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ISSUE 19: Spring 2019

FORAGER

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Quality raking Quality forage



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From the cover MEASURING FOR MANAGEMENT

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In the Winter issue of Forager, readers had the opportunity to enter into a draw to win a free pair of AIGLE wellington boots. Here, Helen Mathieu, Area Sales Manager for Germinal, hands Don Shore of Stryt Isa Farm his new pair of wellies. Mr Shore is a dairy farmer in Chester.

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Editor's NOTE

To drive productivity in a post-Brexit world, all grassland farmers must embrace the growing number of technologies available to them, writes Aly Balsom.

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We're on the cusp of a "fourth agricultural revolution" which will be underpinned by technology and innovation.

That was the message from Michael Gove in his speech to the Oxford Farming Conference (OFC) at the start of the year and was a message that resonated throughout last month's Dairy-Tech event at Stoneleigh Park.

The fact the industry now has an event that's dedicated to dairy technology speaks volumes in itself. For years, the livestock sector has been

viewed as the poor relation to the arable sector which has been embracing cutting edge tech

for years - but no more. We're catching up, and the gains that are being made are marked.

It's about time. As we know, UK farming has lagged way behind countries like Germany and Australia in the productivity stakes since the 60s. It's now widely recognised that the use of technology is part of the solution to surviving post-Brexit and without farm subsidy after 2027. That was highlighted by the government's £40 million productivity grant supporting investment in technology, released last year.

At the OFC Gove said analysis of big data, drone development, machine learning and robotics would together "allow us to dramatically improve productivity on

traditionally farmed land, not least by reducing the need for labour, minimising the imprint of vehicles on the soil, applying inputs overall more precisely, adjusting cultivation techniques more sensitively and therefore using far fewer natural resources, whether carbon, nitrogen or water, in order to maximise growth."

Making the most of GPS is one thing that grassland farmers could get much better at. In this issue, we look at the role of Controlled Traffic Farming on grassland in limiting soil compaction and boosting dry matter yields. In fact, taking the time to drive on set routes in the field, rather than simply taking the fastest route back to the clamp, has been shown to boost yields by around 13% (page 14).

There's no doubt technology is getting cleverer and is of increasing relevance to

grassland farmers. At Dairy-Tech there were presentations on the use of drones to assess when maize crops were ready to

harvest and robot weed killers. The Small Robot Company - which has been part funded by farmers - is developing three robots; Tom, Dick and Harry. Tom roams the farm, identifying where weeds are a problem and whether plants are healthy. In the future the aim is to also enable him to take soil samples. He can then send for the treatment robot, Dick. He will arrive on farm and locate and kill individual weeds with an electronic zapper.

But technology doesn't just mean fancy gadgets, it means adopting innovative management techniques, such as using grazing management software and sexed semen to ensure the value of everything produced on farm is maximised. This forward-looking approach is one being adopted by Tristan and Jacki Dale in Shropshire (see page 16). The new GrassCheckGB initiative is also another example of the role of monitoring and recording grassland productivity data to drive performance (see page 12).

As beef farmer, Michael Shannon puts it: "If our livestock industry is to really progress, we need to be managing from the perspective of hard facts and data."

This is ultimately what technology will help us do. 

There's no doubt technology is getting cleverer and is of increasing relevance to grassland farmers

Next generation

As part of the Next Generation series, Aly Balsom meets Bertie Newman, the youngest of AHDB Beef & Lamb's Strategic Farmers and a new advocate of taking forage seriously.

Purchasing a new farm and owning more acres, whilst also deciding to finish all beef animals, has given Bertie Newman the impetus to improve grassland and produce quality homegrown forage.

The fact the Dorset unit is organic also makes the reasons for growing more on farm even stronger.

Bertie explains: "Organic straights are significantly more expensive than conventional, and often have lower bushel weights. We've got quite a lot of space - it's about getting the best out of it. When you're fattening cattle, you've also got to be more conscious of the quality of the feed you're making."

As a result, since purchasing the 132ha (325 acre) farm in 2017, with father Dan, the pair have turned their attention to improving grassland. This has involved soil testing, hard fencing some fields and moving to a rotational grazing system. With most of the land in stewardship schemes, reseedling has been focused on 49ha (120 acres) that is possible to plough and improve.


This has largely involved planting ryegrass and clover leys to add nitrogen to the soil and push up silage protein. 8ha (20 acres) have also been overseeded with herbal leys as a trial. These mixes include forages such as vetch, chicory, lucerne and plantain. Some spring barley is also grown, which will be followed by turnips (for lambs), and then the ryegrass clover mixes.

The rotational paddock grazing system mostly consists of the 49ha split into 1.4-1.6ha (3.5-4 acre) blocks.

"Grazing management is probably the most important thing I've learnt in the last two years," Bertie says. "Even if the leys have been poor quality, they have been improved by rotational grazing."

However, the farm's reseedling policy has helped drive improvements in silage quality which is also aided by Bertie's attitude to silage making.

"I try and cut early, when grass is ready, rather than by date. I'd rather have quality, than big bulky cuts," he explains. This means his early 2018 cut was 12ME.

As part of his involvement with the Strategic Farmers, Bertie has also started testing big baled silage. He will note down silage quality in a diary and mark up bales using tail paint so he knows which bales come from which field. This has enabled him to identify different quality stocks, which can be partitioned towards the appropriate group of animals. For example, growers of 350-450kg will receive 1-1.5kg barley plus the highest protein silage, whilst finishers of over 550kg will get 3kg barley and the highest energy silage. 

In the HOT SEAT



Name: Bertie Newman **Age:** 24 **Farm:** Manor Farm, Cattistock, Dorchester, Dorset.

System: 607ha (1,500 acres) farmed including 132ha (325 acres) owned. 120 Aberdeen Angus x Friesian and 20 Hereford sucklers put to a Charolais terminal. All calves are finished at around 23 months. 1,200 North Country Cheviot ewes, put to a Texel terminal and lamb in April. Lambs sold deadweight.

What's the biggest challenge you've faced to date?

Persuading the bank manager to lend me some money. It was down to a good business plan and a bit of luck in the end.

What do you think your biggest challenge will be in the future?

The continued push from supermarkets for cheap food, which will always keep margins tight.

What's been your greatest success?

Moving and becoming part of the business. I'm pleased so far with how the business is going.

Where do you see yourself in 10 years' time?

There's two options; I'll either be farming a bit more ground with more stock, or I'll be bankrupt!

Name three things in your life which are key to your success

My parents, Dan and Helen, my bank manager and a bit of good luck.

What's the best bit of advice you've ever received?

There's no such thing as a problem, just a solution that hasn't been found.



How to set up sheep rotational grazing

Adopting a rotational grazing system on a sheep unit can bring big benefits, but requires some strategic investments in infrastructure. Aly Balsom finds out more.

So you've heard from other farmers and consultants that rotational grazing is the best way to manage grassland, but you aren't quite sure whether it will work for you or where to start - so what should you do?

Grassland consultant James Daniel from Precision Grazing believes sitting down and doing the calculations around return on investment should be the first port of call. Once you've done that, the decision should be a no brainer. Then it's simply a matter of deciding what set-up works for your farm.

"You can justify the investment by simply looking at the ability to grow more grass over winter and spring," James explains (see box 1). "Everyone has a winter feed deficit and everyone can do better at extending the grazing season and setting themselves up for a better spring."

Work out ROI and labour costs

By rotational grazing in the autumn and winter, potential grass growth will be maximised and utilisation

improved because ewe intakes are restricted to what they need, rather than what they want. Such a strategy will also improve spring growth potential.

Add to that, the added long-term benefits of improved sward longevity, pasture quality and summer grass growth - leading to better lamb performance post-weaning - and the message only gets stronger.

Farmers then need to cost in their time to evaluate what kind of system they want to install.

- Permanently splitting up fields with an electric fence will cost more but require less labour on an annual basis.
- A temporary system will cost less, but requires more labour input each year.

James advises that owner/operators use a labour cost of £30/hour to take into account what you would have to pay someone else to do that job, which includes budgeting and planning.

Plan water

The next and most important step is determining your water supply. Often farmers start with the fencing, but water supply will determine if and how you are able to divide fields.

James estimates that water makes up 30-40% of total rotational grazing infrastructure costs on a sheep system, with pipework alone potentially costing about 45p/metre.

- Look at pipe size and flow rate.
- Plan for peak demand (June/July) when ewes are lactating and temperatures are high.
- A 70kg lactating ewe requires 10.5 litres/day. So 200 ewes and lambs need 2,100 litres/day.
- Using small portable troughs (<200 litres), which move with the flock, reduces total investment cost, but the flow rate needs to meet demand. 200 ewes require minimum 5.8 litres/minute.
- Increasing pipe diameter is the best way to improve flow rate on a mains or gravity-fed system (eg. increasing from 20mm to 25mm, +56% cross-sectional area).

