FORAGER

Issue 26 / Summer 2021

NEW TECH

What's available now, soon and in the future?

CARBON-FRIENDLY GRASSLAND

UNLOCKING NITROGEN EFFICIENCY

MAKING A SUCCESS OF AUTUMN GRAZING

BEEF | SHEEP

CONTENTS

SUMMER 2021

NEW TECH

GRASS SEED

FORAGE

AUTUMN RESEEDING

FORAGER
Issue 26 / Summer 2021

FORAGER is available free of charge to farmers and industry specialists.

Editor: Fiona Carruthers
E: fiona@reverberate-pr.co.uk

To be added or removed from the magazine mailing list please contact:
forager@reverberate-pr.co.uk
T: 01823 602806.

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Germinal
Sowing future seeds

PIONEERING SOIL CARBON PROJECT LAUNCHED

Technology company, Agricarbon, has partnered with First Milk and Nestlé to carry out intensive soil carbon analysis on First Milk supplier farms. Using state-of-the-art machinery originally developed for NASA to sample soils on Mars, the project allows soil carbon sequestration to be quantified over time to support First Milk's net zero ambitions. Nestlé is supporting the project to drive meaningful progress in carbon reduction through its supply chain; First Milk supplying several Nestlé UK production plants. The soil carbon map created from the project will demonstrate how farms can capture more carbon through sequestration and inform the development of proactive soil stewardship.

First Milk's Sustainability Director, Mark Brooking, commented: "Having robust, scientifically-validated soil carbon data is critical to the successful delivery of our sustainability strategy. This project accentuates the potentially positive impact of grass-based dairy farming and advances the work already being done on our members' farms."

FORAGE APP FOR FARMERS

A new forage app for farmers from Corteva Agriscience provides 24/7 access to expert agronomy advice and resources. Available to download for free, the app includes decision-making tools to identify appropriate seed and crop protection solutions for growing the best quality and quantity of forage. The app mirrors the move of many farmers to digital tools and offers easy navigation for quick reference and access to support tools for making the right decision at the right time.

To download the app, go to **corteva.co.uk/forage**

WHAT'S ON

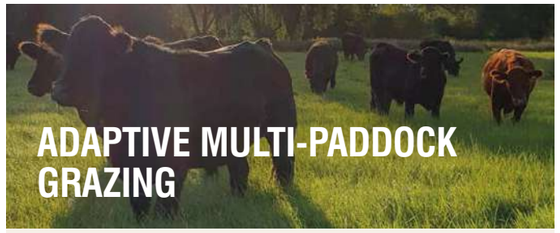
FACE-TO-FACE FARM WALKS RETURN

Germinal is delighted to announce a series of farm walks this summer, by kind invitation of the host farmers. These events look at the proactive approach to grassland management being taken by farmers achieving outstanding livestock performance from forage. As well as hearing from the farmers themselves, expert technical advice and practical insight is provided by Germinal's forage specialists.

Due to the uncertain nature of COVID-19 restrictions, please register in advance so you can be contacted in the event of a cancellation: **https://germinal.co.uk/farm-walks-register/**

DATE	VENUE / FARM TYPE
Wednesday 14th July	Host farmer: Rheinallt Harries Llwynmendy Farm, Bethlehem, Llandeilo, Carm, SA19 6YE. ***Dairy***
Wednesday 21st July	Host farmer: Andrew Marrow Park Farm, Park Lane, Endon, Staffs, ST9 9JA. ***Dairy***
Tuesday 27th July	Host farmer: John Goffin Mauldslie Farm, Gorebridge, Midlothian, EH23 4TB. ***Sheep and deer***

Summer Dates



ADAPTIVE MULTI-PADDOCK GRAZING

McDonald's UK and FAI Farms Ltd are using adaptive multi-paddock grazing (AMP) to build soil, reduce inputs and increase both biodiversity and farm resilience. The two companies have initiated a project to better understand farming regeneratively using AMP grazing for beef cattle. FAI and McDonald's are investigating what transition across more farms might look like by reviewing the ethical, environmental and economic impact of this approach with detailed monitoring of metrics such as soil biology, carbon emissions, animal behaviour, and daily live weight gains.

Harriet Wilson, Agriculture & Sustainable Sourcing Manager at McDonald's UK & Ireland says: "We know grazing systems provide an opportunity to futureproof the beef industry and drive more resilient production. This programme will create a roadmap to ensure our future beef supply contributes to a sustainable food system."

NEW TECH ROUND-UP

Advances in technology are bringing new opportunities for agriculture. Forager takes a look at how robotics, satellite data and infra-red sensors are providing new ways to grow, measure and analyse forage.

Looking Ahead

Automated growing

The Hands Free Hectare project is run by Harper Adams University and Precision Decisions. It started in 2016 with the aim to be the first in the world to grow, tend and harvest a crop without operators in the driving seats or agronomists on the ground. The project has now expanded to a 'Hands Free Farm' of 35 hectares, exploring the possibilities of taking operators off vehicles and reducing vehicle size to reduce soil compaction and look after the environment.

The farm is currently growing wheat, oats and beans in rotation and hoping to gather data that shows drone spraying and seeding is a viable alternative for UK farms. "This technology is already being used widely in China, Australia and America. But stringent controls in the UK and Europe mean we need to do more work to prove to the HSE chemicals won't drift," explains Mechatronics Researcher at Harper Adams University, Jonathan Gill.

"We are looking to carry out a project using drones on a sheep rotational system, to try ideas such as visually identifying patches where reseeding is required and then establish herbal leys in these areas. We also see potential for drones to establish cover crops. For example, turnips could be seeded by air in a wheat crop without damaging what's already growing."

Jonathan concludes that while drones and robotics have the potential to remove a lot of the dull, dirty and dangerous jobs on a farm, there is always a place for a 'real live farmer' in automation. "Like a tractor, this technology is just another tool to deliver benefits to agriculture. The number of variables and external factors means we will always need a human to evaluate the decision-making processes, but hopefully gives us the option of working smarter. It's a very exciting time."

You can find out more about the Hands Free Farm project at www.handsfree.farm

Jonathan Gill

Coming Soon

Satellite Pasture Measurement

Recent changes in affordability and frequency of satellite imagery is allowing LIC to start trialling its Satellite Pasture and Cover Evaluation (SPACE) service in the UK. The service uses images taken by satellites to measure pasture cover and deliver results by email to dairy and beef farms, replacing the labour-intensive task of measuring grass manually on a weekly basis.

The service was initially trialled in New Zealand where it is now commercially available and being used by over 1000 farms.

"The benefit of this software is it brings consistency of measurement and is massively labour-saving," says Mark Ryder, General Manager LIC Europe. "Even with the same plate meter, people vary in their 'plonking' technique, and those with large grazing platforms can easily spend a day per week out measuring grass. Previously, only monthly satellite images were available, which wasn't ideal for regular grass measurement, especially if that image was partially obscured by cloud. Now we have access to weekly images, the opportunities are really opening up.

