ISSUE 18: Winter 2018/19

FORAGER

HOMEGROWN FEED FOR SUSTAINABLE FARMING

FUTURE PROOFING YOUR FORAGE

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Chewing the Cud:

Page 6 to 14: Mother Nature didn't pull any punches in 2018. In this nine page special, FORAGER explores the best ways for producers to future-proof their businesses by future-proofing their forage.

We welcome feedback, suggestions for articles and contributions. **Editor:** Aly Balsom T: 07912 344 219 E: aly@alybalsommedia.co.uk **Advertising:** Sarah Allin T: 01694 731777 E: sarah@abccomms.co.uk **FORAGER** is available free of charge to farmers and industry specialists. To be added or removed from the magazine mailing list please contact: abc@abccomms.co.uk T: 01694 731777. **FORAGER** is published periodically. FORAGER Magazine is registered with the British Library ISSN: 2052-0816 (print) ISSN: 2052-0824 (online)

Editor's NOTE

This year's drought has created numerous forage headaches for farmers, but also highlighted the need to build resilience into farm businesses, writes Aly Balsom.

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If anyone wanted proof of the effects of global warming, they only needed to look at the prairie-like fields of the south of England this summer and headline grabbing news stories from around the world.

From extreme high temperatures in Britain to droughts in Australia, floods in Indonesia and wildfires in California, 2018 had it all.

The World Weather Attribution Consortium says this summer's northern Europe heatwave was made twice as likely by climate change. They also predict events even worse than this summer's to strike every other year by 2040.

> **"Although extreme weather events cause challenges for farm businesses, they also offer the opportunity to step back and critique how well your business coped."**

Steps obviously need to be taken to halt global warming on a global scale. However, that aside, it appears that extreme weather events - whether drought or rain - are only likely to increase in frequency.

This is unlikely to be what farmers want to hear this winter. Particularly considering many have already eaten in to much of this year's forage stocks and are facing dwindling supplies following depressed summer growth.

However, although extreme events cause challenges for farm businesses, they also offer the opportunity to step back and critique how well your business coped and whether you need to put in place steps to protect yourself against similar situations. That's why we've included a "Future Proofing Your Forage Special" in this edition of Forager (pages 6 to 14).

Farm Business Consultant, Oliver Hall says although this year was challenging, it shouldn't have been enough to "knock you off your perch" (page 6).

That revolves around ensuring your business is profitable in the good years, so it's able to cope in the bad. As such, understanding your five year performance average is a must - along with planning ahead.

He suggests doing the same with forage and planning to make a bank of forage as a contingency. It's something Welsh farmer Matthew Jackson is thinking of doing in response to this year too. He's one of several farmers in our special that are rethinking forage strategies (page 14).

Sheep and beef farmer Phil Kent is also revisiting his approach to herbal leys, which are more able to cope with dry conditions. Many producers reacted to the summer drought by putting in Westerwolds to fill the forage gap, whilst others turned to turnips and forage rape for a late bite. I also hear reports of farmers renting arable stubbles to find extra forage to get through the autumn.

Thinking long-term about an alternative, resilient forages is a key strategy that all farmers should be considering, with multiple options available to help all farm situations (page 8).

A regular reseeding strategy is also a must, considering newer reseeds tended to cope better and longer with the dry environment - although obviously there's a limit to performance on any ley if rain fails to come.

Although we will all have our fingers crossed that next year is a more straightforward one for forage production, we could well be missing a trick by writing this year off as a complete one-off. Ultimately, building resilience into the business will bring big long-term benefits all round. F

Next generation

Changing an all year round housing system to a grass centric one was an obvious first step for 23 year-old Tesco Future Farmer, William Holmes, as Aly Balsom finds out.

Putting in cow tracks and getting cows out to grass as soon as possible were the first things on William Holmes' hit list when he took on the management of High House Farms two years ago.

He was quick to realise that getting cows out of the shed, focussing on milk from forage and shifting to an autumn block would be the best strategy to secure the future of the then Holstein herd that was housed all year round and yielding 9,500 litres.

"From a cost point of view, grazing is the cheapest and highest quality way we can feed. And that's what me and dad know best. The grazing cows side of things was never in doubt," he explains.

High House Farms is one of three farms run by William's father George Holmes. All units have forage at their heart, with George managing a 300 cow autumn unit and Jon Hurford contract farming their 330 cow spring calving unit. William works closely with George to determine the direction of all three units, but is the manager at High House Farms, which is contract farmed for Johnnie Russell.

Since moving to the farm, William has moved to an autumn block by culling and buying in. Reseeding is under way, with the emphasis on improving silage ground by using dedicated mixes including Aber High Sugar Grasses.

The fact grass rotations are designed off the back of grass plate metering provides information to target reseeding or improvement work on poorer performing fields.

With 21 different soil types across the farm, High House Farms is the most challenging of the three farms to manage from a forage perspective.

William says: "One of the aims going forward is to better suit what we are growing to different areas. So at the top of the hill where it's chalk downland and dries out, we may put in red clover or lucerne."

Twelve month rolling figures put milk from forage at 2,900 litres a cow from total yields of 7,000 litres. William believes getting better at producing high volumes of good quality silage will be a key part of hitting a target of 4,000 litres from forage.

"Our grass silage is high quality, but we tend to not have much of it," he explains. "It's taken a while to understand the field characteristic on farm and how they perform, but in doing this, the silage block has grown, which should help our silage stocks in the future." F

In the HOT SEAT

Name: William Holmes **Age:** 23 **Farm:** Manages 304ha (750 acres) at High House Farms, but also involved in strategic decision-making on another nearby autumn unit run by father and spring unit which is contract farmed.

System: All three farms are forage based. High House Farms calves 420 cows from 20 August to mid November. They yield 7,000 litres at 4.1% fat and 3.4% protein. Holstein base crossed to either Swedish Red or Fleckvieh.

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

The summer of this year. Trying to run a forage based system without any grass is difficult, and trying to make sensible decisions through the summer to limit the damage this winter has been a challenge.

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

Probably staff. Running three dairies already and with aspirations to run more, we need good quality staff. Finding and motivating them will be harder and competing with other industries that are able to offer more flexible working hours.

What's been your greatest success?

The way the farm has improved since I've been here. Like improving youngstock, lameness, cow condition and not letting the grass get out of control.

Where do you see yourself in 10 year's time?

Hopefully managing multiple dairy farms and probably doing less day to day manual work and more deciding on where the business is going.

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

Definitely my family and girlfriend and their support, the team on the farm and the Tesco Future Farmers Foundation which I've learnt a lot from.

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

Probably work smarter not harder - it's a shame I can't seem to listen to it myself.

How to build business resilience

Creating a resilient business that's able to cope with market and weather volatility is a must for any farmer looking for a long-term future, as Aly Balsom reports.

The realities of farming mean there's a high chance that a business will be hit with a poor forage year or low milk price once every five years. But here's the question - Is your business fit to withstand the challenge?

AHDB Dairy board member and Andersons farm business consultant, Oliver Hall believes this year's extreme weather volatility has highlighted the importance of running a resilient business that's able to cope with the ups and downs.

Although this year has undoubtedly created challenges for farm businesses in terms of forage supplies, Oliver believes it shouldn't be enough to "knock you off your perch."

"Some farmers have had to spend £20,000 per 100 cows on extra feed this year, but they had good businesses, a high milk price and a plan, so even if it meant borrowing extra money in the short-term, it was not a problem for them or the bank. Others sold their cows because of the drought and put themselves out of business," he explains.

This highlights the importance of making the most of the good years to get you through the bad. Ultimately this hinges on ensuring businesses are profitable in the main and farmers understand their performance.

Capitalise on the good years

Consequently, Oliver urges producers to look at their five year performance average and act on information. "It's important to recognise that you need to look at profitability over your five year cycle and benchmark to see if it's good enough to meet the demand of the business," he explains. "If you're only just scraping through on your five year average, it's not the bad year that's tripped you up, it's the four average years you've had."

Percentage of turnover as profit is one crucial key performance indicator (KPI) that should be understood by all farms. The aim should be to target 30% of turnover, pre-rent and finance, with performance tracked every year and as a five year average.

Benchmarking within and between different farms provides a useful tool to identify areas for improvement if performance is below target. For example; are variable costs too high? Or is it administration or machinery and labour costs? Oliver says it's simply about looking at what's being brought into the business, where money is being spent and where to focus attentions to do better.

He believes "Profit is a conscious choice," and suggests farmers carry out a "backwards budget" based on a profit target. This means asking at the start of the year how much profit you want, then challenging the relationship between income and costs needed to achieve it.

