±2	7	±2	7	±2	5	±2
41-60	10	±2	8	±2	8	±2	8	±2
21-40	8	±2	8	±2	8	±2	8	±2
1-20	12	±2	16	±2	18	±3	14	±2
0	22	±3	26	±3	26	±3	30	±3

Based on 967 responses in 2014, 1 106 in 2015, 813 in 2016 and 928 in 2017 from livestock holdings with temporary grass.

Table 8.2: Proportion of livestock holdings that have sown their temporary grassland with high sugar grasses by proportion of grassland: 2014 - 2017

Proportion of temporary grassland (%)	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
100	20	*±3*	20	*±3*	17	*±3*	21	*±3*
81-99	6	*±1*	5	*±1*	4	*±1*	5	*±1*
61-80	9	*±2*	8	*±2*	7	*±2*	7	*±2*
41-60	9	*±2*	9	*±2*	8	*±2*	9	*±2*
21-40	6	*±2*	9	*±2*	9	*±2*	8	*±2*
1-20	8	*±2*	11	*±2*	11	*±2*	12	*±2*
0	42	*±3*	38	*±3*	43	*±4*	39	*±3*

Based on 967 responses in 2014, 1 106 in 2015, 810 in 2016 and 928 in 2017 from livestock holdings with temporary grass.

Table 8.3: Proportion of holdings by the frequency with which holders reseed their clover sward: 2014 – 2017 [(a)]

Frequency of reseeding	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
1 to 12 months	2	*±2*	1	*±1*	2	*±1*	1	*±1*
1 to 2 years	6	*±2*	4	*±1*	4	*±2*	4	*±1*
2 to 3 years	12	*±2*	8	*±2*	6	*±2*	8	*±2*
3 to 5 years	42	*±4*	32	*±4*	31	*±4*	28	*±4*
5 to 10 years	32	*±4*	24	*±3*	20	*±4*	24	*±4*
10 years and over	3	*±2*	1	*±1*	2	*±1*	2	*±1*
Never/Do not reseed	2	*±2*	29	*±3*	35	*±4*	32	*±4*

Based on 733 responses in 2014, 801 in 2015, 560 in 2016 and 641 in 2017 from livestock holdings with temporary grass.
(a) Results for 2015 onwards are not directly comparable with previous years as the question was amended to include the option “do not reseed”. Those who did not reseed may have previously left the question blank.

Table 8.4: Proportion of holdings by the frequency with which holders reseed their high sugar grass sward: 2014 – 2017 [(a)]

Frequency of reseeding	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
1 to 12 months	2	*±1*	1	*±1*	2	*±1*	2	*±1*
1 to 2 years	8	*±3*	5	*±2*	5	*±2*	3	*±1*
2 to 3 years	18	*±3*	9	*±2*	13	*±3*	14	*±3*
3 to 5 years	41	*±4*	34	*±4*	36	*±5*	29	*±4*
5 to 10 years	26	*±4*	23	*±3*	24	*±4*	25	*±4*
10 years and over	3	*±2*	2	*±1*	2	*±2*	2	*±1*
Never/ Do not reseed	2	*±1*	26	*±4*	17	*±4*	25	*±4*

Based on 575 responses in 2014, 694 in 2015, 428 in 2016 and 574 in 2017 from livestock holdings with temporary grass.
(a) Results for 2015 onwards are not directly comparable with previous years as the question was amended to include the option “do not reseed”. Those who did not reseed may have previously left the question blank.

Table 8.5: Frequency with which livestock holdings take action to reduce stocking rates when fields are excessively wet: 2016 - 2017

Frequency	2016		2017	
	% of holdings	95% CI	% of holdings	95% CI
Always	72	*±3*	70	*±2*
Some of the time	26	*±2*	27	*±2*
Never	2	*±1*	3	*±1*

Based on 1 603 responses in 2016 and 1 656 in 2017 from holdings with livestock.

Table 8.6: Frequency with which livestock holdings take action to keep livestock out of water courses: 2016 - 2017

Frequency	2016		2017	
	% of holdings	95% CI	% of holdings	95% CI
Routinely	61	*±3*	63	*±3*
Some of the time	28	*±3*	27	*±2*
Never	11	*±2*	10	*±2*

Based on 1 454 responses in 2016 and 1 495 in 2017 from holdings with livestock.

