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A comparison of the 2016 and 2018 Farming Connect baseline surveys

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Cronfa Amaethyddol Ewrop ar gyfer Datblygu Gwledig: Ewrop yn Buddsoddi mewn Ardaloedd Gwledig

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Introduction

The Farming Connect baseline survey has been run in 2016, 2017, and in 2018. This report compares the results of the 2016 and 2018 surveys. In 2016, 1082 farmers and their businesses were surveyed from across Wales and in 2018, 915 farmers took part in the survey.

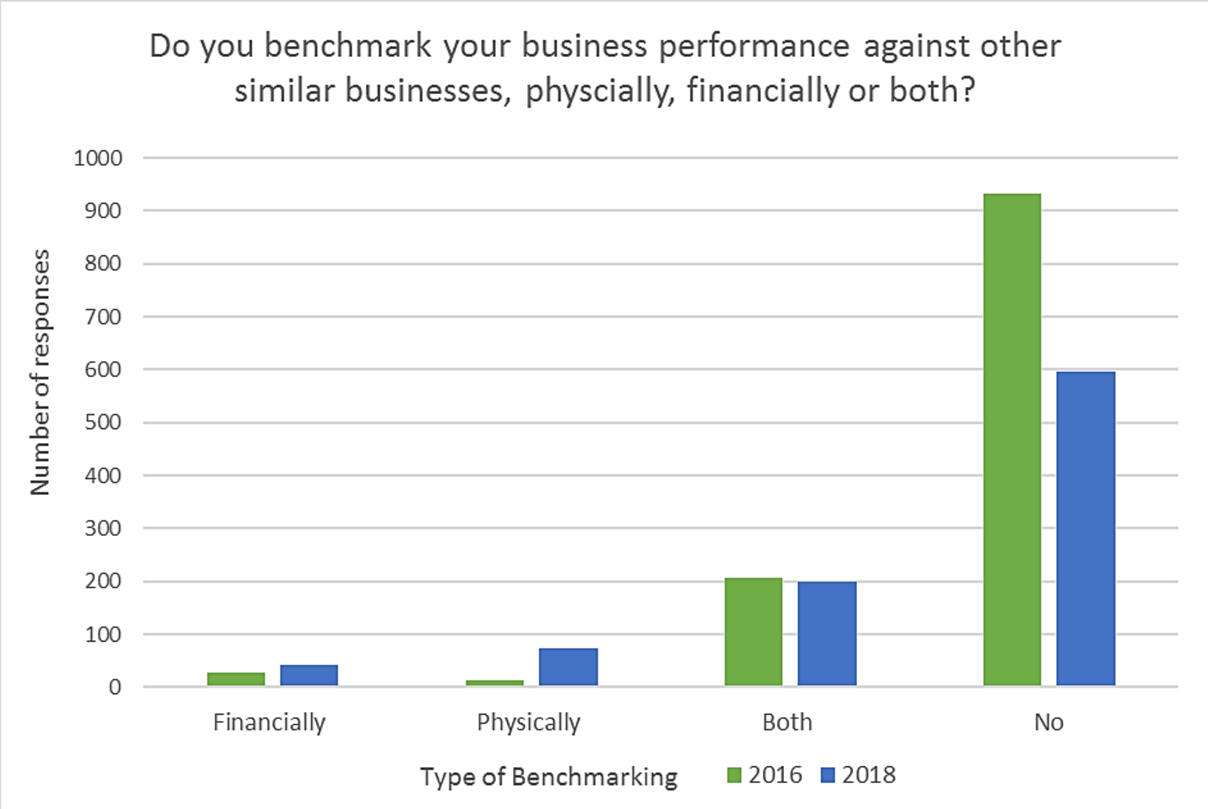
The key findings of the report indicate that farmers are engaging in activities provided by Farming Connect and are able to interpret the resulting information for application to their farm business. Feedback suggests that members would like more frequent communication/advertisement about Farming Connect events, courses and opportunities. Results also indicate a possible deficit in farm businesses with a written business plan, with many participants indicating that they had clear ambitions for their business but the minority actually having a written plan in place. The report to follow gives an indication of farmer behaviours and on-farm activities, both in general and as a result of the Farming Connect programme.

NB. For some questions, the total number of responses is greater than the number of participants. This is a consequence of respondents offering more than one answer to a given question (which may be up to five different options, depending on the question).

Survey results

Q1 (a): Do you benchmark (compare) your business performance against other similar businesses physically, financially or both?

Response	**Number of responses**		**Percentage responses (%)**	
	2016	**2018**	**2016**	**2018**
Financially	27	41	2.3	12.8
Physically	13	74	1.1	23.2
Both	206	199	17.5	62.4
No	933	N/A	79	8.6
Total Responses	1179	319	N/A	34.9
Total non-responses	0	596	N/A	65.1



Overall, the number of respondents that benchmark increased from 2016 to 2018, from 20% to 30%. In 2016, the majority (86%) of responders did not benchmark their business; by comparison, only 30% of responses to the 2018 survey indicated that they did not partake in any sort of benchmarking.

Most responders benchmarked their business in terms of both financial and physical parameters and this level remained relatively similar between 2016 and 2018 (17% and 18% respectively). A significant increase can be observed in those benchmarking their business using just one parameter, between 2016 and 2018 the number of people financially benchmarking rose by 34% and those physically benchmarking by 82%.

Best practice benchmarking links processes and performance provides a balance of production, financial, environmental and social factors and presents information, which enables easy and unambiguous interpretation by farmers (Ronan and Cleary, 2000). However, it is important that the correct metrics are used when assessing a business, as focussing one single measurement can be misleading, for example, examining profitability in isolation often does not reflect "best practise" (Lawrence *et al.,* 1998; Ronan and Cleary, 2000). Therefore, Farming Connect should continue to promote the benefits that benchmarking could bring to a business in terms of production efficiency, by utilising case studies from businesses that have used Farming Connects Measure to Manage scheme to improve their efficiency and business performance.

Q1 (b): If "yes", have you started benchmarking as a result of any of the following Farming Connect activities in the last two years?

Activity	Number of responses		Percentage Responses (%)	
	2016	2018	2016	2018
Agrisgôp	2	38	1.4	16.9
Discussion groups	45	180	32.6	80.0
Discussion Groups, Agrisgôp	1	24	0.7	10.7
Discussion Groups, Agri Academy	N/A	3	N/A	1.3
Discussion Groups, Agrisgôp, Agri Academy	N/A	4	N/A	1.8
Farm Business survey	12	14	8.7	6.2
Farming Connect advisory service	9	N/A	6.5	N/A
Aberystwyth University	29	9	21.0	4.0
Agri Academy	N/A	10	N/A	4.4
Other	33	20	21.7	8.9
Total responses	138	225	11.7	25
Total non-responses	1042	686	88.4	75

The reasons for starting benchmarking have changed significantly between 2016 and 2018, with a much higher level of engagement occurring with Agri Academy (an increase of 100%), Agrisgôp (95%) and Farming Connect Discussion groups (75%). This is likely the result of increased awareness of the programmes Farming Connect offers via enhanced advertising and communication. Overall, most responses indicated that benchmarking activity was initiated as a result of discussion groups, 33% in 2016 and 80% in 2018. This indicates success of knowledge exchange activity in this area, suggesting that farmers have found discussion groups beneficial and are adopting new practices as a result. Peer education is an effective method of training/teaching as participants are often more receptive to learning from others that have tried and tested a new concept thus providing a sense of credibility and that can relate easily to one another. Peer learning also allows participants to expand their social network and form new business relationships. The methods and skills required to run a successful farm have traditionally been passed down from generation to generation and sometimes from neighbour to neighbour, as such, most farming practices began as peer-to-peer interaction. Therefore, it is unsurprising that this method of communication and training is more effective amongst farmers (Roling and Wagemakers, 2000). Faysse *et al.*, (2012) found that it is important to facilitate this knowledge exchange, as in a standard, day-to-day situation only two-thirds of farmers regularly discussed practices with one another. The survey results suggest that Farming Connect play an important role by providing a platform for discussion groups and the financial resources to facilitate learning and innovation.