Fill the forage larder

A similar planning strategy should be taken to forage supplies, with the aim of "filling the larder" during a good year to try and safeguard supplies in challenging years.

"There will always be good and bad forage years so we need to find ways to de-risk ourselves," comments Oliver. "We should carry 30-40 days of forage as a contingency. That should be part of a strategy in any forage based business."

This could mean rethinking strategies, such as renting more land or changing cropping plans. However, before doing so, it's important to establish forage demand and forecast how much the farm can grow. Again, total farm grass production should be looked at as a yearly and five yearly average.

Regularly monitoring exactly what you have in clamps and bales so you can plan for any shortfall is also essential (see page 12). The same is true for routinely monitoring grass growth. If grass growth looks to be dipping off, steps can then be taken to cost out buying in more feed, move heifers off the farm early or reduce numbers for example.

Oliver says: "If you've got grass and livestock, you need to measure to manage. And a side shoot of measuring grass is that you can track production and see if you're short….Farmers that monitored this year versus those that didn't, probably had better strategies to help growth, such as slowing grazing rotations early."

Measuring also enables any deviations in performance between fields to be identified so that steps can be put in place to improve growth by targeted reseeding or improving soil indices.

"Find the bottom 25% of the farm and lift that. That's where you want to focus your attention as that will raise dry matter production across the farm," he stresses.

Oliver believes it's in all farms' interests to maximise growth and utilisation of grazed grass, particularly considering Teagasc profit monitoring analysis of Irish dairy farms in 2017. This shows that grass utilised explains over 60% of the variation in net profit per hectare and each additional tonne of grass utilised per hectare was associated with an increase in profit of €287 (£253).

The aim should be to fill the forage "larder" during a good year to try and safeguard supplies in challenging years.

Resources

- View AHDB Dairy's Drought 2018: Future-Proofing Your Business webinar with Oliver Hall and Tony Evans of The Andersons Centre on YouTube.
- AHDB Dairy also has a Feed and Forage calculator to help calculate feed supply and demand.

Business targets

- 30% of turnover as profit, pre-rent and finance.
- Carry 30-40 days of forage as a contingency.
- Find and improve the bottom 25% performing fields.
- Maximise grass utilisation - grass utilised explains over 60% of the variation in net profit per hectare (Teagasc).

"It's important to recognise that you need to look at profitability over your five year cycle and benchmark to see if it's good enough to meet the demand of the business," says Andersons farm business consultant, Oliver Hall.

Resilient crop options to help future-proof your forage

There are multiple solutions for livestock producers looking to safeguard their forage production. Laura Mushrush finds out more.

Increasingly unpredictable weather and volatile feed markets means investing in homegrown forages that are able to cope with challenging climatic conditions and bridge the feed gap when needs be has never been more relevant.

This year saw temperatures rise to one of the hottest on record, with the start of the summer officially the driest since modern records began. At the same time, FAO data has shown increasing price trends for protein feedstuffs like soya, wheat and maize since the 1990s, with continued volatility.

With this in mind, Germinal's research station in Wiltshire opened its doors to start the rigorous process of collecting extensive performance data on trial plots to provide the industry with scientific insight into different homegrown forage applications.

To take into account different farm systems and regional differences, this is being run alongside various farm trials across the country, from Wales to Norfolk and Scotland to Dorset. These will assess how different forage systems perform in real-life scenarios.

Below, Felicity Lenyk, product development manager for Germinal, outlines the resilient crop systems she's seen perform best in the field this year - and which could be considered by farmers looking to protect themselves against feed and climatic volatility.

Multi-species leys to build resilience into leys

Best uses: Rotationally grazing sheep and cattle

"When you have multiple species in a ley, the different growth curves are going to allow you to capitalise on the best growth throughout the year," says Felicity. "This year, multi-species leys grew longer through the summer than pure grass."

An increase in growing days and forage quality also maximises livestock production. In a 2017 trial on Trefranck Farm (see Autumn 2017 Forager) lambs grazing multi-species leys had a daily liveweight gain of 364g/day, while lambs grazing non-reseeded pasture gained 200g/day.

According to Felicity, the livestock and forage production increase is driven by the synergistic relationship of each species, with different rooting depths and structures aiding resilience during challenging periods.

PERENNIAL CHICORY Example Variety: Puna II

18-25% crude protein

6-9tDM/ha yield as a pure stand

Deep tap roots

Non-bloating

Good summer growth

High mineral content (P, Mg, Zn, Cu, Na)

Perennial chicory also has been suggested to have anthelmintic properties, reducing worm burden in livestock.

WHITE CLOVER Example Variety: AberHerald

20-25% protein

Estimated nitrogen fixation of 150kg/ha N

Versatile – cutting or grazing

Grow a variety of small, medium or large leaf clovers to suit your livestock class and to prevent them from being grazed out. Only use varieties from the Recommended Lists.

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Boosting protein in silage leys

"Growing red clover and lucerne silage leys this year has really paid off because of their root structures. While grass leys were burning off completely, the deep roots of these two species were able to suck up any last bit of moisture," says Felicity. Besides drought tolerance, red clover and lucerne's strongest contribution comes with their high protein content.

RED CLOVER Example Variety: AberClaret

16-25% protein

Fixes up to 250kg/ha N

Improves soil structure

11-13tDM/ha

Persists for 4-5 years

LUCERNE Example Variety: Timbale

18-24% protein

Little to no artificial N required

12-14tDM/ha yield

Persists for 4-6 years

PLANTAIN Example Variety: Tonic

8tDM/ha yield as a pure stand

Highly palatable

Up to 28% protein

Branching, fibrous roots

Good growth at the shoulders of the season and during summer

High mineral content (P, K, S, Ca, Mg, Na, Zn, Cu, B and Co)

In September this year, a farm in Northumberland was achieving 330g/day average DLWG across 600 ewe lambs on a plantain rich, multi-species sward.

Management tips

Without proper management a forage system will never perform to its potential, says Germinal area sales manager Helen Mathieu.

It all starts with the soil

- Test soil nutrients every three years for pH, phosphate, potash and magnesium levels.
- Make it routine to dig into soil to check soil health (for example, worm activity and soil structure).
- Keep off fields in wet conditions.
- Take remedial action by sub-soiling, aeration or reseeding/over-seeding when damage is unavoidable.
- Keep fertiliser and manure application records and produce a fertiliser plan.
- Test organic nutrient inputs (farmyard muck and slurry) to maintain appropriate indices.

Reseeding for resilience

- Aim to reseed leys every 5 to 6 years, depending on the variety and crop rotation, improving 15% to 20% of your productive grassland each year.

"From an extremely late spring to a severe drought, this season has tested grassland to its limits. Younger leys less than four years old have performed better than older leys, with better earlier growth and the ability to recover after the summer," comments Helen. "This is partially due to younger plants being able to handle stress better than older plants. But it's also due to the progress in variety development that has been made in the last 10 years."

Choosing the right variety

- No matter what resilient forage options suit farms best, producers should only choose varieties from the Recommended Grass and Clover Lists.
- Varieties on the Recommended Lists are tried and tested by independent review under conditions in the UK. Productivity, nutritional quality under grazing and conservation management, seasonal ground cover, winter hardiness and disease resistance are all tested. Anything that does not make it onto the list should not be used because they have not performed up to standards.

To view the Recommended Grass and Clover Lists online or to order a hardcopy, go to www.britishgrassland.com/RGCL.

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Brassicas to bridge the forage gap

Best uses: Break crop, disease control, strip grazing, extending grazing seasons

"Best practice for grass reseeds would be to use these as a break crop," says Felicity. "Brassicas can work well as a summer break prior to autumn drilling or sown in July-August to utilise over the winter months and set up a spring reseed."

Brassicas can complement a grass-based system really well. As grass growth naturally dips in the summer, utilising something like stubble turnips or a hybrid brassica provides high quality forage to strip graze through this period. Hybrid brassicas, kale or swede also offer the opportunity for saving on winter feed and housing costs by growing a bulk of homegrown forage that can be utilised through the winter months.

KALE **Example Variety:** Maris Kestrel

16-17% protein

10tDM/ha yield

Good option for autumn and winter grazing

Strip graze

Cold and frost tolerant

HYBRID BRASSICAS **Example Variety:** Redstart

17-18% protein

6-8tDM/ha yield

Cold and frost tolerant

Suitable for summer, autumn and winter grazing

Multi-graze opportunities

For best regrowth and multiple grazings, remove stock once the crop has been grazed down to the base of the leaves to allow the plant to recover. Grazing to the soil will inhibit regrowth. Typically needs five-six weeks of rest between grazing periods.

