

ISSUE 14: SUMMER 2017

FORAGER

HOME GROWN FEED FOR SUSTAINABLE FARMING

FRESH THINKING ON SILAGE

New approaches at the
Gelli Aur Innovation Site

FOCUS ON WATER

Avoiding waste and
ensuring better supply

CASE STUDY REAPING THE BENEFITS OF RESEEDING

GRASSLAND & MUCK EVENT PREVIEW



FORAGER

HOMEGROWN FEED FOR SUSTAINABLE FARMING

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— EDITOR'S NOTE —

Aly Balsom highlights the need to embrace technology in light of Brexit and the importance of not being afraid to change.



As we start on the long road to leaving the European Union, the need for the farming industry to get smarter and better at what we do has never been stronger.

In two year's time, we will need to be confident that we are as efficient as possible, able to differentiate ourselves and compete on the world stage. Government and policy makers will of course play a crucial role in that process, but so will farmers in selling themselves to the public and making sure their businesses are as robust as possible.

Whatever your system type - beef or sheep, all year round housed dairy or grass based milk production - science and technology will be fundamental to success. When it comes to farmers, no one can afford to run their systems on a wing and a prayer. Recording, monitoring and using technology to tweak performance is a must. That doesn't necessarily mean buying expensive gadgets. It could mean testing soils and manures more regularly to enable more efficient nutrient management, or using the Recommended Grass and Clover Lists to select proven and tested varieties to best suit your

set-up (see Chewing the Cud, page 30).

Regularly measuring grass is another one (and one *Forager* readers will be more than familiar with). However, some of you will know that you can still improve how you manage grass. A recent survey carried out by the organisers of the Grassland & Muck event (see our preview on page 6 & 7), showed that 70% of

Adaptation is key. It's so easy to never change because "that's how we've always done it," but in the current environment, that's a dangerous mentality to have.

respondents never measured their grass and 14% never tested their soils. Encouragingly, a growing proportion (46%) - compared to when the last survey was carried out - were using the Recommended Lists.

There's also a host of new gadgets either being developed or on the market that can help grassland farmers get smarter at how they manage pasture. Although paying out for such gadgets may go against the low cost, grassland mentality,

embracing the right type of technology could pay dividends in terms of reduced labour and better grass utilisation. In the future, grass management may not even involve leaving the kitchen table thanks to the development of satellite technology to measure grass and predict growth (page 10).

Adaptation is also key. It's so easy to never change because "that's how we've always done it" but in the current environment, that's a dangerous mentality to have. The Legg family from Somerset (see p14) are a shining example of the benefits of not being afraid to completely change a system to safeguard their future.

Welsh upland farmer, Iwan Davies is another example (page 22). By embracing reseedling and selecting the right breed of beef and sheep to complement his farm, he is maximising his assets. He is also using the positive messages surrounding producing beef and lamb from forage as a important marketing message. As an industry, this will again be another key tool to help differentiate ourselves as we develop a domestic and export market post-Brexit.

FORAGE BITES

Digestible knowledge for all things forage.

Correct nutrition maximises value of reseed

A focus on nitrogen and sulphur management has the potential to dramatically improve the productivity and return from grassland reseed, according to independent grass specialist George Fisher.

“Reseeding typically costs £450-£500/ha, but over a five year period these leys can produce a total of 624,000 MJ/ha of energy compared to around 440,000 MJ/ha from permanent pasture,” he explains.

Using a milk price of 22p/litre, Mr Fisher puts a milk production value on this extra energy of almost £7,500/ha – highlighting a rapid return on reseeding investment. However, he says the key to gaining maximum advantage is to minimise drop-off in the ley’s energy.

“Without adequate nutrition, a new sward can lose the equivalent of 4,500 litres of milk production potential each year. Modern varieties are able to use nitrogen more efficiently, so have the potential to out-compete other pernicious grass species.



“Trials carried out by CF Fertilisers in 2016 show the use of sulphur delivered a 29% increase in grass growth for both first and second cuts on reseed in the first full growing season.”

Industry rallies around glyphosate

European scientists have given glyphosate a clean bill of health, rejecting any suggestions it can cause cancer.

The opinion was issued by the European Chemicals Agency (ECHA) in Finland in March this year, providing a boost to industry campaigns seeking renewal of the product’s EU license at the end of this year. The news also comes as a big relief to farmers who so often rely on its use to create a clean seedbed ahead of grassland reseeding.

Campaigning is being led by the NFU, who welcomed the ECHA opinion on the safety of glyphosate, stating that this view was shared by regulatory bodies around the world, including the World Health Organization, the UN Food and Agriculture Organization and the European Food Safety Authority.

Science focus needed post-Brexit

The British Society of Animal Science (BSAS) has joined the NFU and others in calling for staunch support for agriculture post-Brexit.

Speaking at the society’s annual conference in April, BSAS president professor Liam Sinclair said the government needed to engage with all sectors of the industry to develop policies which were firmly focused on science, innovation and adding value to UK food production.

“If there isn’t a substantial amount of applied research and knowledge transfer to allow the livestock industry to improve its efficiency and profitability then food security will be seriously challenged.”

To assist policy makers as they discuss the future of UK food and farming outside the EU, BSAS has produced a policy white paper which sets out five key areas on which government must focus to ensure the long-term sustainability of UK livestock production and research.

View the BSAS Brexit white paper at www.bsas.org.uk/brexit

Danish compact feeding approach turns TMR approach on head

The Danish method of ‘Compact TMR’ feeding, which soaks the dry components of the ration in water and mixes the TMR for over half-an-hour, has the potential to redefine feeding in the UK and improve efficiencies, according to its founder Professor Niels Kristensen (*pictured right*).

Where as traditional TMR feeding advice has focused on avoiding over-mixing to maintain plenty of structural fibre, this new approach turns the concept on its head. Instead, the emphasis is on providing cows with a consistent, well-processed ration, which they are unable to sort.

Speaking at a Mole Valley Farmers team training day in Buxton, Derbyshire, Prof Kristensen from University of Copenhagen said: “This is not about changing the components of the ration, it’s about feed mixing and feed bunk management. By changing the way you handle forage and the TMR, you can feed the same ration and boost yields.”

The benefits have already been seen in Denmark, where an estimated 50% of farms have taken up some or all of the concept.

Yield increases of between 1,500-2,000kg/cow/year were seen on farms that fully embraced the concept between 2012 and 2015. Partial adopters also saw an uplift of 500kg during the same time.

Prof Kristensen explained that soaking the dry components of the ration in water was one of the key attributes of the Compact TMR approach. This helped the commodities ‘stick’ to the fibre in the mix. Any grass, fibrous materials and minerals were then added and processed for 15-20 minutes. Maize silage was then added and mixed for a further 15-20 minutes.

With the Compact TMR approach, the fact the forage is part-processed means the cow doesn’t have to work as hard to process it herself which aids feed efficiencies and yields.



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GRASSLAND & MUCK PREVIEW



This year's Grassland & Muck has it all, with over 250 exhibitors showcasing the latest machinery and technology and a host of seminars and demonstrations to help farmers make better use of forage and muck, as Forager finds out.

Visitors will get to hear the latest advice on making the best quality silage possible as part of a series of new ensiling talks at Grassland & Muck 2017 on 24-25 May.

Will Wilson from clamp supplier Bock, and silage consultant Dr Dave Davies, will be sharing their thoughts in a number of free to

attend 10-minute talks taking place on the hour at the event's North Clump.

According to Will Wilson, business development manager at Bock UK, clamp design is key to both the quality of silage and ease of ensiling, but often clamps are too wide, too long and overfilled. He recommends installing sloping walls, as they improve compaction against the panel. Clamp dimensions also play an important role, as a wider clamp presents a large silage face.

"The face is the second highest cause of waste in the clamp, so should be as small as possible," explains Will.

He says face size should be determined by the speed of emptying, but the face should move back at least 2m a week.

Dr Dave Davies says achieving the

correct density in the clamp is also important and requires thin layers of no more than 15cm.

"The target is 700kg of fresh matter per m³; which, depending on the silage dry matter, is approximately equivalent to 220kg of dry matter per m³," explains Dave, who will be speaking on behalf of Volac.

Dave says aerobic spoilage can cause losses of up to 25% in the clamp, and most problems at feeding are because the clamp was filled incorrectly and at the wrong density. He believes additives can protect against losses, but the choice of products can be confusing.

He adds: "When selecting additives, look at advice from AHDB and ask if there have been independent trials to prove the benefits to livestock."

IN BRIEF

Maximising the potential of clover

Plant breeders from IBERS Aberystwyth University will include a focus on red and white clover in their Science and Innovation area at Grassland and Muck, demonstrating the progress being made with these high-value protein crops.

Revamped RB209 to be released

AHDB will be launching the revised RB209 - now called the Nutrient Management Guide. The new guide features updated recommendations and has been redesigned for ease of use.

Soil and nutrient clinic

Those farmers looking for advice on soil issues can get their questions answered as part of the Soil Management Clinic and a series of talks at the Muck trade stand area at the event. A range of ADAS experts will be on hand to offer their thoughts on areas such as cultivation, improving soil structure, identifying compaction and improving drainage.