NB. The total number of responses here varies, as some responses included several activities, which were counted separately.

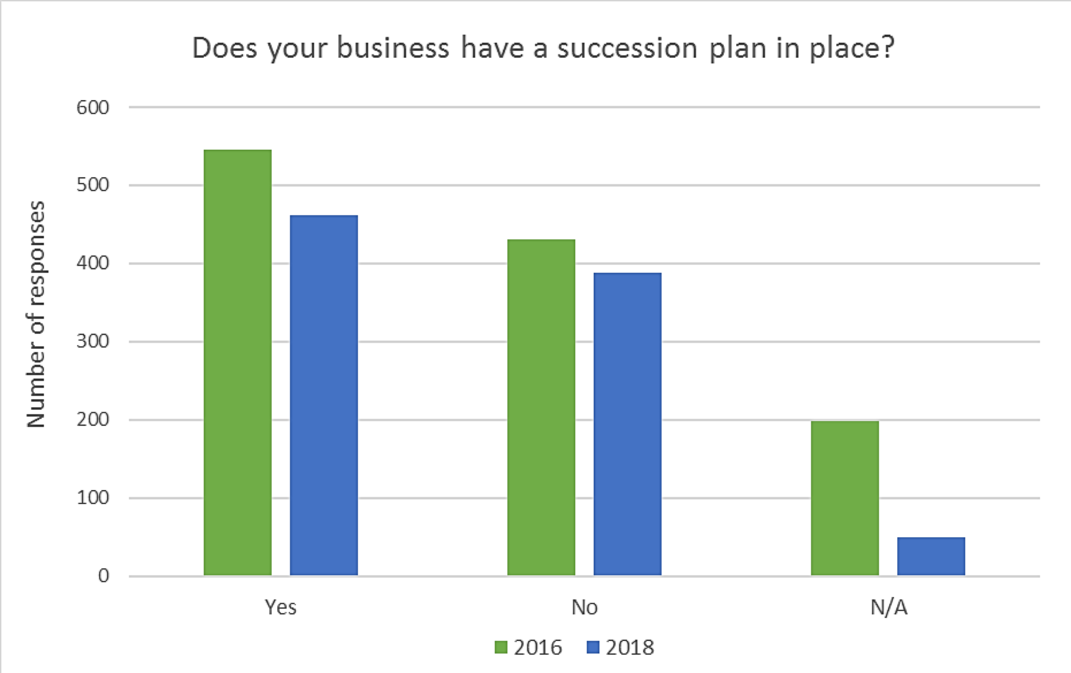
Q1 (c): Have you used your benchmarking figures to make changes in the way you manage your farm in the last two years?

Responses between 2016 and 2018 remain fairly consistent for this question. In 2016, of those that responded to the question, 44% answered that they used their benchmarking figures to make changes to their farm whereas 64% did not. In 2018, 43% used these figures to make changes in farm management and 57% did not. This result may suggest that farmers require more support in using benchmarking figures to produce meaningful results and to translate these into practical changes on the farm. The response rate to this question increased between 2016 and 2018, from 35% to 43%.

Response	**Number of responses**		**Percentage responses (%)**	
	2016	**2018**	**2016**	**2018**
Yes	187	169	44.7	42.9
No	231	225	55.3	57.1
Total responses	418	394	35.5	43.3
Total non-responses	761	519	64.5	56.7

Q2: Does your business have a succession plan (someone to take over from you when you retire) in place?

Response	**Number of responses**		**Percentage responses (%)**	
	2016	**2018**	**2016**	**2018**
Yes	545	461	46.5	51.3
No	430	388	36.7	43.2
N/A	198	50	16.8	5.5
Total Responses	1173	899	99.5	98.3
Total non-responses	6	16	5.0	1.7

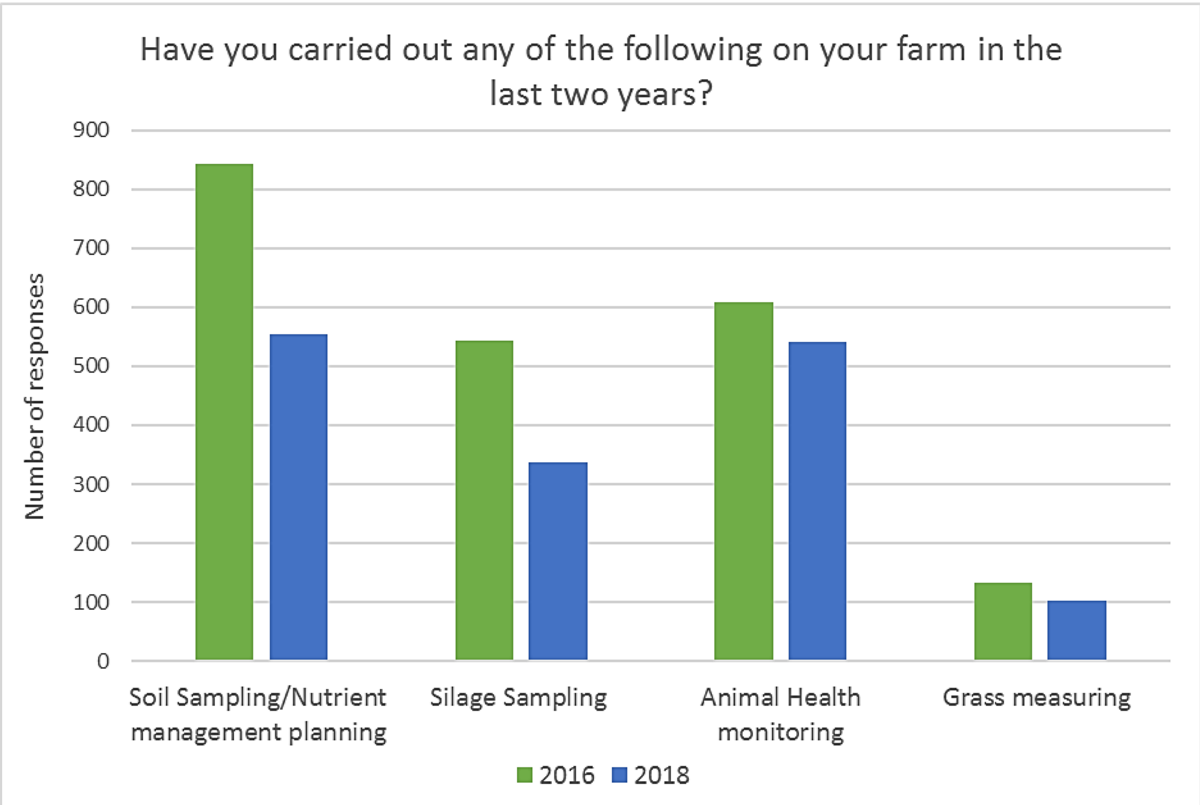


Between 2016 and 2018, the percentage of those that indicated they had a succession plan in place increased proportionally in relation to the total number of participants (46% and 51% respectively). However, in terms of individual numbers, fewer participants claimed to have a succession plan in place (545 in 2016 versus 461 in 2018). Similarly, the number of participants that responded claiming they did not have a succession plan in place increased proportionally (36% in 2016 and 43% in 2018) but decreased in terms of raw numbers (430 vs. 388 respectively). The number of responses indicating that this question was not applicable declined significantly between 2016 and 2018, from 17% to just 5%. This result may suggest that farmers are becoming more aware of the importance of having a succession plan in place. Dealing with change in a family farming business can be particularly hard where farming is a way of life, as well as a business and communication about succession, can often be difficult.

