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Collaborating for rural success

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Collaborating for rural success




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Contents

FOREWORD

European Innovation Partnership (EIP) Wales is currently funding a variety of projects which are giving groups of farmers and foresters from across Wales the opportunity to trial innovative ideas, methods or technology at a practical level within their businesses. There are 46 funded projects with over 200 farmers and foresters taking part, all investigating something new which could bring real benefits to their business.

This booklet is showcasing nine of the projects with updates on the work they have been doing and the lessons they have learned so far. With the emphasis on businesses making use of technology to streamline their operations, projects such as those using sensor technologies linked through the Internet of Things are investigating how this could be used on farms to improve issues such as farm security and slurry management.

One of the featured projects has shown how the latest genomic technology can really help dairy farmers with their breeding decisions and allow faster genetic improvements in the herd. With the high cost of rearing heifer replacements this could have real financial benefits to the farms going forward.

There is also an update from the trees in bracken project. Planting trees in areas where bracken grows is an ongoing problem so this project is looking at new and old methods of controlling bracken while the trees are establishing. It will be interesting to see which methods work best as this project continues.

We hope you enjoy reading about the projects and maybe some of the issues outlined will have relevance to your business. For updates on all of the EIP Wales projects visit the Farming Connect website at **www.gov.wales/farmingconnect**

The European Innovation Partnership for Agricultural productivity and sustainability (EIP-AGRI) was launched by the European Commission in 2012. The programme is being delivered in Wales by Menter a Busnes on behalf of the Welsh Government.

Lynfa Davies
Knowledge Exchange Manager, Farming Connect

Assessing the potential of genomic testing dairy heifers to increase genetic gains and financial returns

Genomic testing replacement heifers has a cost benefit of £19.39/heifer according to a three-year project involving nine Welsh dairy farms. The project compared the difference between estimated breeding values based on parent averages – a composite of a heifer's family pedigree - and genomic Predicted Transmitting Ability (PTA). The PTA provides information early on in a heifer's life to allow breeding decisions to be made before rearing costs are incurred. Genomic testing is now 60-70% reliable for predicting future performance compared to just 35% for parent averages but it adds an extra £25-£30 to rearing costs.

The project, which involved 432 Holstein Friesian heifers, weighed up this cost against the benefits and calculated a £19.39/heifer cost benefit - the total economic benefit was £46.89/heifer and the testing cost £27.50/heifer. However, Victoria Hicks, of Kite Consulting, who analysed the results, says the cost benefit figure does not include any additive and compound interest that investing in herd genetics creates. "Any improvements in this crop of herd replacements will pass onto future generations. Improving fertility and health with the use of genomic testing will allow herds to increase the productive life of the herd which, in turn, will reduce the replacement rate and allow the freedom for selection intensity to occur,'' she says.

Heifers were tested in April 2018, by a farm technician to reduce the risk of testing and sampling errors. Once these heifers had started their first lactation their performance was monitored until September 2020. Of the 432 animals tested, the project achieved a final dataset of 291 with genomic and traditional PTA results and complete 305-day lactation information. Some animals didn't fully reach the 305 days, had missing fertility information or their traditional PTA could not be recalculated because their sire didn't have an official UK proof available.

A reduction in average £PLI from traditional to genomic proofs of -£44 was significant, says Ms Hicks.

"The change in animal ranking is also important as your best or worst heifers might not actually be your best or worst heifers once you have sight of their genomic information."

The project focussed on milk production, fertility and somatic cell count (SCC). The most striking result was in SCC - the bottom 25% of heifers ranked by genomic SCC index had the highest average number of high SCC occurrences and the highest cumulative SCC. In contrast, for animals ranked by their traditional SCC index, the poorest SCC performance occurred in the top 25% for both high SCC occurrences and cumulative SCC. Fertility performance showed a difference of 18 days to conception between the top and bottom 25% based on genomic fertility index but just four days when the traditional fertility index was applied. This average difference worked out at 5.25 days – at £5/day for the extended lactation this added up to £26.25.

There were no statistically significant differences in the milk production performance of heifers using genomic and traditional PTA – 305-day milk yield and solids production was measured against the milk kgs PTA trait.

Ms Hicks says the project had proven the ability for genomic testing to identify inferior or superior heifers at an early age based on health, fertility and production. The benefit of genomic testing lies in the increased progression of genetic gain, she adds.

