THE MAGAZINE FOR FARMING & FORESTRY IN WALES

FARMING connect

FARMING connect
cyswllt FFERMIO

08456 000 813

Demonstration Network
Genomics – The benefits of testing to help breeding decisions

Agricultural Infrastructure:
Structures for stock health and welfare soundness

Llywodraeth Cymru
Welsh Government

ISSUE 34 - July/August 2021 | www.gov.wales/farmingconnect

Cefngwilgy Fawr - Demonstration Site

Demonstration Site: Cefngwilgy Fawr, The Gorn, Llanidloes, Powys

Technical Officer: Lisa Roberts

Project Title: Improving herd health through the use of technology

Project Introduction:

Maintaining herd health and reducing infectious diseases are major drivers in improving the efficiency and profitability of suckler herds. Calf health is one area in which Edward and Kate Jones, Cefngwilgy Fawr, are keen to address following cases of pneumonia in their calves in past years. Pneumonia is caused by a range of factors which include: infectious agents (pathogens), housing environment, management and the immune status of calves. It is estimated that pneumonia can cost up to £82 per affected suckler calf, with costs rising significantly when subsequent treatments are required.

The suckler herd at Cefngwilgy Fawr consists of 50 Limousin-cross and British Blue-cross cows which are mostly spring calving, which calve indoors and are then turned out to pasture.

This project focuses on improving the monitoring of calf health and ensuring early interventions to reduce disease incidence and antibiotic use on-farm. An ear tag which measures calf activity and temperature has been placed on the spring-born calves to monitor their health. Initial trials on the system have shown that it can detect disease approximately two days prior to the appearance of clinical signs. This enables targeted antibiotic usage and has the potential to improve growth rates and reduce calf mortality as disease is detected early. Through improved productivity, the carbon footprint will also be reduced. The housing environment will also be monitored through the use of on-farm sensors and LoRaWAN technology.

Graph 1. Activity for selected calves

Graph 2. Ear temperature for selected calves

Figure 1. Ear tag which measures calf activity and temperature has been placed on the spring-born calves to monitor their health

Project Objectives:

- To improve calf health and performance
- To identify disease early-on and apply interventions where necessary
- To reduce the use of antibiotics

RHWYDWAITH ARDDANGOS DEMONSTRATION NETWORK

For further information on this project, please visit the Farming Connect website: gov.wales/farmingconnectourfarms

Ysgellog - Focus Site

Focus Site: Ysgellog, Rhosgoch, Amlwch, Anglesey

Technical Officer: Non Williams

Project Title: Micronutrient availability in grassland soil: its role in promoting grass production and quality

Project Introduction:

Achieving an appropriate balance between soil macronutrients and micronutrients is fundamentally important in ensuring optimum performance from grassland. Prescriptive soil analyses are commonly used to determine concentrations of the major macronutrients (i.e. nitrogen, phosphorus, potassium) in agricultural soils. However, soil sampling for micronutrients is not as commonly practised, despite both macro and micro nutrients interacting with each other. Micronutrient deficiencies in soils can lead to major constraints to crop productivity and quality.

Livestock differ in micronutrient requirements to those required for grass growth. Soil characteristics, e.g. pH value can influence the soil's micronutrient status and how much of these trace elements are taken up by the plant. In addition to this, soil micronutrient supply in agricultural systems is often driven by other management practices, e.g. slurry and farmyard manure (FYM) spreading. Careful interpretation of soil, FYM and forage mineral results side-by-side is required to understand the recycling of micronutrients on the farm, and the impact of one element (e.g. use of FYM) on another (soil nutrient profile). An increased understanding of nutrient cycling and its role in promoting best environmental practices is important to avoid detrimental processes from occurring, e.g. compaction and run-off.

The aim of this project is to determine the micronutrient status of a lowland beef and sheep farm's soils in the context of promoting grass growth and quality and to evaluate the implications of the results on the farm's management practices.

Initial soil sampling has been conducted on a proportion of the farm's grazed and silage fields in the spring with data analysis to follow.

Micronutrient	Average result (across the sampled fields)	Range (across the sampled fields)
Ammonium Nitrate Extractable Calcium (mg/l)	930	830 – 1155
Mehlich III Extractable Copper (mg/l)	6.5	4.5 – 10
Organic matter (LOI) %	10.2	7.6 – 11.8
Ammonium Nitrate Extractable Sodium (mg/l)	36.6	29.5 – 43
Mehlich III Extractable Sulphate (mg/l)	59.7	49.3 – 72.6

Table 1. Some of the initial soil sampling results.

The next steps include forage mineral and FYM analyses. This data will be used as a baseline for the remainder of the project as any changes and recycling of micronutrients are examined.

For further information on this project, please visit the Farming Connect website: gov.wales/farmingconnectourfarms

EIPWALES

Cydweithio er ffyniant gwledig
Collaborating for rural success

Targeting nitrogen where it counts

Foliar feeding is proving to be an effective way of cutting nitrogen (N) use whilst increasing dry matter (DM) yields.

In 2019, four dairy farmers from across Pembrokeshire and Ceredigion that were driven to increase their fertiliser efficiencies came together to set up a project to investigate the performance of foliar feeding compared to granular (solid/prill) fertiliser. On each of the farms, one large grazing field has been split into three plots to compare both fertiliser applications against a control plot of no N input.

Soil and grassland consultant Nigel Howells, who is working with the group, explains why foliar feed helps boost yields.