The only thing we can't control is cloud cover, but our work in New Zealand has helped us to create algorithms using rainfall and growth data to make very educated guesses on pasture covers in this eventuality."

"LIKE A TRACTOR, THIS TECHNOLOGY IS JUST ANOTHER TOOL TO DELIVER BENEFITS TO AGRICULTURE"

TRIAL FARMS REQUIRED

LIC is currently seeking farms in the UK to trial the SPACE technology. To enable calibration, farms need to have robust historical data (i.e. regular plate meter records), be relatively flat and ideally a consistent pasture cover.

LIC is using satellite images to measure grass covers

For more information, please contact Sean Chubb schubb@liceurope.com

Available Now

Real-time dry matter data

An infra-red sensor for measuring crop constituent values during harvesting and mapping them using GPS position is now available. It comes from AGXTEND™, a CNH Industrial brand specialising in emerging precision farming and ISOBUS solutions. NIRXact sensors can be mounted on forage harvesters and balers to measure moisture and nutritional composition of harvested crops in real time. Their main application is to obtain a high-accuracy dry matter content analysis, but they can also read other values such as protein, starch and fibre.

NIRXact sensor fitted to forager spout

Another use for the sensors is on slurry tankers, where they can record slurry application rates. Here, the NPK content of slurry spread can be logged across a field, potentially reducing mineral fertiliser inputs and ensuring nitrogen applications stay within legal limits.

Big data acquired by the sensors in the field can then be gathered into Field Trace Cloud software. This allows fields to be mapped and provides prescriptions for optimising yield and quality of the crop, for example to inform variable rate input application.

Find out more at agxtend.com or via your local Case IH or New Holland dealership.

CARBON-FRIENDLY GRASSLAND

Grassland is playing a major role in reducing the nation's carbon footprint. But producing carbon-friendly grassland may involve taking a new approach to its management. Ann Hardy investigates.

Livestock attracts bad press when it comes to greenhouse gas emissions. But grassland itself – the very crop that's only digestible in commercial farming by ruminant livestock – has better carbon credentials than almost any other mainstream crop grown in the UK.

While this presents the dilemma of linking the most carbon-friendly ground cover with livestock species whose function depends on greenhouse gas emissions, the challenges are not insurmountable and are being addressed by farmers using traditional, modern and emerging techniques.

Dr Elizabeth Stockdale, Head of Farming Systems Research at NIAB, says there is plenty farmers can do both to give their grassland a greater ability to absorb carbon dioxide (CO_2) and help it hold on to the carbon it already has, both within and under its structure.

"Grassland sits in a good place," she says. "It provides constant ground cover meaning whenever the sun shines it is photosynthesising, capturing and supplying carbon into its root system and feeding soil organisms."

This cycle of photosynthesis coupled with microbial decomposition creates organic matter, which locks away carbon.

"Well-managed grassland does a better job of storing carbon than arable crops, partly because it does not leave bare soil exposed," she adds.

There are also other factors giving grassland superior carbon credentials, one of which is its growth rate.

"Improved, intensively-managed, productive grasslands capture a greater amount of the sun's energy and more carbon from the atmosphere," she explains.

But even this presents a dichotomy as the growth processes on which this performance depends have traditionally relied on high inputs of artificial nitrogen.

"Nitrogen fertiliser is expensive to make in terms of fossil fuels, so it's associated with high embedded carbon emissions," she says.

Clever legumes

Sward productivity can be maintained, however, without artificial nitrogen using legumes. With their ability to convert nitrogen from the air into a form which can be absorbed by the plant, carefully chosen legumes complement the grass.

This doesn't just mean white clover in grazing swards and red clover in those intended for silage, but includes 'clever' legumes with benefits beyond their nitrogen fixation.

"PRODUCTIVE GRASSLANDS CAPTURE A GREATER AMOUNT OF THE SUN'S ENERGY AND MORE CARBON FROM THE ATMOSPHERE."

DR ELIZABETH STOCKDALE

Dr Elizabeth Stockdale, Head of Farming Systems Research at NIAB

"WHENEVER THE SUN SHINES (GRASSLAND) IS PHOTOSYNTHESISING, CAPTURING AND SUPPLYING CARBON INTO ITS ROOT SYSTEM AND FEEDING SOIL ORGANISMS."

DR ELIZABETH STOCKDALE

"These clever legumes include birdsfoot trefoil and sainfoin, which contain condensed tannins," she says. "They have been shown to reduce methane production, the main greenhouse gas produced during ruminant digestion, so these species could be integrated into grass swards to bring a range of benefits."

Diverse swards

Dr Stockdale suggests adding other species to a grass sward has further benefits when it comes to carbon capture.

"The key for carbon capture is optimising resource use," she says. "This could mean better use of nutrients, for example, by having a more diverse sward with a wide-ranging set of roots to exploit different niches in the soil."

Alongside legumes, she cites deep-rooted herbal species, drought-tolerant grasses or species which 'prefer having wet feet' to collectively 'triple our benefits'.

"More variety in the sward is good for biodiversity, but can also benefit productivity and carbon capture," she says. "With the right balance of species, we gain more 'bang for our buck' as each one uses resources in a slightly different way."

Soil disturbance

Grassland needs to be reinvigorated with new varieties and species and choosing from the Recommended Grass and Clover Lists can increase productivity and potentially disease resistance. But Dr Stockdale points out that introducing new species raises questions around reseeding methods, with ploughing known to release greenhouse gases which would otherwise remain locked in the soil.

"It's recommended to use an option involving the least amount of soil disturbance but sometimes ploughing may be needed to help address structural problems," she advises.

Farming systems and soils

Many uplands and grassland areas of the UK use farming systems which have stored carbon efficiently over many decades.

"Many of these grassland soils have good reserves of carbon. Although their carbon-carrying capacity bucket is nearly full, it is important to maintain this position by continuing carbon-friendly practices," she says.

She predicts a strong drive to integrate grassland into arable rotations.

"A lot of interest in this area has focused on arable soils which have low organic matter and are ideal for conversion to grass. Therefore, there are likely to be opportunities for livestock to graze temporary lowland leys," she says.

Equally, on existing mixed farms she makes a case for grass and arable platforms to be integrated, rather than kept apart.

"Planning carbon-friendly approaches needs to be coupled with a good understanding of soil and environmental factors," she says. "Sandy and silty soils have lower carbon-carrying capacity than heavier soils where clay minerals help stabilise the carbon; the bucket is also bigger in deeper soils."

Emphasising the importance of farmers knowing how to measure their carbon and target their gains, Dr Stockdale says the AHDB Soil Biology and Soil Health Partnership provides tools for the purpose.

"These help farmers measure their soil biology, understand their soil carbon status and better maintain healthy soils for both productivity and environmental benefit," she says.

Some of these measures are expected to form part of the Environmental Land Management (ELM) scheme. She is confident the scheme will reward farmers for the measures they take towards creating carbon-friendly swards.