- If you have your own water supply, it may be possible to increase the pressure in the system to increase flow rate.

Moving water to stock should always be seen as a last resort as it is time-consuming. Instead, see if you can pipe water from one field to the next. Portable troughs (if sufficient flow rate) or larger troughs, located in the centre of a field that will be split, can be an efficient way to provide water.

Map the farm

Grassland consultant, Charlie Morgan says the next step is splitting up the farm into equally sized paddocks where possible, whilst taking into account water supply.

- Establish group size - ie. 200-300 animals per group.
- Match paddock size to group size, labour, grass growth and stock requirements.
- A ewe will eat 2.5% of her body weight a day.
- Work on an average stocking rate of five ewes an acre for the whole year.

Example:

- 200 ewes/group, weighing 60kg = 1.2kgDM/head/day requirement or 240kgDM/day total.
- Paddocks are entered at 2,500kgDM/ha, grazing down to 1,500kgDM/ha, with 500kgDM/ha of wastage.
- 2,500kgDM/ha - 2,000kgDM/ha (1,500+500) = 500kgDM/ha available grass/ha.
- For a paddock to last two days = $2 \times 240\text{kgDM/day} = 480\text{kgDM/ha}$ requirement.

At this level, 1ha is meeting requirements for two day's grazing, so split fields into 1ha or 2.5 acre sizes.

Think about fencing

Temporary

- Polywire is light and flexible, making it perfect for temporary fencing. However, its high level of resistance means a high voltage drop on long distances, so avoid using for medium-longterm fences.
- Consider the size of the energiser used, which will be influenced by the length of fence.

- One joule of stored energy is needed per 600m of fence (3 strand polywire) or 1500m (3 strand steel wire).
- Solar power has come a long way - off the shelf solar energisers now go up to 10-15 joules.
- Solar power units cost about £100-£150 more but will eliminate the risk of a battery going flat and save time from not having to collect sheep that have broken out.

Permanent

- How you set up permanent fencing will depend on practicalities such a topography and how many wires you want.
- Cost - about £1/metre.
- Consider gate placement and materials - fibreglass posts are preferable over wood or steel as it means modified vehicles or stock can cross over them, which reduces labour input. **i**

1 Rotational grazing - how the numbers stack up

Farmers are often tight for grass during March and many provide supplementation to ewes (pre lambing or post lambing). By rotational grazing from September to scanning and providing lambing paddocks with a 120 day rest period, the farm has more grass in spring and growth potential is dramatically improved, which could remove the need to supplement for about 28 days.

Example Farm:

- 400 twin-bearing ewes receiving 0.5kg/head/day of concentrate = 200kg concentrate/day.
- @£260/tonne + feeding out costs of £50/tonne = £62/day.
- Over 28 days = £1,736 cost saving.
- Depending on set-up, this saving could pay for the investment in infrastructure for rotational grazing.

2 Charlie Morgan's key considerations before rotationally grazing

Get soils right first - Test soils and address any imbalances. You can't expect good grass growth on a rotational system without a good base.

Measure it - Make sure you measure grass covers using a sward stick or plate meter so you can plan rotations and manage effectively.

Can you utilise the extra grass grown?

Whether it's lining up the contractor to cut the extra grass or introducing more stock, make sure you have steps in place to utilise the grass grown.

Grants - Are grants available in your area to help with investment in rotational grazing?

Managing for maximum efficiency

Combining forage budgeting software with low tech infrastructure is helping one Sussex sheep farmer capitalise on the benefits of rotational grazing, as Luke James finds out.

For flock manager Matt Blyth, grassland management is all about setting targets, measuring, monitoring, and analysing the results.

That's how he knows that efficiencies resulting from rotational grazing contribute an additional 1.5 tonnes DM/ha, with no extra inputs, and that his reseeded leys produce 50% more dry matter than his unimproved grassland. With dry matter valued by Matt at between 9 and 11p/kgDM, he's able to equate the gains from rotational grazing to £135/ha of extra income.

He's spent 15 years at Didling Farms, near Midhurst in West Sussex, fine-tuning his paddock grazing system, and – with good use of forage budgeting software, alongside what he describes as 'low tech' infrastructure – he's as close to being in full control of his inputs and outputs as any sheep farmer.

The farm includes an arable component and in total extends to 330ha (815 acres). The 183ha (452 acres) currently in grassland comprising 38ha (86 acres) of zero input downland, 56ha (138) of permanent pasture and 89ha (220 acres) of reseeded leys. During the peak grass growth period, this supports a flock of 800 Lleyne and Lleyne x Aberfield ewes and a contract calf grazing enterprise that runs alongside the sheep.

Ewes come inside prior to

lambling, when they receive a TMR based on high quality red and white clover silage. They then go straight out on to the paddock grazing system soon after lambling in late March.

Paddocks

"The entire grazing area is organised into 2 to 3ha paddocks and at the outset we'll have 40 to 50 ewes with lambs on a paddock," explains Matt. "As grass growth increases, so does the stocking rate, and at the peak we could have as many as 250 ewes plus lambs on a paddock. We maintain this system through to weaning in early July and beyond."

Whilst efficiency of grass utilisation is the main benefit, Matt also believes the system offers significant time saving, with the sheep tightly stocked and running between paddocks every two or three days.

He explains: "Compared with shepherding a flock spread over a large area, working with ewes and lambs in confined spaces means you see every animal routinely, with little effort. It's a big benefit that's not always appreciated when first looking at the system."

After weaning, ewes take priority over lambs, to ensure they reach and maintain the right body condition score for tupping and

through to housing pre-tupping.

"It's vital to maintain the required dry matter intakes in the ewes at this stage, otherwise we'd pay the price with a lower lambing percentage," explains Matt. "If grazing is compromised for the lambs, we can compensate by feeding creep or selling a bigger proportion as stores, but it won't affect the business in the longer term."

Quality leys

The highest value leys are those that are in the reseeding cycle, so no older than seven or eight years and comprising what Matt considers the best grass varieties available to suit the farm's needs.

"We always reseed with Aber High Sugar Grass leys, as these provide the best combination of dry matter yield and digestibility," he adds. "We include white clover and have also tried including herbs. We've tried perennial chicory, but now favour plantain as the herb option in with the ryegrass and white clover. The plantain certainly gives higher growth rates, is more drought resistant and I believe gives us the bonus of early growth that really helps in the spring."

Red clover is another forage option that Matt sees real value in, with AberClaret included in leys destined for silage for the in-lamb ewes when they come inside.

The silage aftermaths, with red clover component, provide an ideal sward for finishing lambs.

Forward planning is key to the long-term success of the system and Matt makes full use of the Farmax feed budgeting programme to forecast future production, stocking rates and field allocations. It's a system that allows him to optimise performance off pasture and add value by making full use of any surplus production. It is allowing the farm to take on additional stock in the form of contract black and white beef calf grazing, something that Matt calculates has contributed £4,000 of additional income in the last year. **F**

Infrastructure considerations

When it comes to infrastructure and equipment to support the rotational grazing platform, the biggest consideration is provision of water. By supplying this through overground alkathene pipes and portable drinkers the cost is not excessive.

Matt believes fencing itself is easily affordable when set against the additional dry matter production possible.

Batteries are a cost, and can go missing, so he is now set on investing in a mains power supply around the perimeter of the grazing area – a cost he thinks will soon be recouped through not having to replace or charge batteries.

With grass covers measured with a sward stick, and a soil probe used to determine nitrogen application timing, the farm is a good demonstration of how a good degree of precision management can be achieved without breaking the bank.

Relative dry matter production per year

Pasture type	kg DM/ha
Downland	2,500
Permanent pasture	6,000
Aber HSG ryegrass + white clover	9,000
Aber HSG ryegrass + red clover	11,000



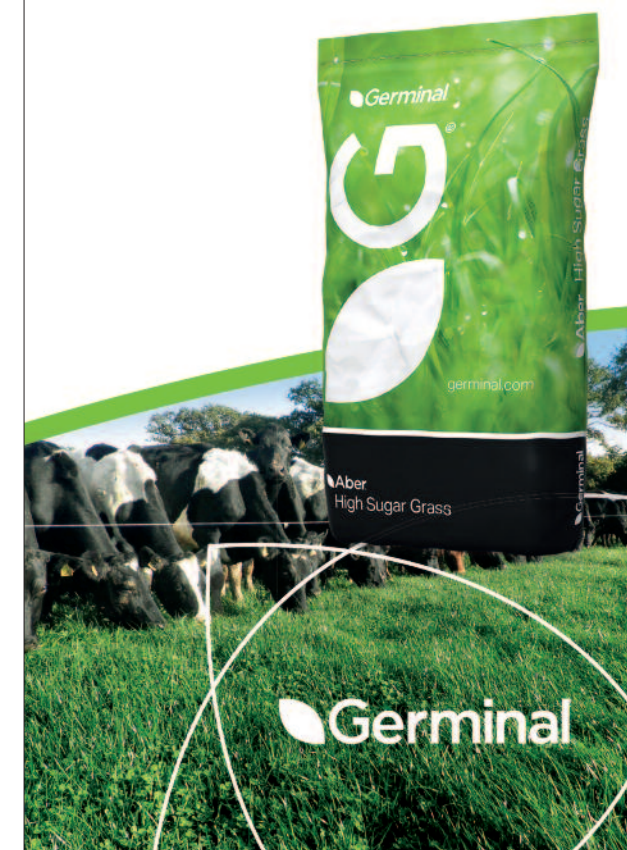
Matt Blyth is able to equate the gains from rotation grazing to £135/ha in extra income.