A theoretical selection point of £150 PLI, used to decide whether heifers would be bred to a beef or dairy sire, showed the potential for breeding mistakes to occur when only traditional PTA values are used since 22.9% of heifers were misidentified as being either above or below £150 PLI.

Victoria Hicks, Kite Consulting

This resulted in lost £PLI potential of £6,914 for the next generation.

"Averaged over the cohort of animals that made it through to the final analysis, plus 15.4% to account for losses, equates to £20.64 PLI lost per animal,"
says Ms Hicks.

Increasing the rate of genetic gain should be a priority for all dairy farmers given increasing environmental concerns and requirements,
she adds.

But herds that are expanding and need to maximise heifer numbers are unlikely to achieve the full cost benefits shown by the project because they cannot be as selective in their breeding choices, Ms Hicks admits.

Herd expansion may however come into question in the Clean Air Act proposed in the UK Government's Environmental Bill so improving herd genetics could provide a route to expansion without increasing cow numbers, she says.

CASE STUDY

Culling decisions at Argoed Hall Farm, Mold, have been based on fertility, lameness and mastitis but the business now intends to use genomics to factor production into the decision-making on which animals to keep in the herd and which to let go.

Father and son Roger and Tom Bletcher were among the nine dairy farming businesses involved in the EIP Wales project.

The genomic tests on their 400-cow all-year-round calving herd showed a big variation between animals, says Tom.

"We need to make the most out of every cow place on farm, using genomics will reduce the variation within the herd and allow us to accelerate our genetic gain,'' says Tom.

He admits he was initially sceptical about genomics but the results of the project had given him the confidence to use genomics going forward.

"As there is more and more focus around sustainability and lowering our carbon footprints we are going to need to be as efficient as possible and to look at ways to drive those efficiencies."

The farm supplies milk to Arla on a constituents-based contract – the herd is averaging 4.4% butterfat and 3.5% protein.

Genomics add a further layer of data in an industry that is becoming more data-driven – but there is a danger of that information not being used constructively, Tom suggests.

"You can test all your animals and have the data but you have to do something with it and make your breeding decisions based on that data.''

A challenge with selling the idea of genomics to farmers is the time lag before a return can be seen from the investment.

"When cash is tight and you are not seeing a return for two or three years it might put some farmers off as they may see a greater return investing in other areas of their business that pays back sooner,'' says Tom.

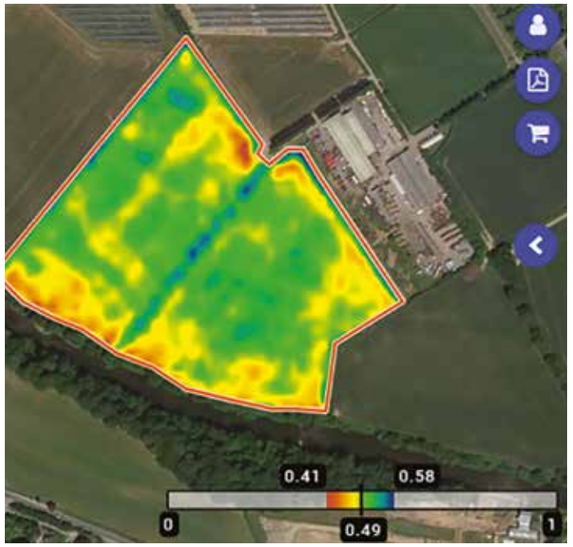
But, having seen the benefits, he says he plans to continue with his own testing now that the project has ended.

Tom Bletcher, Argoed Hall Farm

For more information on this project visit the website: *https://businesswales.gov.wales/farmingconnect/business/european-innovation-partnership-eip-wales/approved-eip-wales-projects/assessing-potential*

Developing a novel way of rapidly measuring agronomic treatment effects on grass growth

Remote sensing techniques have been shown to identify grass growth responses to different fertiliser and slurry treatments more rapidly than measuring yield with a rising plate meter during a project underway on three Welsh farms.



The three-year EIP Wales project is investigating if data acquired by drones and remote sensing is robust enough to be used to prevent the need for farmers to walk fields and manually measure grass heights.

In the first phase of the project, comparisons were made to data collected by a rising plate meter. While a plate meter can be adequate for detecting large treatment differences, measuring grass yield can be time consuming and laborious, says Cate Barrow, of ADAS, who is managing the project.

"Some new forage harvester systems allow grass yield to be mapped, but relatively few farmers have access to this technology," she adds.