The aspiration to continue the family tradition and the family's emotional attachment to the farm are also valuable and unique motivators in addition to profitability that increase the likelihood of intra-family succession (Kerbler, 2012; Suess-Reyes and Fuetsch, 2016). It is important that Farming Connect continues to run a Succession campaign (including support in the form of workshops, surgeries, mentoring) in order to help increase the number of farm businesses with an effective succession plan. The implications of not having a succession plan in place are clear, from liquidation and an end to the business to a loss of farming knowledge/skills and traditional practice (Beattie, 2014). The negative cultural impact of a loss in farmers is also significant, as the majority of land in Wales is protected and maintained by farmers. This would result in a loss of public goods and endanger the iconic landscapes of Wales, which are strongly linked to Welsh language, culture and heritage. These results may indicate that Farming Connect could increase advertisement of their Succession Campaign or make the services more widely available around Wales.

Q3 (a): Have you carried out any of the following on your farm in the last two years?

Activity	Number of responses		Percentage responses (%)	
	2016	2018	2016	2018
Soil Sampling/Nutrient management planning	843	553	40.0	36.1
Silage Sampling	543	336	25.5	22.0
Animal Health monitoring	608	540	28.5	35.2
Grass measuring	133	102	6.0	6.7
One activity undertaken	322	275	32.2	35.9
Two activities undertaken	316	269	31.6	35.1
Three activities undertaken	261	173	26.1	22.6
Four activities undertaken	83	147	8.3	19.2
Total Responses	1001	767	85.0	83.8
Total non-responses	177	148	15.0	16.2



In 2016, the most popular activity engaged in by participants was soil sampling or nutrient management planning with 39% engaging in the activity. Two years later in 2018, the most popular activity was animal health monitoring (*e.g.* blood sampling, faecal egg counts and lameness scoring) with 35% of participants engaging in this activity. Overall, Soil sampling/nutrient management planning and animal health monitoring have remained the two most popular activities between 2016 and 2018. Grass measuring is the least popular activity amongst participants, remaining constant proportionally at 6% engagement over the 2016-2018 period.

There is also a trend between 2016 and 2018 suggesting that fewer people participated in these activities, on the whole, however, this may not necessarily be correct as the sample size (number of people participating in the survey) was smaller in 2018 (909) compared to that in 2016 (1179). It, therefore, cannot be inferred whether fewer people did indeed take part in these activities or if the difference is simply due to fewer people being surveyed.

Over the 2016-18 period, engagement remained high with 85% of total respondents engaged in at least one of the above activities – this may indicate that farmers are taking practical steps to improve their businesses.

It is important when changing behaviour that messages are carefully targeted, many farms in Wales are smallholdings so innovations and best practice on larger scale farms may not be applicable. It is also important that a change in behaviour is incentivised and the value of these changes are clearly demonstrable, the benefits of measurements such as soil and silage sampling and improving animal health are obvious and plentiful, thus providing clear motivation for farmers to engage (Rose *et al.*, 2018).

Q3 (b): If "yes", have you used this information to make changes in the way you manage your farm in the last two years?

Of those that carried out sampling/analysis activities, the majority did use these results to make changes to farm practice (87% in 2016 and 80% in 2018). Although there is a proportional decline in those that made use of these results between 2016 and 2018. There may be many reasons for farmers not making changes, for example, if changes were not necessary, the capital was not there to facilitate changes or because additional support was needed to interpret results.

Response	**Number of responses**		**Percentage responses (%)**	
	2016	**2018**	**2016**	**2018**
Yes	887	633	87.9	80.6
No	122	152	12.1	19.4
Total responses	1009	785	85.5	85.8
Total non- responses	171	129	14.5	14.1

Q4: Do you have a clear ambition for your business over the next 3-5 years?

In 2016, just over half (53%) had a clear ambition for their business in the next 3-5 years, and then in 2018, this proportion rose to 67%. As previously mentioned, fewer people were surveyed in the 2018 cohort, which means proportional results are different from the raw data. Nevertheless, there is a clear increase in the number of participants with a clear ambition and fewer with no clear ambition (46% and 32%, respectively).

Response	**Number of responses**		**Percentage responses (%)**	
	2016	**2018**	**2016**	**2018**
Yes	631	611	53.5	67.1
No	549	297	46.5	32.9
Total Responses	1179	911	100	99.5
Total non-responses	0	3	N/A	0.5

Q5: Do you have a written business plan outlining how you will deliver your ambition?

Following on from question 4, the proportion of participants with a written business plan is extremely low. In 2016, only 10% of those surveyed had a written business plan. This equates to 29% of the people who answered 'yes' to having a clear ambition for their business in question 4. Similarly, in 2018, 81% of participants indicated that they did not have a written business plan in place. This equates to 26% of the respondents who previously answered 'yes' to having a clear ambition in question 4.

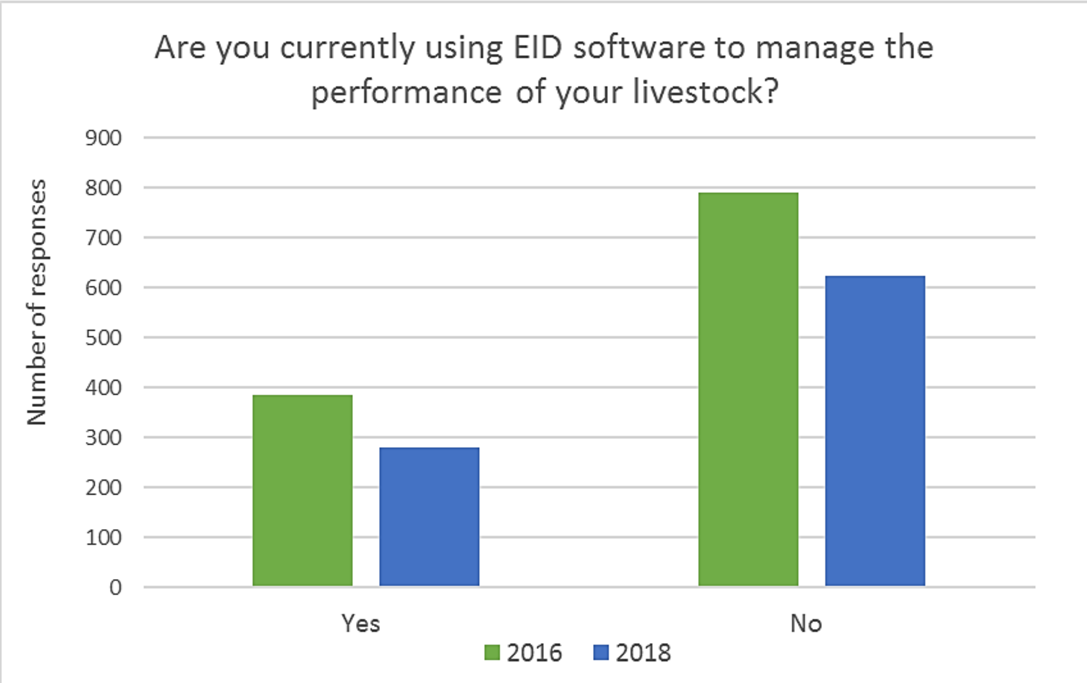
This suggests that there may be a need for increased promotion and awareness of the Farming Connect Advisory Service. Farming Connect currently offers up to 80% funding towards the cost of a business advisor for planning and advice so further publicising this service could help encourage the adoption of written business strategies. In order to achieve business aims and to maintain control, it is important to make a record of targets and practical steps in a business plan. This may be something that is out of reach financially or geographically for farmers, especially those that farm in a more traditional way. Conventional farmers typically learn and adopt practices from the preceding generation and as such do not tend to seek the advice of outside parties (Rose *et al.*, 2018).