Aber HSG
Mixtures

Maximise the value of your leys

- 100% Aber High Sugar Grass
- Outstanding season-long yield, quality and energy production for highest financial returns
- Leading varieties on the UK Recommended Grass & Clover List and the Irish Pasture Profit Index.

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Monitoring growth and forecasting forward with the Farmax software allows areas of grassland to be taken out to make quality silage at the right time.

Planning for resilience



This year's 20th Positive Farmers conference in Cork, Ireland, talked about the resilience of pasture based systems and lessons from 2018. Aly Balsom caught up with some of the speakers after the event.

Every October, the team at Saturn Farms sits down and puts in place a forage plan for the year ahead.

Such a plan is underpinned with financial figures, with the business looking at the acres needed, reseeding plans, contractor fees and fertiliser costs to hit forage requirements, based on stock numbers.

"We have an exact plan for forage for the year and a target for winter fodder," Bill O'Keeffe, CEO of Saturn Farms, told *Forager*. "We're quite structured and quite rigid. That's important for us and it helps our share milkers perform better."

The Saturn Farms business has three share milking arrangements (see box) and works with landowners. All of the share milking arrangements are based around a grass based, spring block calving model.

Data sharing

Data sharing is seen as key to success, with all farms having a grass growth graph pinned to the wall and a recording sheet which outlines forage requirements. As silage gets made, the sheet is updated (see table) so the teams can see if they're on track to meet requirements.

"This is a plan and we continuously go back and monitor. This is done monthly. We do a stocktake and update the table accordingly," explained Bill.

It's a strategy that helped last year as the farm teams knew they were short for this winter by the time they got to July. As a result, fodder could be bought-in, well in advance. Westerwolds were also drilled after corn on three of the farms to help bridge the forage gap.

Bill believes a daily 9.35am conference call between all of the farms also "creates a rhythm that drives execution".

Data captured from all of the farms in the preceding 24 hours will be displayed on a dashboard on each unit. Teams can then share

their milk performance, any animal health issues or grass management challenges, with each other.

Bill added: "We have daily conversations about the grass the cows are going in to and how they have grazed out in the last 24 hours. Some farms might have a challenge with grass quality or poaching. Then someone else may suggest a solution to the problem from another farm; could they look at on/off grazing or back fencing for example? It's about sharing ideas and the KPIs of the last 24 hours."

Culture

This fits with Saturn Farms' culture of creating a positive team environment, which is fuelled by a passion to continuously learn and develop (see box). Bill believes this has helped to retain their team and also see them prosper, despite the

challenges of 2018. Last year everyone was under pressure due to the drought, which meant long hours to ensure stock were fed.

Saturn Farms works hard to develop their teams. Bill believes the business' track record of retaining every team member who has passed probation, is testament to this.

"It's creating a culture where they feel valued," he said. "You're better able to deal with challenges if you have strong teams and you need to do everything you can to build strong teams."

This includes investing in annual training and completing quarterly reviews with every team member.

Bill added: "We believe sharing Saturn Farms objectives allows all team members get on board to achieving the overall goal and feel part of something bigger."

Saturn Farms - example forage budgeting table (working on a 22% dry matter silage)								
Farm	Number of silage bales made in last 24 hours	Tonnes in pit (fresh weight) last 24 hours	Bales yield (DM)	Total tonnes in pit (DM)	Total tonnes DM yield	Total tonnes DM required for 5 month winter	Acres	% to fill
Conna	355	350	71	77	148	707	472	79
Griffinstown						361	241	100



The Saturn Farms team has three values: Learn Forever, Think Win Win, We Try Harder.

Saturn Farms - Fact File

- Headed up by Bill and Audrey O'Keeffe.
- Saturn Farms leases farms from landowners that wish to step away from daily tasks associated with farming.
- Business aims to support young people getting into agriculture.
- Saturn Farms has share milking agreements with a number of young farmers.
- All of the share milkers began as employed workers for Saturn Farms first, but with the ultimate aim of running their own unit. Once they proved themselves,

gained knowledge and built capital, they then set up a share milking arrangement with Saturn Farms.

- Saturn Farms provides HR and farm management support, together with training.

The share milking arrangements are:

- Eoghan and Cherish O'Dwyer at Griffinstown and Burrow Farms – two 260 cows herds.
- Rob Colton at Giltown Farm - 270 cows
- Padraic Greene at Conna Farm - 400 cows

Stocking rate drives profitability

Stocking rate is a "strong productivity force," which requires careful consideration by farmers in order to drive profitability and environmental sustainability on grazing systems.

Data from The National Farm Survey of Irish dairy units highlighted the economic benefits of stocking rate. The results showed that farmers with a higher stocking rate (SR) of 2.53 cows/ha had a higher gross margin per hectare of €4,045. This compared to a €1,710/ha gross margin on the 'bottom' farmers with a SR of 1.65 cows/ha. This was linked to the positive effect of increased SR on pasture utilisation, with every 1t of DM/ha utilised, worth €180/ha.

A separate study of farm data from across the UK, EU, Australia and New Zealand, also showed that, on average, every one cow per hectare increase in SR, gave an 11% increase in milk solids per hectare.

However, Dr Brendan Horan of the Animal & Grassland Research and Innovation Centre, Teagasc, stressed that correct SR for an individual farm stemmed around balancing feed requirements with pasture growth.

"Stocking rates need to be high as a force for productivity and profitability, but not too high so there are negative environmental consequences. You're looking for a moderate stocking rate that delivers relatively high performance and good grass utilisation, with minimum feed input," he explained.

In Ireland, the average grass focused herd had a SR of 2 LSU/ha (Livestock Units), and fed 1t/cow/year and grew about 10t of grass/ha or less. However, Brendan believed these farmers could make big gains in performance by increasing their stocking rate to 2.5 LSU/ha by growing more grass and relying less on supplementation. This would be achieved by thinking about areas such as better soil fertility and grazing practices.

He concluded: "The answer to producing food in a sustainable way is getting better and our systems need to improve. That includes good herd genetics, a compact calving to match the grass growth curve and stocking accordingly."

This requires clarity and disciplined management around:

- Pasture cover at calving.
- Rotation lengths.
- Grazing intensity and residuals.
- Use of supplements.



Stocking rates need to be high as a force for productivity and profitability, but not so high that it causes environmental consequences, says Dr Brendan Horan.

Appropriate Stocking Rate (SR) (LSU/ha) of pasture based systems				
t supplement DM/cow	Pasture grown, t			
	10	12	14	16
0.00	1.5	2.0	2.3	2.6
0.25	1.7	2.1	2.4	2.8
0.50	1.8	2.2	TARGET: 2.5	3.0
0.75	1.9	2.3	2.7	3.1
1.00	CURRENT AVERAGE: 2			

Target 2.5 LSU/ha, feeding 500kg a cow a year of supplementation and growing 14tDM/ha.

Measuring to aid management



Forager reports on GrassCheckGB, a new initiative to help all farmers across Great Britain improve grassland productivity and pasture utilisation.

A pilot network of 50 beef, sheep and dairy farms across England, Scotland and Wales has been set up to provide data for GrassCheckGB, a project that will monitor the growth and quality of pasture and make predictions of future growth.

Findings from the project will be published weekly enabling farmers to plan and make informed decisions on grassland management.

Each of the 50 farms will additionally receive specific information on their grassland productivity and utilisation, nutrient efficiency and performance of livestock from grass on their own farm. They will also have the opportunity to discuss their grassland performance with grazing management specialists and network with other pilot farmers involved in the initiative.

The initiative is a collaboration between the Centre for Innovation in Livestock (CIEL), The Agri-Food and Biosciences Institute (AFBI), Rothamsted Research, the three GB

meat levy bodies, and industry sponsors Germinal, Waitrose, Cawood Scientific and Handley Enterprises.

Nikki Dalby, project lead for CIEL says the selected farms form an effective monitoring network, representing a range of geographical areas, soil and climate types and farm system.