Technology exists in arable situations that allows crop growers to gather data on the effect of different agronomic treatments and to use this information to optimise crop management. Grassland farmers in contrast have not had this technology and this risks improvements to productivity, says Ms Barrow.

For the EIP trial, tramlines were established on the three farms and responses to different agronomic situations was measured – one involved measuring growth in different grass and clover mixes, in another different rates of sulphur fertiliser were applied, and in the third situation slurry use and its responses were monitored.

Grass growth in all situations was measured at regular intervals using a rising plate meter and drone and satellite images. Statistical analysis of the data captured by the drone and the satellite showed significant differences in the agronomic treatments applied at the farms – information that was not available on the plate meter.

In one trial, at Trostrey Court Farm, Usk, the novel technology detected the impact of applying a double rate sulphur fertiliser treatment as the farmer, David Morgan, wanted to investigate what yield and quality improvements could be made if he changed his fertiliser regime.

Ten tramlines were created in fields where four cuts of silage would be taken. Each tramline received the same amount of non-sulphur fertiliser and management throughout the season and sulphur fertiliser was also applied in May and June in varying amounts – from zero to a double rate, to identify an optimum application rate. Five rising plate meter measurements were taken weekly from early June through to the third cut on July 6th. According to these measurements there was no statistically significant differences in grass response, not even between those where no sulphur fertiliser had been used and those that received a double rate. Drone measurements and forage samples however showed visible differences between the strips.

When ADAS analysed these and satellite data it calculated a significant response to the sulphur treatment. One of the measurements used was Normalised Difference Vegetation Index (NDVI), which is an index of plant greenness or photosynthetic activity. The tramlines where 100kg/ha of sulphur was applied showed an NDVI difference estimated to equate to an increase in grass biomass of about 2000kg/ha compared to tramlines where a half rate of 25kg/ha was applied.

The discovery that analysis of the spectral reflectance indices (SRI) data resulted in several statistically significant differences being detected between the agronomic treatments whilst analysis of the rising plate meter data did not is important, says Ms Barrow.

"It probably results from the SRI data being based on many thousands of individual measurements across the whole tramline test area, whereas the rising plate meter relied on five measurements per tramline," she explains.

"The rising plate meter approach is likely to be adequate for detecting large treatment differences, but the SRI information from the drone image appears to be capable of detecting smaller treatment differences."

The project will now look at whether the satellite images can provide equally valuable insights into the effect of agronomic treatments on forage growth as the drone data.

"Access to additional data from satellite and drones could be used to inform precision agronomy and help grassland farmers fine-tune grassland management and improve farm performance, says Ms Barrow.

Further information about this project can be found on the website:

https://businesswales.gov.wales/farmingconnect/business/european-innovation-partnership-eip-wales/approved-eip-wales-projects/developing-novel-way

Using photo selective films to enhance the profitability of leafy salad production in Wales

Polytunnel plastics which control light quality has the potential to improve yields in some varieties of leafy salads, and is under investigation in a new Welsh project.

Different varieties of light-modifying plastics are being tested under normal growing conditions at two market gardens in Wales. The findings from the first year of the three-year EIP project showed that most types of plastics used in horticulture improved overall productivity.

But it was plastics that manipulate light that performed the best in one variety, probably due to their ability to modify the microclimate and reduce stressors on plants, says Will John, of ADAS, who is managing the project with horticultural expert Chris Creed.

"We have started to develop the evidence case for the use of light-modifying plastics in leafy salads production," he reports. But, as only a single complete growing cycle has so far been completed, more work is needed to provide conclusive results, he says.

"This evidence was developed for a crop grown in early autumn, where shorter day lengths and lower temperatures are likely to have impacted overall production," Mr John explains. Testing the impact of materials in crops grown in the summer will overlap with periods of increased risks of pest and disease development and high humidity, he adds.

But conversely, these periods are when the additional benefits of photoselective plastics also have potential to have a more significant positive impact compared to clear conventional plastics. Diffuse plastics can alter the direction of light, scattering it and allowing a more homogenous distribution compared to direct sunlight. This allows light to penetrate deeper into the canopy to generate greater productivity and potentially increase yield outputs: this helps to maximise the proportion of a lettuce that is marketable.

The project is being carried out over three growing seasons at two sites in North Wales - Mostyn Kitchen Garden, Holywell, and Hooton's Homegrown, Anglesey.