Rotational grazing demo

See rotational grazing in action and get your questions answered as part of a new intensive rotational sheep grazing feature at the event.

Production from grass forums

Whether it's reseedling, maximising milk from forage, driving sheep or beef performance from grass or manure management, the production from grass forums have something for everyone. The forum theatre is located on stand 301, with talks taking place throughout the day.



Displays to demonstrate how grass and clover breeding is improving root structures will feature on the collaborative Germinal and IBERS stand.

Host of equipment to launch at event

Grassland & Muck always promises a host of new machinery and innovative product launches, and this year's event is no different, with more than £20m worth of machinery on display and in working demos.

Whether it's grass measuring equipment, muck spreaders, new tractors or near infra-red forage analysis technology, there will be something for everyone.

One of the gadgets on display will be a new trailed plate meter that fits on a vehicle's drawbar and automatically records grass covers.

The Rapid Plate Meter (RPM) (above right) from Agricultural Supply Services (stand 430), can record covers at vehicle speeds of up to 18mph, reducing the time needed to walk fields with a conventional rising plate meter.

The RPM is also claimed to have higher accuracy compared to a rising plate meter due to increased frequency of recording. The system takes a reading every 50cm travelled versus 30 plus readings a field with the rising plate meter.

There are two models available. The RPM15 has a console, whilst the RPM20 links via Bluetooth to an Android App. The App is able to download paddock information from Agrinet in 'walk' order and store this data on a phone. At the end of the 'walk' the data is uploaded straight to Agrinet from the App.

KUHN Farm Machinery will also be displaying a wide selection of hay and silage making equipment at this year's event. This includes the FC 3160 TCD RA centre-pivot trailed mower conditioner (pictured right) with grouper functionality, the GA 13131 four rotor grass rake, and the GMD range of disc mowers.



Grassland & Muck 2017

What you need to know

When: Wednesday 24th (8.30am-5pm) and Thursday 25th May 2017 (8.30am-4pm).

Where: Stoneleigh, Warwickshire, CV8 2LG.

Tickets: Save £4 on an adult ticket price by booking in advance at

www.grasslandevent.co.uk



Grass plots match mixtures with system type

Germinal will use large-scale plots at the event to demonstrate a range of varying sward types, highlighting the advantages of matching mixtures to required dairy system output.

The company's Knowledge Advances zone will feature eight commercially available dairying swards, each designed to best suit the needs of either predominantly housed herds, extended grazers, or the more traditional summer grazing / winter housed operations.

Germinal GB national agricultural sales manager, Ben Wixey says: "Whatever the system, the priority should be to maximise production from forage, therefore reducing the reliance on more expensive bought-in feeds."

Reseeding 10-15% of grassland every year and using the best varieties from the Recommended Grass and Clover Lists (RGCL) to match system type is a key part of this strategy, which makes the grass plots a must see attraction at the event.

The new editions of the RGCL will be launched at the event. For more information, see Chewing the Cud on p30.

Day to determine A NEW DIRECTION

Attending farm open days should always offer visitors something new to ponder or might prompt a total re-think. Luke James previews a forage event geared to challenging conventional thinking.

Save the date: 4 July 2017

Any livestock farmers seeking to produce more milk or meat from forage should set aside Tuesday 4th July as a day not to be missed.

This is when Trefranck Farm, near Launceston, Cornwall, will open its gates to stage a reseeding demonstration day packed with information, innovation and trials results that will highlight the real potential of homegrown forage.

Host farmers Matt and Pip Smith, themselves three years into an intensification programme rooted in improved forage use, have worked with forage experts Germinal to set up a series of demonstrations that should interest dairy, beef, sheep and even deer farmers alike.

Highlights on the day will include:

- Lamb growth rates trial (run in conjunction with AHDB Beef and Lamb).
- Old versus new pasture grass growth rate comparison.
- Reseeding drills demonstration.
- Rotational grazing focus.
- Soil structure demonstration.

To register your intention to attend this event, please contact Louise Bailey at Germinal on 01522 868714.

Those attending will qualify for BASIS points.

Location: Trefranck Farm, St. Clether, Launceston, Cornwall, PL15 8QN.

Host farmers focused on intensification

For host farmers Matt and Pip Smith, stocking density is the key to making their 121ha (300-acre) grassland unit at Trefranck Farm work to best advantage.

Situated just to the north of Bodmin Moor, near Launceston, the farm offers the opportunity for higher productivity from forage, and the couple – with support from their families – have been hard at work over the past three years improving drainage, fencing, reseeding and implementing more intensive grazing strategies.

The flock of New Zealand Romney and NZ Romney x Lleyen sheep currently numbers around 1,000 ewes, but the aim is to go as high as 1,500, with ewe lambs sold primarily for breeding and ram lambs all finished off grass. The farm is also now supporting a herd of 300 Romanian red deer, which will be bred to produce venison, with quality forage again the primary feed resource.

Intensification has been achieved through a combination of rotational

grazing and pasture renewal, with Germinal's Aber HSG 3 long term grazing mixture the main ley of choice. Brassicas and fodder beet also provide additional forage, along with baled silage, to sustain the ewes and followers through the January to March period when grazing is limited.

The flock is set-stocked for outdoor lambing from the last week of March, typically scanning at around 175–185% with a target to achieve 150% weaned and sold. Stocking rates are increased substantially over the summer months, with regular grass growth monitoring and effective use of rotational grazing.



Setting out paddocks for cell grazing.



Germinal's Daniel Lowe (left) and Matt Smith.

How does reseeding benefit growth rates?

A season-long lamb growth rate trial across 22ha (54 acres) of grassland provides the centrepiece for the Trefranck Farm reseeding demonstration day.

Two 7ha (18 acre) farmlets, reseeded in September 2016, plus a 7ha block of old pasture, will each be rotationally grazed with 200 ewes and their twin lambs from the end of April through to the end of June. All three blocks will be managed the same, with entry covers of 2,000–2,200kgDM/ha grazed down to 1,200–1,400kgDM/ha as sheep are moved on. Any surplus grass will be made into round bale silage, with the number of bales and lamb weaning weights all being recorded at the end of this period. Grass growth data will be recorded throughout the period, ewes will be body condition scored and there will be random faecal egg counts carried out.

From the end of June, each block will carry 250 ram lambs, with the same grazing management protocols being applied. Regular weighing will be carried out to monitor growth rates and carcase information will be recorded at the point of slaughter.

At the open day on 4th July, visitors will have access to the first stage results and will have the opportunity to register to priority access the final results.

Farmlet reseeds for comparison with old pasture

Aber HSG 3

Kg	Variety
3.0	AberAvon HSG late diploid PRG
2.0	AberMagic HSG intermediate diploid PRG
3.0	AberGreen HSG intermediate diploid PRG
3.0	AberChoice HSG late diploid PRG
3.0	AberWolf intermediate diploid PRG
1.0	AberPasture white clover blend

Aber HSG 3 with multi-species formulation

Kg	Variety
2.0	AberAvon HSG late diploid PRG
2.0	AberMagic HSG intermediate diploid PRG
3.0	AberGreen HSG intermediate diploid PRG
2.0	AberChoice HSG late diploid PRG
2.0	AberWolf intermediate diploid PRG
1.0	AberPasture white clover blend
1.0	AberClaret long lasting red clover
1.0	Tonic plantain
1.0	Puna II perennial chicory

Reseeding method (September 2016)

Soil analyses carried out
Old ley sprayed off
Cultivations (disc and power harrow)
NPK fertiliser with sulphur applied to seedbed, plus calcified seaweed
Sowing with power harrow / drill combination at 15kg/acre

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Tech to aid GRASSLAND MANAGEMENT

The grassland world is catching up when it comes to the use of technologies to monitor and manage grazing. Aly Balsom takes a look at some new and emerging systems.

Fancy gadgets and technologies may be largely written off by cost focused, grassland farmers, but the fact feed and environment are even harder to control in such systems means they could well be missing a trick.

Mark Rutter from Harper Adams believes "smart systems" are very relevant to extensive systems.

"For a lot of farmers, grazing is actually an act of faith, so there's definitely scope to bring in technology," he says.

Mark says such technologies could reduce the labour aspect associated with grassland management and potentially encourage more farmers to make better use of grazed grass.

Some of the systems currently on the market and in the process of being developed include:

1. Automatic release gates

Automatic timer release gates can be set to open at a pre-determined time to move stock to a new field or grass break or encourage cows to walk back to the farm for milking.

A module is attached to the gatepost to replace the hook eye that a spring gate latches onto. This then releases at a pre-set time. Some farmers choose to put an empty plastic drum on the opposite side of the hook, so when the gate pings back cows get an 'acoustic signal' to move. The ultimate aim would be to develop these systems to link to sward depletion so cows are moved at the optimum time (see Vocal Tags).

Cost: Kiwikit sells the Batt-Latch Gate Release Timer for £330.

2. Vocal Tags

Bioacoustic technology or 'vocal tags' are currently being used by researchers to monitor pasture cover. A microphone listens to the number of bites and chews a cow makes. The bite to chew ratio then gives an indication of grass length. For example, they take fewer bites and more chews when grass is longer and many bites and fewer chews when grass is short.