She adds: "We are in the process of organising the installation and testing of monitoring equipment across the network. This will enable us to capture key meteorological data such as temperature, rainfall and sunshine hours, and each farmer will measure grass every week throughout the grazing season.

"Benchmarking current and potential grassland performance will support novel research and we hope will encourage uptake of innovative grassland management practices such as pasture (grazing) management and nutrient budgeting."

CIEL is supporting the purchase of equipment on farms using funds from Innovate UK, the UK's Innovation Agency.

Farmer set-up meetings have taken place in Devon, Powys, Yorkshire, Perthshire and Dumfries and Galloway, offering farmers training on measuring grass yield and the technical specifics of the monitoring equipment and software.

The Agriculture and Horticulture Development Board (AHDB), Hybu Cig Cymru (HCC) and Quality Meat Scotland (QMS) are supporting the involvement of the beef and sheep pilot farms using the £2 million fund of AHDB red meat levies, which has been ring-fenced for collaborative projects. This is managed by the three GB meat levy bodies. The ring-fenced fund is an interim arrangement while a long-term solution is sought on the issue of levies being collected at point of slaughter in England, for animals which have been reared in Scotland or Wales.

"We're looking to maximise the growth rates off grass and will typically average 1.5kg/head/day over the grazing period," says Michael. "We then outwinter on brassicas, with bales placed in situ as supplementary forage. We've done well with hybrid brassicas such as Swift, and this year we've experimented with a swede and kale combination, which I call my 'TMR in the field'. We aim to average 0.6kg/head/day from outwintered cattle."

Grassland is routinely reseeded with the Aber High Sugar Grass long term grazing ley Aber HSG 3, which is entirely comprised of high D-value diploid perennial ryegrasses.

"I'm focused on grazing, so I'm using varieties that rank highest for grazing yield and grazing D-value on the Recommended Grass and Clover List," adds Michael. "I don't set out to make silage, but when grass growth becomes too strong to be effectively managed with grazing, we use silage making as a management tool to maintain sward quality."

Currently, Michael manages his rotational grazing system using a sward stick, introducing cattle at a sward height of 12–15cm and moving them on to fresh grass daily. During the peak growth period, cattle will easily be achieving growth rates of 2kg/head/day off grazed grass.

"There's always scope to do better and there's no doubt in my mind that managing from the perspective of accurate data will be a step forward for my business."

Look out for updates on the GrassCheckGB project in future issues of *Forager* magazine.



If our industry is to progress, we need to be managing using hard facts and data," says beef farmer Michael Shannon.

CASE STUDY - Filling an information gap

Lanarkshire beef farmer Michael Shannon believes his involvement in GrassCheckGB will provide valuable data which was previously unavailable for his 100ha (247 acres) beef and sheep farm.

"I found there was a lack of local knowledge available on what is possible to grow in our area," says Michael, who farms at Thankerton Camp Farm near Biggar. "That was a big frustration when we were setting up our forage-based system as we had no idea of

what was possible, and little chance of doing effective forage budgeting.

"Over the years we've come to know the potential of our ground and learned how to judge grass growth by eye, but we still don't have figures. If our livestock industry is to really progress, we need to be managing from the perspective of hard facts and data.

"You cannot manage what you're not measuring, in my view, so this initiative is a welcome development and should provide a

boost to anyone seeking to maximise their production from forage."

Michael finishes 150 beef cattle a year, entirely off forage, in addition to running a lambing flock of 235 ewes. Store cattle are bought in at around 12–15 months of age and will reach a target carcass weight of 300–320kg after about a year on the farm. Two-thirds of his finished cattle are sold through his own Damn Delicious quality meat business.



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Controlled traffic farming boosts grass yields

Adopting controlled traffic farming on grassland has the potential to reduce soil compaction and drive about a 13% increase in dry matter yields. Aly Balsom finds out more.

It can be all too tempting to go for the quickest and most direct route out of the field when you're carting silage back to the clamp, but such a random approach could be damaging soils and depressing grass yields.

Such ad-hoc movements of traffic over grassland means that, on average, about 83% of a field cut three times using a forage harvester, with slurry applied, will be covered in wheelings. On those areas, soils will be compacted and less productive (see box 1). In fact, one SRUC trial highlighted a 14.5% reduction in yields over three years on both heavy and light soils when compacted using machinery.

Dr Paul Hargreaves, grassland researcher for SRUC has been involved in numerous studies looking at the effects of soil compaction. This has included AHDB's "Controlled Traffic Farming: Methods applied to Grassland Silage Management" Report, which involved SRUC and Harper Adams University College.

Paul believes grassland farmers have much to gain from adopting controlled traffic farming (CTF) systems, commonly used on arable systems.

"It's about trying to control the movements of machinery around a

field to limit the area they cover and running all machinery along similar wheelings. It's trying to think of grass as an arable crop," he explains.

This means that, rather than driving anywhere on a field, all traffic must follow the wheel marks that run parallel to the line of traction and then around the headland. This may take more time and investment in equipment, but this is paid for with improved yields (see box 2). Increased fuel costs are also negligible, with results from an AHDB Yorkshire demonstration farm actually showing a reduction in fuel consumption from 7.98 litres/ha to 5.82 litres/ha by using CTF. The trafficked area in this case was reduced from 57.4% to 23.5%.

"We need to reduce damage to soils and controlled traffic farming seems to be one of the ways to do it," comments Paul.

He recognises that a CTF strategy involves a bit of planning, but is more than doable on a grassland system. He suggests thinking about the following:

1. Calculate your smallest working width

Establish the working width of your equipment (or contractor's equipment). This is the smallest width all of the equipment will cover as they move across the field. For example, if your minimum working width is nine metres, then all your equipment needs to work within that width - including the rake, slurry spreader, forage harvester etc. This means equipment will likely have to work along 3m wide tyre tracks in the field.

The critical thing is getting the forage harvester and trailers to work within this width (see graphic).

2. Plan out each field

Once you know the working width of your machinery, divide the width of each field by this number to work out the lines. For example, if the field is 162 metres wide and your minimum working width is nine metres, split it into 18 lines.

If a field is not evenly divisible by the working width, ensure you record which areas machinery is travelling on more and target remedial work on that area.

3. Invest in technology

To adopt CTF, investment in technology will be needed. As a minimum, Paul believes GPS technology is a must. However, to fully appreciate the benefits of CTF, auto-steering, together with GPS is the best option. The level of accuracy of the GPS system used will effect costs and thus return on investment (See box 2).


Many modern tractors have GPS fitted as standard, but are often underutilised in grassland situations. "If you've got it, use it or make sure the contractor uses it," adds Paul.

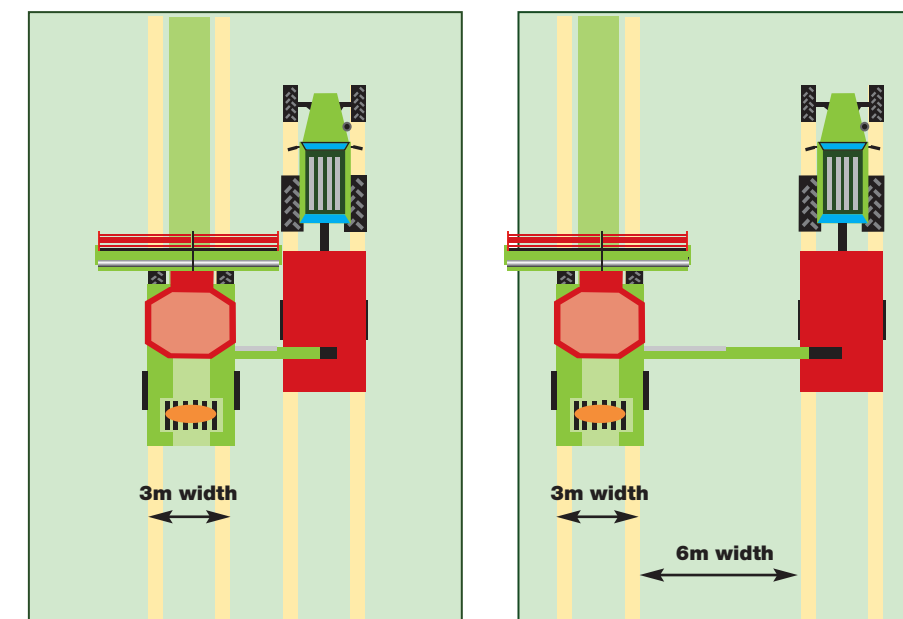
At a basic level, if farmers are reluctant to invest in technology, then simply not driving in diagonals across a field can be beneficial. Using marker posts in the field to define the travel lines can also help tighten up wheelings. However this will be dependent on the accuracy and care of individual machinery operators.