CARBON-FRIENDLY GRASS

- **Choose productive species** to maximise photosynthesis
- **Incorporate legumes** to fix atmospheric nitrogen
- **Look out for 'clever legumes'** which cut methane emissions
- **Introduce multi-species swards** to exploit different niches
- **Minimise soil disturbance** to keep carbon locked away
- **Check soil type** to understand its carbon capacity
- **Consider moving grassland** into arable rotations
- **Visit ahdb.org.uk/greatsoils** for measures of carbon storage

GRASS SEED SELECTION

The 2021 Recommended Grass and Clover List was published last month. But what does it tell you and how can it improve your grassland productivity? Forager finds out.

The cost of production is a major consideration for livestock farmers, whether measured per litre of milk or kg liveweight gain. Any improvement in grassland management to produce better quality forage cost effectively on farm benefits profitability as well as being fundamental to gains in productivity.

Productive grass leys can provide 1kg DM of grazed grass for just 5p or the same amount of DM grass silage for 10-12p. But however well managed, as grass leys mature, the proportion of indigenous grass increases and perennial ryegrass falls. This reduces ley performance with lower DM tonnage and metabolisable energy (ME) yield, and a poorer response to inputs. At this point, reseeding with high-performing grasses keeps grassland as productive as possible with most reseeds seeing a return on investment within a year. Although grass seed is not the most expensive element of a reseed, not choosing the best variety for your system can be costly in the long term. The two most important elements to consider in a reseed are having the right species for your situation and the best variety of each species.

The Recommended Grass and Clover List (RGCL) for England and Wales, published annually in May, is the most recognised 'go to' reference guide for finding those varieties. A separately funded and derived list is published in Scotland. The lists are designed to help grassland farmers find the best varieties to suit a particular system and production goals when buying mixtures from a merchant or grass seed company.

> "PLANT GENETICS ARE AS ADVANCED AS ANIMAL GENETICS SO WARRANT THE SAME ATTENTION."

Varieties being considered for the list go through a rigorous testing programme. The varieties are tested independently at 4-5 sites across the country over a four-year period. Attributes such as yield, quality, persistence and disease resistance are tested in different weather conditions, soil types, grazing and cutting regimes. As a result, inclusion on the list guarantees performance in the UK, rather than just the country of origin.

To be added to the RGCL, a variety has to be better than those already there. Only around 1 in 20 of the varieties tested makes it onto the list, so they represent the best of the best. The list demonstrates a continual improvement in plant breeding, with a 1% DM and 0.5% D-value increase year on year.

WHAT'S NEW IN 2021

New this year is the first Festulolium to be considered for a perennial ryegrass list. AberRoot has lined up extremely well against the intermediate tetraploid group with very high-quality grazing and cutting, superior DM yields and no weaknesses. It has the 2nd highest mid-season grazing D-value, high ME yield and excellent seasonal growth across the important times of spring, summer and autumn.

Festulolium trial plots

THE RGCL IN DETAIL

Figure 1

Recommended List of Intermediate Perennial Ryegrass Varieties 2020/2021

Variety	Heading date	Simulated grazing management: Total annual yield (Average = 100 at 9.87t DM/ha)	Simulated grazing management: D-value (Midsummer)	Conservation management: Total annual yield (Average = 100 at 15.35t DM/ha)	Conservation management: D-value (2nd conservation cut)	Ground cover (1 = poor 9 = good)	Crown rust	Brecklera	Suitable for my farm
Diploids									
Boyne	21 May	99	75.5	104	69.9	6.4	8.0	5.5	
Galgorm	22 May	105	78.1	105	75.4	6.2	7.5	[5.3]	
AstonConqueror	24 May	99	77.6	100	74.3	6.7	4.6	[6.3]	
Nifty	24 May	101	77.7	101	71.8	6.5	7.3	5.4	
Moira	24 May	99	76.6	102	74.2	6.1	6.8	7.5	
AberDart	25 May	97	78.3	95	72.9	7.2	6.4	3.9	
Glenariff	25 May	99	75.9	98	73.1	6.4	8.3	5.8	
AberZeus	27 May	104	78.5	102	74.7	7.4	8.0	5.1	
AberMagic	28 May	102	77.9	100	72.1	6.5	8.1	3.7	
AberWolf	28 May	100	78.4	101	72.6	7.1	6.7	4.6	
Gosford	29 May	99	77.8	100	73.8	6.5	7.6	4.6	
Agaska	30 May	101	76.8	99	72.2	6.3	8.4	[5.9]	
Elyria	30 May	98	77.1	97	72.8	6.9	8.2	7.1	
AberGreen	30 May	102	77.7	101	73.6	6.8	7.8	5.1	

Heading date: A spread of heading dates within a mixture gives flexibility but a tighter range is needed in silage mixtures to prevent potential loss of yield and quality seen with a wider range of dates.

Yield: 100 is the average yield for varieties on the RGCL so a number higher than 100 indicates an above average yield.

D-value: A measure of quality referring to the amount able to be digested with a higher number indicating greater digestibility. This also relates to ME value as digestibility is connected to energy availability.

Ground cover: An indication of suitability for grazing or cutting. Higher scoring varieties are more suitable for grazing, whereas cutting favours leys with a more open growth habit, giving a lower score.

Disease resistance: Disease can reduce both yield and grass quality and is dependent on site and variety. Scores in the RGCL relate to resistance, so a higher score indicates a variety is more resistant to the disease.

The lists provide details of single varieties although most grass seed is sold within a mixture. This is because mixtures give the flexibility required in most farming situations and offer the benefits of the different species included. The range of characteristics found in different varieties within a mixture gives the ability to cover more soil types, weather patterns and livestock. If conditions were totally predictable, straights could give better results, but for the vast majority of grassland systems, mixtures are more suitable.

Germinal's National Agricultural Sales Manager, Ben Wixey, stresses the importance of using the lists: "Plant genetics are as advanced as animal genetics so warrant the same attention. The independently-compiled recommended lists act as a safeguard to know which varieties are best across a range of performance factors. They give grassland managers the confidence to make informed choices when planning a reseed."

HOW TO CHOOSE THE RIGHT GRASS SEED MIXTURE

- **Does it offer a balance between quantity (DM yield) and quality (D-value)?**
- **Is it right for how it's going to be used?** Grazing, cutting or both; short-term or long-term; type of livestock
- **Is it tolerant of the typical conditions experienced on your land?** Dry, waterlogged, specific diseases
- **Are the varieties included on the recommended lists?**

To learn more about using the best grass varieties and excellent grassland management, join an upcoming series of webinars led by Germinal's grass and forage specialists. For more information, sign up to the Germinal mailing list: **https://germinal.co.uk/subscribe**

THE LATEST IN CUTTING EDGE FORAGE RESEARCH

Forager catches up on the latest UK grassland research from around the UK.

DEVELOPING CLIMATE-SMART GRASS VARIETIES

Scientists at Aberystwyth University's Institute of Biological, Environmental and Rural Sciences (IBERS) have been working for many years to produce grass varieties with both the production qualities and stress tolerance livestock farmers need from their grassland.