Section 9. Livestock feeding regimes and breeding practices

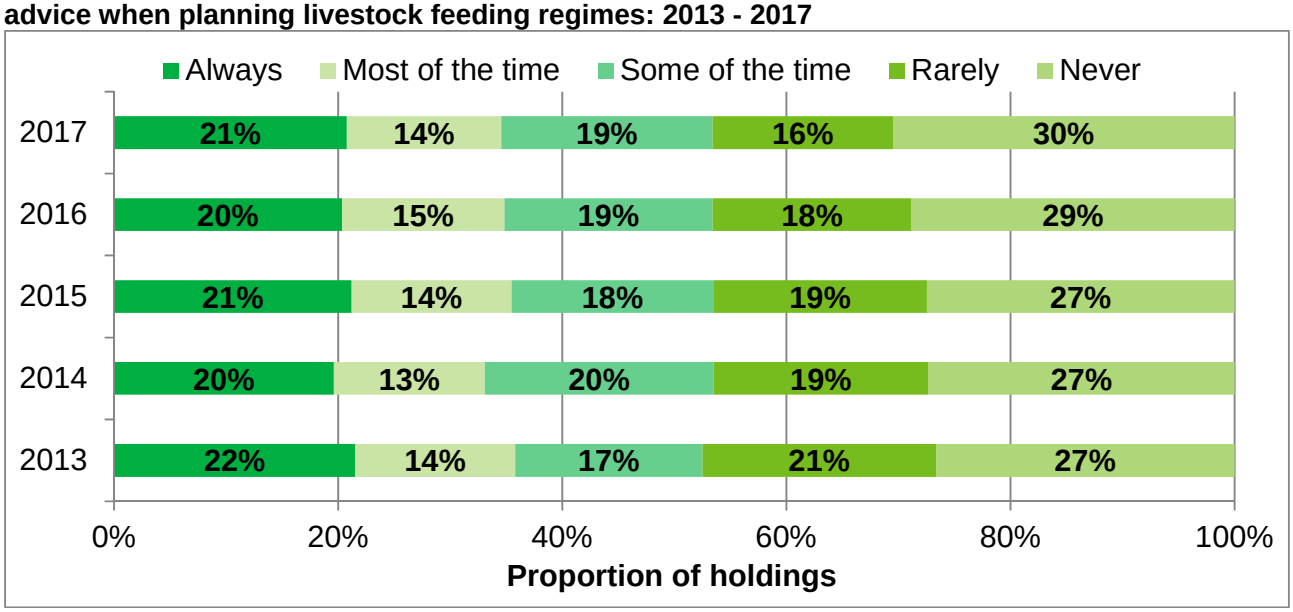
Cattle and sheep breeding practices are another area which can contribute to herd and flock productivity and efficiency which in turn can reduce GHG emissions. A Profitable Lifetime Index (PLI) is a scoring system to identify cattle with the best 'genetic merit' used when choosing bulls to breed with dairy cattle. The PLI uses a combination of attributes including life expectancy, health, fertility and milk production. Estimated Breeding Values (EBV) estimate the genetic worth of animals using desirable traits such as meat production. In addition to playing an important role in productivity and efficiency, livestock feeding practices such as intake and type of feed, can have an impact on GHG emissions.

Key findings

- In 2017, 70% of livestock holdings used a ration formulation programme or nutritional advice. This has gradually declined from 75% in 2011.
- Whole-crop silage and maize were the most common alternative forages (other than grazed or conserved grass) offered to cattle and sheep by 15% and 11% of farmers respectively.
- In 2017, 24% of holdings breeding dairy cows always used bulls with a high Profitable Lifetime Index (PLI).
- Bulls and rams with high Estimated Breeding Values (EBV) were always used by 16% of holdings breeding beef cattle and 9% of those breeding lambs in 2017.