Compaction is greatest when machinery is driven on wet ground, which makes autumn and the first pass in early spring, key risk periods. Trials have found that soil compaction caused by traffic in the autumn will negatively effect first cut yields the

following year. If possible, Paul advises avoiding driving over wet ground after heavy rain.

- The full AHDB report on CTF

can be viewed by searching for "Controlled Traffic Farming: Methods applied to Grassland Silage Management" online. 



CTF will increase the distance between harvester and trailer from maybe about two metres to nine metres (depending on working width). With this in mind, you will need to:

- Work steady.
- Use high-sided trailers.
- Consider not filling trailers all the way to the top.

1 Why and how to assess compaction on farm

The only way you can establish the extent of compaction on farm is to get out and dig some holes.

- Compaction from 0-15cm will require slit aerating/spiking.
- Compaction from 20-25cm deep will have been caused by multiple machinery passes and will need sward lifting.

One of the main benefits of CTF is the fact you know exactly where traffic has been in a field and can target remedial work accordingly.

Failure to address compaction will:

- Reduce soil quality.
- Increase requirements for nitrogen to achieve the same yields.
- Raise the chances of nitrogen being lost by leaching or through the air.
- Reduce microbial activity in the soil due to lack of oxygen penetration, which will reduce nutrient turnover.

2 The economics of Controlled Traffic Farming (CTF)

Presuming:

- Random traffic systems cover 80% of the field area.
- Reduction of traffic wheelings increases forage yields by 13%.
- The additional cost of CTF is due only to the cost of the navigation system - any improvements in machinery would be part of a long-term replacement policy.

A 1% reduction in the trafficked area increases the benefit of CTF at a rate of between £1.10/ha and £1.50/ha for a two and three cut system respectively.

£1,500 - the estimated cost of a low accuracy (150-200mm) light bar, manual steered system.

£15,000 - the estimated cost of a fully integrated, high accuracy (20mm), real time kinematic navigation system.

28ha (69 acres) - the break even area for four low accuracy, light bar, manual steered systems for a 35% trafficked area CTF system with three silage cuts a year.

175ha (432 acres) - the break even area for a high accuracy, fully integrated steering for a 15% trafficked area for a three cut silage system.

Source: AHDB's "Controlled Traffic Farming: Methods applied to Grassland Silage Management" Report



Turning green into white

Innovative thinking, teamwork and technology lie at the heart of one farming couple's quest for a secure future in dairying, as Luke James finds out.

Shropshire dairy farmers Tristan and Jaci Dale operate with the clear goal of converting the cheapest feed available into the highest value milk.

To this end, they're committed to maximising production from grazed grass through a spring block calving herd and – within the last 12 months – have returned to full organic status to access the best possible milk price.

With 80% of production being achieved from grazing and the organic premium worth around 10ppl, the economics of their approach certainly stacks up. However, the couple are far from complacent and are constantly seeking fresh areas where they can gain further advantages.

In the past year, they've successfully introduced the use of sexed semen to turn the loss of worthless bull calves into an additional income stream, and implemented a grassland reseeding programme that demonstrated real value in a challenging year for grass production.

Based at Hatton Manor Farm

near Church Stretton, the Dales have now built their herd to 330 cows. Breeding has been designed to create a three-quarter Friesian, one-quarter Jersey cross and the herd is now producing on average around 4,500 litres per lactation, with 4,000 litres coming from grazed grass.

"We're only feeding low levels of concentrates through the parlour so it's relatively easy to work out what comes from grazing," says Tristan. "I tend to look at the cost of a kilogram of concentrate as being equivalent to the value of a litre of milk production. If there's no marginal gain, then I cannot see any value in feeding more concentrates."

Rotational grazing

Rotational paddock grazing is closely managed using the AgriNet system, with grass covers across the 152ha (375 acre) milking platform being plate metered and recorded on a weekly basis. Grazing management is described by Tristan as being like flying a plane, in that

it's the take-off (turn out) and landing (end of season) that are the most important to get right.

"We fully subscribe to the idea that the first grazing round is for the grass and the second round is for the cows, so when the cows go out in February, we're focused on getting the cover down in order to maintain quality later in the season," he says.

"As a more general guide, however, we aim to go into paddocks at 2,700-2,750kgDM/ha and leave post-grazing residuals of 1,500kgDM/ha. Using the AgriNet programme really helps us to keep on top of the grazing management and keep the grass in front of the cows as close to optimum as possible. We certainly don't want them grazing covers above 2,800kgDM/ha so currently use baled silage making as a tool to manage any surplus."

With another 61ha (150 acres) of adjoining land becoming available later this year, Tristan and Jaci plan to introduce a dedicated silage area and possibly look at some alternative forages.

However, they have already seen improvements to their forage output with grassland reseeding on the existing platform.

"We've not been big into reseeding previously, but have seen the benefits this year in terms of dry matter production and milk yield response," says Tristan. "Like many, we suffered with the drought last summer, but it was clear that reseeded ground outperformed the older leys and we definitely saw an uplift in production when cows went onto these paddocks."

"It's certainly in our plans to reseed more routinely, as part of our overall strategy to continue to improve our production from forage."

Sexed semen adds value to block calving system

With pure dairy bull calves effectively being a cost to the business, the Dales have turned to sexed semen in the past 12 months in order to virtually eliminate an unwanted by-product and convert this into additional revenue for the business.




Field access tracks that operate as a 'one-way system' are an example of innovative thinking that maximises cows' time at grass.

Tristan, who does all the AI, has achieved comparable conception rates using Cogent's SexedULTRA 4M as he has previously using conventional semen. 83% of the herd is PD'd to calve down in the first six weeks of the block.

"We actually started serving 10 days earlier than normal, to build in some insurance in case we didn't achieve comparable conception with the sexed semen," he says. "We served our best 100 cows with either the British Friesian Kirkby Premier or the Jersey Ribblesmount Beaumont. Both are now available from Cogent as sexed semen."

The remaining 200 plus cows were served to an Aberdeen Angus to produce a valuable beef calf. Quality Aberdeen Angus stock bulls were also run as sweepers, sourced from the Melview Angus herd.

Tristan adds: "We await the results once calving is underway, but we've calculated the benefit using a 'worst case' outcome, and assuming 90% of calves born from sexed semen being heifers. Having taken account of the extra cost of the sexed semen (and even assumed a lower conception rate), we're predicting a financial benefit of £9,000 to £10,000 this year, even if we sell the beef calves at the earliest opportunity at a week old."

"We've also virtually eliminated the problem of the unwanted bull calf, something that we and all dairy farmers would far rather avoid." 

Use of the AgriNet grazing management software and sexed semen are examples of how the Dales are willing to embrace new technologies to progress.





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Suckler Series: Making her pay

Part two: Refining inputs

In part one of this three-part series, we looked at how increasing output efficiency could improve a suckler unit. In part two, Laura Mushrush finds out the benefits of improving input efficiencies.

When it comes to improving the production efficiency and profitability of a suckler unit, focus needs to shift from reducing input costs to assessing if input investment can be altered to maximise output.

That's the view of European Veterinary Specialist in Bovine Health Management and RCVS Specialist in Cattle Health and Production, Martin Tomlinson of the University of Glasgow.

"Refining input while maintaining or increasing the same margin of output is the next step to improving production efficiency," he explains. "A cow requires two major forms of input to produce output: genetic material and nutrition. Whether it's making genetic selections for the next calf crop or how a forage system is

managed, input quality is going to have a significant impact on the quality of outputs."

Genetic input

The most fundamental input is genetic material. With 85-90% of annual conceptions in the UK suckler herd occurring through natural service, this places a lot of importance on bull management.

"Prior to the breeding season, bulls should be put through an annual Bull Breeding Soundness Exam (BBSE) to assess breeding potential. Along with assessing locomotion, this is vital for managing infertile and potentially sub-fertile bulls," explains Martin.

"Approximately one in three bulls in the UK is sub-fertile. These bulls can still get animals in-calf, but a fertile bull should achieve 60-65%

of conceptions in the first cycle in a group of 40-50 cows."

While artificial insemination (AI) is more time intensive than natural service, it can reduce input costs while giving producers access to animals with greater genetic potential and profitability.

"Natural mating may be easier, but it's often more expensive than using AI. Bulls are both expensive to buy and keep, and are otherwise non-productive," explains Martin.

"The costs of keeping a bull are commonly underestimated. Based on an average longevity of four working years, depreciation and fixed and variable costs, they can cost upwards of £1,500 per year. Calculating your bull costs per calf produced can often be a useful procedure if considering controlled breeding regimes and AI."

Nutritional input

The second essential input for a profitable suckler herd is nutritional resources. While there is a huge variation between farms relating to land, feeding and management systems, everyone needs to be able to answer the same question: Do you know what your land is capable of producing?