Drought is a stress many grassland farmers experience and look to overcome. Festuloliums are beginning to offer a potential solution. They are hybrid grasses, bringing together a high-quality ryegrass with a deep-rooted drought tolerant fescue.

But not all festuloliums are the same; their differences coming from their 'parentage'. Following the success of breeding AberNiche, a festulolium with Italian ryegrass characteristics, a perennial ryegrass cross festulolium, AberRoot, has been developed.

Festulolium field trial at IBERS

AberRoot is a cross between an Atlas fescue found in the hot, dry conditions of North Africa and an Aber High Sugar Grass perennial ryegrass, also bred at IBERS. This means it has maintained sugar levels, with the persistency and versatility of a perennial ryegrass and the fescue's deeper root structure giving it greater tolerance of dry conditions. It is the only high sugar grass festulolium.

Bred by conventional plant breeding methods, it has been trialled successfully across the UK. Reflecting this success, it is the first perennial cross festulolium to be listed on the Recommended Grass and Clover List (RGCL), judged alongside the intermediate perennial tetraploid group. It is a long-term grass variety showing yield and quality advantages for grazing and cutting with good overall disease resistance and no specific weaknesses.

Atlas Mountains

UNDER-SOWING MAIZE

Forager continues to follow the work being done on Trevase Farm in Herefordshire, where David Pursey has been under-sowing maize successfully for the last five or six years. Over the last year, David has hosted trial work, testing different grasses and festulolium with and without clover.

Most farmers under-sow maize with an Italian ryegrass as it establishes well and grows quickly. The festulolium David is using, AberNiche, takes the positive attributes of Italian ryegrass and adds the stress tolerance of a meadow fescue.

Recent trial results show this stress tolerance of AberNiche has paid off.

Last year saw a very warm and dry spring, followed by heavy rain later in the growing season causing stress in many varieties exacerbated by damage at harvest. It appears the fescue properties of AberNiche helped it cope with these conditions. The AberNiche plots grew the most forage after the maize harvest, giving a 3,500kg DM/ha yield in March after grazing in the previous November.

A dry summer can increase potential for a shortfall of forage the following winter. Studies such as this continue to test grass varieties in challenging conditions. These results suggest a festulolium, like AberNiche, under maize can provide autumn grazing and early spring growth.

AberNiche plots at the end of February 2021

QUALITY OF MULTI-SPECIES

Interest in the benefits of sward diversity is gaining ever more momentum.

Soil fertility, forage quality, drought tolerance and improved biodiversity to name a few. The on-going multi-species trial work at the Germinal Research Station (GRS) in Wiltshire continues to underline their value. As reported previously, the 2020 trial results showed highest yield in plots containing a mixture of legumes and herb species with multiple grasses. GRS Manager, Dr Jo Matthews, comments: "Chicory and plantain contributed 60% of the total yield from mixtures in which they were included. This indicates they were the main drivers of the increased yields seen from these mixtures compared to standalone grasses. But the latest findings show even simple mixes of red and white clover can benefit both yield and protein quality. The highest protein levels were seen in mixtures containing white or red clover. This is most likely to be due to clover's nitrogen-fixing abilities." Protein and metabolisable energy (ME) fluctuate throughout the season and is strongly influenced by when each species begins flowering/heading. Each species has its own growth cycle which impacts the sward, so more work is being done to establish exactly what this means for use on farm.

Multi-species trial plot at GRS

COUNTRYSIDE STEWARDSHIP MIXTURES

The multi-species trials at GRS also include some wildflower mixes eligible for countryside stewardship agreements.

Results indicate it's best to treat these mixtures like a crop, i.e. sow into a fine, firm seedbed and early enough to aid establishment. How well the wildflower mix established directly related to when it was sown, largely due to a lack of moisture. The seeds are small and some species slower to establish so need to be sown in good conditions with a fast strike or weeds can dominate. In the extremely dry 2020 season, monthly measurements showed the success rate tailing off from June onwards. Although it may be possible to drill beyond June in a wetter season, as payment is only made for areas where plants are established and to secure flowering in the year sown, sowing early is recommended.

SUMMER FOCUS

WHY CALCIUM IS THE SECRET TO UNLOCKING NITROGEN EFFICIENCY

Mark Tripney, ISoils Director

Balancing calcium in soils is the foundation to achieving better nitrogen utilisation. And although doing this with agricultural lime is relatively cheap, easy to do and comes with numerous other benefits, as much as 40% of UK soil still has sub-optimal calcium levels. Forager talks to agronomist and ISoils Director, Mark Tripney, to find out more.

Soil health, nutrient availability and efficient fertiliser use are some of the most talked-about topics in UK agriculture, and calcium can play a role in tackling all of them. Described as having both an 'understated role' on UK farms and the 'forgotten nutrient', the link between calcium, pH and improving fertiliser efficiency is one still needing to be better understood.

Where soil calcium levels are balanced, pore space is created which helps water percolation, root penetration and allows the soil to function aerobically as it should. Calcium also affects numerous biological processes in the soil, including nitrification. This biology flourishes when calcium is readily available.

Invest in soil analysis

Before you apply nitrogen, or any fertiliser, start by doing a detailed soil analysis, so you really understand your soil. The tendency to use very basic soil tests which simplify analysis to only include pH level, phosphorous, potassium and magnesium can be detrimental. Instead, choosing a more detailed soil report helps develop a better understanding of your soil's nutrient levels. It enables you to identify what might be limiting the potential of your fertiliser applications and ultimately your forage, including inadequate calcium supply.

"My advice is to choose a broad-spectrum soil analysis which includes calcium, CEC (cation exchange capacity) and micronutrients," explains Mark. "This provides an understanding of the balance between the main elements within the soil and ensures you are only applying the extra inputs you really need. And although more expensive than a standard soil test, the cost is easily recouped through the benefits detailed sampling brings to your business.

"Although pH is a good place to start, it won't give you the full story. For example, your soil pH might be at the 6.5 target, but it could still be short of calcium and not supplying enough of essential nutrient to your forage."

An increasing trend on land receiving large volumes of organic manure is the effect of potassium on soil pH. It is not uncommon to find soils with an optimised soil pH of 6.5 but low calcium and magnesium levels. A simplified test would suggest there is no issue, leaving the crop and animals prone to the effects of a lack in both these nutrients due to the excess potassium.

"Calcium is almost always under-supplied as it is lost from soils continuously through various processes, including crop off-take. But by far the biggest losses relate to the use of inorganic fertilisers and leaching. Therefore, it should feature in nutrient plans every year," advises Mark.

Table 1 lists the amount of calcium carbonate required to neutralise each kg of nitrogen supplied by these fertilisers.