"In the case of granular fertiliser, nutrients are applied to the ground before being washed into the topsoil by rain and then taken up by the root system of the plants. A host of different factors such as soil compaction, drainage, bio-activity, soil temperature and dry or wet weather reduce the efficiency of N uptake by the grass to 50-60%.

"Foliar feeding bypasses the soil as it is taken up by the pores in the leaves rather than through the roots, which increases its efficiency to 80-85%."

The nitrogen use efficiency (NUE), the increase in DM yield achieved per kg of N applied, was shown in 2020 to be significantly greater in the foliar feed plots compared to the conventional plots. It was 3.8 times more efficient at site 1; 16.5 times more efficient on site 2; and 2.7 times more efficient on site 3. At site 4, the foliar feed was 2 times as efficient on the silage plot but only marginally more efficient on the grazed plot.

During this final growing season the foliar feed application rate has been increased to investigate how much N applied through a foliar application is required to match the plots treated with the granular fertiliser. This will illustrate how much less N can be applied through foliar feeding to achieve the same DM output. The project is demonstrating how the use of foliar feed is more efficient that conventional prilled fertiliser with less N required to achieve the required outputs. This has the potential to provide multiple benefits in the form of lowering N use and hence the carbon footprint of the farm, reducing run off and the possibility of pollution and reducing costs for the farmer without reducing yields.

How is foliar feed prepared and applied?

The foliar feed used in the project is a mixture of urea (source of N) and humic acid (a source of carbon) which are mixed together in water. The combination of humic acid (HA) and urea forms

Figure 1. A 'Tow and Fert' sprayer specifically designed to apply liquid fertiliser.

stable chemical bonds, which decreases the nitrogen release rate and increases utilisation efficiency of the foliar feed. The fertiliser is then spread using a conventional tractor mounted sprayer.

Table 1. Comparison of conventional fertilised plots and foliar fed plots

Site	Conventional plots			Foliar feed plots		
	Total N applied/ (kg/ha)	Additional yield (compared to no fertiliser) (kg/ha)	Additional yield/kg N applied	Total N applied/ (kg/ha)	Additional yield (compared to no fertiliser) (kg/ha)	Additional yield/kg N applied
Site 1	275	2,700	**9.8**	93	3,500	**37.6**
Site 2	205	900	**4.4**	47	3,400	**72.3**
Site 3	275	4,600	**16.7**	75	3,400	**45.3**
Site 4 (Grazed)	240	4,600	**19.2**	65	1,600	**24.6**
Site 4 (Silage)	460	10,300	**22.4**	182	8,300	**45.6**

Mike Smith is one of the four farmers involved in the project. Mike farms at Pelcomb Hill Farm near Haverfordwest, which is a 280 hectare farm running a herd of 450 cows.

"The success of foliar feed so far hasn't really surprised me because we've previously used foliar feed on crops of wheat and maize but it's been great to form a project with other farms to test its effectiveness in a grassland situation."

For further information on this EIP project, please visit the Farming Connect website: gov.wales/farmingconnect

Fro Farm - Focus Site

Focus Site: Fro Farm, Abergavenny, Monmouthshire

Technical Officer: Gwenan Evans

Project Title: Genomics – The benefits of testing to help breeding decisions

The Young family are milking 220+ autumn calving, Holstein Friesian cows and rear approximately 70 replacement heifers each year. They have had a keen interest in breeding for many years although, lately, their breeding criteria has changed to take more account of Profitable Lifetime Index (£PLI), while ensuring they still use type traits to breed a functional cow but with less angularity and less stature.

The aim of the project was to decide if genomic testing is financially worth investing in on a commercial dairy farm. Genomic testing for heifers has been widely available in the UK for around eight years now and is presented in the same format as genomically tested bulls with very similar levels of reliability if reviewed within breed.

Overall, the results show that there is variation in an animal's genetic potential between PTA (predicted transmitting ability) and genomic data and importantly, the genomic £PLI figure is 20% more accurate allowing a more strategic breeding policy to be implemented to maximise returns.

However, as part of the project, the AHDB Herd Genetic Report (HGR) was used with the Inbreeding Checker to carry out the initial evaluation of the heifers, pre genomic testing. The inbreeding checker is a new addition to the AHDB HGR, with 10 generations of data, it checks how closely related any sire with a genetic index is to any heifer/cow in a milk recorded herd.

Within this review, AHDB HGR data revealed that the average inbreeding for the 63 heifers was 6.6%, when the industry recommendation is to avoid above 6.25%. In the case of inbreeding, this can include:

- reduced animal fertility
- reduced production
- potential health issues
- long-term challenge of correcting these issues

Further investigation found that the current programme the family had been using to calculate inbreeding had not been calculating properly, with less generation data. This was a major concern at Fro Farm with several replacement heifers being over 12% inbred, with the R2's at 6.8% as an average and the R1's currently at 7%.

Table 1 shows the significant risk posed by not having accurate data when looking at inbreeding levels for two heifers, randomly chosen at Fro Farm.

Animal	AHDB	HUK	Company A	Company B	Genomic
A	8.65	3.78	3.78	Not possible	9.2
B	7.47	2.49	0	Not possible	9.4

Table 1 *– Inbreeding percentage figures for different companies for two heifers at Fro Farm in spring 2020.*

This difference in figures would not have been found if the project at Fro Farm had not used the AHDB HGR report as an initial screen of the data. From the whole project, these unexpected results have had the biggest impact on breeding decision-making at Fro Farm.

The main conclusion from this study is the importance of reliable, accurate data and the need to ensure any information used can be trusted. Wrong data can have huge implications in the future, if not identified.