SWEDES **Example Variety:** Triumph

11-12% protein

Very high energy bulb - 12.5-13MJ/kg ME

10-11tDM/ha yield

Disease resistance

Medium-dry matter bulb for winter grazing of sheep and cattle

Offer the highest ME value of any brassica options because of the high energy content in the bulb. Typically grazed any time from November onwards, swedes work well as a post-Christmas grazing crop for stock due to the winter hardiness.

FORAGE RAPE **Example Variety:** Avon

18-20% protein

4-5tDM/ha yield

Rapid establishment

Good option for summer break crop

Strip graze

Good disease resistance

High leaf to stem ratio means this is a good option for finishing lambs.

STUBBLE TURNIPS **Example Variety:** Vollenda

16-17% protein

5-6tDM/ha yield

High energy bulb

Strip graze

Establish at the end of April for a summer break crop

Establish in the summer for winter grazing prior to Christmas

For best regrowth and multiple grazings, remove stock once the crop has been grazed down to the base of the leaves to allow the plant to recover. Grazing to the soil will inhibit regrowth. Typically needs five-six weeks of rest between grazing periods.

FUTURE-PROOFING YOUR FORAGE SPECIAL

Festuloliums to combat drought and flooding

Best uses: Cutting leys, areas prone to drought or flooding

Festuloliums are a hybrid between either perennial or Italian ryegrass and one of many fescue species; they often have extensive root systems. Along with combating drought and flooding, these properties also reduce soil erosion and compaction, while giving the plant access to a broader nutrient profile at greater soil depths. As there are many types of varieties, depending on the parents, individual varieties can be better suited to grazing or cutting. This should be assessed by using the Recommended Lists.

Felicity says: "Festuloliums offer farmers the opportunity to grow ryegrass based genetics in areas of stress where ryegrass may not normally prosper. They are particularly suited in areas of drought and flooding or where it is too cold to grow pure ryegrass varieties. It must be stressed that Festuloliums can be crosses between a wide range of parents, so individual varieties should be assessed. They tend to be slow to establish, but have good DM yields, quality is close to ryegrass, but does not yet match it."

FESTULOLIUM **Example Variety:** AberNiche

Fescue/Italian ryegrass hybrid

Performs well under environmental stress like drought

Rooting structure helps mitigate flooding

High yielding

AberNiche has been studied as part of the SureRoot project and its root structure has been found to help water infiltration and reduce surface run off. It could therefore be a valuable addition to areas prone to flooding.

To give producers the tools they need to make their farms as environmentally and economically sustainable as possible, Innovate UK is funding a project by IBERS to reduce the nutrient requirement of forages. Here, genotypes grow in the National Plant Phenomics Centre to visualise growth at different phosphate levels.

Ongoing research on track to reduce forage nutrient requirements

As global livestock production is politically and economically pushed to become more sustainable, the Institute of Biological, Environmental and Rural Sciences at Aberystwyth University (IBERS) is advancing its plant breeding programme for more nitrogen (N) and phosphorus (P) efficient perennial ryegrass and white clover varieties.

"The challenges facing grassland agriculture are threefold," says IBERS plant breeder Rosemary Collins. "First off, we're at a point in time where political and public scrutiny are at an all time high, driving the need for things to be produced as efficiently and sustainably as possible. Secondly, we're having to face the reality of limited natural resources, like global supplies of rock phosphate being finite. On top of this, the fluctuating costs of nutrient inputs are trending upwards, making them difficult to budget for."

In February 2016, IBERS began the "Application of innovative plant breeding and phenotyping technologies to reduce the nutrient requirement of forages and improve livestock production efficiency," aka, project "APPLE," which has been funded by Innovate UK.

"Because N and P are foundation nutrients for perennial ryegrass and white clover species, there is a huge opportunity to increase sustainability in livestock farming by improving nutrient efficiency and production for these species," says Rosemary. "However, efficiency of nutrient use is not currently a criterion for variety recommendation in the UK testing system and must be achieved without compromising forage yield and quality."

Research and development

According to Rosemary, a combination of state-of-the-art imaging approaches from the National Plant Phenomics Centre in IBERS and traditional plant selection approaches is being used to identify individual plants with improved nutrient use efficiency. Once genetic markers are developed from these plants, they are applied to elite varieties to form new breeding populations.

"In this way, improved nutrient use efficiency gets 'built in' to new varieties coming onto the market. This forms a 'win-win' outcome for farmers: forage varieties with all the usual production and persistence traits expected from the IBERS programmes, with the added bonus of reduced nutrient use," explains Rosemary.

Seed of the best performing individuals has been produced in 2018 and was sown in October into field plots of contrasting nutrient status for validation. First yield results will be available in spring and summer 2019.

Making the most of forage this winter

Many dairy farmers are having to adopt varying strategies to eke out forage stocks this winter, Aly Balsom takes a look at the key considerations when adopting some of the various approaches.

1 Incorporating straw into milking diets

Feeding more straw in milking diets to stretch silage stocks is being adopted widely this winter. The challenge with this approach is keeping energy levels up as straw will dilute rations.

Independent nutritionist, Charlie King believes straw and concentrates are a cost-effective way of stretching out forage on those farms that didn't forward-buy moist feeds. He emphasises the importance of providing adequate energy levels in any concentrates fed.

He says: "Feed straw and some extra concentrate to maintain energy levels, but remember to balance for protein too, with say soya or urea if needs be."

He advises measuring forage stocks to enable forward planning for any shortfall. "That means you can feed say 1-1.5kg a head of straw with an extra 1kg of concentrate from now, rather than suddenly finding you're short of forage and have to start feeding 3kg a head of straw in February, which will cause palatability issues and crash milk yields."

2 Feeding lower quality grass silage to milkers

Some producers have been forced to feed milking cows lower quality, later silage cuts that would have traditionally been fed to youngstock as earlier cuts have already run out.

When adopting this strategy, analysing silage is as important as ever to ensure diets are balanced accordingly and milking performance maintained. If ration energy levels are already being diluted by higher straw inclusions, then dietary nutrient levels could be even further compromised - again emphasising the need to test.

3 Providing heifers with more straw

Feeding youngstock higher levels of straw and partitioning silage to lactating animals has been the "route to salvation" for many farmers, according to Charlie.

However, he says upping concentrate feeding rates is vital when adopting such a strategy to safeguard youngstock growth rates.

"It will come at a cost. Most farmers may usually feed grass silage and 2.5kg of a 16% protein concentrate. If you're feeding straw instead of silage, you will need 3-4kg of an 18% protein concentrate. So they'll be feeding slightly more of it and it will need to be better quality," explains Charlie.

Some farmers may be forced to reduce forage inclusion rates and up concentrates to extend forage stocks. However, this must be handled with care to prevent rumen upsets.

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4 Feeding wetter, late silage cuts with more concentrate

Fibre will need to be top of the priorities list for those farmers feeding wetter, low fibre silage cuts taken in August/September.

The variable weather this season means there are marked differences between silage cuts. Bryn Davies, Director at Advanced Ruminant Nutrition says first cuts were generally high quality and low fibre, those harvested in the drought were low volume and high fibre, whilst later August/September cuts were of high protein, medium energy with little fibre. All-in-all this adds up to there not being a lot of fibre around and means "ration balance will be challenging this winter."

Bryn says the main challenges will come if farmers are feeding more concentrate to bridge the forage gap, whilst feeding these wetter silages, with high acid load.

"You've got a rumen sitting in a very precarious state due to the low fibre. If you add high concentrate to that, you're very quickly heading to sub acute rumen acidosis (SARA) and very quickly you'll get ketosis," says Bryn, who suggests using straw or soya hulls to fill the fibre gap.

5 Incorporating lower levels of forage in the total diet

Some farmers may be forced to reduce forage inclusion rates and up concentrates to extend forage stocks. However, this must be handled with care to prevent rumen upsets.

Bryn says: "Cows are herbivores and as an industry we don't feed enough forage to cows. Nationally we achieve 1,500 litre a cow milk from forage. We're feeding too much concentrate anyway. So in an abnormal year, we're pushing that button further."

Bryn believes a good minimum to keep in mind is 5.5kgDM/cow/day forage fibre a head.

Below 5kgDM/head and things become dangerous for rumen health. The hope is that maize will help some farmers get out of problems, but if not, then they will need to consider other forage options.

"If you don't address, it could impact butterfats and then eventually milk proteins as cows won't get enough energy. Then fertility suffers," adds Bryn.

Ration balance will be challenging this winter, says Bryn Davies, Director at Advanced Ruminant Nutrition.