TABLE 1. Calcium Carbonate ($CaCO_3$) requirement to counteract acidification of nitrogen fertiliser applications

	Kg $CaCO_3$ required to neutralise each Kg N
Ammonium Sulphate	5-7
Ammonium Nitrate	2-3
Urea	2-3
Calcium Ammonium Nitrate	1.5-2.5
Calcium Nitrate	0

TABLE 2. The effect of soil pH on fertiliser utilisation efficiency

Soil acidity	Nitrogen	Phosphate	Potash	% fertiliser wasted
Extremely acid pH 4-5	30%	23%	33%	71.34%
Very strong acid pH 5.0	53%	24%	52%	53.67%
Strongly acidic pH 5.5	77%	48%	77%	32.69%
Medium acid pH 6.0	89%	52%	100%	19.67%
Neutral pH 7.0	100%	100%	100%	0%

Improve nitrogen use efficiency

At a time where there is ever-increasing focus on reducing carbon footprint at farm level, minimising inputs is important. Using fertiliser in the most efficient way possible is vital and if soil pH levels fall below 6, nutrients are locked up and fertiliser is wasted. Alongside this, fertiliser isn't a cheap input, and wasted fertiliser is wasted money.

Soil at pH 6 can waste almost 20% of fertiliser applications and reduce yield. Table 2 highlights the effect soil pH has on fertiliser efficiency. "Making sure your soil has an adequate calcium supply costs far less than wasting 20% of fertiliser as well as contributing to an improved carbon footprint," says Mark. "It is also important to understand soil with the right calcium availability is better able to sequester carbon and less prone to denitrification due to the greater stabilisation of soil organic matter."

Choose quality liming material

More farmers are moving towards precision application of fertilisers, and lime should be treated the same. The soil pH across a single field can vary significantly, especially where fields slope. Variable lime application can easily be achieved, especially with granular lime products.

The quality of agricultural lime is paramount. Too frequently product is bought on price not specification. Ultimately farmers must take responsibility for what they spread on their land, but suppliers also have their part to play in ensuring they meet the correct legal specification for agricultural lime. To address this, the UK Agricultural Lime Association (ALA) setup the Aglime Quality Standard (AQS). The AQS ensures all participating members meet the 1991 Fertiliser Regulations standard for lime as a minimum and measures the calcium and magnesium content of lime as well as its reactivity. This quality standard, endorsed by the AQS logo, gives farmers confidence in the quality of the agricultural lime they use.

Return on investment

"Liming with good quality material easily pays for itself," Mark concludes. "A recent case study using granulated lime on grassland silage in Scotland saw a spend on lime of £1,440 over two years generate increased silage bale production equating to a profit of £5,760 over the same period. This represents a return of 4:1 on the farm's initial investment. Ultimately healthier soils grow crops of better quantity and quality while also using fertilisers more efficiently and helping reduce the carbon footprint of the industry."

Calcium should not just be considered for pH remediation on a five-yearly liming cycle. It should be part of your yearly nutrient toolkit and applied little and often to keep soil healthy and balanced.

"IF SOIL PH LEVELS FALL BELOW 6, NUTRIENTS ARE LOCKED UP AND FERTILISER IS WASTED."

MARK TRIPNEY

FORAGE: TAKING AN ALTERNATIVE APPROACH

Grazed grass and silage will always be at the heart of a ruminant-based enterprise, but James Marshall examines why farmers are incorporating alternative forages into livestock diets.

Alternative forages provide a cost-competitive, adaptable, high-nutrition feed that can supplement grass intakes during the shoulders of the grass growing season. While the main focus on any beef or sheep farm is to provide plenty of high-quality grass, alternative forages have the potential to help fuel strong animal performance.

Swedes, kale, stubble turnips, fodder beet, plantain and chicory are just some in the long list of alternative forages beef and sheep farmers can add to their crop rotations. And with a range of different sowing times, feeding methods and nutritional benefits, there is an alternative forage to suit every system. Here are two farmers benefiting from taking on an 'alternative' approach to forage.

Andrew Baillie

Andrew Baillie, Carstairs Mains Farm

"We started using a range of alternative forage crops about eight years ago and they have helped us reduce winter feed costs dramatically," explains Andrew, who runs a mixed beef, sheep and arable enterprise in South Lanarkshire. "It used to cost us 98p a day to feed cows over the winter period but now it's down to 22p. Our concentrate feed use for all our ewes has also dropped from 22-23 tonnes a year, to just five tonnes."

> "IT USED TO COST US 98P A DAY TO FEED COWS OVER THE WINTER PERIOD BUT NOW IT'S DOWN TO 22P"

Andrew sells around 80 pedigree forage-finished shearlings each year and aims to have mid-April born commercial lambs fattened and off the farm by Christmas. Deadweight carcass targets for commercial lambs are 22kg.

"We have 15-20 acres of Maris Kestrel kale and overwinter the majority of our cows on this, supplemented with straw bales," continues Andrew. "There is also 10 acres of Triumph swedes as my multi-use 'insurance policy' forage crop. We are sometimes hit with very hard winters and if the kale starts to falter early on in the season, we can turn the cows onto the swedes. But if the weather is good and we don't need to do this, we turn out the commercial ewes on to the crop pre-lambing.

"After we scan the ewes, any ewe hoggs with multiple lambs are overwintered on our 25-30 acres of Redstart hybrid brassicas. These ewes have a high energy requirement and using the high-protein, high-energy brassicas enables us to support their performance without relying on bought-in concentrate."

Andrew also has five acres of stubble turnips and uses these to flesh out and finish pedigree rams before sale.

"Many buyers comment on how active and fertile the forage-finished rams are," says Andrew. "Rams leaving my farm for another grass or forage-based system don't suffer the same checks and drop-off in performance they would if accustomed to a concentrate-based diet. So, as well as saving money on concentrate feed, we are also producing a better product. It's a win-win situation."

ANDREW BAILLIE
CARSTAIRS MAINS FARM

- **650-acre** farm
- Growing **200 acres** of spring barley and 450 acres of grass and forage crops
- **50** suckler cows and 200 pedigree Beltex ewes
- Commercial flock of **500** Aberdale ewes
- Alternative forages used primarily to reduce winter feed costs

Rob Watkins, Great Corras Farm

"We want to get more than 90% of our spring-born lambs off the farm by September and aim to achieve carcass weights of around 21kg," explains Rob, who runs 1,000 breeding Mule and Mule cross ewes, along with 100 pedigree Texel ewes in Herefordshire. "We started using alternative forages about six or seven years ago, as we needed a good source of natural nutrition that would supplement grass intakes and aid lamb and ewe performance."

"Swedes or turnips are sown directly into pasture in early summer, ready for ewes to graze pre-lambing and before coming indoors for winter. A mixture of plantain, chicory and clover is then sown into the same area in late spring."

Rob now sows between 40-50 acres of his farm with this mix of alternative forages each year and is pleased with the positive impact they have on lamb performance.

"We had a batch of March-born pure Texel ram lambs that failed to meet our breeding standards and we sold them off in September with carcasses achieving a deadweight of 39-40kg," says Rob. "They had done really well on our freshly reseeded forage mix, which provided plenty of protein and good grazing. I am sure the lambs would have just kept growing if left on it for longer!