Genomic testing would be a benefit on many farms where more accurate data can be used to improve herd performance as well as allowing farms to sell surplus heifers that don't fit a farm's requirement. The Young family already had a very focused breeding policy and strong herd management, which results in less variation between PTA and genomic data, but target areas can still be identified with the genomic results. Using this data to aid breeding decisions and employ genetic selection increases the genetic improvement of animals within the herd and therefore producing offspring from the top performing heifers and selecting breeding pairs that will produce offspring with the desired traits which will help achieve the breeding target at Fro Farm.

"In the first instance, it is important to test all animals to know your benchmark/ starting point and then a policy can be developed based on your farm's current herd and future replacement requirements/management policy," said Ben Young.

"On the whole our breeding policy with genomic testing will be very similar but with increased emphasis on production traits and an aim to maintain heath traits."

For a full report on the project, please visit our website: gov.wales/farmingconnectourfarms

The Farming Connect Knowledge Exchange Hub

The Farming Connect Knowledge Exchange Hub (KE Hub) is based at IBERS, Aberystwyth University. Our colleagues there are playing an important role in providing farmers with the latest information from scientific research.

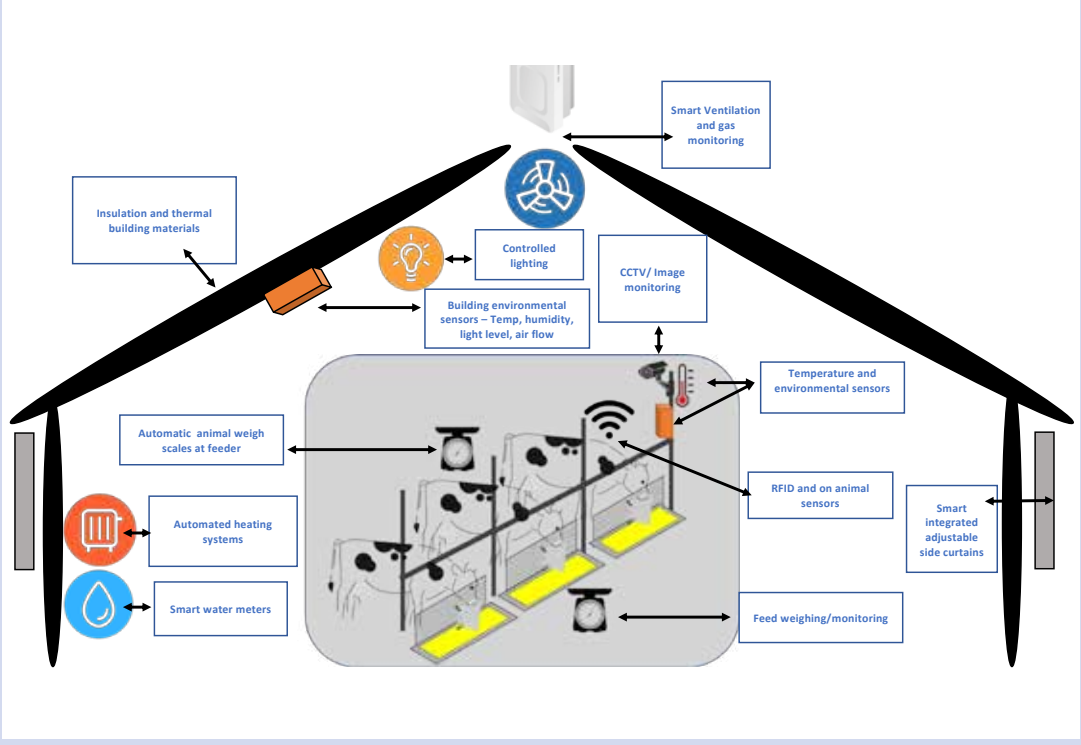
Agricultural infrastructure: structures for stock health and welfare soundness

Providing the correct environment for livestock to be healthy and productive requires careful thought and planning. Technology is increasingly able to help monitor and control the environment but equally, attention to detail when it comes to space allocation, layout of the building and lighting can impact on the animals living there. Dr David Cutress from the Knowledge Exchange Hub at IBERS, Aberystwyth University highlights some of the many factors that can influence the health, welfare and productivity of livestock.

A key aspect of agricultural activities is the infrastructure design to provide the right environment for productivity long term. Infrastructure, however, plays a massive role across the board in agriculture with regards to climate change (building insulation, ventilation, renewable energy sources, energy efficiencies, waste management), farmworker health and safety and animal health and wellbeing. Developing buildings and environments for improved wellbeing can also lead to increased production and often the quality of produce. Specific designs for automatic milking systems, for example, have been demonstrated to improve well-being, lying and feeding times, reduce bullying which can occur at milking and provide cattle with a higher freedom of choice. Factors such as barn wide lighting can impact livestock with noted effects on natural animal day-night cycles. Including controlled lighting indoors may impact immune protection and can combine with low-intensity red lighting during darkness hours to allow farm staff to operate but not impact livestock.

