Grassland management

on the demonstration network

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Foreword

Good grassland management and efficient nutrient management planning underpins all successful livestock enterprises, since high quality grazed grass remains the cheapest and most efficient form of feed.

This booklet provides a brief snapshot of a number of grassland projects that have taken place at a small selection of Farming Connect demonstration farm and focus sites during the past three years. The findings and outcomes demonstrate how farmers participating in this initiative have benefited from introducing more efficient and often innovative ways of working and how with expert advice to guide them, they have been able to produce and utilise better quality grass while also decreasing both production and input costs. Their profit margins increase as new, improved grazing systems are introduced, clovers and deeper rooting herbs improve soil structure and regular monitoring procedures enable them to increase stocking rates without needing more land.

Each farm business in this booklet has been encouraged to achieve 'more from less' to help them implement sustainable grazing management strategies fit for the future. Rotational grazing is clearly gaining popularity and Farming Connect's Welsh Pasture Project reports demonstrate seasonal grass growth rates from different geographical locations and farming systems.

We hope that this new evidence-based learning and first-hand experience inspires you to consider implementing new and improved grassland management systems within your own farm business.

For updates on projects and trials on the Farming Connect demonstration network, visit our website at **www.gov.wales/farmingconnect**

Dewi Hughes
Technical Development Manager, Farming Connect
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Farming Connect - helping you drive your business forward

Eligible businesses registered with Farming Connect can tap into a wide range of Farming Connect support services, guidance and training.

Many services are fully funded, others are subsidised by up to 80%.

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- develop your skills as part of our continuing professional development/lifelong learning programme
- keep up to date with the latest innovations in technology through industry developments and the latest research projects

Measuring grass - the Welsh Pasture Project

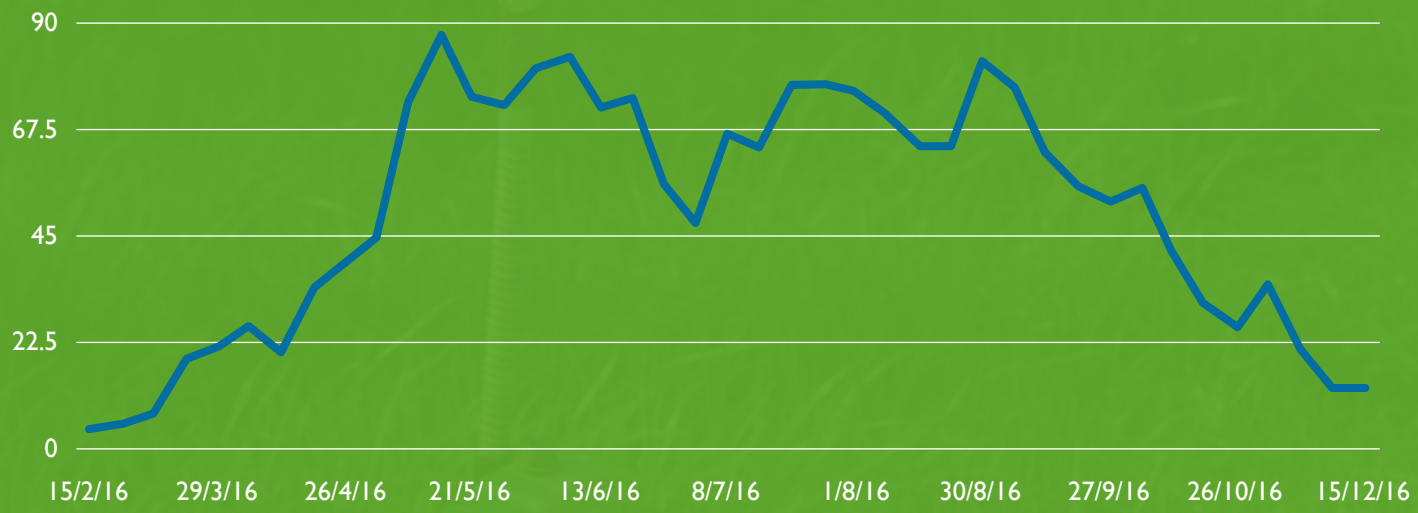
The aim of the Welsh Pasture Project was to encourage livestock farmers in Wales to make best use of their cheapest available feed - grass. Participating farmers were tasked with measuring grass growth throughout the growing season to build a picture of grass availability and which fields were performing best. Armed with this information farmers are able to plan grazing strategies around silage cuts and ensure fields receive targeted fertiliser applications.