"A fresh reseed should last for around five years, but we probably graze a bit too intensively to achieve that. But even if a reseeded ley only lasted a year, the financial return from better lamb performance would make it worth it."

> "THEY HAD DONE REALLY WELL ON OUR FRESHLY RESEEDED FORAGE MIX, WHICH PROVIDED PLENTY OF PROTEIN AND GOOD GRAZING."

Weeds pose a challenge when establishing a plantain, chicory and clover mix, but experience has provided Rob with a workaround.

"You can't spray this mix with weed killer, so it is crucial to achieve a good kill and have a clean pasture well before reseeding," concludes Rob. "It has been a learning process, but our plan now is to focus on killing off all weeds in pasture the year leading up to sowing with swede or turnips. That way the ley is good and clean, ready for subsequent planting with the plantain, chicory and clover mix."

Rob Watkins

ROB WATKINS
GREAT CORRAS FARM

- **500-acre** farm in Herefordshire, running a mix of enterprises
- Runs **1,000** breeding Mule and Mule cross ewes
- Flock of **100** pedigree Texel ewes
- No concentrate use post-lambing or creep feeding of lambs
- Reseeding between **40-50 acres** with alternative forages each year
- Swedes sown directly into pasture end of May and turnips late June
- Mixture of plantain, chicory and clover sown in April

Ewes and lambs in late May

IS AUTUMN RESEEDING RIGHT FOR YOU?

The fundamentals of reseeding are the same in spring and autumn, but which you choose depends on your farming system. Francesca Harding explores why and hears from one farmer favouring autumn reseeds.

To maintain productive grassland, regular reseeding is an essential step. Keeping leys performing to their full potential helps ensure grass remains a highly cost-effective and nutritious feed for ruminants.

As leys mature the percentage of sown grass species decreases alongside an increasing proportion of native species and weeds. With higher levels of native grasses and weeds, there is a drop in both the yield and quality of grazed grass and silage. This can have a knock-on effect on livestock performance and increase the need for bought-in feed to buffer the shortfall. Preventing this deterioration comes down to good grassland management, with regular reseeding using high-quality grass varieties an essential step in restoring productivity.

Choosing when and how to reseed should be based on the farm system and conditions, as well as forage requirements. Both spring and autumn reseeds can be effective but planning ahead and taking time to see the process is right is paramount to success.

Many choose an autumn reseed as this takes grassland out of production at a time when there is less pressure on grass availability. Reseeding in autumn allows the new ley to establish and reach its full production potential over winter, and gives the soil a chance to settle before travel and grazing begins in spring.

Conversely, autumn reseeds come with a narrower window of opportunity. Both weather and soil conditions are likely to deteriorate as the season progresses, so can reduce the chances of successful seed germination and establishment of the newly sown ley. But we hear from one farmer who uses the wetter autumn conditions to his advantage.

Chris Elkington farms 550 mixed breed ewes at Gelston Lamb, near Grantham in Lincolnshire. Taking over a previously arable farm five years ago, Chris and his wife carried out a total reseed. They converted the farm to a 110-acre (45ha) grazing platform which they manage through a rotational grazing system.

Following the initial reseed, Chris is now beginning to concentrate on some of the poorer performing leys. "We look for fields falling behind in terms of grass growth, but also for any not coping with the conditions. We're aiming to reseed around 10 acres each year to keep our grassland performing at its best. The aim is to have young grass swards producing plenty of fresh grass as this helps the sheep perform well."

With an average annual rainfall of only 23 inches (580mm), conditions on Chris's farm tend to be dry and this is what led Chris to opt for autumn reseeds. "For us, moisture is the key benefit of an autumn reseed. Coming into a period where conditions are still warm but also wet can really help to maximise the chances of a successful reseed. As our sheep spend winter elsewhere, it is also a period of rest for the farm so makes sense from a grazing and labour perspective."

With a mix of soil types on farm, including light gravel and heavy clay, Chris uses a variety of methods for reseeding. "On the lighter land we tend to plough, but for the heavier land we normally disc drill and then power harrow. Whichever method we use we're always aiming to produce as fine a seedbed as possible. Although this can be challenging, it's worth taking the time to make sure it's right as it's the foundation of every reseed."

Planning ahead also helps Chris ensure a reseed is successful. "Make sure you soil test and take any remedial action to achieve optimum soil conditions well in advance of reseeding."

"It's important not to rush the process. With autumn reseeds, it feels like the window of opportunity is narrower but make the time to do everything right, particularly the seedbed. Don't be afraid to call in the contractor to do some of the work and take the pressure off if it's needed."

Another important element of a reseeding plan is selecting the right mixtures. Last autumn Chris trialled reseeding a field with a herbal ley containing chicory and plantain. "We've been really impressed with the herbal ley; chicory and plantain seem to cope very well with the dry conditions. The ewes also seem to enjoy it and they are producing plenty of milk. We're definitely planning to reseed more fields with herbal leys in the future. It just goes to show you should never be afraid of trying something new!"

Chris and Louise Elkington

"WITH AUTUMN RESEEDS IT FEELS LIKE THE WINDOW OF OPPORTUNITY IS NARROWER BUT MAKE THE TIME TO DO EVERYTHING RIGHT, PARTICULARLY THE SEEDBED."

CHRIS ELKINGTON

FARM FACTS

Gelston Lamb, Grantham, Lincolnshire

- **550** ewes
- **110** acres
- Rotational grazing
  - **1ha - 1.3ha** paddocks
  - **2** large mobs
  - **3** day move system
- Annual reseed rate **10%**

We revisit our three beef and sheep farmers from across the world. In this issue we find out about the current season and learn about their plans for the coming months.

CONTINUED INNOVATION BRINGS REWARDS

Brian Nicholson, Johnstown, County Kilkenny, Ireland

Like farmers across Britain, Brian Nicholson saw a check in grass growth during early April, leaving him about two weeks behind on his first silage cut. He expected it to run into late May/early June.

By mid-April the weather was improving and lambing almost over, averaging 1.8 lambs/ewe with a mortality rate below 9%. The ewes were on their second rotation and although covers were slightly on the low side, grass growth picked up. Brian had started taking weekly grass measurements to monitor grass growth in each field and manage grazing accordingly.

Soil samples were taken in January to give a true reading of soil fertility from which Brian determined his fertiliser and slurry requirements for the year ahead. In an attempt to reduce his nitrogen inputs, he is using red clover, stitched in after first cut. It's also used to fatten lambs at the tail-end of the season, providing added protein at a time when grass quality is reducing.

Brian also plants the rape/kale hybrid brassica, Redstart, in May, allowing 6-8 weeks before grazing. He finishes his male lambs on the crop at about 36-37kg. By the time the lambs have finished a rotation, the crop is ready to start being grazed again. "These lambs have finished growing and the Redstart really helps them flesh out," comments Brian. The lighter lambs and ewes remain on grass.