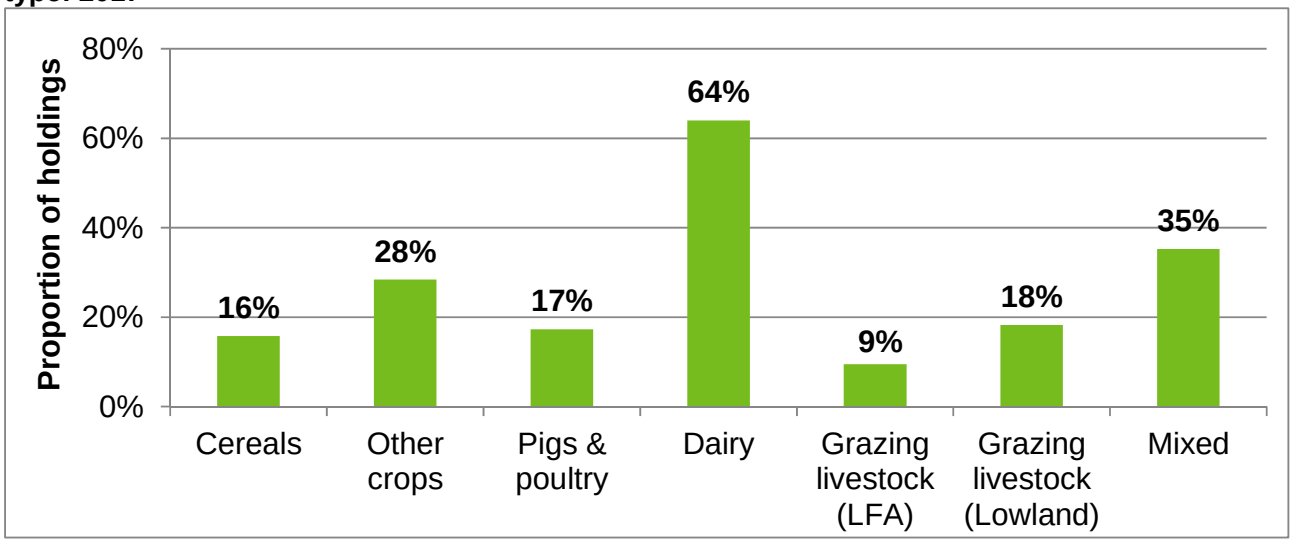
In 2017, just over half (53%) of livestock holdings used a ration formulation programme or expert nutritional advice when planning the feeding regime of their cattle and sheep at least some of the time and a further 16% do so rarely (Figure 9.1).

Figure 9.1: Proportion of holdings using a ration formulation program or expert nutritional advice when planning livestock feeding regimes: 2013 - 2017



Just over a quarter (26%) of farmers offered alternative forages (other than grazed or conserved grass) to their cattle and sheep in 2017. As might be expected this figure varies depending on farm type and dairy farmers are most likely to offer their livestock alternative forages (Figure 9.2).

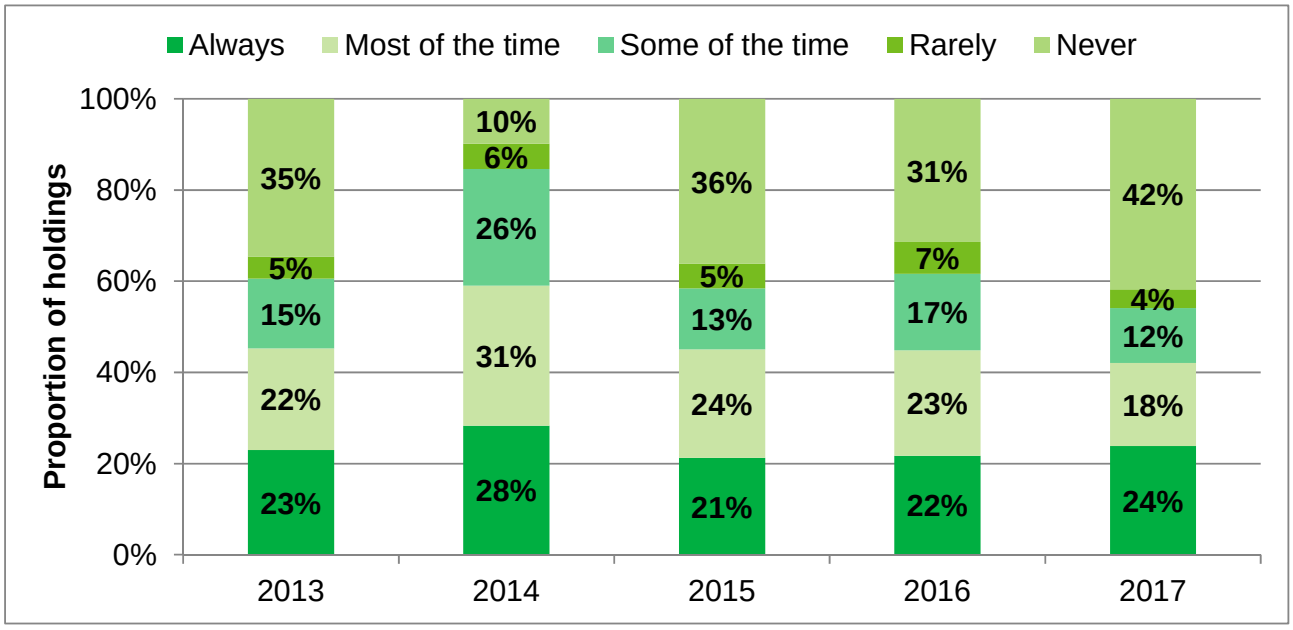
Figure 9.2: Proportion of holdings offering alternative forage crops to cattle and sheep by farm type: 2017[(a)]