Controlled environment agriculture (CEA) is often considered the ultimate application where infrastructure can be designed and modified to purpose, allowing direct control of almost all environmental conditions. Temperature can have huge impacts on animal welfare either directly through heat stress or indirectly by providing beneficial environments for disease vectors to thrive and for infections to spread. Designing buildings with temperature concerns in mind (ventilation for airflow and ease of cooling, heating systems) as well as taking advantage of wireless temperature sensors and systems that can link these into ventilation and

heating control can benefit control and reduce labour. Controlling temperature whilst reducing environmental impacts is also possible by considering solar reflective materials for cooling buildings and solar collectors, renewable energy, or low impact energy systems such as combined heat and power (CHP) and anaerobic digestion for heating buildings. Ventilation can impact cooling but also plays a role in reducing the spread of infectious airborne diseases and reducing dust particles which can affect both animal and human health. Precision technologies can also be incorporated into modern infrastructure to improve overall animal health in a variety of ways. Incorporating radio-frequency identification (RFID) scanners indoors can monitor animal patterns of movement towards detecting illness, oestrus and feeding. Essential throughways can incorporate automatic weigh scales and body condition scanners which can be used to assess illness, detect sub-clinical issues and monitor productivity.



Wern - Demonstration Site

Demonstration Site: Wern, Welshpool, Powys

Technical Officer: Rhiannon Davies

Project Title: The effects of winter ventilation in a dutchman shed

At Wern Farm, a Farming Connect free range poultry demonstration site, trials have been conducted in conjunction with Pruex to regulate and monitor litter moisture and improve air quality within the poultry sheds through the use of non-infective soil bacteria. A key focus is to lower and then maintain low ammonia levels, which will benefit bird health and the wider environment.

The aim of the project is to achieve prudent use of antibiotics through a 3-fold strategy of Find, Fix and Tell.

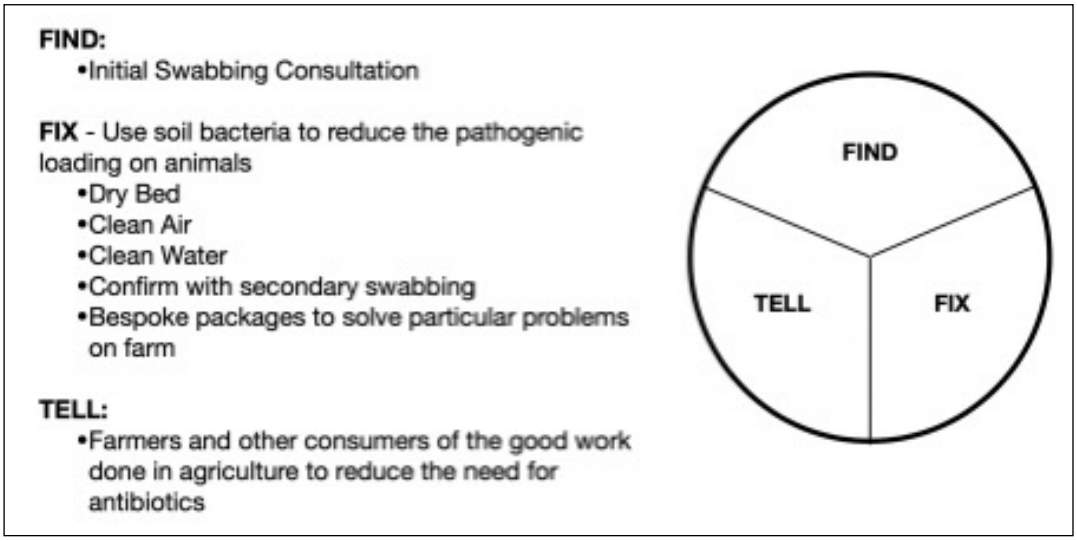


Image credit: Pruex

The following have been used to monitor conditions inside the poultry sheds throughout the project:

- Real time sensors to measure air quality and gas production
- Bacteriology to identify and analyse levels of disease-causing bacteria vs non infective Pruex stabiliser bacteria
- Analysis of moisture content in litter

Wern have seen the following results since introducing the non-infective bacteria:

- Drying up of litter
- Significantly reduced levels of ammonia
- Prolonged periods between mucking out due to litter being dryer and lighter
- Reduced levels of disease-causing bacteria within the sheds due to a dominance of Pruex non-infective stabiliser bacteria
- Improved air quality for staff working in the buildings

Automatic misters spray the non-infective bacteria at set times within the shed and when

data collected from the sensors identifies spikes in air quality and gas production. Every millilitre of product contains millions of beneficial bacteria which travel in a fine mist through the air to populate the shed. Over the winter, with pop holes closed due to bird flu restrictions, the ventilation was not performing correctly in the building and, therefore, moisture was being carried in through ventilation units and being dumped on the litter directly in line with the units.

Air quality cannot be overlooked and is of high importance to maintain healthy birds and reduce respiratory disease. There must be an adequate supply of air into the building, distribution inside the building and flow of air out of the building.

When pop holes were forced to shut in the winter due to risk of bird flu, the entire airflow of the barn changed instantaneously. Cold weather during the winter months provided more challenges to regulating air quality in the building. The building needs to be kept warm enough, but sufficient air needs to be expelled from the building to prevent the build-up of harmful gases and odours. With the pop holes being closed, this changed the ventilation in the shed, where wet air was being dragged in through the gaps by the pop holes. By improving the air quality, a reduction in the amount of cold wet air being vented into the building was achieved and the litter was kept drier as a result. By monitoring and managing the housing using this technology, we identified a drop of 75% in ammonia levels during the warmer months, with levels reducing from 20ppm to 5ppm. Due to the outside humidity being higher during the wetter winter months, the project has recognised that a drop of 75% in ammonia levels is more difficult to achieve.

With the use of smoke bombs inside the building, air flow at the fan level, floor level and belt level were monitored. Rather than a continuous circulatory air flow, it was observed that cold moist air was also being brought in through the fans and collecting at floor level, dropping moisture on to the litter.