This could be developed to determine when the optimum time is to move fences whilst grazing. Including this technology as part of heat detection and rumination systems could be an option.

3. Virtual fencing

Australian company, Agersens has just launched a virtual fence system called eShepherd.

The system uses animal mounted collars which send out an electric shock when they get too close to a virtual fence line, which the farmer maps out using a smartphone app. Animals are 'trained' to understand when they are approaching a virtual fence by the use of an audio prompt.

"Although developed for rangeland systems, virtual fencing has the potential to be used for strip grazing in more intensive systems, and could be used in upland systems in the UK," adds Mark.

Cost: eShepherd is not yet available in the UK but Agersens quotes an estimated cost of £100/animal.



The Australian eShepherd system uses cow mounted collars to deliver an electric shock when the animal approaches a virtual fence.

4. Using satellites to track grass cover

The "Innovate Grasslands" project is assessing how satellites and drones can be used to monitor grass covers on farm.

As part of the Innovate UK funded project - lead by the Satellite Applications Catapult and Agri-Epi - satellite data on grass covers were collected from a number of commercial farms between November 2016 and March 2017.

At the same time, grass plate meter data was gathered and combined with historical data to "ground proof" what was recorded from the sky.



Professor Mark Rutter believes grazing systems stand to benefit considerably through wider use of technology.

The satellites looked at NDVI (normalised differential vegetation index) using grass colour spectrum. This was combined with weather information in a grass model to predict future grass growth.

Fixed wing drones with multi spectrum cameras have also been used to record NDVI and overcome the challenges with cloud cover associated with using satellites. Satellite radar has also been trialled for the same reasons. Information should be ready this year.

How could it be used?

Subject to further funding, the aim is to translate this work into a commercially available tool within the next two years.

Sam Hoste, who is managing the project on behalf of Agri-Epi, says the technology has the potential to bring a number of benefits:

- Help identify variation in grass cover within fields, rather than just a field average.
- Remove the need for regular grass plate metering by providing current, historical and future grass growth predictions.
- Encourage variable rate fertiliser application and enable nutritionists to better balance grazing buffers.



A project is looking at the use of drones and satellites to assess grass covers.

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Grass investment STACKS UP

Making better use of grass brings the highest return on investment and offers the greatest potential for profits, as Aly Balsom found out at the Positive Farmers Conference in Cork, Ireland.



Any business decisions should be well planned and based on long-term returns, which makes investment in better grass growth and utilisation a sensible decision for all, said Moorepark senior research officer Laurence Shalloo.

He explained that Ireland's 2015 National Farm Survey (NFS), showed that the top 20% of producers ranked on profit per hectare, utilised more grass, had lower costs and a greater net margin (see table).

"For every euro coming in, the top 20% were keeping 52 cents. 81 cents (for every euro) were going out on costs for the bottom 20%," he explained.

Survey data showed huge variation in grass grown, with some farms growing 10t/ha and others growing 18t/ha. The same could be said for grass utilisation, with some farmers using around 2t/ha, and others up to 12-14t/ha. Laurence believed much of the variation was due to management, with little regional effect. He said there was much to be gained from improving grass utilisation and emphasised research findings that showed every additional ton of grass utilised/ha could increase

net profit by €180/ha (£158/ha).

Soil testing and addressing any imbalances in pH and Ps and Ks, were high on his list of priorities to drive performance. He ran through various scenarios to highlight the potential financial returns from investing in varying expansion options. This used the baseline scenario of growing 10.3tDM/ha and utilising 7.9tDM/ha with 90 cows and 50ha, with all replacements reared on farm.

Modelling work showed that the scenario where grass growth was increased to 14.3tDM/ha by undertaking improvements such as addressing soil fertility and reseeding, gave the best return. This example also increased grass

utilisation to over 11.9tDM/ha, moved heifers off the platform, leased an additional 20ha and increased cow numbers to match production of feed. Expansion investment cost €413,571.

This doubled the return on overall investment from 2.4% to 5.3% versus the worst performing scenario in terms of profits. In this example, cow numbers were increased without improving grass growth, feed was bought-in and labour increased, with the expansion investment costing €107,343.

This scenario was the only modelled example where the expansion process reduced the profitability of the business, with the return on investment of the expansion process standing at -1.6%.

For the best performing scenario, the return from the overall expansion process stood at 14.6%, which compared favourably to a target of around 10% and a national average in the NFS of 2.7%.

Laurence also drew on NFS results to show that investing in grass compared well with investing in expensive technologies.

"We can get a return of 15% by investing in grass productivity or invest in technology, like AMS (Automatic Milking Systems) and get a return of under 0%," he added.

Farms ranked on profit per hectare from National Farm Survey (Ireland) 2015

	Average	Top 20%	Bottom 20%
Net margin €/ha	1,165	2,126	278
Grass utilised kg/ha	7,796	9,378	6,359
Stocking rate LU/ha	1.93	2.23	1.69
Concentrate kg/cow	926	800	1,091
Grazing season length (days)	242	255	229
Milk solids (kg/ha)	887	1,019	774
Total costs €/kgMS	3.03	2.48	3.78
Costs as % of income	59	48	81

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Forage overhaul SECURES FARM'S FUTURE

Moving away from a "hit-and-miss" reseeding policy and producing quality silage and zero grazed grass has been part of a strategy that's helped the Legg family to halve feed costs and secure their farm's future, as Aly Balsom reports.

When Steve Legg sat down and worked out that the 140 cow herd at Pickett Farm was consuming nearly £30,000 worth of soya every year and achieving under 6,500 litres, he knew something had to change.

That was the spark that lit the touch paper and immediately resulted in Steve and father Roger undertaking a full investigation into their costs and performance using Promar's Milk Minder Dairy Costings. The resulting data signalled a complete shift towards a forage focused system.

Roger explains: "In 2008-2009 our milk from forage was 1,045 litres a cow a year. That's absolutely shocking. It couldn't

have been any worse. We were stagnating and everything we had, we were spending on soya."

That meant that even during the milk price highs of 34ppl, the Leggs were struggling to make any money as costs were also climbing as they tried to chase yield. They subsequently decided to tackle the issue head on.

"We had the wrong cows and the wrong facilities and we were starting with the wrong type of grass," explains Roger.

Even before the herd's costings were laid out on paper, Roger and Steve decided to overhaul their "hit-and-miss" reseeding policy and introduce short-term Italian ryegrass leys

into their existing wheat, maize rotation. Up until that point, silage had been taken off "very long-term leys" and permanent pasture, so by reseeding, the aim was to improve silage quality and soil structure.

A forage wagon was also purchased to allow the silage-making process to be brought in house to enable them to cut at the optimum time.

They also overhauled their breeding policy by cross breeding their Holstein herd to Fleckvieh to produce a more robust cow that would efficiently convert forage. Norwegian Red has also recently been brought into the mix.

Zero grazing

However, one of the most marked changes came about at the end of 2015, when Roger and Steve decided to trial zero grazing using a neighbour's mower conditioner.

They quickly realised this would make the most of their farm's layout, whilst housing cows permanently would be a natural progression from housing cows by night due to labour challenges.

Rogers adds: "The cows can't walk to the better ground so we were making them eat the poor stuff as that's what's round the buildings and it's the wettest, hilliest rubbish. So it made sense to bring the grass to them."

In 2016, they invested in a Kuhn FC 313 FF front mower conditioner supplied by Buglers and started zero grazing. Fresh grass is now delivered to cows from April to September. In April, grass was being shipped to cows once daily and fed with a TMR, with grass cut at 2pm to promote maximum sugars. In the summer, grass will be cut and fed twice a day. Steve is targeting leaving 28 days between each cut with 62.5kg/ha of a 23:4:13 fertiliser plus 7 Sulphur applied after harvesting.

The Leggs now have two mowers, which helps at silage time as one mower can be put on the front of the tractor and the second on the back. Steve says this halves labour and the number of tractor passes needed.

"You can do the silage in half a day with two mowers which means you can cut later when the sugars are higher," explains Steve, who also has a Kuhn GF 642 tedder and GA 8731 rake.

Grass quality

Being able to cut when they want, and the improvements in grass quality from reseeding, means the Leggs consistently produce silage of around 12ME, over 70 D value and over 14% protein. To further drive quality and consistency, Steve has also chosen to start reseeding using four year leys, rather than short-term Italian ryegrass leys, which he believes go to head quicker. He is currently using a purpose made Aber High Sugar ryegrass and clover mix including AberEve, AberWolf, Aston Energy, AberBite, AberHerald, a festulolium, AberDai and AberConcord.

Roger has also put in a lot of work clearing ditches, cutting hedges and putting in drains to reclaim some of the permanent pasture land. This fits with the Leggs' approach to making the best of what they have on farm. They are the first to admit that their old buildings and set-up is far from ideal, but they hope one day to be able to invest in silage clamps and slurry storage.

Once the permanent pasture ground has been improved, this will then enter the grass rotation and enable expansion up to 200 cows.

Zero grazing is part of a strategy to make the most of the farm's assets, says Steve Legg.

continued on p16

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Steve says: “We’re confident we have enough land to support 200 cows on just home produced forage and concentrates, with very good silage.”