(a) For holdings with cattle and/or sheep

The most common of these forage crops were whole-crop silage and maize which were offered by 15% and 11% of farmers respectively.

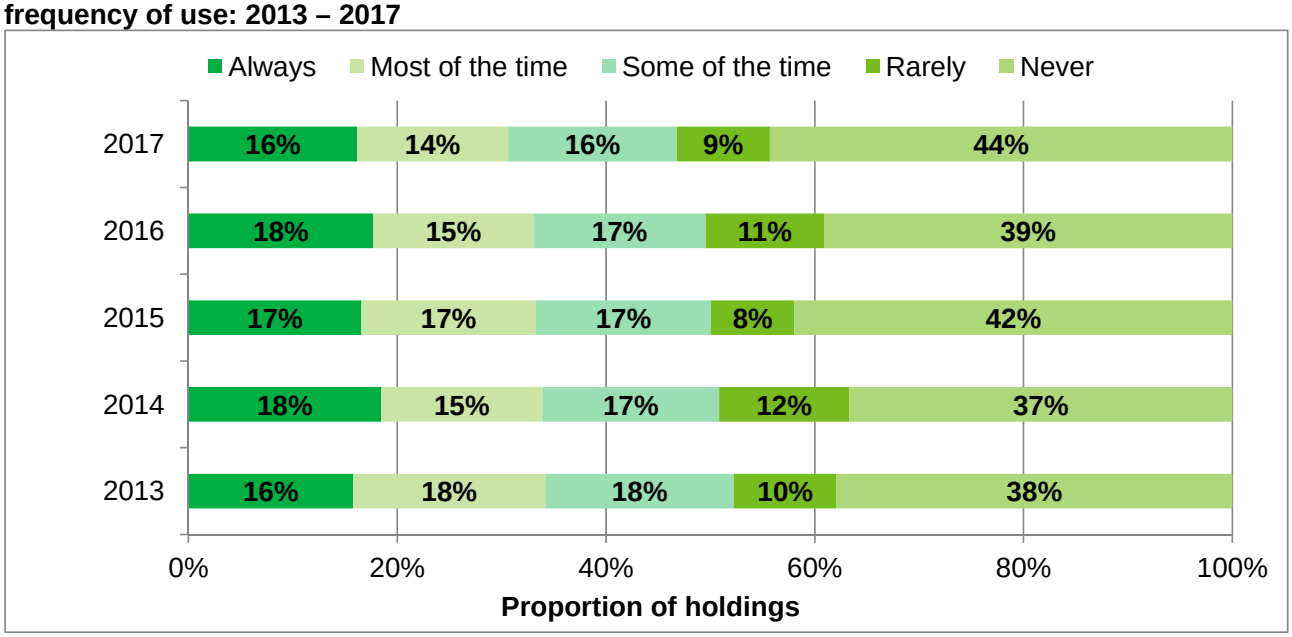
Figure 9.3: Proportion of holdings using bulls with a high PLI when breeding dairy cows by frequency of use: 2013 - 2017 [(a)]



(a) For holdings with dairy cattle

In 2017, 24% of livestock holdings always used bulls with a high Profitable Lifetime Index (PLI) when breeding dairy cows. This is similar to previous years and shows little change from 2011 when the questions were first asked (Table 9.3).