Litter that was nearer to the sprayer units was extremely dry and moisture levels were low in the areas that had been successfully sprayed with the non-infective stabiliser bacteria.

Figure 1. Comparison of litter treated with bacteria spray and normal litter

If bacteria can successfully be distributed across the whole shed with the correct ventilation, moisture levels in the litter can be reduced further to provide the birds with a healthy environment. More litter samples will be collected to analyse the moisture levels in the shed with the pop holes open and ventilation regulated correctly.

RHWYDWAITH ARDDANGOS DEMONSTRATION NETWORK

For further information on this project, please visit the Farming Connect website: gov.wales/farmingconnectourfarms

Erw Fawr - Demonstration Site

Demonstration Site: Erw Fawr, Holyhead, Anglesey

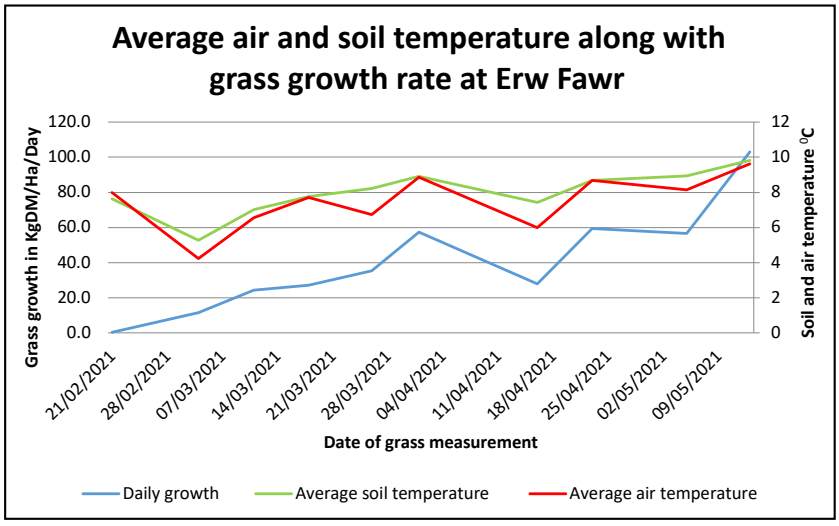
Technical Officer: Rhys Davies

Project Title: LoRaWAN gateway looking to link soil and air temperature with grass growth rate

A LoRaWAN (Low Range Wireless Access Network) sensor has been installed at Erw Fawr to collect soil temperature data to compare with grass growth rates during the 2021 grazing season. Installed back in October 2020, a small five-year battery life sensor has been sending temperature data every 15 minutes via a LoRaWAN gateway installed in one of the paddocks that is regularly measured with a platemeter. This data is being interpreted on a bespoke dashboard as a series of graphs and downloadable data sheets. Data thresholds can be set with an alarm function on a mobile device to notify the farmer of any required actions such as correct timing of fertiliser or the suitability of soil conditions to apply manures.

The cold period during March and the beginning of April was highlighted in Erw Fawr's grass growth data and is reflected in Graph 1 during the periods where soil temperature dropped below 8°C. As you would expect, soil temperatures take longer than air temperatures to rise or fall as a rule, however the sharp cold frost at the end of February lowered soil temperature sharply from 8°C to below 6°C which restricted grass growth to below 20 kgDM/ha/day.

Other climate factors such as light and soil moisture impact grass growth and continuous work with new cost-effective LoRaWAN sensors at Erw Fawr will combine all the available data to aid the management and timing of fertiliser and slurry application to optimise grass growth by also minimising environmental impacts.



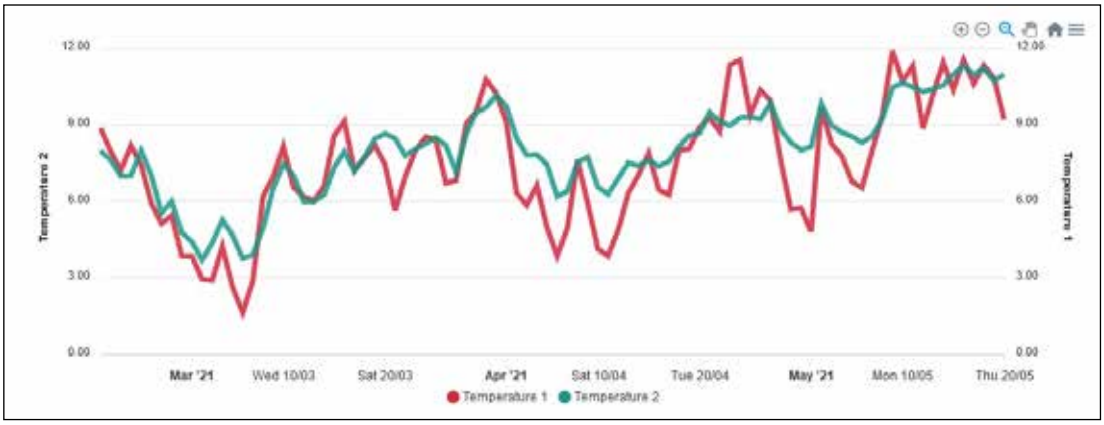
Graph 1. Soil and air temperature data with weekly grass growth measurements

Figure 1. Dual temperature sensor fitted to paddock post. One probe is set 6 inches below ground while a second probe is tied to the fence post.