Only a single planting was achieved in 2020, at the beginning of September, but multiple successive plantings will be carried out in 2021 and 2022. Individual low polytunnels with 1x3m footprint and a 1m maximum height have been skinned with each plastic.

Salad is also being grown under clear plastic and on bare ground, to provide comparisons with typical production methods. Three mainstream leafy salad cultivars were planted under each tunnel - Lollo Rosso, Lollo Bionda and Green Oakleaf.

In 2020, plants were harvested on October 7th and 8th and their height, marketable weight and diameter, leaf number and condition were assessed. Leaf colour and area were also recorded. Growth responses were relatively comparable between the clear, diffuse and UV-blocking plastics, says Mr Creed. However, both Lollo varieties gave a greater marketable weight in the UV blocking and diffuse treatments compared with the clear plastic, although not statistically significant it is worth following up in future repeats.

"The curled nature of these varieties leads to a more compact head compared with the Green Oak Leaf, so the increased scatter of the diffuse plastic may be beneficial in aiding light penetration into the head," says Mr Creed.

But the project highlighted a possible trade-off between gross yields and marketable quality – conditions that produced the greatest yields generated the weakest colours, an issue possibly for the strong red colour of Lollo Rosso. Leaves however did show some pigmentation and were not scored as unmarketable, says Mr Creed.

For Green Oak Leaf, there were no significant differences between any of the plastics, which may indicate that the benefits of protection may be linked primarily with the microclimate modification as opposed to light manipulation specifically, he adds.

All plastics used are commercially available, and were obtained from an industry supplier to ensure that, should other growers wish to use the findings from this project to inform their own growing methods, they can easily adopt this approach on their sites.

For more information on this project visit the website:

https://businesswales.gov.wales/farmingconnect/business/european-innovation-partnership-eip-wales/approved-eip-wales-projects/using-photo

Establishing trees in dense bracken

Tree choice may be key to the successful establishment of new woodland on bracken-covered slopes in Wales. Steep land which cannot be farmed is often well suited for growing trees but bracken, which also thrives on the slopes, can out-compete young trees. Farmers and foresters in mid-Wales have embarked on an EIP Wales project to study different approaches to controlling bracken that avoid expensive and environmentally-concerning aerial herbicide treatments.

The first year of the research was hampered by extreme levels of rainfall followed by very dry conditions but nonetheless the project has achieved some interesting interim results, reports woodland planner Dr Peter Jackson, who is managing the project. The project is putting mechanical and other control methods on trial on two farms in the Cambrian Mountains but it is the species of tree that has produced the most conclusive evidence so far.

The mortality rate between species varied significantly, with just 5% of losses for birch and rowan saplings and around 10% for Sitka spruce, says Peter. But for oak, losses climbed to an average of 25%, even over 30% at one site.

"This initial data seems to suggest that oak is a riskier proposition for native woodland planting in bracken," says Peter.

But, as mortality rates may have been influenced by the drought in the spring, this will require further research as the project progresses, he adds.

Alternative methods of bracken control, including cultivation and cutting, were trialled. A Robocut and minidigger were used and the effect of strimming and trampling was also examined. The project found that there is a very limited window for mechanical cultivation in upland conditions - in September and October. The work must be done before the soil reaches winter wetness but the bracken needs to have died back sufficiently for hazards such as rocks to be visible.

But where mechanical cultivation was used, in the form of a Robocut with cultivator attachment and a mini digger with bucket and rotovator attachment, the density of the bracken was significantly reduced. However, the process was slow and so would prove costly.

The remote controlled Robocut machine with a cultivator attachment

Yet none of the treatments had a significant impact on mortality compared to sites where the bracken was not controlled. Peter admitted that this result was unexpected as there have been many instances of heavy losses of trees planted in bracken.

He surmised that there could be greater mortality in the untreated rows in the next few years. "A proportion of the young trees in the untreated rows were alive but not thriving and there are likely to be further losses next year," says Peter.

But cultivation did influence tree height, allowing birch and rowan to grow significantly taller; this effect was not seen in the oak and spruce however. At one of the two sites, strimming and trampling treatments also led to a significant increase in tree height, although the results were inconsistent.

André Gallagher farms 200 acres organically at Nannerth Fawr, Rhayader, and is one of the farmers involved in the EIP Wales project. His land climbs to 900 feet and over the last 30 years he has planted around 10,000 trees on his rough ground. Mr Gallagher has attempted to control the bracken using different approaches over a number of years and admits that safety has been a concern.