Response	**Number of responses**		**Percentage responses (%)**	
	2016	**2018**	**2016**	**2018**
Yes	188	164	16.6	18.0

No	919	749	82.9	82.0
Total responses	1109	913	94.0	99.8
Total non-responses	73	3	6.0	0.2

Q6 (a): Are you currently using electronic recording software to manage the performance of your flock/herd?

Answer	**Number of responses**		**Percentage responses (%)**	
	2016	**2018**	**2016**	**2018**
Yes	385	280	32.8	31.0
No	791	623	67.2	69.0
Total responses	1176	903	99.7	98.7
Total non-responses	5	12	0.3	1.3



When respondents were asked about their use of electronic identification system, there was very little fluctuation between 2016 and 2018 proportionally (32% and 31% respectively). It is perhaps surprising that the use of new EID technology has not spread throughout Wales over the two-year period.

The use of computers and EID is a relatively new technology, especially in traditional Welsh farming systems and may not be necessary on small-scale farms, found commonly throughout Wales. Providing support and advice to those that are interested and facilitating discussion with those already using the technology may be useful in disseminating information. Demonstration farms are also a useful tool in propagating information, as seeing the system tried and tested in a similar system can provide motivation and spark an interest in new users (Rose *et al.,* 2018). It is also important to consider that because EID is a new technology is can be costly in the short term for farmers, this is a very significant deterrent in changing behaviour, so a clear cost benefit in the long term needs to be demonstrated.

Q6 (b): If "yes", please provide a narrative of what type of system you operate:

EID System	**Number of users**		**Percentage users (%)**	
	2016	**2018**	**2016**	**2018**
NMR (National Milk Records)	10	3	3.2	1.1
Shearwell	42	38	13.3	13.7
Weighing scales	5	9	1.6	3.2
Uniform Agri	2	9	0.6	3.2
FarmIt3000	10	5	3.2	1.8
Allflex	10	3	3.2	1.1
Interherd	8	4	2.5	1.4
Boarder software	7	2	2.2	0.7
AgriData	18	15	5.7	5.4
FarmIT	2	4	0.6	1.4
FarmPlan	4	7	1.3	2.5
Milk analysis	3	4	0.9	1.4
TruTest	2	6	0.6	2.2
Unspecified EID stick/wand	1	16	0.3	5.8
Unspecified tag/reader	68	13	21.5	4.7
Unspecified EID/reader	77	101	24.3	36.3
Other	36	50	11.4	18.0
Total non-responses	864	638	73.2	69.7
Total Responses	315	277	26.8	30.3

Of those currently using an EID system, most did not specify the brand, however, of those respondents, Shearwell was the most popular branded system in both 2016 and 2018 (13% in both years). The second most popular computer programme in 2016 was AgriData, with 6% of respondents using this system. In 2018, the trend remained the same as 5% of participants were also using this system. The use of weighing scales also increased from 2016 to 2018.

The total number of responses to this question were less than answered yes to using an EID system, suggesting that these respondents did not know the type of EID system/could not provide information that is more specific or were disengaged with this question.

Q7: 2016: Do you or others working on the holding intend to undertake accredited training through the Farming Connect programme in the next 2 years?
2018: Are you intending to complete any accredited training courses in the next 12 months?

The question provided in each survey was slightly different between 2016 and 2018, but some comparisons may still be drawn from the data. In 2016, participants were asked specifically about taking part in training run only by Farming Connect over the course of the next two years and a 99% response rate was achieved. In 2016, 85% of participants intended to engage in training provided by Farming Connect, this is a positive response to see farmers engaging with Farming Connect and making use of training provided. In 2018, results were different with 60% intending to partake in accredited training in the next year. This fall in numbers may be due to the timescale applied to the 2018 question (one vs. two years) or down to a range of other mitigating factors such as lack of time, income, access *etc.* Nevertheless, this indicates room for improvement in farmer engagement, whether that is in the use of varied communication tools (such as postal communication with the option to go paperless), flexibility when it comes to access (*e.g.* working around key farming times of the day) and geographical location (providing workshops and training in a variety of easy to access locations).

Response	**Number of responses**		**Percentage responses (%)**	
	2016	**2018**	**2016**	**2018**
Yes	1000	551	85.0	60.8
No	177	353	15.0	39.2
Total Responses	1177	905	99.8	98.9
Total non-responses	2	10	0.2	1.1

Q8 (a): 2016: Do you have woodland on your farm?
2018: Have you considered planting trees on your farm?

As previously, this question differed between 2016 and 2018, this time more significantly, which will not allow for comparison.

Answer	Number of responses		Percentage responses (%)	
	2016	2018	2016	2018
Yes	729	432	61.8	47.6
No	450	475	38.2	52.4
Total responses	1179	907	100	99.1
Total non-responses	0	9	N/A	0.9

Question 8 in 2016 asked participants whether they had woodland on their farm currently and the majority (62%) answered 'yes'. However, in 2018, participants were asked if they had considered planting trees on their farm resulting in a lower proportion answering 'yes' (47%). The reason for the proportionally lower positive response in 2018 may be found in the 2016 question, as a large number of farmers already have woodland on their farm and therefore may not be interested planting more trees.

Q8 (b): 2016: If 'yes', do you do any of the following?

Response	Number of responses	Percentage responses (%)
Manage your farm woodland	278	44.0
Utilise any of the timber resources	41	6.5
Both	27	4.3
None	285	45.1
Total responses	631	53.5
Total non-responses	548	46.5

The additional question in the 2016 survey asked participants if they interacted at all with their farm woodland. Between question 8 (a) and 8 (b) approximately 100 participants that answered 'yes' to having farm woodland did not provide an answer to this question. This may suggest that a portion of the non-responses are participants that have woodland but do not utilise it. Overall, 44% answered that they managed their woodland, but only 10% utilised timber from their woodlands. This may suggest that Farming Connect should continue to offer additional information for farmers to encourage sustainable use of their timber. This would, in turn, translate into a cost-benefit and may encourage others to consider planting trees on their land.

Q9: Other than bovine TB, what is the biggest animal health issue at the moment, relevant to your holding?

In both the 2016 survey, the most pressing concern of farmers surveyed was generalised

Health Issue	Number of responses		Percentage responses (%)	
	2016	2018	2016	2018
Lameness	158	102	19.0	12.8
Parasites (incl. fluke and resistance)	136	137	16.3	17.2
Foot rot	90	79	10.8	9.9
Pneumonia	57	56	6.8	7.0
BVD (Bovine Viral Diarrhoea)	55	53	6.6	6.7
Johne's disease	55	51	6.6	6.4
Sheep scab	43	81	5.1	10.2
Abortion	44	16	5.2	2.0
Mastitis	31	23	3.7	2.9
Digital Dermatitis (incl. Contagious Ovine Digital Dermatitis (CODD))	30	29	3.6	3.6
Fertility	25	25	3.0	3.1
IBR (Infectious Bovine Rhinotracheitis)	21	12	2.5	1.5
Tics & lice	19	17	2.3	2.1
Maggots	16	10	1.9	1.3
Toxoplasmosis	10	3	1.2	0.4
ORF (Parapox/scabby mouth)	7	4	0.8	0.5
Fly strike	6	5	0.7	0.6
Leptospirosis	4	9	0.5	1.1
Pasteurella	0	6	0	0.8
Avian influenza	0	5	0	0.6
Other	30	37	3.6	4.6
Total Responses	835	794	70.8	86.8
Total non-responses	345	121	29.2	13.2

lameness in both sheep and cattle, which accounted for 19% of responses; this was closely followed by parasites, including liver fluke and anthelmintic resistance, which constituted 16% of responses. In the 2018 survey, this trend was reversed with parasites accounting for 17% of responses and lameness for 13%. Participants also expressed significant concern in both 2016 and 2018 about footrot in sheep (11% and 10% respectively), with a small decline between the two surveys.