The project has helped farmers to optimise production and improve utilisation which in turn has environmental benefits by reducing emissions per litre of milk or kilogramme of meat produced.

The project is relevant to all grassland farmers particularly those that are able to implement rotational grazing systems.

The graph below details the daily growth in KgDM/Ha at Cefnamlwch, near Pwllheli, during the growing season in 2016. This is an example of how farmers can build a picture of grass growth across their farm and use the information to make management decisions.

Measurements at Cefnamlwch, Pwllheli - daily growth (kg DM/Ha)



The aim for those participating farms was to ensure that key staff learned how to monitor grass growth and take the necessary management decisions to achieve improved grazing outcomes.

The challenge was to match supply (grass growth) with demand (livestock dry matter intake (DMI)) to maintain yields and fertility whilst minimising waste and maximising grass yield.

Project messages

- Measure weekly during the main growing season - conduct at a set day and time each week.
- Create a weekly grazing plan to list the order of fields to be grazed over the following seven days.
- Pastures will regenerate at varying degrees of growth ranging from very slow to periods of vigorous growth. The grazing plan should be adjusted accordingly.
- Adjust average grazing rotation length to help achieve reasonable utilisation.
- Planning when and where the last round of grazing begins will protect your grass wedge for the spring. This could also be achieved by drying off, culling or selling stock according to late season grass growth.

Why you should always measure grass

Understanding an individual farm's grass growth rates is very important, this should then be matched with the **requirements of the herd or flock** to manage **stocking rates** and requirements for **buffer feeding or silage.**

Set stocking has an expected utilisation of around 50% whilst paddock grazing and good sward management can increase utilisation to around 80%.

Increasing grass growth and utilisation by one tonne DM/Ha is worth **£197/Ha** for Welsh grassland farmers

Managing grass in dry conditions

Longer periods of dry weather can be an issue for grass based systems. In these conditions farmers should focus on managing regrowth carefully. In 2018, after the severe downturn in growth in June and July, one Welsh Pasture Project farmer was still able to close paddocks for silage in August.

This was achieved by protecting the average farm cover above 1,800 KgDM/Ha and selectively culling 4% of the herd.

Continued weekly measuring along with the opportunity to carefully consider the grass and silage stocks available were essential in achieving this.

As a result, grazed grass made up less than 50% of the ration for only a three week period in mid July.

Rotational grazing systems

In 2016, Pen y Gelli, near Caernarfon, converted from a set stocked to a rotational grazing system with the aim of improving grass yields and quality.

Introducing rotational grazing at Pen y Gelli

- Fields were sub-divided using semi-permanent fences and additional water troughs added to enable the 24Ha block of land to be split into 1Ha units.
- Fertiliser applications were based on the outcomes of soil tests and inputs were matched to grass growth requirements.
- Weekly grass measurements contributed to the development of a grazing plan that led to better utilisation of grass, increased lamb growth rates and an increase in flock size from 400 to 500 breeding ewes.
- Rotational grazing increased the amount of grass grown by 25% and utilisation was also much better. This increased the stocking rate enabling Pen y Gelli to increase the flock size.
- Higher quality grass throughout an extended grazing season reduced the need for bought in concentrates which led to reduced costs.