20 February 2021 to 20 May 2021

Temperature 1	
Min	-4 °C
Max	23 °C
Average	7.48 °C
Temperature 2	
Min	3 °C
Max	12 °C
Average	7.96 °C

Table 1. Temperature readings from Erw Fawr



Graph 2. Temperature readings from Erw Fawr shown on the farm dashboard (Green = Soil, Red=Air)

Erw Fawr is one of the farms involved with the Welsh Pasture Project. Please visit the Farming Connect website to see their latest growth rates.

gov.wales/farmingconnect

PROSIECT PORFA CYMRU
WELSH PASTURE PROJECT

RHWYDWAITH ARDDANGOS DEMONSTRATION NETWORK

For further information on this project, please visit the Farming Connect website: gov.wales/farmingconnectourfarms

Digital animal health workshops help to drive performance on Pembrokeshire farm

A focus on animal health improvements is driving performance and reducing costs at a Pembrokeshire dairy and livestock farm.

Phil and Sian Evans have instigated changes to management practices in the business's dairy, sheep and beef systems since attending a series of digital animal health and welfare workshops led by vets and supported by the Welsh Government, Farming Connect, Lantra and NADIS.

Phil and Sian Evans formed a partnership with Sian's parents, John and Sylvia Williams, in 2019, a process that was assisted with support from the Farming Connect Venture initiative.

The family farm at Fagwrgoch, Rosebush, with 270 acres, supports a dairy herd, a flock of 300 sheep and a dairy-to-beef enterprise.

Phil and Sian have used interactive Farming Connect workshops to increase their knowledge on a variety of topics, from sheep parasite controls and preventing lambing losses to antibiotic resistance and reducing lameness and mastitis in dairy cows.

As a result, greater strides have been made in tackling issues which will have a direct impact on profitability.

"It proves you can up your standards. Never presume you can't improve as you can," says Phil.

In their Texel-cross flock, for example, they will now vaccinate lambs for pneumonia at three weeks of age after suffering losses this season – they had previously relied on immunity being passed to lambs via vaccinated ewes.

"We have quite a number of older ewes and because they weren't producing sufficient colostrum, we fed powdered colostrum or cow colostrum but that didn't give them immunity

to pneumonia," explains Sian, who also works off-farm as a community nurse.

Attending the lambing losses workshop made them question those losses and to take action to prevent future mortalities.

"We had post mortems carried out on the lambs whereas in the past we might have accepted the losses without questioning them," says Phil.

Faecal egg counts will be used more widely this year to inform decision making around worming protocols to reduce anthelmintics use.

Cow foot health is another priority area, and a review was undertaken of footbath positioning and protocols after attendance at one of the workshops.

Phil had also acquired foot trimming skills through accredited training part-funded by the Farming Connect Lifelong Learning and Development Programme, allowing him to deal with lameness issues more promptly.

The business also places emphasis on controlling mastitis - the rolling somatic cell count average is just 83,000 cells/ml; Fagwrgoch was the 2020 winner of Glanbia Cheese's annual Quality Cup competition for supplying high quality milk throughout the year.

The herd produces an annual milk yield average of 8,600 litres at 4.58% butterfat and 3.47% protein and is dried off using teat sealant only.

Udder health management advice provided at the workshop has increased their knowledge further.

Phil and Sian believe knowledge sharing is hugely beneficial and urged others to take advantage of the workshops. "They are free so why wouldn't you choose the option to attend," says Phil.

The workshops they attended were delivered by their farm veterinary practice, Prostock Vets.

For further information on the training courses available, please visit the Farming Connect website; **gov.wales/farmingconnectskillsandtraining**

Miranda Timmerman, of Prostock Vets, said increasing farmer knowledge through interactive workshops not only benefits the animal's health but improves the farmer's profitability.

"If you look after your animals, they'll look after you," she says.

"We aim to discuss all areas of livestock farming and help plant new ideas that farmers can go home and investigate on their own farms."

At Fagwrgoch, the smooth running of the business has been further facilitated by Sian accessing ICT training through the Farming Connect ICT Programme.

The one-to-one training in the use of Excel, delivered via a video conferencing service, has made the job of VAT record keeping much easier, she says.

Keep children safe on farms – take steps NOW to reduce the risks!

Tragically, farms are the only workplaces in the UK where children continue to have life-changing, sometimes fatal, injuries year after year.

Moving farm vehicles such as cars, all-terrain vehicles (ATVs) and tractors; machinery; livestock; dangerous substances; stacks of hay, straw and silage; silos and slurry pits, ladders and gates are just a few very typical but often hazardous areas which can prove deadly to a young, enquiring mind.

Well known tv presenter and farmer Alun Elidyr is an ambassador for the Wales Farm Safety Partnership (WFSP), a collaboration of rural organisations determined to create awareness about farm safety and reduce the number of tragic incidents and deaths that occur on farms across Wales each year.

"Farms and farmyards are busy working areas which are full of potential dangers, but Farming Connect can help you identify the risks and put in place systems to reduce them, particularly as we move towards summer, when children spend more time outdoors," is the message from Alun.

Alun says that children should never be allowed in the farm workplace unaccompanied and unsupervised.

Farming Connect provides training courses and e-learning modules on a range of safety-related topics, for more information please visit the Farming Connect website; gov.wales/farmingconnectskillsandtraining. Eligible businesses can also apply for a fully-funded one-to-one, confidential farm visit from one of our experienced 'farm safety' mentors.

For further information on making your farm a safe place for children, visit the Health & Safety Executive website at www.hse.gov.uk/agriculture/topics/children.htm

"Without a competent adult who is completely focused on keeping them safe, the risks of allowing children outside on their own on a working farm are simply too great."