Home produced diet

The Leggs have already made big strides to produce much of their ration on farm with the diet now balanced by independent nutritionist, Rob Minter. In the main grass growing season, their own wholecrop barley is fed to compliment high quality zero

grazed fresh grass. In the winter, this fresh grass is replaced by grass silage, and homegrown lupins are then added to the TMR to account for the lower protein content of silage versus fresh grass (see box). Maize is also fed in the TMR, alongside up to 8kg of a high fibre cake in the parlour.

They have yet to have a full year with the zero grazing system, however, the benefits of improved forage use were clear to see in the 2015/16 year when they increased their milk from forage figures by 3,000 litres per cow per year and

slashed their feed rate/litre. However, a challenging milk price environment last year and a poor second cut has meant performance has taken a hit this year (see table).

Nevertheless, Roger says the changes have positively impacted on costs and secured the long-term future of the business.

“We’ve cut feed costs by 5ppl. They were 10ppl and they now average 5ppl through the year. If we hadn’t have made these changes we would have struggled to survive.”

Lupins bring cost benefits

Growing lupins has allowed the Leggs to cut soya from the ration and help reduce their feed costs.

Having had a short break from the crop when soya prices declined, escalating soya costs and declining milk price encouraged Roger to reintroduce the crop. Since then, the Leggs have grown yellow and white lupins to produce a high protein feed. For example, combined white lupins are expected to produce a 36-40% protein feed at 15ME.

The Leggs have experimented with feeding the crop in multiple ways. Last year they crimped the crop and fed it as a grain. This year Steve has decided to wholecrop the lupins at the combining stage and put them through a forager with a maize cracker. As the plant dies from the top down, the grain should be ready before the stalk and the lower dry matter of the stalk should make ensiling easier and provide a good balance of fibre and protein.

The Leggs drill the crop in early-mid April after turnips, which are grazed by sheep brought on to the farm over winter.

They have the following tips for lupin establishment and harvest:

- Ensure a fine seed bed, like you would with any new spring seed bed.
- Choose free-draining soils around pH6.
- Weed control is vital - always use a pre-emergence spray as that’s your only line of defence against weeds in lupins.
- Desiccation can be an option, but it can damage the grain.



As part of The Lupins in UK Agriculture and Aquaculture project (LUKKA), IBERS have undertaken a study to assess the practicalities of feeding grain lupins on farm as an alternative to soya or other bought-in proteins and the subsequent effects on lamb performance and carcass grades.

Read more in Forager’s Protein Supplement at www.foragemagazine.co.uk

Pickett Farm forage facts

- 55ha (137 acres) of grass in arable rotation - used for silage and zero grazing.
- 20ha (50 acres) barley.
- 22ha (55 acres) lupins.
- 33ha (81 acres) wheat.
- 9ha (22 acres) maize - this has been reduced and corn acreage increased to reduce costs and create greater flexibility in what follows the crop.
- 61ha (150 acres) of permanent pasture - in the process of being reclaimed.

Performance changes at Pickett Farm

	Total yields per cow per year	Milk from forage per cow per year	Feed rate/litre
April 2008-March 2009	6,447 litres	1,045 litres (minus figures on occasion)	0.42kg/litre
May 2015 - April 2016	7,175 litres	3,900 litres	0.24kg/litre
March 2016 - February 2017	6,100 litres	2,500 litres	0.3kg/litre

Poor milk price last year meant the farm pulled back on yields, whilst lack of money to invest in fertiliser impacted grass growth. A poor timed second cut also knocked grass silage quality which all impacted on milk from forage. This year has highlighted to the Leggs the importance of investing in forage. Their aim is to achieve 4,000 litres per cow per milk from forage a year, moving forward.

ARE YOU WATER WISE?

Whether this summer is a dry or wet one, livestock water supply is an important consideration and could be an area for improvement on many farms, as Luke James reports.

Water is a resource that is all too often taken for granted by livestock farmers operating in our temperate UK climate.

It’s generally plentiful, and sometimes (all too often in recent years) there’s too much of it, but it is nevertheless an input that needs valuing and managing if businesses are run at optimum efficiency.

For dairy farmers in particular, water can be a limiting factor on production if not supplied

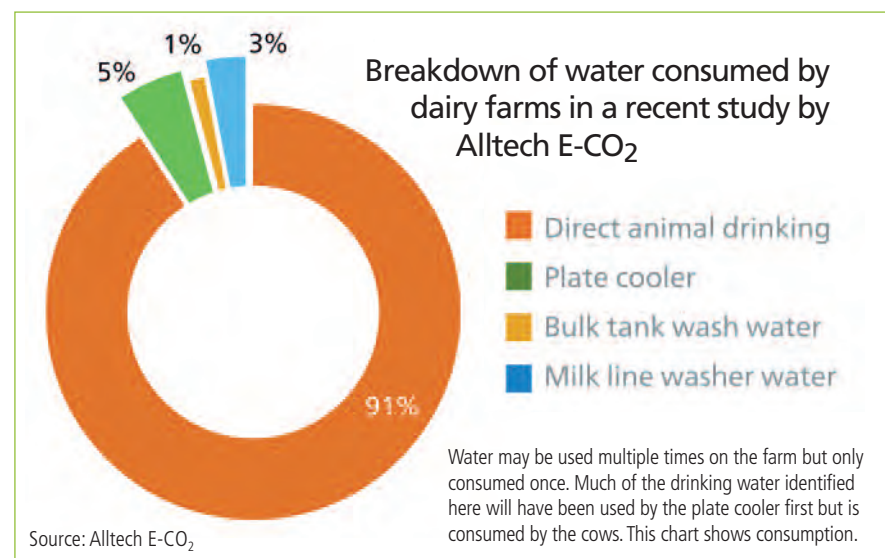
adequately. According to Andy Wynne of environmental consultancy Alltech E-CO₂, it’s also a very variable cost for the considerable proportion of dairy farms reliant on mains water.

“Of over 4,700 dairy farms that we’ve carried out environmental assessments on since 2009, around 40% are relying on mains water and their average cost of water per litre of milk produced is over 0.5ppl,” he says. “This average is itself significant, but

the variation in prices paid reveals that water will be costing some dairy farms well over 1ppl. From this same data set, we can see that only 15% of herds are collecting rainwater, so there is clearly an opportunity for some at least to do better with minimal investment.”

Alltech E-CO₂ includes water footprinting alongside it’s carbon and cost of production assessment tools, or offers it as a stand-alone service where required. In the company’s own experience, having





a focus on water can often deliver instant rewards.

Andy adds: “We know that a cow requires between five and seven litres of water to produce a litre of milk and that availability of a clean supply is an essential prerequisite of efficient production. We also know that water use varies massively on UK units, with the least water-efficient farms consuming three

times more than the average. This again shows there are likely to be opportunities to do better, either by using water more efficiently or being sure that the right quality and quantity is always available.

The use of CowSignals appraisals as part of Alltech E-CO₂ assessments have also highlighted that fundamentals like water quality can be limiting

factors. This makes disciplines such as cleaning out troughs weekly, critical to herd performance.

Ideally, there needs to be enough trough space so that the herd can consume two thirds of its total daily consumption at one time. Cows can easily consume 100 litres per head per day.

Andy says it’s also important to be aware of peak rates of requirement. “Cows can drink 15 litres in 45 seconds, so design and layout of water supplies, in sheds and in grazing fields, is very important,” he says.

Systems fit for purpose

Peak demand is one of the most important criteria when designing a water supply system, according to Bertie Troy, managing director of Grasstec Group, who include consultancy on grazing infrastructure amongst their range of services.

“Cows will consume most of their water within 90 minutes of milking and this needs to be factored in if adequate supply is going to be maintained,” he says.

Using a formula derived from this understanding, Bertie calculates that a 150-cow herd, for example, will require a system capable of delivering 75 litres per minute, so pumping capacity and pipe sizing needs to be appropriate.

“It’s quite common to find situations where herd size has increased but the water infrastructure is lagging behind,” he says. “Half inch pipes may have been suitable for smaller herds in the past, but where cow numbers have increased it is quite possible water has become a limiting factor due to insufficient flow or pressure.”

One way to increase water flow without increasing pipe size is to convert to a loop system, as Bertie explains.

“With a loop system water flows in two directions at much slower velocity, reducing the friction. This has the effect of increasing the flow by 40-50% through the same pipe size and that will mean more consistent pressure and supply to grazing paddocks.

“In our experience, installing a loop doesn’t require a significantly greater length of pipe than a single line, so can be a very cost effective solution to an out-dated supply.”