Farming Connect offers a plethora of information and training on parasites (be these gastrointestinal, fluke or lungworms) which has helped to increase awareness of the problem as well as resistance. In the 2016 survey, 16 responses mentioned parasitic resistance and 13 responses did so in 2018. The provision of faecal egg counts through Farming Connect is an effective way of tackling worm burdens of livestock whilst reducing the risk of drug resistance and increasing awareness amongst farmers (McKenna, 1981). It is important that farmers are aware of this service as well as methods by which they can reduce the risk via land management and biosecurity, for example, a key strategy for reducing infection with liver fluke is well-draining land (standing water and flooding provide the ideal environment for the intermediate host snail) (Bowles, 2018). Setting up/utilising existing local discussion groups (geographically formed) could be useful here, as previously mentioned peer learning is an excellent form for delivering information where sometimes instruction from vets and scientists can contain too much information and be overwhelming.

In 2016, sheep scab was only reported by 5% of participants as a concern, however, in 2018, this figure doubled to account for 10% of responses. Sheep scab (psoroptic mange) is a highly contagious disease caused by mites, which can survive off the host for up to 17 days (Chivers *et al*., 2018). After its deregulation in 1992, cases of scab rose dramatically, to more than 7,000 outbreaks in 2004, as such, sheep scab is an economically significant disease, costing up to £18 per sheep to treat and the UK sheep industry approximately £8 million per year (FUW, 2014; Bisdorff *et al*., 2006). Sheep scab was made a priority in the Wales Animal Health and Welfare Framework Implementation plan in 2016/17 with many companies and bodies, including Farming Connect, widely publicising the problem and offering information and support to farmers (Welsh Government, 2017). Another contributing factor to increased awareness may be discussion groups, as farmers interact more with others from their locality their awareness of neighbouring farms increases. Seeing the impact of sheep scab on surrounding farms along with a certain amount of peer pressure (be that intentionally or unintentionally) may be an effective tool for changing behaviour.

Increased awareness is reflected in the response to this question, with farmers becoming more aware of the disease and the required biosecurity measures to prevent its spread. A report by Chivers *et al*., 2018 surveyed members of the Welsh Lamb and Beef Producers cooperative (WLBP) and found that on 29% of farms, no quarantining procedure was used for new stock, as such, this may be a subject that Farming Connect could offer additional advice and information on as well as publicising the importance of quarantining procedures.

Other notable changes include the concern about Avian Influenza in the 2018 survey, which is possibly linked to the nationwide 2017/18 outbreak of bird flu (UK Government, 2018). Concerns about abortion also decreased by almost 50% between the 2016 and 2018 survey, which is supported by data collected by the GB veterinary diagnostic network showing that diagnosed cases of abortion in Wales have generally decreased (See table below).

Cause of abortion	Recorded diagnoses in Wales	
	2016	2018
Enzootic	108	59
Toxoplasma	55	35
Campylobacter	34	22
Listeria	15	6
Salmonella	18	5
Not Listed	6	11

Table 1: Data taken from the GB Veterinary Diagnostic Network concerning the prevalence of the top five causes of abortion in sheep in Wales in 2016 and 2018.

A decrease in concern about Pasteurellosis can also be observed (by 57%) which coincides with the Sheep Health and Welfare Report for GB in 2016/17 and 2018/19 which documented more than a 50% reduction of pasteurellosis diagnoses in sheep of all ages (SHAWG, 2016; 2018).

Consistency was demonstrated in with regards to pneumonia in both calves and lambs, which was highly recorded in both 2016 and 2018 (7% in both years), as well as Bovine Viral Diarrhoea (BVD) accounting for 6% of responses.

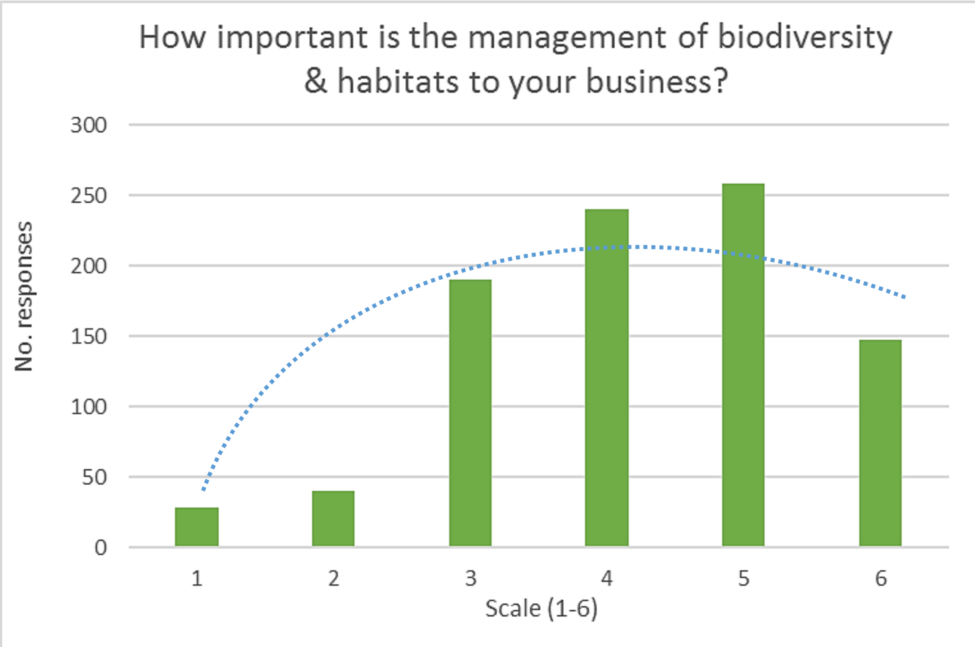
Q10 (a): On a scale of 1-6, how important is the management of biodiversity & habitats to your business (1 not important and 6 being very important)?

NB: It is important to note trends from the overall spread of the data. The responses to this set of questions will be presented in separate tables.

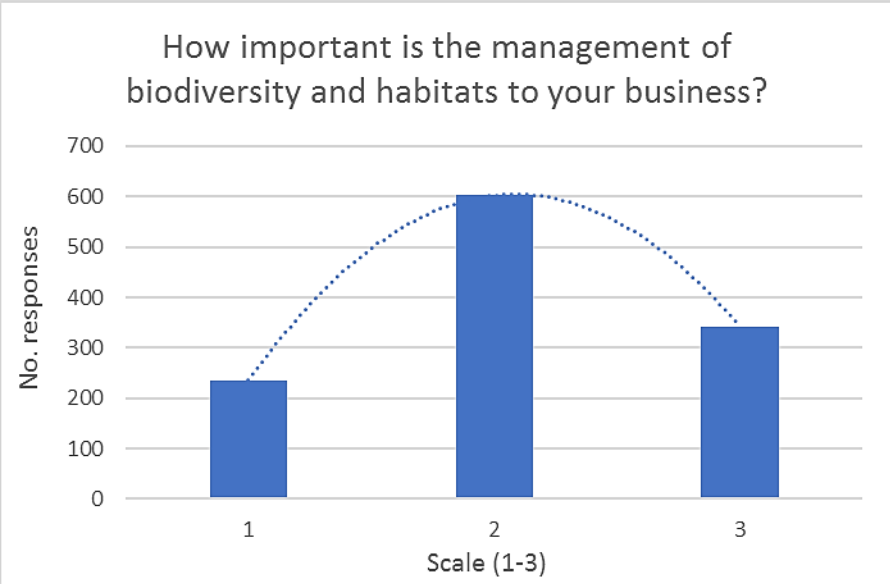
When participants were asked how important biodiversity and habitats were to their business, in both surveys responses clustered around the middle of the scale (in 2016, 51% of responses indicated two and in 2018, 76% of responses fell between three and five on the scale). A normal distribution skewed slightly towards the upper end of the scale is evident in 2018, suggesting that whilst the management of biodiversity and habitats is not the most important issue for participants it is still of concern. The same may be said of the 2016 responses, where 29% of respondents selected three compared to 19% selecting one on the scale.