Project results

Set up cost of rotational grazing
£341.79/Ha

An increase in Mega Joules (MJ)/Ha of
31,000

Annual return on investment on
24Ha £5,582

Lamb finishing weights increased by
1.5Kg

The benefits of grass budgeting

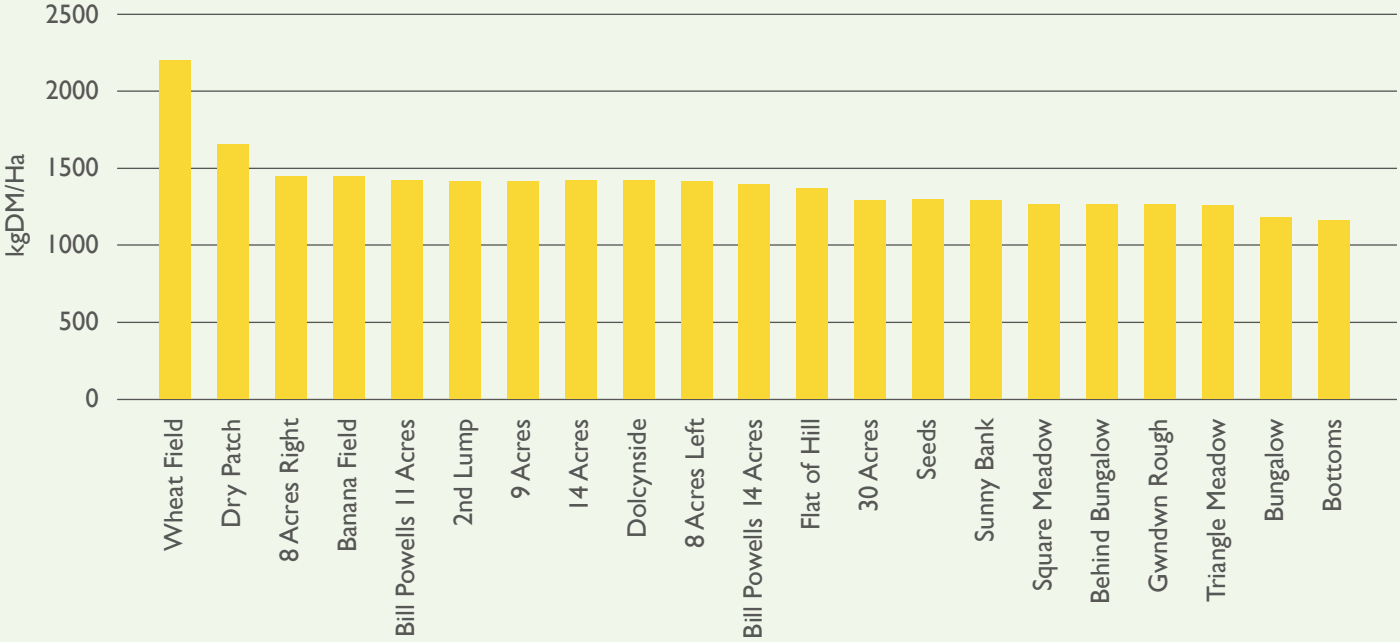
Planning ahead and anticipating grass availability is a key principle of rotational grazing. During September 2018 a rotational grazing system was established at Dolygarn, near Llanbadarn Fynydd, with support from a grazing specialist. The goal was to develop an all grass wintering system and by taking regular grass measurements an accurate autumn and winter grazing plan was established.

Project results

Regular measuring, even into the winter months, provided the following information and data:

- Cover measurements recorded an average cover of 1381kgDM/Ha.
- The lambing paddocks measured an average of 1450kgDM/Ha. This was under target, and likely due to wet and frosty conditions.
- Supplementary feed would therefore be required from 7 weeks before lambing (15th February).
- Ewes requiring supplementation were housed so that fields could be rested and ewes fed appropriately. These included ewes carrying singles with a body condition score (BCS) of less than 3 and all twin and triplet bearing ewes.