Trough size and location is another key factor. These should

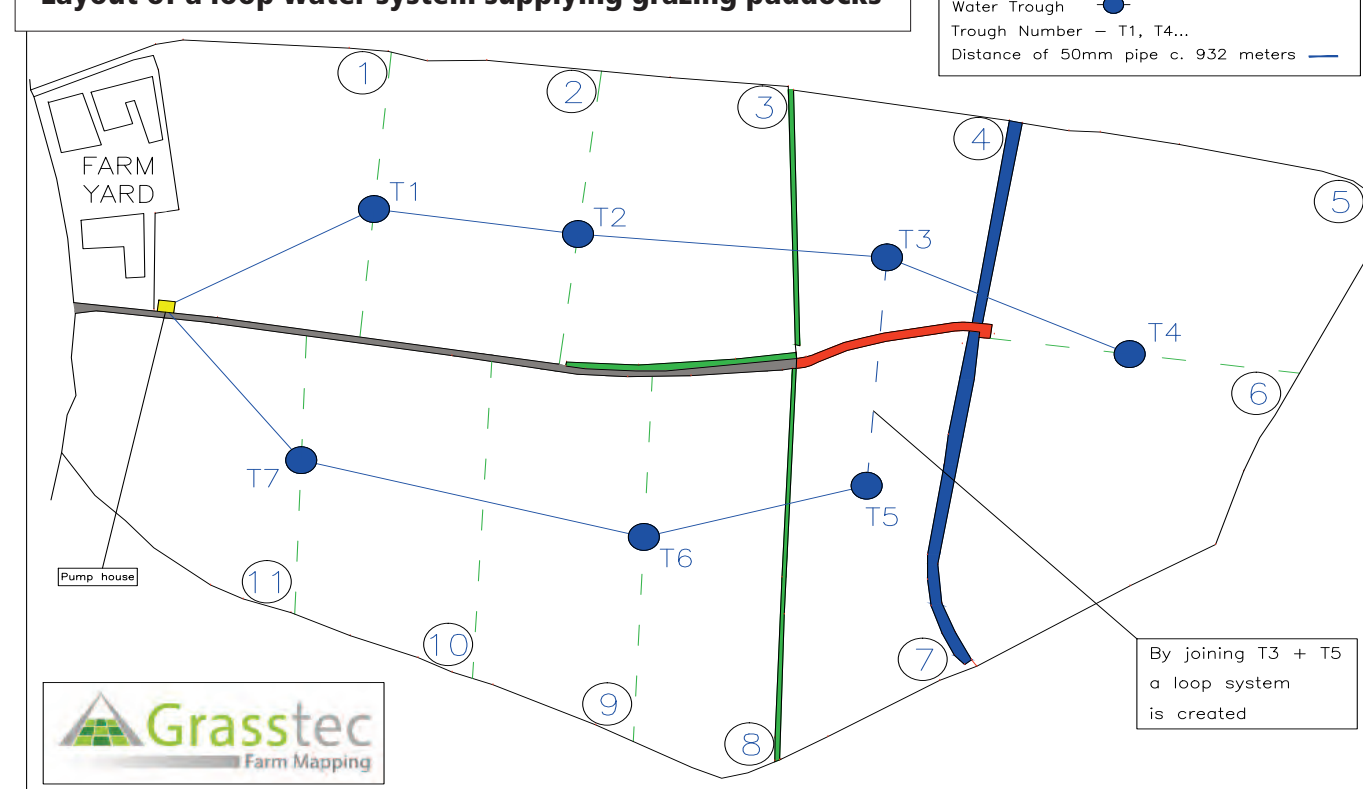
never be placed on roadways, as this slows the movement of cows to and from paddocks.

“For herds of less than 300 cows, we recommend placing troughs along fence lines approximately one-third the way into the field;

sharing troughs between fields in this way reduces overall costs.

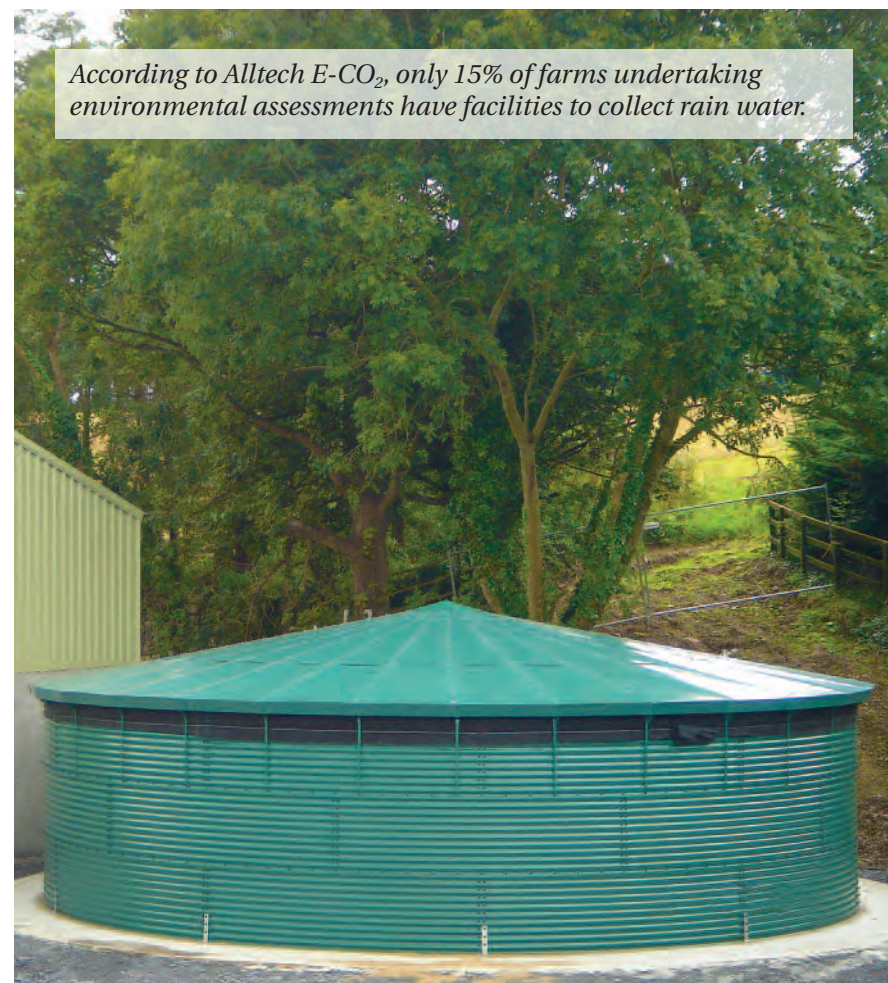
“For larger herds, we recommend placing troughs in the middle of fields,” adds Bertie.

Layout of a loop water system supplying grazing paddocks



WATER CHANGES

From April 2017, changes to the way water is retailed allows farmers to shop-around for the most competitive supplier rather than being tied to a local monopoly supplier. This introduction of competition to the water market could allow farmers reliant on mains water to reduce their costs.



According to Alltech E-CO₂, only 15% of farms undertaking environmental assessments have facilities to collect rain water.



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How to avoid FEEDER DOWNTIME

A well maintained and reliable feeder wagon, together with trusted staff are key elements in maintaining high milk from forage performance in a large year-round calving dairy herd, as Luke James reports.

For Cheshire dairy farmer Ian Garnett, a fail-safe diet feeding operation is key to his 750 cow enterprise achieving fifty percent of its 8,000 litre average from homegrown forage.

With milkers and replacement heifers spread across four units, during the winter feeding period, the once-daily feeding routine can amount to a five hour commitment, and four or five loads, so there is little room for error.

Responsibility lies with Les Taylor and Luke Ross, who between them ensure the diet feeder keeps running and the cows are fed the right ration, correctly formulated, properly mixed, and on time. Les is primarily involved during the winter period, with Luke in support in winter and continuing on the feeder throughout the grazing season.

“Our aim is to produce as much milk as we can from homegrown feed, keeping the concentrates per litre figure down at around 0.2kg/litre,” says Ian,

who is based at Clay Bank Farm, near Knutsford. “This means we need to produce quality grass and maize silage, first and foremost, but then we need an efficient and reliable operation to feed it.”

The winter ration is kept relatively simple, with one main mix for the milkers and a lower grade version of this ration for late lactation cows and youngstock. This is then topping up in the parlour. Dry cows receive lower quality round bales, which are higher in dry matter and lower in potassium.

Ian adds: “Once cows are at grass, we continue to buffer feed a lower level ration, to complement grazing. Our rule of thumb is that up to 10kg fresh weight of buffer feed can be offered without any detriment to grazing intakes.”

A typical milking ration consists of grass silage (60%) and maize (40%) with a mineralised protein blend included at 2kg/cow. Grass silage, made from up to four cuts a season, is wilted and tedded over two days to produce a consistent 30% dry

matter forage. Maize is drilled at a relatively low seed rate of 42,000 seeds/acre, allowing more sunlight into the crop in what is a marginal growing area, and helping to avoid any delay in maturity.

The diet feeder that has been in constant use at Clay Bank Farm since 2009 is a Kuhn Euromix 2070. Trailed behind a John Deere 6630 tractor, the machine covers around 18 road miles each day, clocking up roughly 7,000 hours in its working life to date.

The Euromix is a twin vertical auger model and is fitted with weigh cells and a digital read-out, allowing accurate measurement of loading and feed-out.

Weekly servicing is carried out by Les Taylor to ensure the wagon is always performing at it's best and producing a consistently mixed ration. Maintenance checks include cleaning, greasing and a check of all components. An annual service by the dealer will include checking the gearbox and an oil change, plus a change of knives.