Score	No. responses	Percentage responses (%)
1	28	3.1
2	40	4.4
3	190	21.0

4	240	26.6
5	258	28.6
6	147	16.3
Total responses	903	98.7
Total non-responses	12	1.3



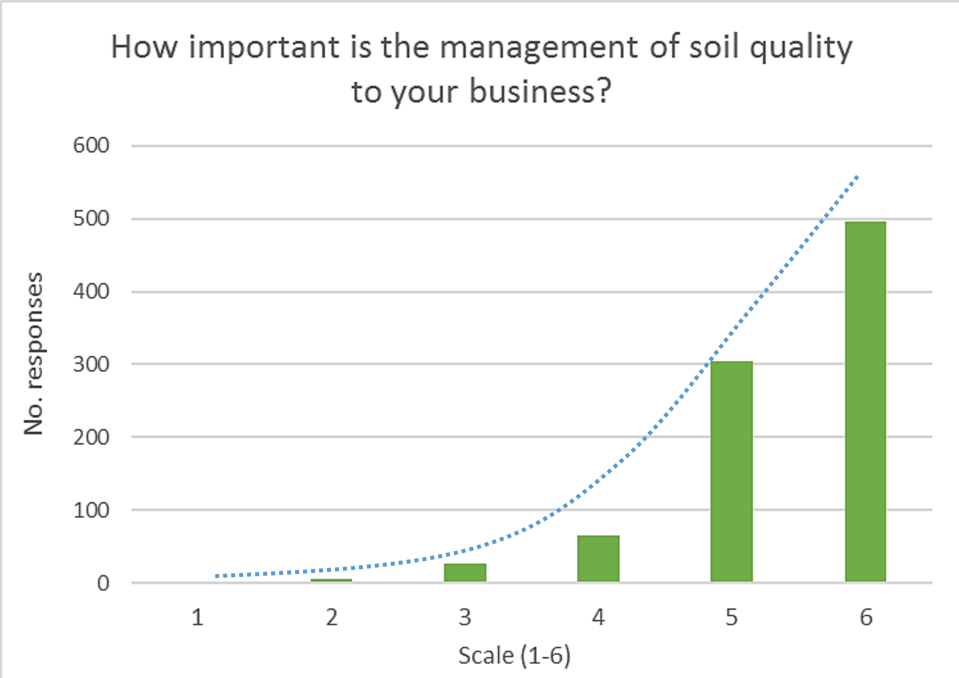
Score	**No. responses**	**Percentage responses (%)**
1	235	20.0
2	602	51.2
3	342	29.0
Total responses	1176	99.7
Total non-responses	3	0.3



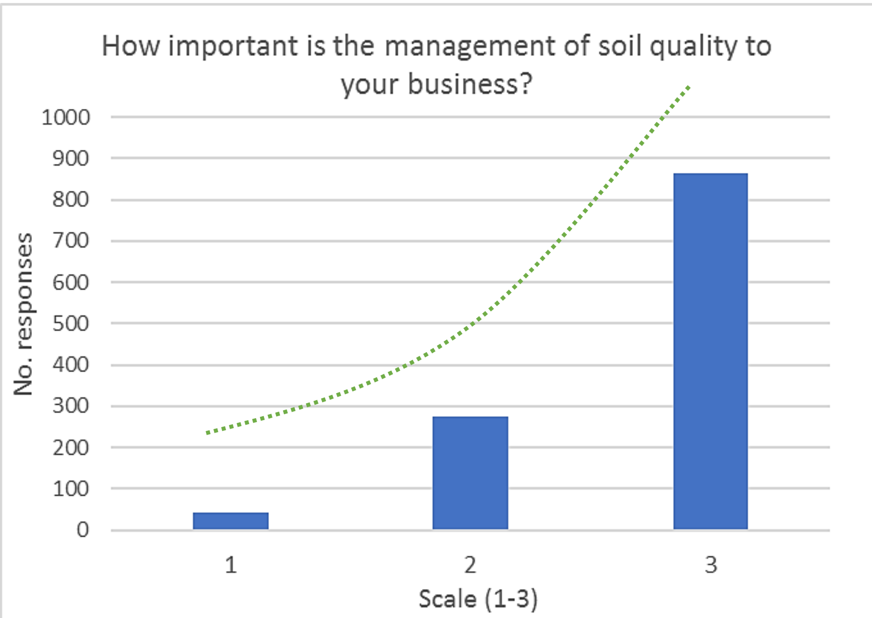
Q10 (b): On a scale of 1-6, how important is the management of soil quality to your business?

A linear pattern can be observed in both surveys in response to the question asking about the importance of managing soil quality. The majority (90%) of responses in 2018 indicated a five or six on the scale and in 2016, 73% selected three at the top of the scale. This suggests that the management of soil quality is very important to those farmers surveyed, likely due to the direct impact of soil quality on productivity. This is also reflected in question 3(a) where soil sampling and nutrient management planning was the most popular activity over 2016 and 2018 with those surveyed. This suggests that participants are aware of the importance of soil quality and are taking practical steps to improve their soil.

Score	**No. responses**	**Percentage responses (%)**
1	2	0.2
2	5	0.5
3	27	3.0
4	65	7.2
5	305	33.9
6	496	55.1
Total responses	900	98.4
Total non-responses	15	0.6



Score	No. responses	Percentage responses (%)
I	41	3.5
2	276	23.4
3	863	73.3
Total responses	1177	99.8
Total non-responses	2	0.2



Q10 (c): On a scale of 1-6, how important is the management of water quality to your business:

A similar trend can be observed with the management of water quality, in 2018, 87% of respondents indicated that the management of water quality was at the higher end of the scale of importance (five and six). In the 2016 survey, 62% of participants selected three (on a scale of 1-3 where three is most important) when asked about water quality. This suggests that participants are aware that water quality in Wales is an issue, especially in terms of pollution from fertilisers and waste (slurry run off). Increasing awareness of incentives to maintain/improve water quality from the Sustainable Management Scheme support service and of advice regarding slurry/waste management via Farming Connect may help protect and improve Welsh farmer's water sources.

Score	No. responses	Percentage responses (%)
1	5	0.6
2	4	0.4
3	24	2.7
4	80	8.9
5	389	43.3
6	396	44.1
Total responses	898	98.1
Total non-responses	17	1.9

Score	No. responses	Percentage responses (%)
1	106	9.0
2	335	28.5
3	736	62.5
Total responses	1177	99.8
Total non-responses	2	0.2

Q10 (d): On a scale of 1-6, how important is the management of the landscape to your business:

Score	No. responses	Percentage responses (%)
1	2	0.2
2	18	2.0
3	50	5.6
4	185	20.7
5	462	51.7
6	176	19.7
Total responses	893	97.6
Total non-responses	22	2.4

Score	No. responses	Percentage responses (%)
1	147	12.6
2	509	43.6
3	512	43.9
Total responses	1167	99.0
Total non-responses	12	1.0

The data trend for this question demonstrated that the importance of landscapes differed slightly between 2016 and 2018. In 2016, 43% of responses recorded indicated an importance of three on the scale, and then in 2018, the majority of responses (52%) were recorded at five. Whilst the management of landscapes was not ranked as highly as soil, for example, it does seem to be important overall. This may suggest that Welsh farmers are aware of their surrounding landscapes, especially in terms of tradition and culture. Landscapes are a significant public good and it is important that farmers are aware of the opportunities for funding after leaving the EU to maintain iconic landscapes that characterise Wales (The Heritage Alliance, 2017). This provides a key incentive for farmers in addition to the personal importance of these landscapes.