How to measure silage stocks

Rather than estimating silage stocks and guessing if you have enough silage for the winter, getting out and measuring supplies will prevent any nasty surprises this spring. Bryn Davies urges farmers to measure and monitor silage stock densities every month. A simple way to assess density is by taking a sheer grab of silage:

- Multiply the width x depth x height of the sheer grab.
- Eg: 1m x 1m x 0.5m = 0.5m^3.
- Then weigh a sheer grab of silage in the mixer wagon.
- If it weighs 500kg, then you know that you have 500kg/0.5m^3 of the clamp (or 1,000kg/m^3).
- Match this with recent dry matter analysis of the silage. Eg. if it's 30% dry matter, that's 150kgDM/0.5m^3 (500kg 30%).
- Then measure the volume of the clamp monthly and test dry matter every two weeks to make sure it's not changing.

Tips on maximising forage use this winter

- Think about clamp management - forage is short so you don't want to waste it through heating. Try and go across the clamp weekly and vary the depth of the silage you take to achieve that.
- Consider using an organic acid if you can't stop ration heating - this will stop intakes from being compromised due to yeasts and moulds.
- Keep an eye out for variability within a clamp - there's a huge difference between cuts, so if they are layered in the clamp, it could create issues with consistency day to day. Try and work across the clamp in a uniform way.
- Target nutrition towards the animals that will give you the biggest payback - give your best to the transition and fresh cows.
- Don't overfeed protein - don't just feed protein because it's cheap - think about the environmental impact and implications on the cow. Brewers grains are high in protein so make sure they're balanced.
- Make sure what the cow receives is exactly what's being rationed - measure refusals (target 1%) and analyse. If the diet doesn't correspond to the ration sheet - ask why.
- Plan ahead for next year - walk the farm. Are fields damaged, will weeds need addressing, do you need to get sheep on?

Farmers share forage views

Aly Balsom speaks to three farmers to get an idea of how the drought has impacted forage supplies, how they will stretch stocks this winter and lessons for the years ahead.

"It's been an absolute disaster of a year. We've grown about half the amount of grass we grew last year, purely because of the weather. Last year we grew 13tDM/ha and this year it will likely be 7tDM/ha.

We had a slow winter because of the snow, then it was a swamp and we struggled to graze, and since 5 May we've had 1 inch of rain. We cut what's ahead of the cattle on a rotational paddock system. The trouble is, apart from May and early June, there hasn't been anything. We've been feeding silage and hay since the start of July (speaking end October).

Luckily we grew 8ha (20 acres) of fodder beet for the first time. We'll use that and deferred grazing for dry cows over winter. I've bought 230 extra bales of silage to help with feeding in the autumn and spring. Because of the year, we've also put in an extra 12ha (30 acres) of turnips to provide extra winter brassicas.

Moving forward, I'm reluctant to jump the gun, reduce stock considerably and change the system on a one off. But if this becomes a continual problem, we will have to look at reducing stock numbers. I'd also like to continue to grow fodder beet.

MATT HOUSE, farm manager, Bowden Farms, Templecombe, Somerset.

150 crossbred suckler cows, bred to Angus - producing store calves. Will calve 250 in spring.

"The summer drought, the Beast from The East and high stocking rates this season have meant we've spent about £40,000 extra on feed. As we're on a heavy farm, we've been fortunate as the grass kept growing and we probably had an extra month's growth compared to others in the area. We've still grown about 2tDM/ha less than normal so we've been short 420kgDM/head. We've also been stocked higher at 5 cows/ha as I'm stocking a new farm.

MATTHEW JACKSON, Abersoch, Wales.

Share farming 440 cross-bred spring block calving dairy cows with David Wynne-Finch.

Numbers will drop by 100 cows this winter which will ease pressure.

We were buffer feeding in June and July when normally cows would just be on grazed grass and meal. We fed palm kernel and java beans with the grass silage to stretch out stocks. They'd also been on silage and moist feeds in March-April to keep energy up during the Beast from The East.

We'll probably feed straw to dry cows this winter to stretch out silage.

I'm not necessarily concerned with these odd weather outbreaks. We get them every 7-10 years so it's pretty few and far between. But as a contingency we will probably start building a 150tDM bank of silage as a safety net moving forward.

"Normally we get a dry spell for a month to six weeks when grass slows up and we feed a couple of bales before housing. This year we fed 8-9 bales a day to sheep and beef in July and August. We rarely feed to sheep at all and this year ewes and lambs had bales before weaning,

The rotational grazing definitely delayed the effects of the drought as there was good regrowth and moisture retention. The speed of growth in the spring also helped as we were able to take 270 silage bales which helped in the drought.

We're probably about 100 bales short now, so about 60 tonnes of dry matter. We weren't able to take a haylage cut in August so we haven't got any. I've bought in some straw which will help eke out forage.

PHIL KENT, Treswarrow Park Farm, Port Isaac, Cornwall.

850 ewes and 400 ewe lambs with lambs sold to a supermarket. 280 dairy cross British Blue and 140 native cross dairy calves bought at two weeks old and sold at 12 weeks or finished.

Luckily we planted more rape, turnip and kale mix and straight kale for out-wintering this year.

This year highlighted how much better the chicory copes with the drought and showed us that we maybe need to increase the area of herbal leys next year. F

Multiple gains from sward diversity

Increasing plant diversity in swards can be good for the soil, the productivity of grazing livestock and the environment - and could also benefit arable farmers, as Luke James reports.

Sometimes called herbal leys, sometimes multi-species swards, the concept of increased plant diversity has been gaining momentum in recent years.

With a bigger environmental agenda on the horizon, and the issue of soil health likely to remain at the heart of future agricultural support policy, we can expect interest to continue.

According to Helen Mathieu from Germinal, the principles that are proving beneficial to livestock farmers are also a potential solution to some of the problems faced by arable farmers. As such, multi-species leys could be a useful bridge between these sectors and a catalyst for some much-needed change.

"Introducing livestock back onto arable farms is a hot topic and I can only see this becoming more and more popular," she says. "Where arable farms are looking for relatively long-term breaks, possibly to control blackgrass or to improve soils, then multi-species leys grazed by sheep or cattle are a worthwhile consideration. The additional benefits from a multi-species sward, as opposed to straight ryegrass for example, are significant and we're seeing real benefits for following arable crops."

Defining multi-species

One of the challenges for farmers looking to sow a multi-species ley is to know exactly what the composition should be. Many mixtures currently on the market being promoted as herbal or multi-species leys may contain well over a dozen components, but Helen recommends a more simplistic approach.

> **"Using deep rooting species such as perennial chicory or plantain means nutrients are being taken up from a different part of the soil profile."**

"Ideally we are looking to include nitrogen fixing and nitrogen lifting plant types, and to combine species with complementary root and leaf architectures, so that we are maximising the capture of sunlight, water and nutrients," she explains. "This can be achieved with a grass, a legume and a herb – so three main plant types – and there is increasing evidence of the benefits of this approach."

Including nitrogen-fixing species such as clovers alongside ryegrasses, for example, has been shown to result in comparable or higher animal performance than is achieved from ryegrass-only swards with higher nitrogen fertiliser inputs.

There is also evidence showing that plants with different – but complementary – root structures can lead to more effective use of soil nutrients, giving an overall advantage compared to monoculture swards. Using deep-rooting species such as perennial chicory or plantain, for example, means nutrients are being taken up from a different part of the soil profile than is the case with shallower rooting ryegrasses. Having several different species will also mean multiple sources of protein, energy and minerals, presenting a more complete nutritional profile."

These benefits can translate into improved animal performance and help reduce reliance on bought-in feeds and fertilisers, and there are tangible benefits for soil health too. But the gains are only likely if mixtures are comprised of the best performing varieties, adds Helen.

She says: "Our advice is the same as it would be for any other seeds mixture. Wherever possible it is advisable for at least half the seeds mixture to be a high ranking perennial ryegrass, with all other components to be either selected from the latest Recommended Grass and Clover Lists or to be from a known and reputable source."

CASE STUDY - Sam and Charlotte Clarke, Oxfordshire

Oxfordshire sheep farmer, agronomist and consultant, Sam Clarke has witnessed improved lamb growth rates on multi-species leys and is convinced of their long-term role at Manor Farm, Steeple Aston.

Sam runs the Clarke Farming Partnership with his wife Charlotte, and is a host farm for the LAMBPAR project - a joint project between AHDB and Germinal. This - and the BEEFPAR project - are looking at the potential benefits of integrating livestock onto arable farms by establishing and grazing multi-species leys. This is one example of how Germinal are developing their knowledge of multi-species leys, and sits alongside other demonstration sites and their own research centre in Wiltshire.

The Clarkes farm 515ha (1,273 acres), lambing around 700 of their own ewes in three flocks and rearing an additional 1,000 sheep on contract on grassland and an arable rotation including cover crops and brassicas.