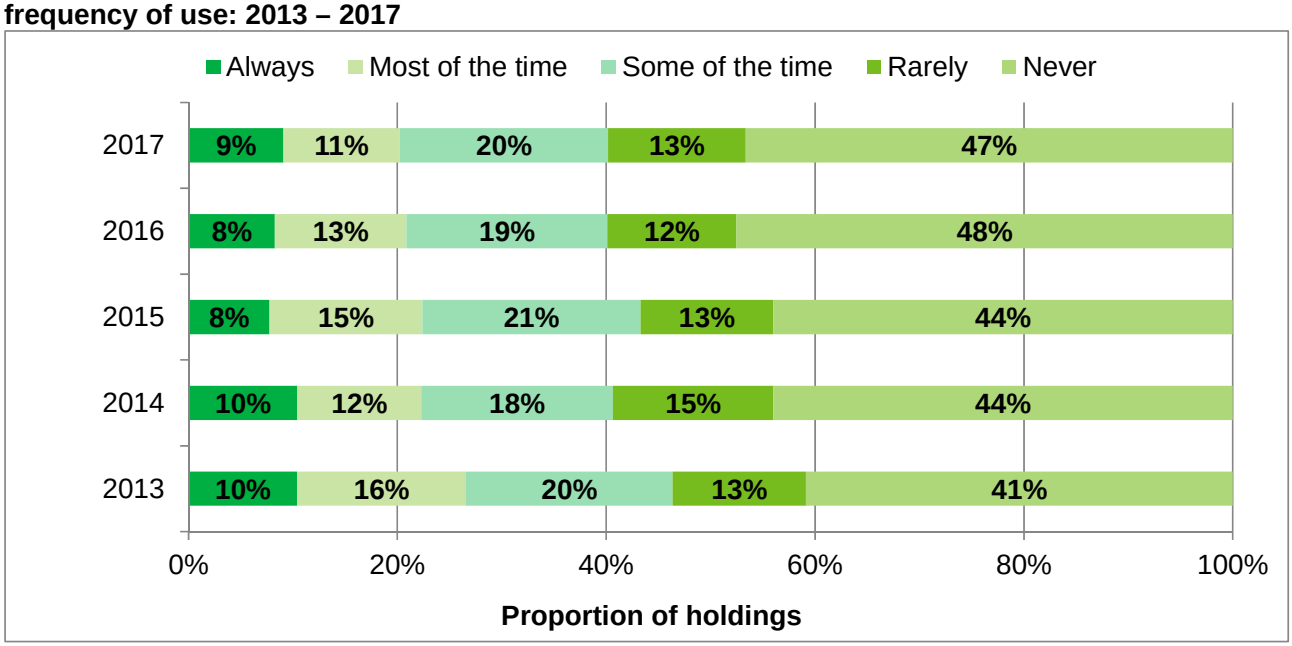
Figure 9.4: Proportion of holdings using bulls with high EBVs when breeding beef cattle by frequency of use: 2013 – 2017



(a) For holdings with beef cattle

Estimated Breeding Values (EBV) estimate the genetic worth of animals using desirable traits such as meat production. Under half (47%) of holdings used bulls with a high EBV at least some of the time when breeding beef cattle in 2017 (Figure 9.4). This is little changed from 2015. The equivalent proportion of holdings using rams with a high EBV at least some of the time when breeding lambs was 40% (Figure 9.5).

Figure 9.5: Proportion of holdings using rams with high EBVs when breeding lambs by frequency of use: 2013 – 2017



(a) For holdings with lambs

In addition to the proportion of holdings using bulls and rams with high EBVs (Table 9.4 and 9.5) the proportion of beef cattle and lambs that this figure relates to has also been calculated (Tables 9.6 and 9.7). By using responses from the 2016 June survey we are able to give an indication of the proportion of animals that are covered by this practice. In 2017, the holdings using bulls and rams with high EBVs at least some of the time accounted for 55% of beef cattle and 49% of lambs at June 2016.

Table 9.1: Proportion of holdings using a ration formulation programme when planning cattle and sheep feeding regimes by frequency of use: 2014 - 2017

Frequency of use	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Always	20	±2	21	±2	20	±2	21	±2
Most of the time	13	±2	14	±2	15	±2	14	±2
Some of the time	20	±2	18	±2	19	±2	19	±2
Rarely	19	±2	19	±2	18	±2	16	±2
Never	27	±2	27	±2	29	±3	30	±3

Based on 1 679 responses in 2014, 1 748 in 2015, 1 470 in 2016 and 1 566 in 2017 from holdings with cattle or sheep.