He hopes the project will find new solutions.

"We have tried bashing it, cutting it every year but it has not been very successful. It reduces the height of it but doesn't really solve the problem."

Visit the website for further information about this project:

https://businesswales.gov.wales/farmingconnect/business/european-innovation-partnership-eip-wales/approved-eip-wales-projects/establishing-trees

The mini diggers at work. One with a bucket and one with a rotovator attachment

The mini digger rotovator attachment

The mini digger rotovator planting trial strip

Paving the way for 'Internet of Things' on Welsh farms

Is the on-going hype around Internet of Things (IoT) justified, and furthermore, what potential does it actually have to redefine and transform how farmers work?

These are some of the question that two EIP Wales projects aim to tackle head-on. Titled 'Using IoT technology to improve slurry management' and 'Early adoption of on-farm IoT sensor networks to alert and notify farmers to improve security,' both have set out to investigate how IoT applications can be developed and applied to add value to managing farms in Wales.

Aled Jones, a dairy farmer at Hendy, Caernarfon is one of three farmers in north Wales who are testing the capabilities of a selection of Long Range Wide Area Network (LoRaWAN) enabled IoT sensors to make better informed decisions on when conditions are appropriate to apply slurry on fields in relation to minimising the risk of polluting near-by water courses.

"Following a thorough review of commercially available sensors and a comprehensive field mapping survey that was carried out in November 2020, we are now ready to deploy sensors on our farms," explained Aled. "These will monitor parameters such as soil moisture, soil temperature and air temperature."

"Sensors will be placed in a representative field location on each farm. A continuous stream of data, along with the immediate weather forecast will be fed into a data visualisation tool which will then advise us whether field conditions are suitable for applying slurry or not," said Aled.

"We will be testing and evaluating how the information will allow us to minimise the risk of agricultural pollution in water. We're also interested to explore how the system could help us make better use of nutrients and provide us with a self-auditing tool to log conditions at time of slurry application," he added.

The IoT Farm Security project, has bought together five north Wales farms to look at utilising data generated from various IoT sensors to alert and notify them of suspicious incidents involving farm assets that are statistically most at risk to theft.

Sensors will be programmed to communicate with a farmer's mobile phone sending concise, clear and informative messages alerting to unusual movement of key assets.

The project is investigating how commercially available sensors can be used to tackle the following areas of priority as identified by the Rural Crime Team at North Wales Police.

1. Quadbike theft.
2. Monitoring the open/close status of various on-farm infrastructure.
3. Tracking valuable mobile farm equipment such as trailers.

The project will be simulating incidents on farms to test how early alert notifications can assist the police with valuable intelligence to track down thieves within hours or less.

Utilising LoRaWAN sensor networks in this way could prove particularly useful especially considering the results of the 2020 NFU Report on Crime which showed theft from farms cost Welsh farmers £2.6m in 2019 - an increase of 11% from the previous year.

"These projects are attempting to test and trial IoT technology to deliver tangible benefits for farmers,"

noted Geraint Hughes, the Innovation Broker supporting both groups. "Talking of potential is all well, finding applications that actually make a difference to agricultural practice is the key, and both projects are driven by farmers."

"To help us learn about how to put IoT to best use on farms, both groups are taking part in continuous participatory evaluation that includes focus groups, simulation reviews and attitude surveys,"

explained Geraint Hughes.

Regular updates about these two ground breaking projects will be posted on the website;

Using IoT technology to improve slurry

https://businesswales.gov.wales/farmingconnect/business/european-innovation-partnership-eip-wales/approved-eip-wales-projects/using-internet

Early adoption of on-farm IoT sensor networks to alert and notify farmers to improve security

https://businesswales.gov.wales/farmingconnect/business/european-innovation-partnership-eip-wales/approved-eip-wales-projects/early-adoption-farm

A LoRaWAN gateway (aerial) that can be installed outside, on a roof of a shed for example.

INTERNET OF THINGS – busting the jargon

AgriTech:
The application of digital technology and 'big data' in agriculture is often referred to as AgriTech. It can include applications for data collection and processing, robotics and artificial intelligence to improve efficiency. Also referred to as 'Agriculture 4.0' to denote the rapid adoption of digital technology as farming's "4th revolution."

Smart farming:
Smart farming is all about leveraging advanced digital technology, and sometimes referred to as "precision farming." Agricultural digital devices can provide farmers with more control on raising livestock, growing crops, environmental aspects and security through tracking, monitoring, automating and analysing. This includes using modern technology to increase productivity, influence decisions, optimise processes and manage resources.