Sam says: "We see a huge role for multi-species leys in our mixed farming situation, and particularly on the brash that is prone to drought. We're including them in the cropping rotation, to build organic matter, and will even scratch them into permanent pasture where we can to improve the productivity as much as possible.

"We'll be doing some species counts to fine-tune the mixtures and will probably increase the perennial chicory content in future, as this seems to suit our soils best. But overall we see the multi-species approach really helping to integrate the arable and sheep businesses."

Through the LAMBPAR trials - which over two seasons so far have compared the performance of rotationally grazed lambs on a multi-species ley with a comparable group on a quality ryegrass and white clover ley - Sam has seen the potential to improve output per hectare.

"Although neither 2017 or 2018 were particularly easy seasons weather-wise, we have definitely seen significantly better performance in the lambs grazing the multi-species leys," he reports (see table). "It's difficult to be too specific as to why growth rates are better; it may be due to the quality of the sward, or some anthelmintic properties in the herbs, or higher overall dry matter production from the sward. There's definitely been higher growth rates and a more level plane of production in lambs on the multi-species swards."

Clarke Farming Partnership

Forage overview:

- 265ha (655 acres) permanent pasture.
- 50ha (124 acres) grass and clover / multi-species leys.
- 80ha (198 acres) cover crops (mustard, vetch, oats).
- 120ha (297 acres) brassica fodder crops (stubble turnips / kale).

Multi-species mixture composition:

6.0kg **Aber HSG** intermediate diploid perennial ryegrass
1.0kg **Timothy**
1.0kg **Puna II** perennial chicory
1.0kg **Tonic** plantain
1.5kg **AberPasture** medium/small leaf white clover blend
1.5kg **red clover** blend

12.0kg/acre

Comparative lamb weights at 8 weeks

	Heaviest	Lightest	Average
Multi-species ley	32.6kg	18.2kg	23.7kg
Grass and white clover ley	31.7kg	17.9kg	22.9kg

Source: LAMBPAR, Manor Farm, Steeple Aston, 2018

During the worst of the drought in 2018, it was clear that perennial chicory and plantain helped maintain productivity in Sam Clarke's multi-species leys.

Breathe easier with clean air

Luke James speaks to vet Dan Humphries about the modern-day issue of dust from straw bedding machines and looks at an alternative approach to solving the problem.

When bales were small and stored in dry barns, and bedding was spread with a pitch fork, dust wasn't such a big issue in cattle sheds.

Now that's changed, and most straw is in round or big square bales, often stored outside, potentially contaminated, and is increasingly chopped through a spinning turbine and blown into sheds from above.

Modern methods save time and labour, and may use less straw, but the downside is the risk of airborne particles – something that can impact on the health of cattle and anyone working in that environment.

"We see a lot of problems resulting from poor air quality in cattle sheds, and dust can certainly be a factor," says Dan Humphries of the specialist dairy veterinary consultancy Dairy Insight.

"There's obviously the challenge to respiratory health, but dust can also be a cause of eye problems, with runny eyes attracting flies and leading to conditions such as New Forest Eye. We should also consider how working in a dust-filled environment can affect human health, with conditions such as Farmers' Lung a possible consequence."

When it comes to lung health in cattle, it's hard to under estimate the importance of clean air, and understanding some basic physiology certainly helps to drive the point home.

"Cattle are at a disadvantage from day one when it comes to their lungs, as they have less than half the respiratory capacity of any other mammal of comparable size," explains Dan. "It's also important to appreciate that lung damage tends to be permanent, so any impairment created in young calves, for example, is a problem for life."

Dust is likely to contain pollen, moulds, bacteria and tiny fragments of plant residue. When cattle are exposed to a lot of it, their defense mechanisms can be over powered. The mucus and fine hairs in their trachea and bronchi – which are there to intercept foreign particles – can become ineffective and the animal's immune system becomes compromised. This increases the likelihood of bacterial infections, and the damaging result can be pneumonia.

Dan adds: "I've seen situations where avoiding exposure to dust has been the key factor in preventing pneumonia in calves, so it is a very real risk and something that can have a life-long impact on animal performance."

Trials have shown that buildings will be dust-free within 30-seconds of bedding when using Kuhn's Cleanstraw system (above) whereas poor air quality can last for several minutes otherwise.

Minimising the impact of dust

Dust extraction - as is the norm in bedding and feeds for performance horses for example - is unrealistic on a livestock farm, but a good starting point will be to avoid using straw that is contaminated with moulds or soil.

Another recommendation is to remove cattle from sheds when bedding machines are operating. This is something that could be worked into some farms' routines, but may not always be practical or possible.

One company with an alternative solution is Kuhn Farm Machinery, who now offer a dust control system within their straw bedding equipment range.

Kuhn has developed a dust dampening system for machines in its straw bedder range.

Available on new equipment, or as a retrofit upgrade for existing machines, the Cleanstraw facility reduces dust in livestock buildings by applying a fine mist of water to straw as it is distributed. It comprises a 64 litre water tank and three misting nozzles mounted at the exit of the straw blowing chute. The nozzles are fed by a pump, which provides water at a flow rate sufficient to apply one litre of water per 100kg of straw, without slowing the machine's normal performance.

Cleaner environment

Applying a mist of water at this rate and in this way eliminates excessive levels of airborne dust by reducing the amount of time that these particles remain suspended in the air. Trials have shown that the air in a typical livestock building will be dust-free within 30 seconds after straw-blowing with the Cleanstraw system has ceased. This compares to several minutes under normal conditions.

Kuhn product specialist Katie Calcutt explains: "Reducing the amount of dust in livestock buildings creates a cleaner, more comfortable and more productive environment for cattle, and is also far better for farm workers. They will be less susceptible to inhaling dust particles and will also have better visibility for manoeuvring the machine and directing straw.

"Adding a fine mist of water as straw exits the spreading chute means very little water is required. This not only preserves the straw's absorbency potential, ensuring it remains an effective and hygienic bedding material, but also means the speed of operation is unaffected."

The Cleanstraw system is available on Kuhn's Primor straw bedders that operate with the Polydrive hydraulically disengageable belt system that drives the feed rotor, and on the Profile Plus range of mixer wagons that have a bedding capability. The system is automatically activated when the Polydrive is engaged and can also be armed or disabled via an in-cab switch.

Suckler Series: Making her pay
Part One: **Increasing output efficiency**

The first step to making suckler cow systems pay is increasing output efficiency. Laura Mushrush finds out more in part one of this three-part series.

The latest Stocktake report from AHDB makes sombre reading, with the average beef farmer in a non-severely disadvantaged area losing £155/cow/year.

The top third aren't fairing much better, with a meagre £26/cow margin, whilst the bottom third are dumping a massive £445/cow into losses.

These figures combined with Brexit uncertainty and increasing politically driven environmental pressures, places suckler production at a critical time for change, says European Veterinary Specialist in Bovine Health Management and RCVS Specialist in Cattle Health and Production, Martin Tomlinson of the University of Glasgow.

"The suckler beef industry still has an essential role in food sustainability given the suckler cow's ability to produce kilos of saleable beef from marginal land," explains Martin. "They are important suppliers of high-quality protein because they utilise feed and by-products of little or no value for human food. Improved environmental and economic sustainability will derive from greater productivity per animal because this dilutes fixed costs and reduces emission of greenhouse gases per unit produced."

More calves/cow = more kg of beef

According to Martin, maximising output is often the "quickest fix" and helps dilute fixed costs on any farm per unit of product sold and generates cash flow.

"Quite simply, fertility is the biggest profit driver of any enterprise," he says. "More calves per cow equals more kilos of beef."

However, there is more to the equation than improved fertility, with time of conception for tight calving blocks having a substantial impact on the profit picture.

"From an economic standpoint, the time factor of production efficiency in the suckler cow is relatively fixed at a year in length. This is due to cow gestation length being approximately 285 days, maternal inhibition of cyclicity lasting up to 60 days and the average oestrus cycle of the cow being 21 days post resumption of cyclicity," Martin explains. "Therefore, we want as many cows as possible conceiving in the first cycle to improve her calf output in a given year."

While calving blocks are nothing new to the UK, their uptake is limited, adds Martin. However, there are multiple economic benefits to make it worth the management. For example, calves born in the first cycle will have 63 days of growth ahead of calves born in the last week of cycle three.

"The Suckler beef industry still has an essential role in food sustainability given the suckler cow's ability to produce kilos of saleable beef from marginal land."

The biggest profit driver in a suckler enterprise is fertility, says Martin Tomlinson. Barren cows can cost upwards of £450 per cow per year in feed costs.