Table 9.2: Proportion of holdings offering alternative forages to cattle and sheep: 2016 - 2017

Alternative forage crop	2016		2017	
	% of holdings	95% CI	% of holdings	95% CI
Whole-crop silage	13	±2	15	± 2
Maize	10	±1	11	±1
Red clover	6	±1	7	±1
Lucerne	1	±1	2	±1
Triticale	1	±0	1	±0
Any of the above	23	±2	26	±2
None of these	78	±2	74	±2

Based on 1 409 responses in 2016 and 1 519 in 2017 from holdings with cattle and sheep.

Table 9.3: Proportion of holdings using bulls with a high Profitable Lifetime Index (PLI) when breeding dairy cows by frequency of use: 2014 - 2017

Frequency of use	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Always	28	±4	21	±3	22	±4	24	±3
Most of the time	31	±4	24	±3	23	±4	18	±3
Some of the time	26	±4	13	±3	17	±3	12	±3
Rarely	6	±2	5	±2	7	±2	4	±2
Never	10	±3	36	±4	31	±5	42	±4

Based on 445 in 2014, 614 in 2015, 458 in 2016 and 543 in 2017 from holdings with cattle or sheep.

Table 9.4: Proportion of holdings using bulls with a high Estimated Breeding Value (EBV) when breeding beef cattle by frequency of use: 2014 - 2017

Frequency of use	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Always	18	±3	17	±2	18	±3	16	±2
Most of the time	15	±2	17	±2	15	±3	14	±2
Some of the time	17	±2	17	±2	17	±3	16	±2
Rarely	12	±2	8	±2	11	±2	9	±2
Never	37	±3	42	±3	39	±4	44	±3

Based on 1 063 in 2014, 1 123 in 2015, 707 in 2016 and 1 005 in 2017 from holdings with beef cattle.

Table 9.5: Proportion of holdings using rams with a high Estimated Breeding Value (EBV) when breeding lambs by frequency of use: 2014 - 2017

Frequency of use	2014		2015		2016		2017	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Always	10	±2	8	±2	8	±2	9	±2
Most of the time	12	±2	15	±3	13	±3	11	±2
Some of the time	18	±3	21	±3	19	±3	20	±3
Rarely	15	±3	13	±2	12	±3	13	±3
Never	44	±4	44	±4	48	±4	47	±4

Based on 811 in 2014, 842 in 2015, 700 in 2016 and 761 in 2017 from holdings with lambs.

Table 9.6: Proportion of beef cattle on holdings using bulls with a high Estimated Breeding Value (EBV) by frequency of use: 2014 - 2017

Frequency of use	2014		2015		2016		2017	
	% of beef cattle	95% CI	% of beef cattle	95% CI	% of beef cattle	95% CI	% of beef cattle	95% CI
Always	23	±4	19	±3	25	±6	19	±4
Most of the time	18	±3	18	±3	19	±4	19	±3
Some of the time	17	±3	19	±3	18	±4	17	±3
Rarely	11	±2	9	±2	10	±3	10	±2
Never	31	±4	34	±4	29	±4	36	±4

Based on 1 063 responses in 2014, 1 123 in 2015, 707 in 2016 and 1 005 in 2017 from holdings with beef cattle.

Table 9.7: Proportion of lambs on holdings using rams with a high Estimated Breeding Value (EBV) by frequency of use: 2014 - 2017

Frequency of use	2014		2015		2016		2017	
	% of lambs	95% CI	% of lambs	95% CI	% of lambs	95% CI	% of lambs	95% CI
Always	12	±3	10	±3	11	±4	12	±3
Most of the time	12	±3	15	±3	17	±4	14	±3
Some of the time	22	±4	24	±4	22	±4	23	±4
Rarely	18	±3	14	±3	14	±4	15	±3
Never	36	±4	36	±4	36	±5	37	±4

Based on 811 responses in 2014, 842 in 2015, 700 in 2016 and 761 in 2017 from holdings with lambs.

Survey methodology

Survey content
The Farm Practices Survey (FPS) – Greenhouse Gas Mitigation edition is usually run annually and collects information on a diverse range of topics usually related to the impact of farming practices on the environment. Each year, stakeholders are invited to request new questions to help inform policy decisions and provide evidence on progress towards agricultural and environmental sustainability.