"One consistent factor is that a suckler cow in early lactation giving 10kg of milk will eat approximately two percent of her body weight, requiring 11-12 ME kg/DM and around 12% protein," says Martin. "To be blunt, the average farm is not maximising forage output to meet these nutritional needs consistently"

When it comes to improving forage production, there are multiple cost-effective management tools producers can utilise for a quick return on investment.

Reseeding

According to data from Germinal:

- After a full reseed at a cost of £193, the performance of a

perennial ryegrass ley that produced 8,000kgDM per year and 80,000 ME per acre per year, will increase to 12,000kgDM per year and 132,000 MJ of ME per acre per year.

- When overseeding is done to rejuvenate the ley, performance increases to 9,000kgDM and 94,500 MJ of ME per acre, at a cost of £100.

Rotational grazing

If a farm is relying on set stocking, another way to increase stocking rates and forage utilisation is by investing in a rotational grazing system.

- Research by AHDB shows a set stocking system with an annual yield of 6 tonnes DM per ha has a utilisation of 50% and usable yield of 4.3 tonnes DM per ha.
- When rotational grazing is implemented, annual yield increases to 10.2 tonnes DM per ha, 65% of which is utilised.
- When paddock grazing is introduced, utilisation increases to 80%.



There is a lot of financial benefits to refining genetic and nutritional inputs, says Martin Tomlinson.

"Creating and understanding sustainable grazing platforms that facilitate soil health, reseeds, rotations and the possible introduction of supplemental forage crops, such as brassicas, can create a forage system that works 365 days a year," concludes Martin. "By adopting the mindset of 'forage farmer first, and the beef will follow,' producers will have a powerful tool for efficient suckler production."

This is part two of a three-part series. In the next issue of Forager, we explore improving the production unit. 1

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Protein bonus from leaf retention

New field studies reveal an underestimated source of value in swedes as a winter feed source, reports Luke James.

Leaf retention has been shown to be a significant factor in boosting the feed value of swedes as an over winter fodder crop for cattle and sheep in new, UK field trials.

In research carried out by Germinal over the 2018/19 season on farms in south Wales, mid-Wales and Scotland, multiple varieties were grown and monitored, with dry matter yields for bulb and leaf being measured alongside nutritional values, rate of leaf loss and grazing preference.

Crops grown on the three farms were also fully costed, with results demonstrating a very high return on investment and highlighting the true financial value of swedes as a winter fodder.

"Farmers involved in the research invested around £385/ha to grow a crop of direct drilled swedes," says Felicity Lenyk, product development manager with Germinal GB. "The best performing varieties yielded over 9t/ha in bulb alone, which works out at approximately 4p/kgDM of high energy fodder.

"However, many farmers growing swedes tend to focus primarily on the root and do not consider the value of the leaf. Our trials show that the leaf can contribute an additional 2 to 4tDM/ha and this is of high nutritional value, particularly protein. Leaf retention through the winter should therefore be considered as part of variety selection if farmers want to maximise the value of their crop."

Analysis of swede leaves throughout the trial showed significant crude protein value, with a range from around 25% up to over 35%. This contributed to a typical leaf protein yield of 1.0t/ha for some varieties and over 58,000MJ/ha of energy, which is a phenomenal contribution to homegrown feed. Leaf retention varied between varieties, with the new variety Triumph consistently showing the lowest leaf loss across all three farms when sampling was carried out between November and January.

"Triumph showed significantly greater leaf hardness, with crops typically retaining 14% more leaf than other varieties on average across all sites," adds Felicity. "We saw the greatest difference in Scotland where most varieties lost 70% of their leaf between November and January, whilst Triumph lost only 44% (see Fig 1).

"Swedes offer a very cost-effective winter feeding solution for livestock farmers, for out-wintering cattle or ewes or fattening lambs. Leaf retention is a factor that affects the ultimate value of the crop and should be a consideration in variety selection in order to maximise returns."

Fig 1: Recorded leaf loss in swede varieties. Lanarkshire, November 2018 - Jan 2019

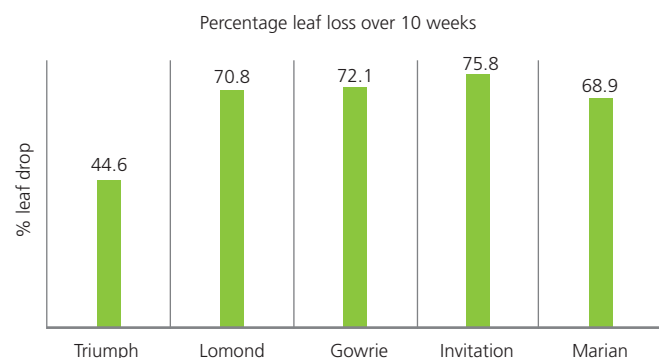
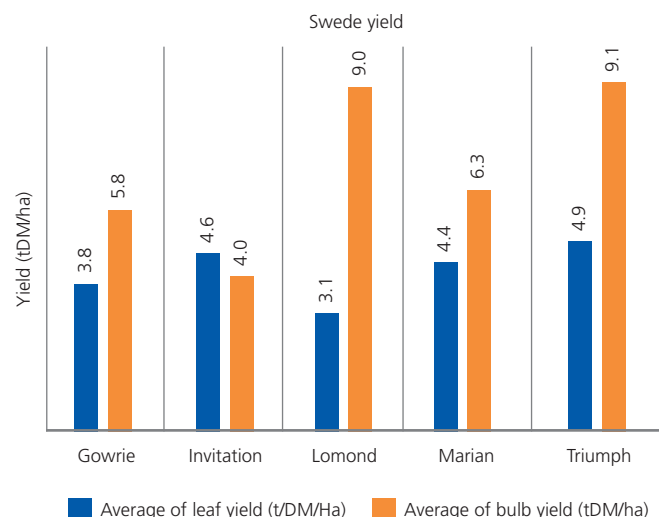


Fig 2: Relative yields of bulb and leaf in swede varieties. Mid-Wales 2018



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Nominations close 30 April 2019

Improve consolidation for big production wins

How confident are you that silage is being effectively consolidated? According to some recent trial work, rolling technique is an area that can be improved on most farms, as Aly Balsom reports.

Poor consolidation is causing significant losses in the silage clamp, reducing silage quality and the production potential of homegrown forages.

Two studies looking at the effects of silage density on dry matter losses and quality on over 35 beef, sheep and dairy silage clamps, found big variations in consolidation both between and within clamps.

Independent forage consultant, Dave Davies carried out the work with both AHDB funding and Dr Kate Le Cocq from North Wyke, Rothamsted Research, using BBSRC funding. He says the differences were particularly evident on the clamp edges.

He explains: "There's big variation. Near the walls and the top of the clamp are on average three fold lower in density than the central part."

Dave believes these inconsistencies are adding to silage costs and causing silage losses that are often invisible. He says: "Silage costs generally take into account the cost of getting it into the clamp.

But the average farmer has got 25% losses which increases the real cost of forage before it gets into the animal. Worse case that's a £40/t dry matter difference in cost."

The on-farm assessments showed that, where consolidation was poor, the energy content of the silage was also less (see table). This was due to the presence of oxygen as a result of poor silage density. Consequently, enterobacteria were able to grow.

These bacteria produce carbon dioxide and water through respiration. As soon as the oxygen runs out, there will be a higher concentration of these bad bacteria, which will produce acetic and butyric acid, ammonia, carbon dioxide and water. This will lead to quality losses.

When the clamp is then opened, oxygen ingress will also cause the yeasts that have grown as a result of poor consolidation to proliferate.

Dave believes 10% losses should be the target on farm. To achieve this, paying equal attention to consolidation and sealing is essential. He advises thinking about the following nine points:

1. Avoid layering silage in too thick layers in the clamp - it can be tempting to put in large layers if trailers are coming in too fast from the field. However, if layers are too thick, only the top is effectively consolidated. 15 cm layers are ideal.

2. Ensure even spread - don't over-heap silage where it gets brought into the clamp as this area will never be truly consolidated.

3. Turn the tractor around - if you can see out of one side of the tractor better, you'll get closer to the wall on that side, so turn the tractor around when you do the opposite side so you can get equally as close.

4. Fill the clamp like a saucer rather than flat roll - this makes the centre lower than the wall so it's possible to get the tractor wheel closer to the wall.

5. Don't stop rolling until silage is fully consolidated - you should be able to see tractor tyre marks on the clamp and the grass shouldn't bounce up behind you.

6. Use a side sheet - this should overlap with the top sheet by at least one metre, if not two metres.

7. Use an oxygen barrier under the top sheet - this is essential.

8. Ensure enough top weight - gravel bags should be touching round the edges and front of the clamp.

9. Use green sheets correctly - green mesh sheets only apply enough weight if they are finished in a dome and tightened daily for the first week to achieve tension. Gravel bags should be placed round the edge. If the sheet is flat, tyres or mats must be placed all over the top, as if you were using a black sheet.