Q10 (e): On a scale of 1-6, how important is the management of water to your business:

Score	No. responses	Percentage response (%)
1	29	3.2
2	22	2.5
3	36	4.0
4	123	13.8
5	493	55.2
6	188	21.1
Total responses	893	97.6
Total non-responses	22	2.4

Score	No. responses	Percentage responses (%)
1	679	59.0
2	247	21.5
3	224	19.5
Total responses	1150	97.5
Total non-responses	29	2.5

The importance of water management to the participants of the 2016 survey was low, as 60% of responders selected a score of one. However, this trend changes in 2018 where 90% indicated an importance score of over four. Perhaps in light of the 2018 summer droughts, this factor has become more of a concern for farmers. The Met Office (2018) has released statistics that show the 2018 summer in Wales was consistently hotter than average and with 36% less rainfall. This caused many private water sources to dry up, the implementation of hosepipe bans, wildfires, health concerns for livestock, flooding and a loss in profits from crops amongst other issues. The knock on effects of the dry period are still being felt, as farmers are experiencing fodder shortages (after having to feed livestock earlier to compensate for the lack of grazing) and poorer quality silage and haylage due to the hot, dry conditions around harvest time. Drought is a very rare problem in Wales, meaning that there are very few strategies in place to manage water in this situation.

Q10 (f): On a scale of 1-6, how important is the management of air quality to your business:

Score	No. responses	Percentage responses (%)
1	7	0.8
2	14	1.6
3	46	5.1
4	168	18.7
5	501	55.7
6	162	18.0
Total responses	899	98.3
Total non-responses	16	1.7

Score	No. responses	Percentage responses (%)
1	441	37.8
2	404	34.6
3	324	27.7
Total responses	1168	99.1
Total non-responses	11	0.9

A similar trend is observed for air quality, as in 2016, as 38% of participants ranked air quality at an importance level of one. Then, in 2018, 56% of participants chose five on the scale of importance. Perhaps a surprising result as air quality in rural Wales is generally good, rarely rising above a pollution index score of two when measured against the air quality index (Welsh Government). However, in large cities in South Wales such as Swansea and Cardiff, the air quality can score between four and seven on the index, indicating higher levels of pollution (Welsh Government, 2019). In 2018, several campaigns pushed for stronger air quality improvement plans in Wales, as well as action by the Welsh Government, for example, the 50 mph speed limit introduced on several major roads and motorways (BBC, 2018). Perhaps these survey results indicate increasing awareness of air quality amongst Welsh farmers.

Q10 (g): On a scale of 1-6, how important is the management of waste to your business:

Score	No. responses	Percentage responses (%)
1	4	0.5
2	12	1.3

3	25	2.8
4	58	6.5
5	413	46.0
6	384	42.8
Total responses	897	98.0
Total non-responses	18	2.0

Score	**No. responses**	**Percentage responses (%)**
1	146	12.4
2	381	32.3
3	654	55.5
Total responses	1178	99.9
Total non-responses	1	0.1

The management of waste is fairly important amongst participants, especially in 2016 where 55% of responders selected an importance level of three. In 2018, the importance of waste management amongst those surveyed was higher, as 89% of responses were recorded at five and six on the scale. This may indicate increased awareness concerning waste management in participating farmers. The global campaign to reduce plastic pollution also saw a surge in popularity in mid- to late-2018, perhaps prompting farmers to think about their own recycling and waste management strategies in addition to increased pressure from environmentally conscious consumers.

The level of farmer knowledge and insight for each topic in question 10 remains unclear, as the questions successfully quantify how important a feature is to farm business but not whether the farmer understands how to measure the health/quality of that feature. Therefore, the above answers are useful from a policy creation perspective, but in terms of knowledge exchange, it is necessary to quantify where the knowledge deficit actually lies.

11. What other assistance from Farming Connect would you like to help improve the efficiency and productivity of your business?

2016:

Feedback area	**No. responses**	**Percentage responses (%)**
Nothing/as is and positive feedback	273	32.4

More Grants	78	8.9
IT/Computer training	55	6.5
Easier access to grants and training	51	6.0
Better communication/advertising	47	5.6
Support for new or young farmers	39	4.6
Funding for trailer test	33	3.9
Training & information on animal health	28	3.3
Funding & help with diversification	28	3.3
More variety of courses	27	3.2
More demonstration farms	26	3.1
More help with business planning	25	3.0
Grants/information on EID	18	2.1
More information on grassland management	16	1.9
Updates on legislation/rues/regulations	10	1.2
Help with renewable energy	9	1.1
Grants for small farms	9	1.1
More accessible events	8	0.9
Help with benchmarking	8	0.9
Funding & help with handling systems	8	0.9
Access to financial advice	7	0.8
Advice on BREXIT	7	0.8
More help with succession planning	6	0.7
Help managing woodland/timber utilisation	6	0.7
More on soil management	6	0.7
Marketing advice	5	0.6
Help improving profitability	5	0.6
Help with paperwork	5	0.6
Total responses	843	92.1
Total non-response	336	36.7

2018:

Feedback area	**No. responses**	**Percentage responses (%)**
Better communication & advertising	75	12.0
Nothing/as is/positive feedback	74	11.9
More grants	59	6.5
Easier access to grants	56	9.0
IT/Computer training	44	7.1
Advice on the government & BREXIT	39	6.3
More variety of courses	37	5.9
Funding & information on diversification	32	5.1
Help with animal Health	28	4.5
More on Soil management	25	4.0
Support for Young farmers	22	3.5

More support/grants for small farms	22	3.5
Help with waste management	18	2.9
More on succession planning	16	2.6
More help with business planning	14	2.5
More postal communication	8	1.3
More discussion groups	7	1.1
More funding for courses	6	1.0
Help with health and safety	5	0.8
Information on renewable energy & the environment	4	0.6
Total responses	623	68.1
Total non -responses	292	31.9

The overriding response over 2016 and 2018 was that participants would like more grants, in various forms, but particularly for small farms. Participants would also like to see the grant process simplified and streamlined, or to receive more help when applying for grants. Similarly, there is a need for easier access and simpler application processes when applying for courses/training, some requested more online whilst others wanted more on paper.

This may also be reflected in the request for more IT and computer training with 6-7% of participants requesting training and help in this area. This is particularly sought after, as tax and VAT will be made entirely digital by April 2019. Several responses, although more in 2018, indicated that participants had poor or no internet access at all, at their holding which could be a critical problem during this transition. Farming Connect already offer help and support with the digital transition, but perhaps further advertising or recommending local bookkeepers/accountants that have experience with farm businesses could also be beneficial. In a similar vein, many participants indicated an interest in new technology (including computer-based systems) such as EID and would like more information about how this could be used in their business; this may be done through demonstration farms, which offer an excellent opportunity to see new technology in action. It is encouraging to see that participants are interested and perhaps willing to embrace technology to help improve their productivity and profitability in the long term.

Another frequent response to this question was that participants would like more and better communication and advertising of what Farming Connect has to offer, which may also increase engagement with activities. Once again, some responders preferred more online and others more postally and on paper, perhaps Farming Connect could consider beginning contact through both mediums and then offer to ‘opt out’ of one or the other (to go ‘paperless’ or entirely postal).
In 2018, more participants indicated a concern about BREXIT (from 7 responses in 2016 to 39 in 2018), understandably so as the March deadline draws closer and the government are still struggling to offer solid answers to many of the critical questions farmers are posing. Offering accurate and unbiased information (through a fact sheet for example) may be beneficial for Farming Connect members.

Another popular response was for more support – financially and practically – for new or young farmers. Several responses indicated a concern that few people are moving into agriculture and that the younger generation needs financial support to carry on the family business. This is reflected in the request for funding for the trailer test, an essential qualification that young farmers may not be able to finance themselves.

Around the same frequency are requests for more information and support with diversification and more training/information in animal health. This indicates that participating farmers are aware of the need to diversify perhaps to help safeguard in the face of BREXIT or ensure the future of their business. In requests for more information on animal health, participants would like more contact with vets and have found existing courses extremely useful.