Reflecting on last year's reseed in low ground near the river, Brian is delighted with the persistency he's seen: "I tried a fescue grass for the first time and it's come through the winter well. It didn't drown even when the fields were waterlogged and is now being grazed successfully."

And this year, a new approach for Brian is precision drilling liquid fertiliser when he stitches in his red clover. "It saves contractor time and labour and is far more targeted to the seed," explains Brian. "There's also less waste lost into the atmosphere and onto surrounding land and hedgerows."

FARM FACTS

- **96ha** (237 acres) tillage and grasslands
- **15ha** (37 acres) forestry
- **1ha** (2.5 acres) wild bird cover
- **950** ewes + **250** replacement ewe lambs
- **1.8** lambs/ewe
- **1,700** grass-finished lambs
- **300g** average daily gain (ADG)

"THESE LAMBS HAVE FINISHED GROWING AND THE REDSTART REALLY HELPS THEM FLESH OUT."

BRIAN NICHOLSON

Brian Nicholson

DRY NEW ZEALAND SUMMER ROLLS ON

Scott McKenzie, Clinton, South Otago, New Zealand.

Building pasture cover for the winter is the focus for New Zealand sheep and beef farmer Scott McKenzie, as prolonged dry spells continue into autumn.

The latest New Zealand Drought Index map, produced by the National Institute of Water and Atmospheric Research, shows widespread dry to very dry conditions throughout Otago – where Scott's farm is located.

More than 90 percent of Scott's 800-hectare property is planted in Germinal's High Sugar Grasses and clovers. The pasture – in particular the AberLasting clover – has managed to hold on despite the dry conditions, says Scott.

"We had five millimetres of rain recently which resulted in the pasture greening up the next day, so it is persisting. All of our clovers are from Germinal, and the pasture seems to really hang on in the dry."

Supplementary feed in the form of whole crop baleage is being used to "keep things ticking along", adds Scott.

"It is becoming increasingly common to be feeding out at this time of the year, as the warm and windy conditions continue to roll on without any decent rainfall."

Every autumn Scott renews up to 25 hectares of pasture, to increase productivity and improve feed value. Scott planted his first paddock of Germinal High Sugar Grass in 2005.

"This year we used the same Germinal pasture mix of High Sugar Grasses and clovers, with some other species such as timothy added. We are also going to be putting some paddocks in lucerne."

Scott applies most of his fertiliser in spring, when soil temperatures are increasing.

"We have already put lime on the paddocks to lift the soil pH, and we will apply di-ammonium phosphate (DAP) and elemental sulphur in early spring (September)."

Scott McKenzie

FARM FACTS

- Large sheep, beef and forestry operation
- **4,000** ewes, 1,200 hoggets, 120 cows and 80 R2 cattle
- Run by Scott McKenzie in partnership with his parents and brother
- **800** hectares (1,977 acres)
- Region subject to environmental extremes

SWEDES TO REPLACE DISAPPOINTMENT OF FODDER BEET

Graham Lofthouse, Bankhouse Farm, Stow, Galashiels, Scottish Borders

Graham Lofthouse describes last winter's fodder beet as a "disaster". The leaf was lost to frost and with the bulbs rich in energy rather than protein, the ewes had to be brought in to be fed, depleting silage stocks unexpectedly. "It's important to have a backup plan," advises Graham. "With the unpredictability of our weather, you can't presume you'll have the same every year. If you need to feed stock, feed your stock because it's all about kilos produced per hectare and future productivity."

Learning from this, Graham is changing to Triumph swedes: "Swede has been grown for a long time in Scotland and I expect it to handle the frost and winter weather better. We're also sowing Balansa clover to bale and feed out as an extra protein source."

Grass growth took a big knock in the unseasonably low temperatures of April, just as lambing started. Twelve straight days of frost and sub-zero temperatures took its toll. It was dry too. "Cold and dry is a bad mix for grass growth," comments Graham. "Having risen to 17kgDM/ha/day at the start of April, it fell away to just five. Once the ewes have lambed and are turned out, demand reaches 30kg/ha/day so a significant upturn in growth was needed."

Graham's store cattle were affected too. "The cattle were in longer than expected but we had enough of a grass wedge in front of them and they went out as soon as conditions improved."

Graham spread urea at 20kg/ha on most of the grazing land. "I feel it has a longer breakdown and performs better in cold weather," explains Graham. He also plans to reseed about 10 hectares of grass, once again choosing mainly high sugar perennial ryegrass varieties best suited to the challenging conditions.