Using grass cover information to plan grazing at Dolygarn in January 2019



Messages from Dolygarn

Grazing grass

Grass measurements provided in January 2019 together with valuable evidence-based expert advice resulted in the following management decisions:

- Do not re-graze any fields (especially the lambing fields) unless the feed budget says you can.
- The grass in the fields will be worth more to the ewes 2-4 weeks pre-lambing with an expected nutritional value of 12ME and 20% protein.
- Split ewes by scan results and BCS; up to seven weeks pre-lambing a ewe in good condition (BCS 3) can be fed to maintenance requirements (1.4kgDM/Ha/day).
- Ewe demand increases dramatically in the last seven weeks and using silage analysis is vital to formulate rations.

Feeding silage

- Check feed intake; what are they actually eating?
- Accept some wastage (10-20%) to ensure maximum intakes.
- Identify which silages are likely to be more palatable (high ME and protein, low NDF).
- Ensure each ewe has adequate feed barrier space.
- Remove what was not eaten and feed to the cows.
- Feed out enough of the preferred silage for two days and record how long it takes to clear the bales.
- Calculate the ewe energy and protein intake - MJME/day and grams of protein/day.

Nutrient management planning

Nutrient management planning (NMP) results in increased savings and a positive environmental impact

50% of Welsh farms have a lower soil pH than recommended for optimum crop production

Up to **9%** loss in DM production in swards with a pH less than 5.5 compared to a sward with a pH more than 5.5

Financial benefits of improving pH levels at Llysun demonstration farm

- Soil tests indicated that many grazing fields were deficient in lime, with pH levels ranging from 2.5 to 5.7. Lime has therefore been applied at the rate of 5 tonnes/Ha.
- Rectifying the soil pH along with grazing leys tighter in the summer increases the stocking capacity.
- Lime is now applied to 20% of the farm annually, with the aim of raising the pH from 5.9 to nearer 6.5. This will help the farm achieve its 10 tonne DM/Ha potential.
- For every £100 spent on lime there is a benefit of up to £700 in productivity, based on the results at Llysun, near Welshpool.

Why conduct a nutrient management plan?

- Using a NMP to its full potential will bring a range of benefits.
- Soil health will be improved, optimising grassland and crop productivity.
- Increase awareness of the economic value of home-produced manures.
- Discover how to optimise the nutrients available in a range of manures with minimal environmental impact.
- Gain an understanding of responsible storage and spreading of livestock manures without compromising water quality.

Target indexes

pH: 6.0 (5.3 on peaty soils) and 6.5 for arable crops
P: Index 2 (16-25mg/l)
K: Index 2 - (121-180mg/l)
Mg: Index 2 (51-100mg/l)

Lower Eyton Farm is a lowland farm in the river Dee catchment, near Wrexham. Soil testing across the 200Ha farm was conducted to determine soil indexes, qualities and structure whilst analysing manures from the beef and poultry enterprises on the farm, to determine nutritive values. An open day at this focus farm provided the opportunity to learn about nutrient management good practice.

Key messages

A field by field approach should be taken

This will match individual crop requirements, whilst considering individual field limitations and benefits. Soil sampling on a field by field basis is essential, due to variations across farmland.

Soil sampling should be routinely done

- Soil sample - send samples to the lab for analysis - use the results to build your NMP.
- Undertake analysis for pH (acidity), nitrogen (N), phosphate (P), potassium (K) and magnesium (Mg) every 3-4 years.
- A NMP will then be compiled by a qualified consultant. The NMP will take into consideration the above and recommendations will be made regarding fertiliser applications for optimum grass growth.

Use the 'Code of Good Agricultural Practice Recommendations' for guidance on application rates

- No more than 250kg per Ha of total N in organic manures should be applied in 12 months.
- Where large volumes of organic manures are applied, more regular testing is recommended.
- Soil sampling should not be done if manure or fertilisers have been applied within the last six weeks, as this will give an inaccurate reading of soil status.