If calves are gaining 1.5kg/day, that's nearly 100kg/calf liveweight difference between the two sets of calves.

"A tight calving block that will allow for more uniformity in the stages of growth of calves will allow for management decisions that will maximise growth for the group, rather than part of the group," says Martin. "This can include housing, time and staff resource, feeding. But when thinking of it in the simplest form of kg/meat produced in a given time frame, it always pays."

Culling barren cows

It's only human nature that culling barren cows can become an emotional decision. Perhaps she's had a good calf every year for the last five years, or she's the daughter of your best cow or maybe she's just the first one to come greet you in the field. However, with the economic impact a barren cow has on a unit's profitability, beef farmers must look at it from a pure business standpoint.

"An adult barren cow will eat 2% of her bodyweight per day of dry matter as maintenance. For a 700kg cow, this is over 5t/DM/year. If you fed this cow on nothing but 500kg bales of silage at 35% dry matter for a year that's a conservative estimate of 30 bales/year. At £15/bale this is £450/barren cow/year," explains Martin. "The next calf that cow produces requires a major profit margin to make her carry over feed costs viable."

While some producers operate with autumn and spring calving blocks that may see the opportunity to roll a barren cow into the next block for a second chance, it should only be done on a case-by-case basis.

"Barren cows that fall out of a block could be carried over to the next, but will only produce an output of saleable kilos of beef in that year if culled," adds Martin. "It's important to look at culling as a viable source of saleable kilos of beef and cash flow and is potentially lucrative if a viable replacement can be either bought in or home bred."

Data, data and dam data

When it comes to improving efficiency, management decisions are only as good as the available data.

"The essence of suckled beef production is kilos of saleable beef from a fixed denominator, which is aligned with the largest fixed cost of a suckler unit at a given time frame. This will be things like land area, square metres of shed space, and adult biomass," explains Martin. "But how many farms in the UK actually have a handle on how many potential kilos of saleable beef they could produce from their fixed denominator?"

While measuring data will require added time resource, it doesn't have to be complicated or expensive, adds Martin. According to him, investing in a weigh scale allows for simple, yet powerful data to help maximise output. There's also a lot of data that often remains untapped from the BCMS and the ability to track an animal's performance through abattoir and market receipts. However, all of this data is worthless if not factored into decision-making and reviewed regularly.

"The diversity within the British suckler industry should be embraced as we market our beef on the world stage. Farming marginal land is by no means a uniform business," concludes Martin. "We do, however, need to be more realistic in how we responsibly assess such farming systems and generate better data to prove its sustainability. Focusing on maximising current output in your system can help cash flow without having to radically alter input decisions or the system itself."

This is part one of a three-part series. In the next issue of Forager we explore improving inputs on a suckler beef system.

All about the grass

From the breed of cows to the way they are grazed, all decisions are made with grass in mind at Harbison Farm, as Laura Mushrush reports.

Every week for the last five years, Hugh Harbison has walked the leys of his family's farm in Northern Ireland with a grass plate meter in hand.

"It's time consuming and requires commitment, but you learn a lot about your grass production by measuring it regularly," explains Hugh. "I've found it really useful to know how each field is doing so we can reap the benefits by adjusting our management to match growth."

Hugh's weekly grass measurements are part of his collaboration with GrassCheck - a grass growth and quality forecast based on collected data from 35 beef, dairy and sheep producers across Northern Ireland. Along with providing fellow producers with management data, the farm has greatly benefited from the rigorous process, increasing its milk from forage by 1,000 litres per cow per year since the start of the project.

Putting a focus on grass

The 100ha (247 acres) farm, located in Aghadowey, Coleraine, is home to 170 Friesians, where Hugh partners with his parents, Alison and Thomson, and wife, Sarah. According to Hugh, the entire farm revolves around its grass system.

"Because of our soil type, rainfall and farm set-up, it doesn't warrant us to grow wholecrop or maize. For us, it is more profitable to concentrate on growing good quality grass," he explains.

To maximise milk production from high quality forage, the farm grows a mixture of early to late heading perennial ryegrass varieties, including AberChoice, AberGain and AberClyde, from Germinal.

"Our focus on grass has been an influence on our cow genetics. Since we get paid quite well for milk fat and protein, we're after a robust cow that is able to produce high quality milk off forage," he adds. "Our milk fat is at 4.42% and protein is 3.52%, which we're really pleased with."

Currently the farm is averaging 3,000 litres from forage from total yields of 7,830 litres a cow a year - a number that is continuously increasing.

"Increasing our milk from forage is something we are constantly trying to improve – with the end goal of hitting 4,000 litres from forage per cow," says Hugh. "This won't be easy to achieve with grass, but it's something we're working towards."

Graze, rest and repeat

To maximise grass utilisation, the farm has implemented an intensive rotational grazing system on 48ha (119 acres). Beginning at spring turnout in April, the entire herd is rotated through 18 paddocks, averaging 3ha (7.4 acres) in size.

"Rather than making grazing decisions based on grass height, we make them by kg DM/ha. Ideally we turn cows on to new grass between 2,500 to 3,000kg DM/ha and take them off at 1,500 to 1,800kg DM/ha," says Hugh. "Typically, every 12 hours the cows get new grass."

Along with keeping a close eye on grass growth measurements to manage the rotation, the farm made investments into portable fencing and water infrastructure so grass leys aren't damaged between movements.

"We've built a kilometre of laneways to move cows from one paddock to the next," explains Hugh. "We've also installed water troughs in each paddock to reduce labour input between moves."

Grass management is worth the investment

According to Hugh, while measuring weekly grass growth rates and analysing the data is a tap into a valuable time resource, it's worth the investment.

"One of the most interesting and valuable lessons I've learned through this is the importance of grass quality and the performance you can get from a cow in relation to the grass in the paddock. For example, if a grass has too much dry matter, then that has a detrimental effect on the quality of grass, which then has a detrimental effect on the amount of milk produced," concludes Hugh. "There's a very fine balance there. And to me, it's small things like that where there's a lot of money to be made."

Farm facts

Cows
- 170 British Friesians cows.
- 80 replacement heifers.
- 12 week calving block.
- 75% calve in first six weeks.

Grass
- 48ha (119 acres) grazing.
- Reseed every six years.
- Soil sampling every other year.

Silage
- 40 to 50ha (99-124 acres) silage per cut depending on paddock grass growth.
- Three to four cuts per year.
- Nutrient inputs from slurry based on soil analysis.

Winter TMR
- Grass silage.
- 2kg maize.
- 1kg soya.

Weathering the drought with reseeded leys

This summer, the farm went three weeks without rain – which is a long stretch for a region acclimated to rain several times a week. However, while some leys were slowing down and dying off, others were still holding up through the drought, notes Hugh.

"We reseed leys at least every six years and have reseeded 50% of the farm in the past five years," says Hugh. "The reseeded leys were producing higher amounts of high quality grass than the older leys." Here is data from Hugh's top and bottom two performing leys in 2018:

2018 Grass Growth Data

Ley performance (out of 20)	Reseeded	DM t/ha (Jan-Apr)	DM t/ha (May-Aug)	DM t/ha (Sep-Oct)	Total DM t/ha
1st	YES	1.7	10.7	3.4	15.8
2nd	YES	1.1	10	2.1	13.2
19th	NO	0.9	6.4	1.1	8.4
20th	NO	0.6	4.4	1.8	6.8

*Measurements are from the top and bottom two performing leys in 2018

Compact feeding turns TMR approach on head

A new approach to feeding that soaks concentrates overnight and increases mixing time in the wagon to 20 minutes has brought numerous benefits to one Cornish farm and should help increase milk from forage, as Forager reports.

l-r Michael Barrett, Three Counties Feeds' Andy Hawken, and Malcolm Barrett.

Michael Barrett is the first to admit that mixing the ration for 20-30 minutes goes against everything farmers have been taught about over-processing fibre, but the results seen at Tredinnick Farm have thrown tradition out the water.

Since adopting the compact feeding approach in February, brothers Michael and Malcolm Barrett have seen less ration sorting, improved dry matter intakes and yield and butterfat improvements, adding up to a benefit worth £1,500/month.

Compact feeding is the brainchild of Danish founder, Professor Niels Kristensen and is a strategy adopted by around half of dairy farmers in the country. The approach focuses on soaking the concentrates in water for around 12 hours and then mixing them with the forage for around 20 minutes to half an hour. The aim is to help the commodities 'stick' to the fibre, which creates a consistent ration, that is hard to sort.

Part-processing the forage prior to feed out means the cow does not have to work as hard to process it herself, which aids feed efficiencies and yields. This has been seen at Tredinnick Farm, where the Barretts have witnessed an average 0.8 litre a cow a day increase.