Cows at Garnett Farms are not an extreme Holstein type, with bulls selected on EPLI with high fertility and good locomotion to the fore.



Luke Ross (left) and Les Taylor team up during the busier winter feeding period to keep a quality forage ration in front of the Garnett Farms cows.

Maintenance tips to keep your diet feeder running

According to Kuhn Farm Machinery feeding and bedding production specialist Katie Calcutt, regular checks and maintenance of the diet feeder are not only about extending the machine's working life, but can also about saving time and money by increasing the operational efficiency. She provides the following pointers on maintaining the diet feeder:

Drivelines and PTO

- Ensure PTO is optimum length and guards are fitted and secure.
- Grease every 50-100 hours, but take care not to over-grease universal joints.

Gearboxes

- Inspect for oil leaks daily.
- Check oil levels when greasing.
- Change oil every 1,500 hours.

Hydraulic pipes

- Inspect for damage routinely and replace any that are showing signs of wear.

Mixing equipment

- Check knives regularly and change at least every 12–18 months.
- Monitor wear of the auger; replace or re-flight if worn.
- Check scraper plate under auger; adjust or replace as required.

Weigh cells

- Monitor and arrange a check or recalibration with dealer if in doubt.

Discharge

- Clean door runners and check movement and closing.
- Monitor condition of conveyors and elevators.
- Check tensioners.

Running gear

- Maintain chassis, axles and suspension in good working order.
- Check wheel nuts daily.
- Inspect tyres and tyre pressures daily.
- Maintain brakes routinely.

Safety first

- Always remove the keys from the tractor before carrying out check and maintenance.
- Check PTO guard, handrails, ladder and platforms daily.

When travelling on public roads

- Ensure all lights are working and a number plate is fitted.
- Brakes must provide at least 25% braking efficiency and a handbrake capable of locking two wheels must be functional.
- Tyres must be appropriate for the distances travelled.

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Welsh upland farm REAPS RESEEDING BENEFITS

Reseeding better ground and selecting the right breed of beef and sheep is helping one Denbighshire upland farm to make the most of its assets and reduce costs, as Aly Balsom reports.

Iwan Davies is a reseeded convert having witnessed a 120g/day difference in liveweight gains between lambs grazed on new leys and those on permanent pasture.

The fact that it translates into faster finishing time, reduced housing costs and an end to concentrate use for finishing, means he is convinced that his approach to grassland improvement is the right one.

He explains: "For the last three years we haven't brought in any lamb creep. All the lambs are finished off grass. We worked out that over a three month period in the spring, we saw a difference of around 180g/day weight gain on poorer leys, and up to 300g on the best (reseeded) ones. That's a massive difference."

Further calculations showed that this extra growth - coupled with the ability to increase stocking rates from five ewes with twins per acre to eight ewes with twins per acre on better quality grassland - resulted in a quick payback.

"We could pay for a third of the reseeded cost in the first three months because of the extra weight put on by the lambs," Iwan adds.

Hafod Y Maidd, near Corwen,

runs 900 predominantly Penderyn ewes and 250 followers, with the flock lambing from mid-March to mid-April. The best ewes are kept pure and retained as replacements. The rest are served to a Texel, with all lambs finished and sold live or dead weight. Lambs generally weigh around 41.5kgLW at slaughter. Iwan also runs 93 Luing sucklers with calves either sold as stores or finished at 18 months old, weighing 600kg. About 20 a year will be finished for the farm's own boxed meat scheme and food festival stand.

The reseeded policy was born out of a drive to reduce costs and make the most of the upland farm's limited, quality pasture. About half of the 469ha (1,160 acre) farm runs across rough, mountain land up to 1,600ft.

The fact this is in a SSSI limits improvement work and makes ploughing an impossibility. The lower lying ground offers greater scope for improvement and it's this land that Iwan has focused on over the last 6-7 years. However, much of this land still lies at 1,400ft.

Having carried out limited reseeded in the past, his new grassland improvement policy uses reduced lamb

growth rates as one of the main criteria for identifying fields in need of improvement.

Crop rotation

Iwan has always regularly tested soil nutrient levels every four years and addressed N, P and Ks accordingly using manure and triple super phosphate where necessary. However, he believes it was the old pasture and grass varieties used that was holding performance back. He has since chosen to use a mix of Aber High Sugar Grasses to improve ground. This includes intermediate heading diploids AberDart, AberMagic and more recently AberGreen, and late heading diploids AberAvon and AberChoice.

As part of the new crop rotation, swedes are used as a break crop prior to the new reseed; most recently the variety Siskin has been used, with Triumph to be grown in future.

These are grazed by ewes prior to lambing. About 7ha (18 acres) of wholecrop barley will also make an appearance in the rotation as part of Glastir.

The swedes are planted at the start of June, with the

preceding grass soil tested and nutrients, such as lime, applied where necessary. The old pasture will then be ploughed, cultivated and precision drilled with swedes.

The following grass ley will be direct drilled in the spring with 150kgN/acre.

Iwan has noted that the newer leys respond better to fertiliser inputs and has consequently decided to target urea application on this ground in the spring to ensure the best return. A slit aerator is also now used where necessary to address compaction, which means land drains better and doesn't dry out as much in the summer.

Cost reduction

Grassland improvement has also benefited silage quality. However, he believes the improved lamb growth rates from grazing lambs on better ground has had the biggest impact on overall farm efficiencies.

He explains: "Before the grass rotation, we seemed to have over half the lambs left in November and the costs were going too high. Now, by October we only have about an eighth left."

This means lambs no longer need to be housed, which saves on labour, shed space and straw

costs. An end to concentrate feeding after weaning also saves about 20t of feed at around £200/t.

Adding the swedes to the rotation has also reduced ewe concentrate feeding by about 6-7t. Now nothing is fed concentrate until one week before lambing.

Ewes lamb outside and move to the better pasture from the end of April. After weaning they then head to the rough, mountain ground to mix graze with the cattle up until the last day of September. Some of the better ground and silage aftermaths are kept back for weaned lambs.

Breeding

Iwan cites breed choice as one of the most significant factors influencing the success of his system. Traditionally he had run Cheviot ewes and continental cattle. However, a shift to the Penderyn and Luing has enabled him to lamb outside and prioritise the best pasture for the sheep and fattening cattle and the poorer pasture for the cows.

Iwan explains: "The Luing have been bred to make the most of forage. A lot of the mountain is rough ground and that's why I chose the Luing as they can rear calves on permanent, poor forage and turn it into milk somehow."

The hardiness of the beef breed means the best conditioned cattle are



Iwan Davies has seen significant improvements in liveweight gains as a consequence of reseeded.

managed on deferred mountain grazing and concentrate over winter. About two thirds of cattle will be finished on the better grass leys. The rest will be winter finished inside on concentrate, silage and wholecrop.

Iwan says the fact the beef is largely grass fed is a key marketing message when selling at food festivals and is something customers are increasingly interested in. Overall, he thinks this grass message and a greater focus on making better use of the farm's land is making a marked difference to the business.

"Reseeded has made a big difference to the business' costs and that makes us more sustainable without a doubt. You can't change the price of beef or lamb much. The only thing you can change is cost. By reseeded and having the correct breed of sheep and cattle, you're halfway there," he concludes.



FRESH THINKING ON SILAGE

Luke James pays a visit to Gelli Aur campus at Coleg Sir Gar in Carmarthenshire, where on-going development work is seeking to drive down the costs of dairying.

Embracing new feeding and silage harvesting strategies is part of an overall drive to use forage as a means of reducing overall costs of production at Gelli Aur.

Run on a fully commercial basis, the dairy herd at Gelli Aur comprises spring-calving and autumn-calving sub-groups that are managed on entirely separate grassland platforms. With common genetics and shared milking and housing facilities, the set-up allows the two forage-based systems to be easily compared.

The cows are all crossbreds, with New Zealand Jersey, Scandinavian Red and Irish Friesian genetics in the mix. The 300 spring-calvers average 4,500–5,000 litres a cow a year and the autumn calvers, 5,500–6,000 litres annually.

Farm manager John Owen says: “Both groups are achieving over 3,000 litres from forage, but the autumn calving group are receiving more concentrates (1.5t/head) and have higher costs overall.”

Cost of production

These higher feed costs are balanced by higher production. However, there is consistently a 2ppl difference in cost of production between the spring and autumn calvers in favour of



Feeding silage on a weekly basis is being achieved with no detriment to feed quality whilst saving diesel and labour costs, says John Owen.

spring calvers. John says this is largely due to lower replacement costs on the spring system due to less lameness, better fertility and generally better health. This influences the herd's profitability, with the spring herd generally proving more profitable overall.

John adds: “The herd in its current format has evolved over the years into what is now a low-input operation. Whilst we know that the spring-calvers are more profitable, we have maintained the two seasonal calving blocks as it suits the farm infrastructure and

allows us to maintain a level year-round production profile.”

Gelli Aur is a Farming Connect Innovation Site and one of its major objectives is to research ways to reduce the costs of production further. For the past three years, the unit has worked on the principle of placing grass silage into a feed passage on a weekly basis, to cut winter feeding costs. This system involves use of a precision block cutter to place silage behind a feed barrier that the cows shunt progressively forwards as they eat the ration.