Internet of Things (IoT):
The Internet of Things or 'IoT' is a growing network of internet-connected devices that collects data. Objects or 'things' connected to the internet sense something, generate data from what they have sensed and then use that data for a variety of purposes.

LoRaWAN:
It stands for 'Long Range Wireless Area Network, and can be used to transmit and receive data over long distances. LoRaWAN is a way of linking sensors, devices and applications together and is particularly useful in a rural setting. Compared to mobile phone networks it requires very low power to transmit small packages of data.

IoT sensors:
There are countless types of sensors that can be configured to a LoRaWAN gateway, which in turn is connected to the internet. Possible sensors can include:

- Buttons and switches that can detect if something is pressed or if, for example, a door or gate is open or closed.
- Ultrasonic sensors can transmit an inaudible signal and detect how long it takes for that signal to bounce off a surface and return. From this data we can work out the distance, for example, the level of a slurry pit or the level of a river.
- Soil moisture, nutrient and temperature sensors.
- GPS devices installed on a LoRaWAN enabled sensor can be used to transmit where an object is, but also could be set up so that it alerts someone if the item moves out of a certain area. For example, an application can be created that detects a quad bike moving beyond the farm boundaries outside a defined time range and goes on to trigger an alert if necessary.
- Temperature, light and humidity sensors can be used widely. For example, a fridge containing vaccines will rapidly rise in temperature if the door is left open.
- Rain, wind, sunlight and other weather-related parameters can be monitored by sensors.

Improving the diagnosis and treatment of gastrointestinal round worms in cattle

A Ceredigion dairy farm is revising worming protocols for its replacement heifers after a parasite control research project detected early stage resistance to clear wormers.

The Jenkins family, who milk 400 New Zealand Friesians at Pentrefelin Farm, Talsarn, outwinter 210 R1 and R2 heifers on deferred grazing; this system increases vulnerability to roundworms because it limits opportunities for clean grazing in the spring.

They were routinely worming youngstock but were concerned this could lead to treatment resistance so they embarked on this project to examine ways of improving the diagnosis and treatment of worms in cattle.

The project will run for three years and involves two other dairy farms in the same region.

At Pentrefelin, two wormers - benzimidazole oral, a white wormer, and ivermectin injectable, a clear wormer - were tested on 15 calves; faecal egg counts (FECs) were recorded before and after treatment.

Resistance testing using full Faecal Egg Count Reduction Tests (FECRT) was carried out by the farm's vet practice, Steffan Vets, Lampeter, using Techion UK's FECPAK[G2] system.

If a wormer is fully effective, egg counts should drop by a minimum of 95%, says Eurion Thomas, of Techion UK, who is working with the farmers on the EIP project.

Although egg counts had reduced by 100% in calves treated with benzimidazole oral, they reduced by only 81% in the group given the ivermectin injectable. Mr Thomas says that at this stage the results point to a failure in treatment efficacy rather than true wormer resistance.

Irfon Jenkins, who farms with his brother, Eurig, and their parents, Aeron and Glenys, admits the findings were a surprise, not least because heifers were growing.

The worms present in the pre-treatment samples were the two most common species, *ostertagia* and *cooperia oncophora*. The species that survived was *cooperia oncophora*, which is less pathogenic and impacts less on performance.

This is likely to be why heifer growth rates were not affected too badly when the wormer didn't fully work - heifers at Pentrefelin achieve an average daily liveweight gain of 0.7kg from birth to calving at 24 months; the project will now examine if better control on worms can further improve this performance.

In the trial, white and yellow wormers were shown to be fully effective.

Mr Jenkins says he will now be far more selective in the use of the clear group of wormers and he may make some changes to heifer grazing policy, with clean grazing provided on reseeds in the spring.

He is also more proactive with dung sampling. "We had been FEC testing before this project but not regularly enough," he admits. In future, heifers won't be dosed routinely, only when egg counts show treatment is needed, with the exception of a routine lungworm treatment in late summer or early autumn.

Mr Jenkins says it is important that dairy farmers learn lessons from the sheep industry and the progress it is making on addressing anthelmintic resistance.

During the course of the project, disease modelling will be used to estimate relative pasture contamination levels at the end of the grazing season to inform grazing plans for the following year, such as fields that can be safely grazed and those that should be cut for silage.