Variation in silage quality within a clamp (from a UK dairy farm)

Area on clamp (samples were taken from a middle strip across the clamp)	Metabolisable energy of silage (MJ/kg DM)	Milk yield potential (yield/m ³ of silage) (working on 5MJ of energy/litre)
Centre	12.1MJ/kg DM	472 litres
Left	11.6MJ/kg DM	359 litres
Right	11.1MJ/kg DM	201 litres

Working out how good you are at consolidating

Now is a good time to take some core silage samples from your clamps to assess how good your consolidation strategy is and whether you need to change your approach for the season ahead.

Although book values on density can be used, Dave Davies has seen big variation in book and actual values, with some farmers having more silage in reality than that estimated using set figures.

- The corer should be inserted perpendicular into the open clamp face (straight in).
- The weight from each core taken should be weighed in kilos.
- Use the calculation below to work out the kilos of fresh weight/m³ as an indicator of consolidation.
- Target 650-700kg of fresh weight/m³ 

Kilos of fresh weight/m³ = weight of silage in a core (kg)/volume of silage in the hole

Volume = 3.142 (Pi) x the radius of the hole 2 (m) x depth (m)

To assess density:

- A silage corer can be purchased for about £120 or made on farm using a 2-2.5 inch metal tube and angle grinder.
- About nine samples should be taken from various points on the clamp (including the sides and centre).





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Film binding aids forage quality

Avoiding net binding of silage bales offers more than just easier recycling, reports Luke James.

For farmer and contractor Mike Hughes, having a baler-wrapper combination with film-binding capability is as much about forage quality as any of the other advantages that this technology offers.

He knows this from his own experience - making around 2,000 round bales for his 80 cow suckler herd - and from feedback from dairy and beef farmers around Haverfordwest where he provides a contracting service.

Mike says: "The initial attraction of film binding is that you avoid using net wrap and no longer have the hassle of separating two materials before disposal or recycling. But for me the real benefit is producing better quality silage.

"We operate a forage based system at home and make all our silage in round bales, so we put a lot of emphasis on getting the job right. I've seen no mould on film-bound bales at all, and that's an indication that bales are totally sealed from the start and no air is getting in at any stage. It stands to reason, as we are effectively wrapping bales in an extra three layers of film, but we're doing this without adding cost so there really is no downside."

Mike took delivery of a Kuhn FBP 3135 BalePack in July last year, about halfway through his baling season, and has to date done around 4,000 bales with the machine. Although it is possible to use net binding with this machine - as the binding and wrapping

functions are independent - he's been committed to the film binding approach from day one and has found his contracting customers have been happy to accept the change.

"We've managed to keep the cost about the same, even though film is a little bit more expensive than net, and that's possible because of the flexibility that this machine offers," explains Mike. "Most importantly, with Kuhn's IntelliWrap system, we have the option of applying as many layers of film as we choose, so four, five, six or seven, for example. The previous machine we had only offered four, six or eight layer options. This means it's easier to reduce the outer wrap by one layer, to save costs, given that you've already applied

three layers for binding the bale.

"It's the customer's choice, at the end of the day, and it will often depend on how much they value silage quality."

It was the patented film binding technology that really convinced Mike to plump for the Kuhn machine when making the change last year. 'Machine of the Year' in the AgriTechnica forage harvesting category in 2018, and a LAMMA Silver Award winner in 2019, the FBP BalePack uses two standard 750mm stretch film rolls to fully encapsulate the bale. As well as improving silage preservation and making the recycling of waste plastic easier, it reduces plastic usage by up to 30% by pre-stretching the wrapping film by 70%, prior to application. Film loading is also quicker and easier as each roll weighs just 27kg, compared to the wider rolls used on other film binding systems which can weigh between 40-90kg.

As a contractor as well as a farmer, Mike is also interested in speed of operation, not only of the wrapping, but also for the baling part of the operation.

"It's part of a contractor's job to be able to cope with different crop conditions and to be in and out as

quickly and efficiently as possible," he adds. "For me the pick-up and feed in to the baler is critical, as I need a machine that can cope with the heaviest of crops and deal with the shorter grass that we are sometimes presented with. So far, we've found performance in the field to be problem free, whatever the conditions. That's mainly down to the rotor auger on the baler intake, which is second to none."

Customer feedback is important, and Mike is pleased to have had good news back from one farmer who views bale quality as particularly important.

"We work with one dairy farmer where bales made during the summer as part of the grazing management process are then used as supplementary feed for the out-wintered replacement heifers," explains Mike. "The bales are left out in the field and the wrap is removed as required and the quality has been so good that heifers have actually put on condition this winter. In addition, there's just the plastic to deal with, and no net to separate, so everyone is happy."

In addition to baling grass silage, Mike also produces around 500 quality haylage bales for the demanding equestrian market. **F**



Separating net from wrap prior to recycling is a thing of the past for farmer and contractor Mike Hughes.

An effective film binding function was the key determining factor in Mike Hughes' choice of wrapper-baler combination, primarily for reasons of forage quality.



Kuhn's twin-reel film binding bale wrapping system won a silver award in the Livestock Innovation category of the 2019 LAMMA Innovation Awards.

Forage reliance

Sole reliance on forage has saved a Northern Ireland suckler farm £90 per head per year in feed costs. Laura Mushrush finds out more.

Father and son business partners Paul and Frank Turley take a pretty no-nonsense approach to running their beef herd.

No second chances for open, not in-calf cows. No need for calving assistance. No concentrates for cows. No creep for suckler calves. No winter housing.

Located on the outskirts of Downpatrick, the farm consists of 150 head of Aberdeen Angus x British Friesian suckler cows and 100 head of bucket reared Holstein cross Aberdeen Angus beef calves.

"We expect our cows to do everything for us. Any time we have to put in unnecessary labour or feed we lose out on our profit margin," explains Paul.

Forage focused

The success to the business is multifactorial. However, the driving force has been the ability to tailor farm management and forage production to the unique microenvironment that covers the 162ha (400 acre) farm.

"We have a geographic advantage of being located in a dry area of Northern Ireland that allows us to rely solely on our forage production for feed," says Paul. "In the last four years, this has given us a cost savings of £90 per head per year in feed costs."

105ha (260 acres) of the farm is in Aber High Sugar Grass leys. Because quality is integral to the success of the farm, grass variety selections are based on the top two ranking varieties for D-value on the Recommended Lists. Recently, the farm started growing AberGain perennial ryegrass as a monoculture for its 78.6 D-value. In the last two years, AberGain has been used in mixtures with AberWolf and AberClyde perennial ryegrasses.

Each June, an additional 16ha (40 acres) of grass is taken out and sown to brassicas for outwintering cattle as part of the reseeding rotation. Traditionally, the farm has used Swift or Redstart hybrid brassica for late season sowing, and Maris Kestrel kale for main crop sowing outwintering. However, due

to extreme drought conditions last summer, Redstart hybrid brassica was grazed this winter to capture rapid growth once the drought broke in August.

Paul explains: "Beginning in December, we out-winter all our cows and calves by strip grazing brassicas until we begin calving at the beginning of February. Because we are finishing calves ourselves instead of selling them as weaners, and the cows have such substantial milk production, we wean calves at 10 months of age while they are on brassicas together. This allows calves to have supplemented nutrition without us feeding creep."

Managing pairs

Once on brassicas, calves are supplemented with the farm's highest quality silage and cows receive the lowest quality.

When calving begins in February, new cow and calf pairs are pulled off brassicas and turned out onto grass paddocks at a set stocking rate of one pair per acre to minimise grass damage.



Paul and Frank Turley have been able to save their Northern Ireland suckler farm £90 per head per year on feed costs by switching to a forage only system.


As the spring progresses and grass growth increases, stock densities are gradually increased. By April, the groups end up consisting of 35 to 45 pairs to begin bulling. After three weeks, bulling groups are doubled to assist rotational grazing, and increased again three weeks later to a maximum of 120 pairs. At this point, groups of cows and store cattle are rotationally grazed on four to five different platforms, aiming for 2,900 to 3,000kgDM/ha pre-grazing covers. Weaned and bucket reared calves remain on brassicas until March and are then incorporated into the rotational grazing system.

Frank adds: "Weekly grass measuring ensures timely movement of cattle on to grass with field subdivisions ensuring a maximum two thirds per day allocation, grazing grass covers to 1,500kgDM/ha. Grass is measured by clipping and weighing and, together with paddock size allocation, maximises grass utilisation to above 80%."

Weed control is either chemical and/or topping. Fertiliser is blanket spread once a month and regrowth takes 16 to 30 days depending on grass growth. All cattle are finished in July to September to ensure grazing pressure is reduced in line with the seasonal reduction in grass growth.