John explains: “The system allows us to maintain silage quality in the clamp. And we are finding no significant degradation

in the forage behind the feed barrier either. As such, we are taking significant cost out of the winter feeding system, by avoiding the need for a diet feeder and saving the daily labour costs that are usually incurred.”

Multi-cut silage

With more milk from forage as a primary objective, John is this year working with Farming Connect to compare a conventional silage-making system with a multiple cut approach using a forage box.

This will take place across around 16ha (40 acres) of Aber High Sugar Grass leys sown in the previous autumn, with grass from the two varying systems being

ensiled separately to allow cost and quality analysis to be carried out.

“The project will allow us to determine whether cutting more frequently - with as many as five cuts during the season - is an effective way to achieve more consistent high quality silage,” explains John. “With a more conventional precision chop system, cutting three or four times, we find a significant difference in silage quality between first and second cuts, with milk tending to drop by as much as two or three litres a day when cows go onto the later cut material.”

In both cases, a best practice approach to ensiling grass will be applied, with grass being treated

with a silage additive, layered in the clamp, rolled well and sealed with overlapping side sheets, top sheets and netting.

With both silage cutting systems being fully costed and silage analyses carried out, the aim is to work out the cost per feed unit and make valid comparisons.

“Ultimately, we are striving for a system that will generate the best milk from forage, but costs are an important element as are factors such as being reliant on a contractor or having a system that is self-reliant,” concludes John.

Results from the project will be featured in future issues of *Forager* magazine.

Royal Welsh Muck & Soil Event 2017

On 24th August Gelli Aur will host Muck and Soil 2017, a knowledge transfer event for farmers organised by the Royal Welsh Feature County. This new event will feature working demonstrations, trade stands and research plots on the title subjects, plus information on renewable energy and animal health.

Chair of the local organising committee, Meirion Owen, says: “This new event builds on the success of the Royal Welsh Grassland events and is a fantastic opportunity to showcase the latest thinking and equipment to manage one of our greatest assets – soil.”

For more information go to: www.rwas.wales

For more information on the event and tickets, contact event secretary Rhys Richards on Tel: 07866 734080 or rhys.richards@rhysrichards.co.uk



Silage is cut from the clamp in blocks that are placed in the feed passage weekly. The process leaves a clean clamp face with low risk of secondary fermentation.

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Focus on low potassium forages to AVOID MILK FEVER

Making a dedicated, low potassium silage for dry cows could pay dividends in the fight against milk fever, as Aly Balsom finds out.

There's nothing more frustrating than a mysterious sudden surge in milk fever, but according to Evidence Group vet and nutrition consultant, James Husband, there's usually one main culprit and it's lurking in the silage clamp.

"If you suddenly get an outbreak of milk fever, it's probably what you're feeding and it's usually the potassium levels in forage," he explains.

High potassium (K) levels increase the risk of milk fever by pushing up the ration DCAB level (dietary cation anion balance), which is the opposite of what you are trying to do in the transition period. Secondly, the potassium competes with magnesium in the rumen, which reduces the magnesium status of the cow. Both effects reduce the cow's ability to mobilise calcium post-calving, thus increasing the risk of clinical or sub-clinical milk fever. Higher milk fever rates are also likely to result in more cases of retained foetal membrane, dirty cows and poor cow transition.

James says the aim should be to keep milk fever incidence below 5% and ideally below 2%. He believes the cheapest way of avoiding milk fever is to focus on reducing dietary potassium levels in the run up to calving. Having a low potassium diet also helps when feeding a low DCAB ration as less anionic salts are needed to get over the 'high potassium mountain'. Anionic salts are unpalatable so having to feed less means ration palatability is maintained.

As most of the diet at transition is forage-based, reducing forage potassium levels should form the main focus of attention in the three weeks before calving.

James adds: "Your main choice of forage should be based on palatability and potassium content. You're aiming for less than 1.4% potassium in the overall transition ration, so you need to get the forage potassium contribution as low as you can."

Grass silage is one of the highest risk forages in terms of potassium content, with levels typically varying from 1.3% to over 3%. Crops cut from a "fresh flush of grass" are usually the highest, whilst crops taken from fields that have had high slurry applications also analyse at the upper end of the spectrum.

James suggests getting a forage mineral analysis done on silage stocks to establish the potassium status. There are then a number of ways to reduce overall levels. However, he believes there are big benefits to be had from producing a dedicated, low potassium grass silage for dry cows (see box). He says the fact a case of milk fever costs around £200 makes the minimal effort required more than worthwhile.

How to reduce dietary potassium levels

1. Make a dedicated low potassium forage

- Choose fields that haven't had dung or potassium applied and/or fields that you could let go to head.
- On block calving herds consider grazing 'standing hay', which tends to be lower in potassium.
- Plan ahead and avoid applying potassium to the land you select (nitrogen can still be applied).

2. Dilute the ration with low potash forages

- Use low potassium forages such as maize (1-1.5% K), wholecrop (1%) or wheat straw (around 0.7%) to dilute potassium levels.
- Damper wholecrop can be particularly useful as it limits sorting and is low in DCAB.

3. Buy in low potash forages

- If you're unable to produce low potassium, homegrown forage, consider buying in low potassium forage such as straw or brewers grains which can be clamped with 5 or 6:1 soya hulls.

4. Use calcium binders

- If you can't dilute high potassium forage with maize or wholecrop, feeding a calcium binder might be the only option.
- This is costly, but it nullifies high potassium forages.



"If you suddenly get an outbreak of milk fever, it's probably what you're feeding and it's usually the potassium levels in forage," says James Husband.

TRAWSGOED UPDATE

Aberystwyth University's Trawsgoed Farm is on a mission to reduce costs of production, with increased use of forage in both dairy and sheep enterprises playing a significant role in the strategy. Farm manager Martin Davies provides an update on progress, 18 months into his role.

Improving grassland remains our most important priority, but it's a step-by-step process by necessity as we still need to maintain efficient performance from our 400 milking cows and 750 breeding ewes.

This has meant targeting the worst performing pastures first for renewal, and then adopting an approach that minimises the impact of taking land out of production and gives the new leys the best possible conditions to establish and thrive.

In 2016, we opted to grow wholecrop (replacing forage maize in the dairy ration) and ploughed up the least productive pastures in time to grow spring barley. The spring barley boosted our forage supplies for last winter, producing around 12 tonnes/acre freshweight, and created an important break that has benefitted the new leys sown afterwards. We drilled the dual-purpose Aber HSG 4 mixture, with white clover, and these leys are now beginning to deliver quality silage and grazing for the cows.

In addition to continuing with wholecrop, this year we are planning to use brassicas as break crops, with the additional forage produced supporting our sheep enterprise. We're considering two varying strategies, one to precede autumn reseeding and one ahead of next spring's reseeding.

Catch crops to finish lambs

After an early grazing, we'll spray off the old sward, except for an

area that will be left to provide a grass run-back for the sheep when utilising the brassicas. We'll apply FYM before ploughing and working down the seedbed to a fine tilth, applying P, K and lime to the seedbed, based on soil test results, to achieve the optimum pH and soil index 2.

The aim will be to drill the fast-growing rape Avon and the leafy small-bulbed grazing turnip Appin, in separate blocks in early May, at 2.5kg/acre. These should produce 1 tonne DM/acre in just eight weeks, providing quality grazing for finishing lambs by the beginning of July and allowing ample time to prepare for autumn grass reseeding.

Autumn and winter forage

As with the catch crop preparation, we'll prepare a seedbed for sowing Redstart hybrid brassica on the remaining ground, drilled around the first week of June at 2.5kg/acre with a slot seeder to a depth of 1cm. We'd expect this to provide around 2 tonnes DM/acre by early September (12 weeks) and provide a valuable high protein forage for finishing lambs that are remaining from the catch crop area.

On the remaining portion of the field we plan to sow Triumph swede, drilled at 1-2kg/acre. This will provide around 3.5-4 tonnes DM/acre of overwinter forage for breeding ewes and ewe lambs.

This ground will be cleared in good time to allow ploughing and seedbed preparation ahead of a spring grass reseed.



Martin Davies



Triumph swede



Appin grazing turnip



Avon forage rape

A range of brassica fodder crops used as break crops are helping to reduce the pest threat when reseeding grassland, whilst also providing valuable late season grazing.

Farm facts:

- 300 ha (741 acres)
- 400 milking cows targeting 8,000 litres (4,000 litres from forage)
- 750 breeding ewes, finishing lambs off forage

Targets:

- Progressive improvement of grassland
- Use of clovers and brassicas to boost homegrown protein
- Wholecrop and brassicas as grassland reseeding breakcrops

Multi-use workhorse AIDS FORAGE EFFICIENCY

A versatile shredder can be a valuable tool on livestock farms seeking to maximise use of forage. Kuhn Farm Machinery's Sam Green looks at the requirements for what should be a truly multi-purpose machine.

On progressive livestock farms, where quality forage is the priority, the shredder is a machine that should rarely gather dust at the back of the shed.