Keep in touch with regular updates on this project by visiting the website: *https://businesswales.gov.wales/farmingconnect/business/european-innovation-partnership-eip-wales/approved-eip-wales-projects/improving-diagnosis*

Irfon Jenkins, Pentrefelin Farm

Alternative forage systems for marginal land

A group of farmers in south Wales have just completed a three year project looking at the suitability of multispecies leys for sheep and beef producers in marginal areas. The EIP Wales project looked at how seed mixtures containing a range of grass, legume and herb species performed compared to conventional ryegrass/clover mixtures in upland conditions with high rainfall, thin soils and relatively low inputs. The group were keen to explore if the multispecies leys would offer any yield, quality and persistence benefits above traditional leys.

In 2018 the three project farms established a multispecies ley containing four grass species, red and white clover, chicory and plantain, alongside a neighbouring field with a conventional grass mix as a control. Both new leys were then managed similarly over the three years. With the help of grassland specialist Chris Duller and Will John from ADAS the group have monitored the performance of the different leys through to the end of 2020.

Despite the drought conditions of 2018 all farms successfully established their new leys in 2018, although earlier sowing did seem to reduce weed levels and increased the establishment rates of some of the herbs and legumes.

Two of the farms did see an increase in total yields in 2019 from the multispecies ley (up to 30% on one farm) and all three farms recorded greater early and late season growth. By the end of the project there was very little difference between the yields of the multispecies ley and the control – with all six of the fields averaging close to 10tDM/ha/yr.

The three farms did differ slightly in their management (based on individual stock requirements) – with one farm taking a silage cut from the leys, and cattle grazing included on two of the farms. One farm used minimal amounts of nitrogen (30kgN/ha/yr) whilst the farm that was cutting applied 120kgN/ha/yr. All farms tried to graze the fields on a graze and rest policy rather than continual grazing and all farms rested the swards over the winter.

"I was disappointed that lamb weights weren't better, but that may have been down to me letting the ley get a bit strong in the aftermath. Its regrowth speed is very impressive and I think I need to be a bit sooner getting weaned lambs in. The silage we made from the ley has been fantastic – having 12 acres of new reseed on the farm has saved me over £1000 in feed each year," says Ed Roberts, Gilfach Uchaf.

"I would certainly sow another multispecies ley. You really do need to avoid over-grazing them if you want to keep the herbs, and I think a winter break is essential. I probably wouldn't include red clover next time, but the festulolium is a definite winner,"

says Richard Morgan, Gellifedgaer.

"I'm not sure the multispecies ley suited my wetter lower ground so I think you need to be careful where you try and put them. I'm not 100% sold on them, but I'll probably have another go,"

says Phil Thomas, Brynchwith.

Using a range of analytical methods at no stage did the project record any significant differences in sward quality, with very similar energy and protein contents and no strong consistent trends in mineral or trace element levels.

In 2019 and 2020 batches of lambs were weighed on and off the different leys to look at animal performance but none of the recording periods found any animal performance benefits from grazing the multispecies leys. In some instances, there seemed to be an acclimatisation period where lambs were slow to graze the multispecies sward, so their performance suffered – there may also have been a dry matter effect that was limiting intakes with the multispecies sward consistently being lower in dry matter by 1-3%.

By the end of the project the three farms had developed three quite different swards from the multispecies ley in terms of species composition. On the wetter farm most of the legumes, chicory and plantain had been lost from the sward, with the grasses dominating. Another of the farms had found that there was little difference between the control and the multispecies leys after 3 years, with white clover and ryegrass dominating both. Surprisingly the greatest diversity and amounts of chicory, plantain and legumes remained on the farm that chose to cut and applied most nitrogen - but with that diversity also came an increase in weed levels, including docks and ragwort.

Two of the farmers in the project thought the multispecies leys a success, with the other suggesting if he were to sow another multispecies mixture he would choose a drier field. All had different ideas about how they would proceed with seed mixture selection, regarding what they would add in or leave out.

It was interesting to see how quickly some of the swards changed through the project. It seems that its really easy to change the balance of the sward by over-grazing, even for short periods says Chris Duller. "The short recovery time of the multispecies leys following grazing and cutting was really pleasing; it makes them perfect for rotational grazing," he says.