PARTNERIAETH DIOGELWCH FFERM CYMRU
WALES FARM SAFETY PARTNERSHIP

Top tips – steps YOU should take

- **Provide a securely fenced outdoor space for younger children, in sight of your home or farmhouse, so that they can be easily observed and supervised at all times.**
- **Ensure** all children are supervised at all times by a responsible adult whose focus is purely on them, not undertaking farm work at the same time.
- **Plan ahead** any access to the work area by children under 16, for example for education, or knowledge experience, and ensure that the responsible adult supervises and accompanies them at all times.
- **Keep children** away from all vehicles and machinery.
- **Do not allow** a child under 13 to ride on or drive any agricultural self-propelled machines (such as tractors and ATVs) or use other farm vehicles and machinery. **If you do, you are breaking the law!**
- **Ensure** all children over 16 complete appropriate training and wear a helmet if driving, operating or helping operate ATVs (quad bikes).
- **You need a risk assessment** if you employ young people under the age of 18. You will need to take full account of their inexperience, immaturity and lack of awareness of relevant risks. **If you don't, you are breaking the law!**
- **Prevent** access to dangerous areas including slurry tanks, pits, lagoons and silos.
- **Avoid** the risks of children falling from heights or being hurt or crushed by falling objects such as bales.
- **Store** items like ladders, gates, large tyres and heavy equipment safely and out of sight.
- **Keep children** at a **safe** distance from livestock.
- **Keep** all dangerous substances including chemicals, pesticides, medicines and syringes properly stored, locked away and out of reach.

KEEP CHILDREN SAFE ON YOUR FARM

PARTNERIAETH DIOGELWCH FFERM CYMRU
WALES FARM SAFETY PARTNERSHIP

STAY WITHIN THE LAW

Rotational grazing shown to increase soil organic matter on Welsh farm

Demonstration Site: Pendre, Llanfihangel y Creuddyn, Aberystwyth

Technical Officer: Lisa Roberts

Project Title: Impact of rotational grazing on soil organic matter

Early indications from a Farming Connect project have shown that intensive rotational grazing in sheep systems increases soil organic matter (SOM).

Pendre, a Farming Connect demonstration site at Llanfihangel y Creuddyn, near Aberystwyth, is aiming to increase its SOM, not only for the grass performance benefits, but also to sequester carbon.

Increasing levels by just 0.3% would put the farm in a carbon negative position, where it absorbs more carbon than it emits, attendees were told at a recent Farming Connect Demo Farm Live webinar at the farm.

At a 0.3% increase in SOM, the farm's carbon emission balance would be -85.65 tonnes CO_2e, this means that the business would sequester significantly more carbon than it releases every year.

"The carbon sequestration advantage would be huge," said Rhys Williams, of Precision Grazing, a speaker at the event and who has been working with farmers Tom and Beth Evans on their Farming Connect rotational grazing project.

The Evans family had been experimenting with rotational grazing before becoming demonstration farmers and baseline analyses taken at the start of the project showed this was already having an impact on SOM.

At a depth of 0-10cm, SOM in rotationally grazed fields was 8.3% compared to 6.9% in set stocked fields, 8% compared to 6.7% at 10-20cm and 6.1% compared to 4.6% at 20-30cm.

"This demonstrates that rotational grazing can contribute to soil health and soil organic matter and not only does that bring with it the advantages of reducing input costs and increasing productivity but there are environmental advantages from improving soil health," said Mr Williams.

Rotational grazing encourages the growth of plant material which is recycled into the soil and allows a rest period, enabling the plant to increase its root depth.

Stocking high numbers of animals in small paddocks also causes plant material to be trampled into the soil while that high stocking intensity allows livestock manure to be spread evenly.

For the Evans family, the financial advantages of rotational grazing their 500-ewe flock is significant – they have halved their concentrate use because since splitting fields into paddocks and moving sheep around, they are growing a third more grass in a year.

Mr Evans had the confidence to put the system in place after attending the Farming Connect Prosper from Pasture programme.

"I would encourage any farmer looking to the future to attend the Prosper from Pasture programme," he said.

He uploads data from fortnightly grass measuring to the Farming Connect Welsh Pasture Project website.

"I am a strong believer in benchmarking and being able to compare our growth with others is beneficial," he said. "My aim is to increase our growth rate to match others."

Pendre is highly stocked in the spring and early summer post-lambing so through his work as a demonstration farmer he is aiming to improve sward quality and early season production.

To achieve that through reseeding is difficult because taking land out of production puts pressure on grazing.

Overseeding offers a potential short-term solution but there are challenges associated with this, as a project at Pendre has demonstrated.

Two different seed mixes were drilled on 11 September in two fields that were low in clover and ryegrass.

Soil and grassland management specialist Chris Duller, who advised on the project, said ideally it should have been four weeks earlier but demand for grazing ruled that out.

One mix was sown with a vigorous mix of hybrid ryegrass and festulolium to boost early season grass growth and the other with clover and perennial ryegrass – one half of that was sown with seed treated with a lime coating and fertiliser. A section of this included plantain to see if this could be successfully oversown.

A wet autumn followed but it was managed well through the wet conditions by grazing to allow the seeds to tiller out but not at a level to graze out the seedlings.

In spring 2021, the ryegrass level in the ley oversown with hybrid ryegrass and festulolium had been boosted to 60% compared to 20-30% prior to overseeding and festulolium was evident in the sward.

However, there was no evidence of surviving clover or plantain in the sward of the other ley.

There was no evidence that the treatment on the seed improved establishment or survival.