This release includes the results from the FPS run in February 2017. The survey largely focused on practices relating to greenhouse gas mitigation, similar in content to FPS surveys run in February over the previous five years. Topics covered include nutrient and manure management, anaerobic digestion, emissions, fertiliser, manure and slurry spreaders and storage, farming ammonia grant scheme, farm health planning, grassland and grazing and livestock breeding & feeding practices. Where comparisons with earlier years are possible, the results are displayed alongside those from previous years.

The results provided in this release are based on questions sent to approximately 6,000 holdings in England. These holdings were targeted by farm type and size to ensure a representative sample. The survey was voluntary and the response rate was 39%. Thank you to all of the farmers who completed a survey form.

Thresholds were applied to ensure that very small holdings with little agricultural activity were not included in the survey. To be included in the main sample, holdings had to have at least 50 cattle, 100 sheep, 100 pigs, 1,000 poultry or 20 hectares of arable crops or orchards. Therefore, all results given in this statistical release reflect just under 60 thousand holdings that exceed these thresholds out of the total English population of almost 107 thousand commercial holdings.

A breakdown of the number of holdings within the population and the sample are shown below.

Farm type	Number of eligible holdings in England	Number of holdings sampled	Response rate %
Cereals	15 740	1 323	43
Other crops	5 340	775	39
Pigs & poultry	3 200	454	28
Dairy	6 399	972	38
Grazing livestock (less favoured areas)	8 270	700	40
Grazing livestock (lowland)	15 291	1 144	38
Mixed	5 715	589	39
All farms	**59 955**	**5 957**	**39**

Data analysis
Results have been analysed using a standard methodology for stratified random surveys to produce national estimates. With this method, all of the data are weighted according to the inverse sampling fraction.

Accuracy and reliability of the results
We show 95% confidence intervals against the results. These show the range of values that may apply to the figures. They mean that we are 95% confident that this range contains the true value. They are calculated as the standard errors (se) multiplied by 1.96 to give the 95% confidence interval (95% CI). The standard errors only give an indication of the sampling error. They do not reflect any other sources of survey errors, such as non-response bias.

Definitions
Where reference is made to the *type of farm* in this document, this refers to the 'robust type', which is a standardised farm classification system. *Farm sizes* are based on the estimated labour requirements for the holding, rather than its land area. The farm size bands used within the detailed results tables which accompany this publication are shown in the table below. Standard Labour Requirement (SLR) is defined as the theoretical number of workers required each year to run a holding, based on its cropping and livestock activities.

Farm size	Definition
Small	Less than 2 SLR
Medium	2 to less than 3 SLR
Large	3 or more SLR

Availability of results
This release contains headline results for each section. The full breakdown of results, by region, farm type and farm size, will be available at the end of June 2017: https://www.gov.uk/government/collections/farm-practices-survey.

Other Defra statistical notices can be viewed on the Defra website at: https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs/about/statistics.

Data uses
The Farm Practices survey is used to investigate the impact of farming on the environment and to provide up-to-date agri-environment information on current issues to help inform policy decisions. The survey has a wide customer base both internal and external to Defra including Natural England, English Heritage, ADAS, the Environment Agency and the NFU.

Data from the Farm Practices Survey are used in Defra's greenhouse gas (GHG) indicator framework. The framework, initially developed as part of the 2012 review of progress in reducing GHG emissions from English agriculture[1], consists of ten key indicators covering farmer attitudes and knowledge, the uptake of mitigation methods and the GHG emission intensity of production[2] in key agricultural sectors. Information from the survey also feeds into the Defra publication, Agricultural Statistics and Climate Change which provides background context to the current understanding of agriculture and GHG emissions.

In partnership with the Devolved Administrations, the Government invested over £12 million, over a four and a half year period, on the development of an improved GHG inventory to strengthen understanding of on farm emissions. Information from the Farm Practices Survey fed into this project which should enable greater precision in reporting GHG emissions from the sector, so that, going forward, changes made to farming practices to reduce GHG emissions will be properly recognised in the inventory.

Additional information
For more information on how the data was collected you can view the questions asked on our survey form in Annex I over the page.

Finally we are keen to hear your thoughts on this statistical release. If you found the data useful or if you have any other comments please let us know. You can contact us via the phone number on the front page or alternatively email us at farming-statistics@defra.gsi.gov.uk.

[1] https://www.gov.uk/government/publications/2012-review-of-progress-in-reducing-greenhouse-gas-emissions-from-english-agriculture
[2] GHG produced per tonne of crop or litre of milk or kilogramme of meat produced.