One of the most popular opinions expressed was that Farming Connect is delivering the correct type and level of activities, support and information and that participants are happy with the service. Several responses go on to say that, they found specific courses useful and that participants wish to engage more with Farming Connect activities (see below). This is extremely encouraging and whilst feedback is important, it is important to note that participants are finding the current provision beneficial.

208	Happy
209	Happy
210	happy
211	Happy as it is-doing a pretty good job
212	Happy as it is-doing a pretty good job
213	happy at the moment
214	happy at the moment
215	happy enough
216	happy with everything
217	Happy with everything
218	Happy with everything
219	Happy with everything
220	happy with everything
221	happy with everything
222	happy with everything
223	happy with everything
224	happy with everything
225	happy with everything
226	happy with everything
227	happy with everything
228	happy with everything
229	happy with everything
230	happy with everything
231	happy with everything
232	happy with everything
233	happy with everything
234	happy with everything
235	happy with everything
236	happy with everything
237	happy with everything
238	happy with everything
239	Happy with everything-when i need something i phone up and they point me in the right directi
240	Happy with everyting
241	happy with everyting
242	Happy with FC, It covers a lot of thing s
243	Happy with it as it is
244	Happy with the courses
245	happy with the courses available
246	happy with the schemes that are on offer, however need to improve/focus on diversification and
247	happy with the service that's being provided
248	happy with the services and courses on offer
249	happy with the services being offered at the moment
250	happy with the services being offered at the moment

251	happy with the services being provided at the moment,has found practical meetings more wort
252	happy with the services farming connect are providing
253	happy with the services that are being provided
254	happy with the services that are being provided
255	happy with the services that are being provided at the moment
256	happy with the services that are being provided at the moment
257	happy with the way we receive information
258	happy with what you're doing
259	happy with what's already being offered
260	happy with what's available
261	happy with what's available
262	happy with what's available at the moment
263	happy with what's available at the moment
264	happy with what's being offered
265	happy with what's being offered
266	happy with what's being offered
267	happy with what's being offered and has found farming connect very helpful
268	happy with what's being offered at the moment
269	happy with what's being offered at the moment
270	happy with what's being offered by farming connect at the moment
271	happy with whats on offer
272	happy with whats on offer
273	happy with whats on offer
274	happy with whats on offer
275	happy with whats on offer
276	happy with whats on offer
277	happy with whats on offer
278	happy with what's on offer
279	happy with what's on offer
280	Hapus gyda'r cymorth hyd yn hyn

Concluding Remarks

A good level of engagement by farmers with Farming Connect is indicated in both the 2016 and 2018 surveys with results suggesting that many of the farmers surveyed are utilising the opportunities on offer and making practical changes to their businesses. It is particularly encouraging to see an awareness of the environment and an interest in new technologies.

Key areas highlighted by the survey results are the need for more support with benchmarking and business planning. Farming Connect currently offers support and information on both of these subjects; as such, it may be a case of increasing advertising to encourage farmers to engage with the services. Indeed, the survey results from the final survey question indicate that members would like more communication and better advertisement about training and other activities that Farming Connect offers.

It is also indicated that participants would find additional support using computers; IT and online processes (*e.g.* VAT) and databases beneficial. Another popular response from the final question was that participants would like to see more support for young farmers and concern was expressed that few people from non-farming backgrounds are entering the industry. Perhaps Farming Connect could consider offering courses or 'start up' information packs about the 'basics' of farming and sessions discussing entry to the industry.

References

BBC (2018), New 50 mph limit to tackle air pollution in Wales (accessed 28/02/19 at https://www.bbc.co.uk/news/uk-wales-44495726).

Beattie. A (2014), Succession planning – The Do's and don'ts of family succession, *Grains research and development corporation* (accessed 25/02/19 https://grdc.com.au/resources-and-publications/grdc-update-papers/tab-content/grdc-update-papers/2014/08/research-update).

Bisdorff. B, Milnes. A and Wall. R (2006), Prevalence and regional distribution of scab, lice and blowfly strike in Great Britain, *Veterinary Record,* **158**(22): 749-752.

Bowles. L (2018), The Soil Association: Are you informed about liver fluke? (Accessed 26/02/19 https://www.soilassociation.org/farmers-growers/farming-news/2018/june/are-you-informed-about-liver-fluke/).

Chivers. C. A, Rose Vineer. H and Wall. R (2018), The prevalence and distribution of sheep scab in Wales: a farmer questionnaire survey, *Medical and Veterinary Entomology*, **32**(2).

Faysse. N, Srairi. T and Errahj. M (2012), Local farmer's organisations: A space for peer-to-peer learning? The case of milk collection cooperatives in Morocco, *The Journal of Agricultural Education and Extension,* **18**(3): 285-299.

Farmers Union of Wales (FUW) (2014), Sheep Scab: An overview of the disease in Wales (accessed 26/02/19 at http://fuw.org.uk/wp-content/uploads/2015/01/Sheep-Scab-20th-Aug-2014-FINAL.pdf).

GB Veterinary Diagnostic network (2016-2019), GB Sheep Disease Surveillance Dashboard (accessed 26/02/19 at https://public.tableau.com/profile/siu.apha#!/vizhome/SheepDashboard_/SheepDashboard).

Kerbler. B (2012), Factors affecting farm succession: the case of Slovenia, *Agricultural Economics*, **58**(6): 285- 298.

Lawrence. J. D, Shaffer. J, Hallam. A and Baas. T. J (1998), Factors Impacting Production and Economic Variability in Traditional Midwest Swine Enterprises, Journal Paper No J17494, *Iowa Agriculture and Home Economics Experiment Station*, Ames, Iowa, USA.

McKenna. P. B (1981), The diagnostic value and interpretation of faecal egg counts in sheep, *New Zealand Veterinary Journal,* **29**(8)

Roling. N. G and Wagemakers. M. A. E (2000), Participatory Learning and Adaptive Management in Times of Environmental Uncertainty In. *Facilitating Sustainable Agriculture*, Cambridge University Press, UK.

Ronan. G and Cleary. G (2000), Best practice benchmarking in Australian agriculture: Issues and Challenges, Australian Agricultural and Resource Economics Society Inc. *44th Annual Conference Proceedings*.

Rose. D. C, Keating. C and Morris. C (2018), Understand how to influence farmer's decision-making behaviour: A social science literature review, ADHB.

Sheep Health and Welfare Group (SHAWG) (2016), Sheep Health and Welfare Report for Great Britain 2016/17, Second Edition (accessed 26/02/19 at http://beefandlamb.ahdb.org.uk/wp-content/uploads/2016/10/SHAWG-report-2016-17-181016.pdf)

Sheep Health and Welfare Group (SHAWG) (2018), Sheep Health and Welfare Report 2018/19, Second Edition (accessed 26/02/19 at http://beefandlamb.ahdb.org.uk/wp-content/uploads/2018/11/SHAWG-REPORT_2018_11_19_WEB.pdf).

Suess-Reyes. J and Fuetsch. E (2016), The future of family farming: A literature review on innovative, sustainable and succession-oriented strategies, *Journal of Rural Studies,* **47**(A): 117-140.

Welsh Government (2017), Wales Animal Health and Welfare Framework (accessed 26/02/19 at https://beta.gov.wales/sites/default/files/publications/2018-01/animal-health-and-welfare-framework-implementation-plan-2016-to-2017.pdf).

Welsh Government (2019), Air Quality in Wales – Latest measured air quality (accessed 28/02/19 at https://airquality.gov.wales/).

UK Government (2018), Avian influenza (bird flu) this winter 2017 to 2018 (accessed 26/02/19 at https://www.gov.uk/government/news/avian-influenza-bird-flu-in-winter-2017-to-2018).