Compact feeding was first introduced to the farm in February this year, after the brothers approached their nutritionist, Andy Hawken of Three Counties Feeds. Mr Hawken was keen to get involved and brought founder Niels Kristensen on to the farm to explain the concept as part of a farmer focused trip organised by the company.

Having always used some water in the ration, but traditionally mixed and immediately fed out, the Barretts soon switched to the full compact feed approach and started by mixing for 30 minutes.

The effects of changing the mixing approach - without changing ingredients - were first noticed by the change in cow behaviour at feed out. Cows no longer rushed to the feed fence at feed out, resulting in less numbers feeding at once. This is linked to the fact each mouthful of the ration is the same so cows no longer feel the need to move immediately to the feed barrier to sort out "the goodies."

Malcolm explains: "Before, they'd eat a kind of trench in the feed and nudge it out. Now they eat from the top of the pile down."

This - along with the other general effects on cow performance (see box) - meant that this forage season, the Barretts chose to reduce grass silage chop length from 26mm to 18mm in the forage harvester. This has enabled them to reduce mixing time from 30 to 20 minutes.

Although early days, the hope is that the change to feeding will help raise average herd yields from the current 8,700 litres a cow a year to 9,200 litres in the year.

The family are always striving to maximise milk from forage, and aim to produce quality grass and maize silage from the 190ha (470 acres) farm and 134ha (330 acres) of rented ground. This year's first cut was particularly good, analysing at 20% protein and 12ME.

"We were on 3,500 litres milk from forage before compact feeding. On the compact system, I expect the milk from forage to increase. We would hopefully get to 4,000 litres in a better forage year," he says.

Andy says keeping a close eye on the dry matter of the overall ration is vital in order to ensure optimum intakes and performance.

"35% dry matter in the total diet is the target," he explains. "Cows will get loose if you go under it, and eat more. And if it's too dry they won't eat it and the dung will go too dry. 35% is the sweet spot. That means it's important to take regular samples. We test silages once a month or once every six weeks and I also use a dry matter tester on farm to monitor the whole TMR."

Compact feeding - Tredinnick Farm, Liskeard

Ration:

- TMR including grass and maize silage - currently 40:60, hipro-soya, protected fat, minerals and buffer and a Three Counties Feeds blend.
- A high digestible fibre (HDF) 18% cake fed to yield through the parlour up to 8kg a head a day.

Compact feeding strategy

5pm - concentrates soaked in water

- 500 litres of water currently mixed with 750kg of concentrate.
- Water added to wagon using IBC tank whilst the mixer is mixing.
- Left overnight.

5am - rest of ingredients mixed

- Forage ingredients added, mixed for 20 minutes and then fed out.

Benefits:

- 10-15% improvement in dry matter intakes.
- Less sorting.
- Less cows at feed barrier and increased lying times.
- Average 0.8 litres a cow a day increase.
- Fresh cows peaking about five litres a day higher.
- Milk protein yield increased from around 1.29kg/day in May 2017 to 1.55kg/day in May 2018 - this shows the cow is producing milk in a healthy way.
- 0.2% higher butterfats.
- Improved yield and butterfats worth about £1,500/month.
- 10% improved heat detection rate.

Top tips on compact feeding

1. Don't 'half do' compact feeding - you need to soak concentrates and mix the diet for longer to see the full benefits, not one or the other.
2. Test silages and total ration dry matter regularly - this becomes more important on a compact feed system as water inclusion rates will need to be altered accordingly.
3. Aim for a total diet of 35% dry matter.
4. Consider chopping grass silages shorter in the forager - this will reduce mixing time.
5. A well maintained mixer wagon with sharp knives is key to success.

Compact feeding creates a uniform ration that's difficult for cows to sort.

Maximising output per hectare

Pushing forage production to its limits will help sheep producers reduce cost of production. Laura Mushrush finds out more.

As the uncertainty of Brexit looms, sheep farmers must zero in on cost of production, says grassland consultant Gareth Davies of Gareth Grassland. One of the best ways to do that? Grow more grass.

"If you grow greater quantities of high quality grass on your farm you've got options when it comes to making management decisions," explains Gareth. "It doesn't matter if this is carrying more stock on the same amount of land or becoming less reliant on imported feeds – but they're going to have to become as efficient as they possibly can."

It starts with soil

The first step to maximising grass production and reducing cost inputs? Get soil fertility in order.

"The most important component to having productive swards is making sure soil fertility is where it needs to be," says Gareth. "Things like pH, P, K, magnesium, calcium, and sulphur are fundamental to a sward's ability to perform."

The rule of thumb for soil testing is to sample a field every five years. For farms that aren't following a regular soil testing schedule, Gareth recommends choosing 20% of the poorest performing swards to test in the first year, followed by the next bottom 20% in the year after, until the entire farm is in a five year cycle.

"Soil fertility is often overlooked, but carries a lot of weight when it comes to reducing cost inputs and increasing return on investment," he says. "Don't just spread fertilisers because that's what you've always done. First, understand what the soil needs."

Soil structure must also be made a priority, with compaction being one of the biggest barriers to grass growth due to it inhibiting movement of air and water through soil.

Maximising grass production with rotational grazing

To capture the full potential of grass production, sheep producers need to step away from set grazing and instead implement rotational grazing.

On average, the farms Gareth has consulted grow 25% more grass in rotational grazing systems compared to set stocking. This hefty uptick in dry matter potential is due to the plant's development cycle.

"You graze the plant down to golf ball height, and then rest it and allow it to grow back to its prime three leaf stage before grazing it off again. This allows the plant to grow to its potential and allows it to go through its full natural cycle of growth and replenishment," explains Gareth.

"On a set stocking system, the first leaf appears, which is full of lovely sugars. Then stock come along like children in a sweet shop and immediately eat it. However, this is working against what the plant is trying to do. Once eaten, the plant wants to rest and grow back to its three-leaf stage. Under a set stocking situation this never happens, and you have also removed most of the plant's solar panel."

Because the first leaf stage is very nutritious, animals perform well on set stocking systems on an individual basis. However, it works against forage production per hectare.

"You don't necessarily get better ewe or lamb performance by rotational grazing, but what you do is you get better per hectare performance because you carry more stock on the same number of acres," he adds.

Reseed when needed

Once soil fertility and structure has been corrected, if a sward is still not performing, the next step is to reseed. At a minimum, reseeding will increase forage by 20%, adds Gareth, with some farms even doubling their previous production.

"What should also be factored in is the difference in quality of grass. If you were growing 7t/DM/ha of 10ME grass and suddenly you are growing 9t/DM/ha of 11ME grass, the difference is far greater than the extra 2t grown," explains Gareth. F

According to grassland consultant Gareth Davies, soil fertility is the first thing sheep producers need to get in order if they want to maximise forage production.

ROTATIONAL GRAZING

While rotational grazing will require infrastructure investment and labour resource to implement, it is worth the investment, says Gareth Davies.

For example:

- Increasing growth from 5tDM/ha on 5ha to 6tDM/ha or more on rotational grazing is the equivalent of renting 1ha of ground.
- Or if you have a 100ha sheep farm - by implementing rotational grazing, you're able to grow an extra 100t of feed on the same land.

Can additive gains help future-proof farms?

With the need to maximise milk and meat from forage, has the case for using an additive become more compelling? asks Forager.

Independent silage consultant Dr David Davies is unequivocal in his view about making an additive an integral part of good silage-making. "I think farmers should be using an additive on the vast majority of silage," he says.

His reason? Fundamentally, to improve the quality of the fermentation, which then brings other benefits. That said, with so many treatments available, he insists the additive should come with clear proof. And proof on two levels.

Firstly, proof it works in UK conditions: he questions the relevance of relying solely on overseas results obtained on high dry matter grass, which is easier to ferment, but more difficult to make in the UK. And secondly, proof that treating with the additive can actually improve animal performance.

"Farmers faced with lots of different additives to choose from simply turn off," he says. "The choice should be based on trials conducted under conditions that mimic the weather and crops of the UK, that prove reduction in dry matter losses and animal performance responses."

Even good grass can benefit from a proven additive, says independent silage consultant, Dr David Davies, because the better the quality, the more you have to lose.

Controlled fermentation

Although in theory, fermentation happens naturally when grass is ensiled, due to naturally-occurring bacteria on the crop, David says the reason for using a proven additive is because some of those bacteria won't necessarily be the best types to carry out the fermentation efficiently - and some could be very much the wrong types.

"Put simply, you need to direct the fermentation because you can't guarantee what microbes are present. To use an analogy, when milk is processed, it is sterilised first. But grass isn't sterilised when it goes in the clamp. If you use the right additive, you will improve sugar content and reduce true protein degradation in the silage.