Since the farm's production model relies so heavily on grazing, the only silage that is made is from surplus grass growth.

Paul explains: "We typically end up baling silage each year, aiming to have a dry matter greater than 50%, ME greater than 11.5 and protein greater than 14%. This high quality silage has been the key to excluding meal from weanling and store cattle throughout the winter months.

"We look at silage as a by-product of our grass management. Most years, we end up with enough to feed stock in the winter time. If we have excess, we sell it. Very rarely do we have to buy any in." 



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*Tim Downes
The Farm, Shropshire.*



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Succeeding with a six-cut system

Operating a six-cut grass silage system brings multiple benefits for Pembrokeshire dairy farmer, Steve Evans.

For Steve Evans, grass silage isn't simply something to tide his cows through the winter. It's a key foundation for his business.

As many as six cuts a year are taken to ensure the best possible quality for his 500 milking cows and 320 followers at Spittal Cross Farm, Haverfordwest. The herd is made up of a mixture of Jersey x Holsteins and Holstein x Norwegian Red x Fleckvieh crosses, with cows calving in an autumn block.

"We don't have a target for milk yield," explains Steve. "We just make the best silage we can and milk output is a by-product. Our target is 12ME silage at 32% dry matter. With a three cut system, you've got three chances to get it right and generally the grass isn't as 'milky'. With six cuts,

we've got six chances.

"Also, because we're cutting more frequently, we're leaving greener stubbles and the grass actively wants to regrow. Three or four days after mowing the first leaf is back up. We maintain we can achieve more tonnes per acre over the season. We aim to reseed 20% of our silage ground with late heading ryegrass varieties every year."

Steve's move to multi-cut began five years ago after a trip to Holland where he saw the system in action. "We thought: we can replicate this back home and lower our cost of production," he explains. "Our biggest ongoing cost is going to be purchased feeds over winter. So the less we can buy, the better."

With the farm's milk going for cheese production, Steve wants 4% butterfat and 3% protein. Since feeding a more forage based diet, he says butterfat has been 4.6% and protein 3.7-3.8%, so his buyer is happy.

Diet

As well as the multi-cut grass silage, cows receive wholecrop wheat, which is also grown on

the farm, and 4kg/cow/day of a 16% protein blend, all fed through a mixer wagon. An 18% protein cake is also fed at 4kg/cow/day, split between two milkings in the parlour.

Silage and feed passage samples are taken regularly and sent for analysis, so rations can be tweaked accordingly.

"Last year's drought meant concentrates had to be increased by 200-300kg/cow, to 2 tonnes/cow, to make up for poor grass growth in grazing fields," says Steve.

"However, another benefit from leaving green stubbles in silage fields was how quickly they recovered after the dry conditions. Grass yields were only 800kg/ha down on the previous year.

"We make our own silage with our own machinery, except for hiring in a forage harvester from late March to October. The best bit is because we agree an hourly fee for it, I know exactly how much it's going to cost. With cuts being lighter, we can pick grass up at 15-20 acres per hour."

By including wholecrop in the ration, Steve says it adds back fibre



The target 12 ME grass silage is fed with fermented wholecrop wheat and a 16% protein blend through a mixer wagon.

to balance the low fibre in the younger cut grass and provide a gut conditioner. Although cutting grass later would increase its fibre content, he says the lignin in older grass can't be digested, whereas wholecrop fibre can.

Cutting regime

The aim is to take first cut silage around 20 April, depending on the weather, and then cut every 4-5 weeks. As this is cut at 19-20% dry matter and there's not a massive amount of heat at that time of year, the April cut can be difficult to get dry. As a result, quite often this will have to be wilted for 48 hours. After that, subsequent cuts are usually wilted for 24 hours. All six cuts are tedded soon after cutting to accelerate drying.

"After 24 hours we normally get to 32% dry matter," Steve adds. "We've played around with dry matters, but at 32% I'm happy. The damper the silage the higher the chance of acidosis. It consolidates well at this dry matter too.

"Our biggest challenge is slurry. But using a trailing shoe has allowed us to put slurry on throughout the growing season,

despite four week cutting intervals, and allowed us to cut bagged fertiliser use back."

Using an additive

To preserve silage, an additive forms an integral part of Steve's system. But as further proof, he undertook a comparison last season by leaving some grass untreated, while the rest received Ecosyl.

Two separate silage analyses confirmed improved fermentation following the Ecosyl treatment, with a stable clamp and no burning up of sugar. But more significantly, cows yielded 1.4 litres more milk/cow/day on the treated silage, with milk protein increasing from 3.72% to 3.86% and butterfat hitting 4.9%.

Steve says: "These animals were in mid-lactation. If they had been given that silage during peak lactation they'd have probably given an extra 1-1.5 litres again. The comparison was well worth doing. In one field where we had raked it a bit low and picked up a bit of slurry, the Ecosyl overpowered the slurry bacteria.

"The old school says if the sun is shining you don't need an additive

to make grass silage. But you've got to stabilise it in the clamp by dropping the pH quickly. If you don't use an additive, that's not going to happen. My view is, if you're relying more on forage, for the cost per tonne treated, an additive is the right thing to do."



Since receiving a more forage-based diet, Steve Evans' cows have produced 4.6% butterfat and 3.7-3.8% protein.

CHEWING THE CUD

According to NFU Mutual's diversification report, the average farm diversification earns more than £10,000 per year – and that is just a glimpse of the financial potential a new enterprise could bring into a business. To learn more about what it takes to set up a successful farm diversification, Laura Mushrush discusses initial considerations with NFU Mutual Rural Affairs Specialist, Tim Price.

LM: To get us started, how do you define farm diversification?

TP: We see diversification as using existing resources to advance land, buildings and areas of potential with the skills and workforce of a farm to set up an enterprise outside food production.

That can mean anything from renewable energy, contracting, liveries for horses, farm shops, through to pleasure and holiday activities or the refurbishment and letting out of farm buildings for residential or commercial use. There really is a huge list of potential activities that come under that overall heading of diversification.

LM: When assessing a business for diversification opportunities, what are a few initial considerations?

TP: First off, the scope of vision for the farming business needs to be thought about because the farm needs to be kept as the focus. Stakeholders in the family farm should have a discussion which includes:

- Where are we going with the farm?
- Should we be doing what we've always done? Or should we be changing it?
- Should we be stepping up the investment into the farm? Or should we be easing it?
- Is it best to pull back investing in the farm itself and instead invest in a diversification?

If farmers are really good at farming, they need to decide whether they are better off keeping their entire business focus on farming. But if they have the skills, desire and ability to raise money with the resources in a different way, then a diversification can be a huge help to the business.

LM: What other kinds of business implications can a diversification bring to the farm if not planned for accordingly?

TP: Before you get to the stage of laying concrete and putting up walls, you must consider the impact on the farm business structure, particularly for inheritance tax and business property relief. These can be adversely affected and significantly alter the way you run a farm.

When it comes to planning, you must understand possible implications and structure the business in a way to maintain valuable tax relief that both the farm and diversification could get.

LM: Say the farm is keen to expand the business in a different direction. How should they determine which venture is right for them?

TP: Start by looking at potential issues with things like planning permission and highway authority permissions and restrictions.

Safety also needs to be considered. If you have an attractive site, but it has cliffs and other dangerous features, you may have to spend a lot of money fencing them off to prevent the public from getting into difficulties. We recommend including an insurance agent in the process of assessing different diversification opportunities so things can be set up for cheaper and simpler insurance.

LM: What are some of the most common diversification challenges you see farmers struggling with?

TP: Sometimes farmers struggle with labour management requirements for how much time it's going to take to set up and run the diversification, while ensuring the farm has the capacity to keep running properly. It's not going to make the farm more sustainable if all the efforts go into running a caravan site, and the farm gets neglected and falls into loss because time to run that properly isn't being put in.

There is also the labour challenge for getting staff. We speak to a lot of farmers who have challenges to get labour into place. In particular, businesses a long way from urban areas with seasonal work requirements, like wedding venues and holiday accommodation, struggle with this. Lots of the popular tourism sites are, by their nature, in isolated areas, but that does mean you could have a challenge finding people to actually run things and come in to do the jobs, like serving drinks and cooking food. That is something which also needs good research before you make any investments.

LM: What types of diversifications have you seen that bypass added labour challenges, but still allow the farm to create revenue?

TP: Renewables – particularly solar panels – can offer opportunities for extra income for many farmers without a lot of management or labour input. They don't need a lot of work at all, and they fit very well alongside farming activities. For that reason, they're worth considering on the list of opportunities.

LM: What is your parting piece of advice for family farms looking to diversify?

TP: Think very hard about it, consult all family members in the business and do your homework. If it looks to be a good fit, then go for it. **T**