The key messages from the project are that there is an opportunity for successfully using multispecies leys on most farms in Wales, but maybe select one of the drier fields on the farm. There are benefits to be had from diverse mixtures in terms of yields and seasonal growth, but probably only in their first couple of years. There seems to be a good deal of flexibility in terms of grazing management and nutrient inputs – but ultimately the leys will develop differently under different regimes. Probably the best way to find out how they suit your farm is to have a go!

Further information about the project can be found on the website:

https://businesswales.gov.wales/farmingconnect/business/european-innovation-partnership-eip-wales/approved-eip-wales-projects/alternative-forage

Introducing fat-tailed sheep to Wales to satisfy UK market demand

Farmer and lead Operational Group member for the 'Introducing fat-tailed sheep to Wales' EIP Wales project, Peter Williams shares with us an update on the endeavours to learn how the Damara breed performs on his farm on Anglesey during a recent interview. You can read about his experiences here.

What motivated you to introduce Damara lambs to Wales?

Having worked with Damara sheep on a farm in the Middle East in the 1980s, I had always wondered whether it would be possible to develop a successful flock here in Wales. With the challenges and opportunities of Brexit on the horizon, I along with other members of the Group thought now was the time, and EIP Wales made this possible.

What has the project entailed?

To establish the trial we imported embryos and semen from Australia. This took some determination, as there was a copious amount of red tape that needed approval. However, with guidance from Innovation Broker, Geraint Hughes our efforts paid off.

We worked closely with veterinary specialist Ian McDougall of Farmgene to implant the embryos and artificially inseminate the recipient ewes. Since the first batch of lambs arrived in April/May 2019, we have been following a carefully planned monitoring protocol to measure the lambs' performance and comparing them to our control group of lambs.

How did the lambs born last Spring cope with the Welsh weather conditions?

The lambs have thrived and adapted well to the milder and wetter Welsh conditions. We produced six healthy pure-bred lambs – 3 ram lambs and 3 ewe lambs. We also had 75 cross-bred lambs, having artificially inseminated some of our Texel, Lleyn and Romney cross ewes.

Growth rate assessments exceeded our expectations, and the overall health and survial rate of the lambs has been excellent. However, we still need to monitor over a far longer period of time before we know for sure they will be commercially viable – the early signs are very encouraging.

How have you found the eating experience?

The meat is renowned for being tender, lean and juicy and our first experience of 'Damara Môn' lamb in September confimed this. The feedback we had from several prominent Welsh chefs was very positive across the board, with particular praise for the flavour and tenderness.

Will there be more Damara lambs this Spring?

With the second round of artificial insemination and embryo transfers having taken place at the end of 2020, we look forward to continue our investigation and learning, and to welcome a new batch of Damara lambs this April.

What is the main thing you've learnt by being part of the project?

Determination and passion can lead to pioneering success. Working with farmer Bedwyr Jones and ex-veterinarian Tricia Sutton, the project has allowed us to become the first UK producers of Damara lambs.

With support from Agrisgôp, we developed the 'Damara Môn' brand in 2020. We now look forward to further developing the brand, so that more consumers can enjoy the distinct taste of 'Damara Môn.'

If you would like to know more about the project, visit the website:

https://businesswales.gov.wales/farmingconnect/business/european-innovation-partnership-eip-wales/approved-eip-wales-projects/introducing-fat

SUPPORT AND INFORMATION

For more information on the work being carried out by our 46 EIP Wales projects please visit the Farming Connect website. In addition to the EIP projects there are other on farm projects being carried out through the Farming Connect Demonstration Network. These projects are covering a wide range of topics and are helping to address opportunities or problems facing the industry.

If you want to know more about any of the support and services offered by Farming Connect please contact the number below or visit the website.

ADVISORY SERVICE -

Advice on creating business plans, infrastructure planning, soil sampling, rotational grazing, diversification, forestry management, forage analysis and more! Registered businesses can apply for:

- 80% funded one to one advice
- 100% funded group advice

E-LEARNING -

Learn from the comfort of your own home at a level and pace to suit you. 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.

MENTORING -

For farmers and foresters who want to receive guidance and advice from their peers on a wide range of topics.

VENTURE -

Venture is designed to match farmers and landowners who are looking to step back from the industry with new entrants looking for a way into farming.

SKILLS AND TRAINING – HELPING YOU:

- acquire the key skills and competencies you need
- meet your personal, business and technical objectives

All training is fully funded or subsidised by up to 80%.

For further information, visit **www.gov.wales/farmingconnect** or call the Farming Connect Service Centre on **08456 000 813**

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