"In the animal, the most inefficient part of rumen fermentation occurs because of low sugar and because protein has been broken down. If you improve these two, you will get an animal performance benefit," he adds.

Philip Jones, silage microbiologist for Volac, agrees. He believes a key reason some farmers remain sceptical about additive use is a lack of awareness and belief in exactly what they do in the clamp.

"Fermentation is simply a form of pickling," says Philip. "An efficient fermentation occurs when good bacteria convert some of the sugars in the forage into beneficial acid, which in turn preserves the forage against undesirable microbes, such as enterobacteria and clostridia.

Research

"Applying a quality additive essentially provides an avalanche of specially selected good bacteria – as many as 1 million per gram of forage when used correctly. So it puts you in greater control of the fermentation process. Without this, you're leaving fermentation to chance. If silage is fed for half the year, that's a big risk."

Pointing to Lactobacillus plantarum MTD/1, the bacterium used in Ecosyl, Philip says there is now a huge amount of research to pinpoint the logical sequence of benefits that treatment brings – from application right through to animal performance (see graphic).

First among these, he says, is improved fermentation efficiency. "There's a much faster production of beneficial acidic conditions in the first 24 hours after ensiling with treatment than without. That's an important timescale for stopping bad bugs getting established," he confirms.

Following this, he says, are increases in silage quantity and quality. "In grass trials, over 95% of the original dry matter ensiled was retained with treatment – 3.7% more than without treatment. That's equivalent to an extra 37 tonnes available to feed from a 1,000 tonne clamp."

Silage quality

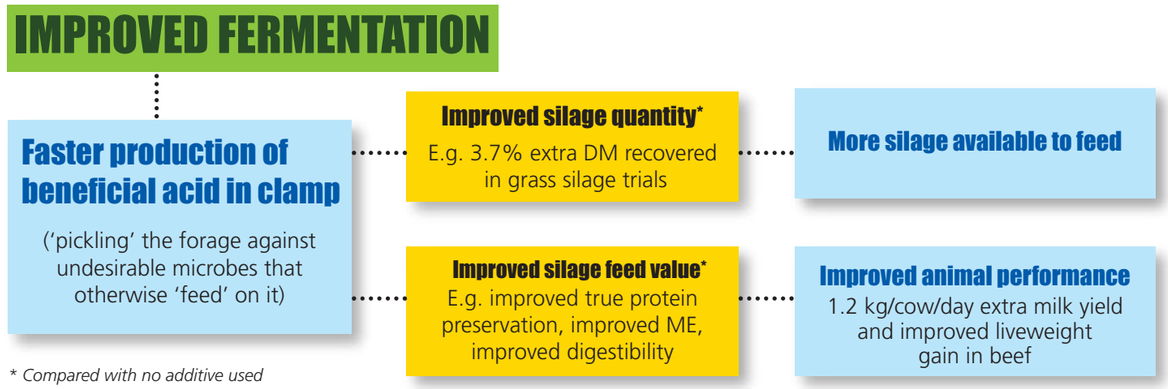
From a quality perspective, Ecosyl treatment has also been shown to boost average ME by 0.6 MJ/kgDM, to preserve more true protein, and to improve digestibility by an extra 3 D units.

Philip adds: "If you're looking to make more from forage, these improvements offer a logical explanation behind the improvements in animal performance also seen. Across a range of forages in 15 independent trials - seven in the UK and Ireland - Ecosyl treatment boosted average milk yield by an extra 1.2 kg of milk per cow per day."

According to David, by making high quality silage, more of the animal's nutritional requirements can be met from home-produced forage.

This can reduce concentrate use and milk production costs, and maintain a healthier rumen, so reducing metabolic disease – all-in-all making profitable milk production far more likely, he adds.

Sequential benefits of Lactobacillus plantarum MTD/1 (Ecosyl) treatment based on research



** Compared with no additive used*

CHEWING THE CUD

It's not always an easy, straightforward task of future-proofing the family farm as leadership and ownership passes to the next generation. Laura Mushrush sits down with family business consultant Siân Bushell to discuss some of the more difficult aspects of succession planning.

LM: When it comes to succession planning, people aren't always sure where to begin. To get us started, what's the first step?

SB: Gosh that's a huge question; It very much depends on where you start from. However, it's probably a good idea to begin with the end in mind. Where do you want to be in 10; 20 or 30 years' time? I came across this quotation by celebrity chef and food writer, Samin Nosrat, "I've learned to envision the ideal end to any project before I begin it now - even the best gigs don't last forever. Nor should they."

People often look on stepping back from the business as a negative thing but planning an ideal withdrawal from the business is possible; especially when you start early.

So, start getting some clarity with what you want and then start the all-important conversation with family members. Communication is the key to maintaining good family relationships.

LM: Starting the conversation seems to be a difficult part of succession planning. What advice do you have for the older generation?

SB: It should be the responsibility of the older generation to start the conversation. In fact, it should be part of a regular discussion about the future of the business. Taking time out to hold a specific meeting to discuss the future would be a good idea. An integral part of that would be succession. This is not a five minute discussion so give it the time it deserves. It may be a good idea to meet in a neutral venue so that everyone is on the same footing and you are not likely to be disturbed. The more businesslike you can make these meetings the better. If you are concerned that there are some issues you would not like to discuss for fear of argument it may be necessary to use a facilitator.

LM: How about the younger generation?

SB: It can be difficult for the younger generation to begin the discussions. They often fear that they look greedy when they just want to have a degree of security for their future. They need to know there is a future for them in that business. Ideally this conversation should be held when they are first discussing coming back into the business, having clarity before they make that important decision. Trying to broach the subject with parents as a discussion about the future business is a start. They may need to recruit some help from professionals who deal with the business, such as the accountant. They need to remember the maxim - seek first to understand. Give the older generation time to express their concerns and work together for solutions that are of mutual benefit.

Both generations need to remember if there is conflict that you cannot change other people. The only person you can change is yourself, so have an honest look at how you are communicating and change your approach if it isn't working.

LM: How do businesses recognise when they can "do it themselves" and when they need to bring in a facilitator?

SB: I suggest businesses try to do it themselves unless:

1. They feel they cannot discuss certain issues because they think they may cause a family rift.
2. They think it is just too difficult.
3. They never seem to get around to it so making an appointment with someone creates that discipline.

LM: What benefits will a facilitator bring to a succession plan?

SB: A facilitator will help create a safe and respectful environment where family members feel comfortable to talk. They will also ensure that each family member can fully express their concerns and ideas. While the family will find its own solutions and make plans with the full agreement of all members, the process is made easier by having an impartial chairperson that can ask the hard questions.

LM: What are some of the most common mistakes you see people making?

SB: Not communicating with all the family together so some family members feel that things have been decided behind their backs.

- Not doing anything and hoping it will all go away - it won't and the longer it is left the less options are available.
- Getting so tied up in not wanting to pay any tax that the plan does not actually suit the family or the business.
- Asking a professional to make a plan for them without having had a family discussion about what everyone wants.
- Refusing to talk specifics with the younger generation. This results in the younger generation feeling very insecure about their future.

Top tips to getting the most out of your facilitator:

1. Hold the meeting in a neutral venue.
2. Invite everyone in the family who has an interest, even those who don't want to farm.
3. Give it a whole day - no time pressures.
4. Accept that the facilitator cannot change other people.
5. The facilitator will not be giving advice.
6. Accept that the family have to implement the plan - no one else can do it for you.
7. If immediate legal or tax advice is needed it may be necessary to invite a solicitor or accountant to at least part of the meeting.

LM: What risks are people taking when not implementing a well thought out succession plan?

SB: There are so many people who are uncertain of their future and this causes so many pressures within families and businesses. Sadly, I see a lot of mental health issues as a result.

Other things people are at risk of:

- Family members will be dissatisfied at best and alienated at worst.
- Unnecessary tax may have to be paid.
- Family fall out can result in the farm having to be sold to pay legal fees.
- The assets may be depleted or even entirely used up to pay for nursing care of the older generation.
- The farm business will stagnate and in today's climate that means it will go backwards.
- There may not be enough money to enable the farm to continue and support the family.
- Uncertainty takes a high toll on mental health.

LM: What advice do you have for businesses that don't have a formal succession plan?

SB: Those who don't have a plan - Start talking about it today. Don't put it off. Talk to all family members together. Take time out to organise a meeting. Use a neutral venue so that everyone is on the same footing and you won't be interrupted. Give everyone time to talk about what they want to happen. Respect everyone's opinion. It doesn't happen overnight so regularly make time to talk and make progress. Do the easy things first.