Match inputs to crop requirements

Matching inputs to crop requirements will make and save the business money and also protect the environment.

Project results

- Lime was required for 19 of the 35 fields assessed due to a low pH level.
- There was a risk of diffuse pollution due to high nutrient indexes present in the soils.
- Two fields had a phosphate index of four therefore the farm should avoid P applications to these fields.
- The value of home produced manure was calculated to be:
  - £4,580 from 300 cattle housed for five months.
  - £1,019 from 5,000 birds.

Grazing strategies for lamb finishing

A focus on the grazing system will result in improvements in animal performance. The advantages and disadvantages of rotational grazing were evaluated at Ochor Farm, Tregaron. Measuring and comparing a range of factors allowed the business to evaluate the best grazing strategies for lamb finishing.

Project targets

- A grassland management system resulting in high quality grass.
- Increased lamb finishing weights.
- Increased production.
- Extended grazing season.
- Reseed old swards with ryegrass and clover mix.
- Higher DM production.
- Earlier spring growth.
- Better response to fertiliser.
- The opportunity to assess and tackle flock health, such as worm burdens through faecal egg counting (FEC).

Project results

- The number of lambs meeting market specification rose by **8%.**

- Better grass budgeting resulted in improved feeding options when retaining lambs that are not meeting market specification.
- The average finished lamb weight increased by **1.5kg** on a rotational grazing system as opposed to conventional set stocking.
- The cash flow position of the business improved.

Cost comparisons at Ochor Farm

Sheep fed concentrates -
GM £774.00 per 150 lambs

Sheep grazing grass -
GM £1,188 per 150 lambs

Forage options for the future

Why incorporate clover into a grassland system?

- Improves soil fertility - reduced fertiliser use.
- Suppresses weeds.
- Reduces soil degradation.
- Improves soil mineralisation.
- Aids water retention.
- Copes with low pH.
- Responds to increasingly variable weather patterns.
- Improves soil structure.
- Improves soil organic matter.
- Aids nutrient availability.

A focus on feed efficiency and greater use of forage

Incorporation of clover into grassland mixtures is a way to reduce both fertiliser applications and diffuse water pollution risk. Effective use of clover will not only improve soil fertility and reduce the need for artificial nitrogen, it can also act as an aggressive weed suppressant.

Annual clovers are high yielding and have drought tolerant characteristics. They could offer farmers a useful alternative as climate patterns continue to change in the UK.

Annual clovers

Annual clovers complete their lifecycle in one year. They only grow from seed and do not reproduce vegetatively. They are popular in the USA where they are used in drought prone areas. Interest in their use is increasing in the UK because of their potential to provide bulky crops that are capable of producing three cuts of silage in addition to late season grazing for finishing lambs. However, they can be tricky to establish.

Trialling clovers in Wales

Farming Connect worked with Llyn Rhys farm, near Wrexham trialling balansa clover. The project specifically assessed the viability of this annual clover, its suitability to the Welsh climate and its forage and grazing capabilities, compared to other forage crops.

Balansa clover is adapted to temperate climates with an annual rainfall of 350-600mm. Although the climate is temperate in Wrexham, rainfall is significant at 785mm.