Mr Duller admitted that overseeding can be "hit and miss" but added: "These are leys that will probably be reseeded in two or three years' time, oversowing provided an opportunity to perk them up."

July or August are the ideal months for oversowing, he advised – any earlier and the germinating seeds would need to compete with established swards at peak growth rates.

Keep grazing pressure tight beforehand, he recommended, and never be too ambitious with acreage. "Always do a few acres at a time just in case it struggles; don't go out initially and oversow 40 acres."

The seeds most suited to overseeding are the biggest – hybrids and tetraploids. These are not the best grazing varieties, Mr Duller added, but pointed out: "Overseeding is a means of topping up the sward and producing the best quality grass in a short period of time.

"It is a struggle to get diploid varieties with smaller seed to germinate quickly and compete - and the results are not so effective."

For further information on this project, please visit the Farming Connect website: gov.wales/farmingconnectourfarms

The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021

The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021 established new requirements to protect the environment from pollution.

The initial requirements apply from 1 April 2021 (Phase 1), with additional requirements phased in from 1 January 2023 (Phase 2) and 1 August 2024 (Phase 3). Additional information on Phase 1 requirements are summarised below. You can also watch a video summary on the Farming Connect YouTube channel.

In areas previously within a Nitrate Vulnerable Zone, there is no phased approach and all of the requirements apply from 1 April 2021.

Phase 1 – from 1 April 2021

- **Notice of construction** - You must notify Natural Resources Wales (NRW) 14 days before construction begins on any new, reconstructed or enlarged slurry or silage store.
- **Field inspections** - Before spreading nitrogen fertiliser, the field must be inspected. Factors to consider include taking into account weather and ground conditions (e.g. frozen/waterlogged ground), slope of steeper than 20%, soil type and the proximity to land drains.
- **Mandatory buffer zones -** Organic manure must not be spread within 50 metres of a borehole, spring or well or within 10 metres of surface water (6 metres if precision spreading), manufactured nitrogen must not be spread within 2 metres of surface water.
- **Incorporation of organic manure -** Organic manures applied to bare soil must be incorporated within 24 hours in most circumstances.
- **Closed periods** for spreading **manufactured** nitrogen fertiliser - Manufactured nitrogen fertiliser must not be spread on grassland between 15 September to 15 January or on tillage land from 1 September to 15 January. Some exemptions do apply, see guidance.
- **Silage making and storage -** There is no change from previous regulatory requirements for storage of silage and silage effluent. You must ensure that you comply with the requirements outlined in Annex 4 and 5 of the guidance.

There will be a range of support available through Farming Connect during the transition periods looking at different aspects of the Regulations in detail, helping you identify what the Regulations mean for you and your farm business.

Guidance and further support

Detailed guidance documents, a Frequently Asked Questions (FAQ) document and additional information on Phases 2 and 3 are available from the Welsh Government website. It is strongly advised that you read the guidance in full before making any changes to your farm. The latest information can be found at: gov.wales/land-management

---

The dedicated technical helpline for The Control of Agricultural Pollution Regulations is operated by ADAS and is available on 01974 847 000.




Ydych chi'n ystyried datblygu isadeiledd eich fferm er mwyn gwella effeithlonrwydd, cynnal iechyd anifeiliaid o'r safon uchaf a lleihau'r peryglon i'r amgylchedd?

Sicrhewch gyngor un-i-un am ddim gyda chynghorydd arbenigol er mwyn cael arweiniad sy'n benodol i'ch busnes.

MAE'R PYNCIAU'N CYNNWYS:

✓ Isadeiledd ✓ Cynllunio a datblygu ✓ Systemau trin anifeiliaid
✓ Dyluniad ac effeithlonrwydd parlwr godro ✓ Effeithlonrwydd ynni / Ynni adnewyddadwy
✓ Ffermio Manwl Gywir (technoleg GPS ac ati) ✓ Rheoli lloeau ✓ Iechyd anifeiliaid

---

Are you looking to develop your farm infrastructure to improve efficiency, maintain the best possible animal health and minimise risks to the environment?

Get free one-to-one advice with a specialist consultant that will enable you to gain guidance specific to your business.

TOPICS INCLUDE:

✓ Infrastructure ✓ Planning and development ✓ Handling systems
✓ Milking parlour design and efficiency ✓ Energy efficiency / Renewable energy
✓ Precision Farming (GPS technology etc) ✓ Calf management ✓ Animal health

I gael eich apwyntiad awr o hyd, ffoniwch **08456 000 813**,
cysylltwch â'ch **swyddog datblygu lleol**, neu **ewch i'n gwefan**.

To get your 1 hour appointment, call **08456 000 813**,
contact your **local development officer**, or **visit our website**.

E-LEARNING

JULY MODULES OF THE MONTH

Our e-learning interactives cover a wide variety of topics which will help you develop new and existing skills, acquire more knowledge and improve working practices within your business.

SHEEP
Anthelmintic Resistance on Sheep Farm
Liver Fluke Control in Sheep
Respiratory Disease in Sheep

BEEF
Farm Liver Fluke Management
Johne's Disease in Cattle
Respiratory Disease in Cattle

DAIRY
Johne's Disease in Cattle
PGE and Lungworm in Cattle
Skin Conditions in Cattle - Cattle Ectoparasites

POULTRY
Injurious Pecking in Laying Hens
Poultry Parasites
Respiratory Disease in Poultry

To see the full list of modules and the comprehensive user guide on completing e-learning modules, please visit gov.wales/farmingconnectskillsandtraining

"I found it such an easy way to acquire more knowledge, always pitched at just the right level and letting me learn at my own pace."