It should be far more than a simple topper to manage grassland that is beyond optimum grazing height, but a multi-purpose implement capable of a range of other tasks that all contribute to more effective growing and use of forage. This will include spring pasture renovation, season-long weed control, shredding the aftermaths of brassica break crops, mulching green manures, and so on.

To meet your own requirements fully, it is worthwhile giving due consideration to the make-up of the machine.

Front or rear mounted

Most operators prefer a front mounted shredder, as this offers best visibility and means all material is

processed before being flattened under tractor wheels. For the best versatility, choose a model with an adaptable headstock – so it will work behind or in front of the tractor.

Hydraulic offset

The ability to easily shift the shredder into an offset position can be useful, particularly if working in plantations or areas with restricted manoeuvrability.

Rotor design

Configuration of the rotor will have an impact on how smoothly the machine runs, it's power use and it's performance. On Kuhn's BPR shredders, for example, the flails are arranged in a helical pattern for optimum balance of the machine. This arrangement also creates a suction effect that means vegetation is upright at the point of shredding, therefore leaving the cleanest and most complete shredding effect.

Shredding mechanism

Hammer flails are fitted as standard on Kuhn shredders. These work in conjunction with two counter knives to provide the cleanest and most complete shredding function for most vegetation – shredding not

stripping. Machines can be fitted with Y-knives instead of hammer flails, where the main requirement is to deal with cereals or maize stubble, for example.

Adjustable hood

An adjustable hood adds versatility to the shredder, as operating with it open allows for rapid progress, whereas working with the hood closed will keep material inside the machine for longer and create a finer chop. This is useful when there is a lot of material to be mulched down and be ploughed in, as it speeds up the degradation.

Roller

The roller is often used to set the cutting height and can have a wider part to play so it is worthwhile opting for a machine with a good diameter roller and robust components. When using the shredder to tidy up swards after winter – ahead of spring growth – a shredder with a good roller will press in loose stones and leave a more productive pasture.

Road transport width

Mounted machines need a transport width of no more than three metres to be road legal.

Reliability and maintenance

Expect your shredder to be kept busy in a variety of situations, so a strong build quality is essential. Maintenance requirements should be relatively straightforward, but be sure to check that grease nipples are easily accessible. The drive to the rotor is a key area, so features such as automatic belt tensioning will reduce any time spent keeping your shredder running smoothly.



STEWARDSHIP SOLUTION

For Cheshire farmer Andy Green, a robust and reliable shredder provides solutions across his many and varied interests, not least in maintaining his commitments within a Higher Level Stewardship (HLS) scheme.

Based at 103ha (255 acre) Bostock Hall Farm, near Middlewich, the mixed farming operation has diversified in recent years with the installation of a solar energy park and a livery yard to supplement the more conventional cereals and store cattle enterprises. With an HLS scheme in operation, grassland is managed extensively by necessity and there are conservation strips within the arable area requiring periodic maintenance.

"We are a diverse operation and now find a reliable shredder to be one of our more useful tools," says Andy. "We bought our Kuhn BPR 280 as a second-hand machine three years ago and use it in its front-mounted format for pasture maintenance, headland management and even for shredding arable stubbles."

Though the current spring has been a slow one and overwintered sheep have kept grassland tidy, revitalising leys ahead of new season growth has in the past been one of the shredder's first outings. The hammer flails on the BPR are ideal for rooting out dead and decaying vegetation after the winter, leaving the sward in the right condition for new growth. The 220mm roller, set close to the rotor, gives the machine good ground-following qualities and leaves fields in the right condition for a

productive season.

Later in the year the BPR becomes a valuable ally in weed control, as herbicide use is restricted under HLS requirements. Being able to quickly and efficiently cover the ground before weeds go to seed is an essential job in maintaining pasture quality.

"It's the versatility that really pays dividends," concludes Andy. "We've had spring barley crops that we've combined very high due to heavy grass content, leaving a really long stubble, but the shredder makes light work of mulching all this down ahead of the plough. The same applies to the buffer strips in the field margins, which we cut every other year. These can be thick with vegetation, but the BPR copes with it easily."



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Chewing the cud

with Karen Brewer

Karen ruminates with Dr Liz Genever, beef and lamb scientist at AHDB, on how farmers can profit from the latest independent variety performance evaluations available in the new Recommended Grass and Clover Lists (RGCL).

KGB: Welcome to Forager Liz and thanks for bringing in copies of the new RGCL, hot off the press. When will farmers be able to get their hands on it?

LG: Thanks for the invitation Karen. Yes this is an early proof as the new editions are soon to be launched at Grassland & Muck, Stoneleigh, on the 24th May. Farmers attending the event will be able to pick up a copy from AHDB, British Grassland Society and most seed supplier stands and it will also be available on both the AHDB and BGS websites. Beef and lamb levy payers will also receive copies in the post, direct from AHDB, in early June.

KGB: This is the sixth year that AHDB has handled production and distribution of the RGCL. What level of recognition is it getting on farm and is it being put to valuable, practical use?

LG: According to a new survey of farmers who have recently sown new leys, only 2.5% of respondents were unaware of the RGCL while more than two in three (68.6%) said they referred to the Lists when planning reseeds in 2015 or 2016. So we know the information is getting to producers and the majority are making good use of it when making reseeding decisions - although clearly there are some who could be using it to greater advantage. It is important to recognise the structure behind the information made available in the RGCL, the huge amount of work funded by the breeders to get the data, the 10-12 years of research it typically takes to get a variety on to the Lists and the effort everyone puts in to keep improving the grass and clover varieties available for farmers to use.

KGB: There's certainly a lot of detailed information on the Lists, how would you like to see it being used on farm?

LG: The RGCL represent the top end of grass and clover varieties available, those that will deliver the highest yields, best digestibility, greatest disease resistance and longest persistency. Reseeding with varieties selected from the Lists will therefore provide the greatest potential for increased grassland performance and higher levels of production in terms of tonnes of silage, kilos of lamb and beef and litres of milk. From the information on the Lists it is possible to put together a bespoke seeds mixture to meet your own specific situation, but we recognise that most farmers will be buying an off-the-shelf mixture put together by their supplier. Before committing, they should get a label and check the varieties in the mixture are on the RGCL. For any that are not on the Lists, they should ask the supplier for more information.

KGB: You don't see the RGCL replacing the advice and support available from seed breeders and suppliers?

LG: Quite the opposite, we want to see an increase in conversations between farmers and seed merchants, with the Lists being used as a tool by farmers to ask more questions of their suppliers and ensure they are getting the right seeds for their farm. Reseeding is not cheap, so farmers need to make sure new leys are fully utilised to get the greatest benefit for the longest period possible. That means they have to be fed and managed



Liz Genever says checking varieties are on the RGCL is a must before buying seeds mixtures for reseeding.

appropriately, but also that the right varieties are sown in the first place to match the requirements of the farm system.

KGB: In addition to the core measure of total annual dry matter yield, what are the other key performance factors identified for each variety on the RGCL?

LG: For grasses it is D-value, ground cover and disease resistance and for clovers, protein content and ground cover. D-value is a measure of quality and refers to the percentage of the dry matter that can be digested by an animal. A higher number is better and this also includes water soluble carbohydrates. Disease resistance can be an important factor depending where you are and the specific situation on your farm, particularly as grassland is generally not sprayed for disease control. Ground cover is a measure of persistency, measured in the second or third harvest year. It is an indicator of the relative lifetime of a variety in the practical situation, although of course grassland management determines the lifetime performance of grass reseeds on the farm.

KGB: Over the last few years, have you seen any significant changes in the way farmers are managing their livestock systems that potentially have an impact on the grass varieties they should be including in reseed mixes?

LG: Seasonal growth patterns have become an important management factor, with more farmers looking for a longer grazing season. We have seen a decline in the number of early heading varieties on the Lists and many farmers have become less focussed on early spring bulk and look for a mix balanced across all seasons. Mixes containing varieties heading at widely differing dates do tend to be harder to manage so where extended grazing is a key part of the system, mixes weighted towards later heading varieties are often the better tool. We are also seeing a change in the diploid versus tetraploid situation, primarily due to breeder investment in developing better varieties. Traditionally diploids had better persistency and tetraploids better utilisation due to animal preference. This difference between them is now less clear cut as there are diploid varieties giving excellent silage and tetraploids with good persistency. The Lists shows what each variety can deliver.

KGB: With so many variables from year to year and season to season, how can farmers know the varieties chosen today will be the right ones for tomorrow?

LG: Reseeding provides a significant boost to performance. Using varieties that are on the RGCL guarantees you have the best grasses and clovers currently available and therefore maximum genetic potential. Naturally farmers are looking for flexibility and multipurpose mixes continue to sell well, but the Lists provide the information for farmers to make better decisions, ask harder questions of their suppliers and select mixes that match their practical requirements.

KGB: For those really wanting to get into the detail, is there more available than the A5 booklet?

LG: We also produce a larger A4 format, accessible on the AHDB and BGS websites (with printed copies available by request) that has additional information including regional disease risks, and there is also an interactive tool on the AHDB Dairy website that farmers can use in making their reseeding decisions.





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