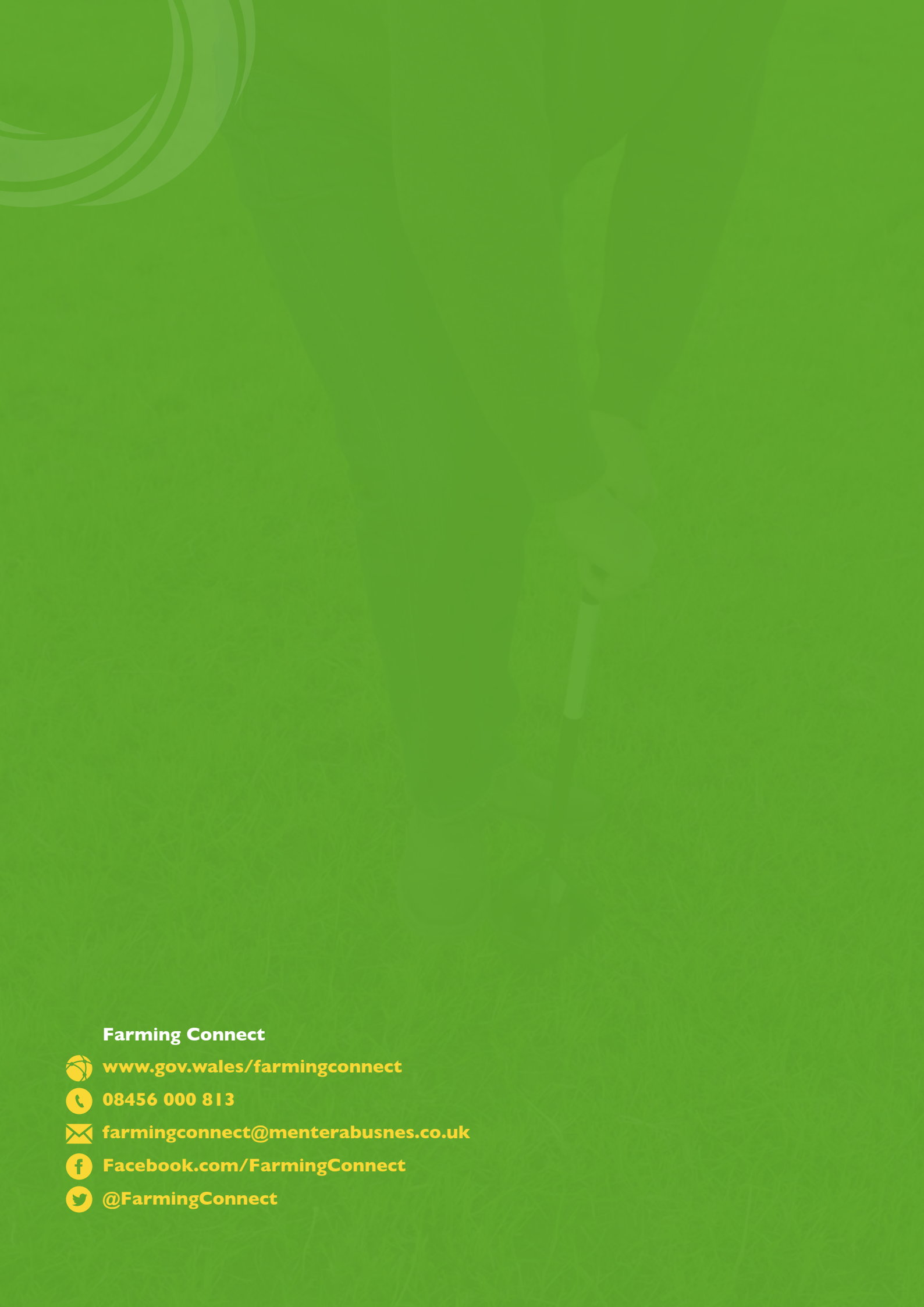
The balansa clover proved to be a good weed suppressant at Llyn Rhys. A useful good quality silage was made, but the persistence of the crop over several cuts needs to be investigated further.

Project results

	Balansa clover with Italian ryegrass	Grass big bale haylage	Conventional grass silage
Crude protein	14.5%	11.7%	9.2%
Metabolisable energy	11.5	11.6	9.5
D value	72	72	59
Dry matter	45.8%	81.9%	42.7%
Fermentable metabolisable energy	9.4	10.5	7.5
pH	4.8	5.7	4.5
Sugars g/Kg	98	78	62

Using silage made from balansa clover and Italian ryegrass delayed the need for supplementary feed by two weeks. Savings of **£1.68/head** on twin bearing ewes.

Nitrogen residues from the annual clover can contribute to improved perennial ryegrass yields.



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