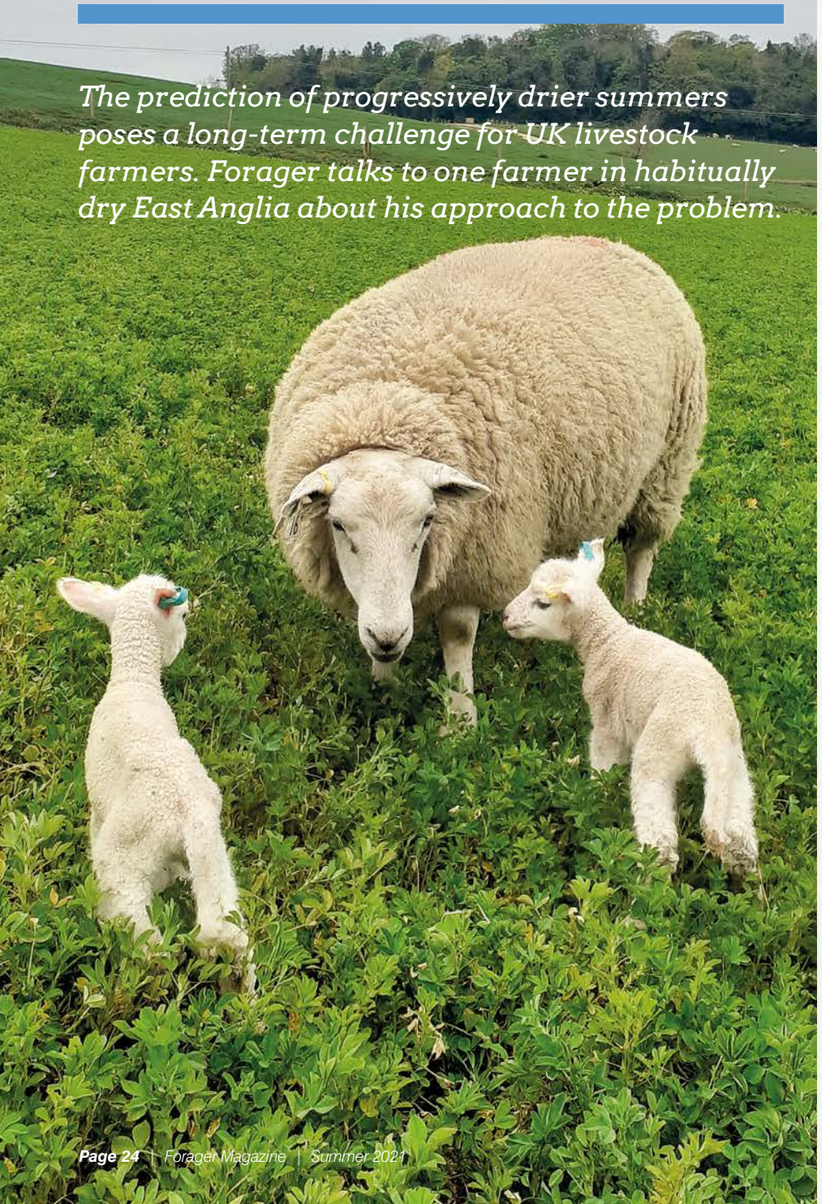
Graham Lofthouse

FARM FACTS

- **109ha** (269 acres) owned, plus 35ha (86.5 acres) rented
- **9.0tDM/ha** (3.6tDM/acre)
- **508** Easycare ewes + 108 ewe lambs
- **1,000** grass-finished lambs
- Lamb to weaning ADG: **0.3kg**/day
- **90** Angus x Stabiliser suckler cows
- Beef ADG: **1.2kg**/day

BUILDING FARM RESILIENCE IN DRY CONDITIONS

The prediction of progressively drier summers poses a long-term challenge for UK livestock farmers. Forager talks to one farmer in habitually dry East Anglia about his approach to the problem.



Livestock farmers in dry areas of the UK can struggle to maintain reliable forage stocks during prolonged periods of low rainfall. Using first-hand experience of how dryland livestock farmers in New Zealand tackle the problem, David Cross is trying their approach on his dry mixed farm in north west Norfolk.

David is currently undertaking an Innovative Farmers Field Lab trial with consultant Liz Genever, exploring the use of lucerne in sheep systems in dry arable areas and studying multi-species grazing options.

Why lucerne?

Lucerne is used widely on sheep stations in New Zealand for its high yield, drought tolerance and nitrogen-fixing ability as well as its protein content and digestibility. With David's aim to maintain a consistent feed supply for his 900 sheep, as well as maintaining the viability of his soils for the arable rotation, lucerne has an obvious appeal.

But successful lucerne grazing requires careful management; its high digestibility comes with caveats. In sunnier climes, more of lucerne's nitrate content is converted to protein, but in more temperate, cloudier UK conditions, nitrates can reach toxic levels.

"We were warned to watch out for red gut," explains David. "We haven't seen any to date, but we've had some clostridial disease and photosensitivity presenting as sunburnt ears in the lambs."

David manages the potential for bloat by transitioning the ewe lambs onto the crop carefully, taking up to three weeks, and always having fibre available, usually as hay. He is also remaining alert to any health issues by monitoring performance closely, able to make prompt management decisions.

Lambing

The twin-bearing ewe lambs are introduced to the lucerne 3-4 weeks prior to lambing with open access to a grass field run back to ease the dietary transition. "The ewes do well on the lucerne from the beginning," comments David. "The lambs are out, and on their feet, as normal with an adequate supply of milk available."

> "AFTER A LONG, DRY SPELL, THE LUCERNE WAS STILL SHOWING CONSISTENT GROWTH."
> DAVID CROSS

Last year by mid-July, after a long, dry spell, the lucerne was still showing consistent growth and drought tolerance. "This is what attracted me to lucerne," stresses David. "It could sustain a stocking rate higher than other fields grazed by mixed-age ewes."

Lucerne is hard to measure with a plate meter, so David calculates production by sward height alone. At 25cm, he knows he has about 40 days grazing and being palatable at any height, he can store food 'up ahead'. But he's learnt once the plant is over 30cm little is gained nutritionally as it's become more lignified and stemmy with higher wastage.

Multi-species ley

In 2020, average lamb weight at 100 days was similar (298g/day) for twin-bearing ewe lambs on lucerne and mixed-age ewes on other forage, despite a higher stocking rate on the lucerne.

"To reduce the demands on ewe lambs in their first breeding year, we used to hand rear one twin of each set," says David. "We don't need to do that with the lucerne. The ewe lambs aren't losing condition; a common fear with tupping them so young."

Post-weaning growth rates in lambs born onto the lucerne were inconsistent last year. This year, David planned to move most lambs onto other forage, keeping the lucerne for smaller lambs to graze for longer.

Multi-species leys

Not surprisingly, David's interest in multi-species leys is based on their potential productivity in drier conditions, thanks particularly to the herbs. Chicory and plantain are popular components with the ability to compete in a mixed sward as well as being more drought tolerant.

Fifteen hectares of a multi-species ley was planted last spring. It comprised two high sugar perennial ryegrasses well-suited to grazing, AberMagic and AberGreen, along with timothy, red and white clovers, plantain and chicory. The perennial ryegrasses are intermediate diploids to give good ground cover and grazing quality.

"We're trying to find the best ley to fit our sheep and arable rotation," explains David. "Like lucerne, I want to use the nitrogen-fixing qualities of the clover within the ley to reduce our inputs and production costs."

The multi-species ley came through the winter well, with the highest covers at 2,300kgDM/ha when David set stocked. This compared with 2,000kgDM/ha from the GS4 stewardship mixture also planted last year.

Future plans

David is improving pasture quality on the farm to remove the need for rented land. He also plans to stop growing sugar beet, finding it uneconomic and challenging since the removal of neonicotinoids. Replacing it with forage allowing direct drilling or min till is more cost effective than ploughing.

With lucerne offering quality feed to stock with high nutritional requirements, David plans to put more multiples on it, such as his mixed-age ewes carrying triplets. The lucerne allows him a reasonable stocking rate of 6 ewes/acre.

He aims to tighten up the raddle groups with the twin-bearing ewe lambs and triplet mixed-age ewes to condense lambing and start on rotations as quickly as possible.

David Cross

GLOVERS FARM, NORFOLK

- **404ha** (1,000 acres) tenanted
- **In partnership** with his father, John
- **Light, sandy loam soils** over chalk; high pH
- **900 composite ewes**
- **Sheep overwintered** off farm
- **Arable rotation** - sub-contracted
- **Pig finishing unit** provides 7,000t manure/year reducing fertiliser costs

COMPOSITE SHEEP

To complement David's attention to producing high-quality, homegrown forage, he has reviewed his flock's genetics, looking to the expertise of New Zealand breeders. David is moving to a composite maternal line, to reduce cost of production and management time, both beneficial to today's commercial demands. Working with UK-based EasyRams, the composite line comprises 100% NZ Romney, East Friesian and Texel (50:25:25).

FARMERS WEEKLY GRASSLAND MANAGER OF THE YEAR 2020 FINALIST

James Muir was a finalist in the competitive grassland manager of the year category in the 2020 Farmers Weekly Awards. Kendra Hall spoke to James about what he's been up to this year.

James measures grass weekly and monitors cow performance closely to gauge feed efficiency

James uses a New Zealand-style system focusing on high grass quality and minimising inputs to maximise milk from forage. All 166ha (410 acres) of their grassland at New Buildings Farm is grazed, with surplus going to silage in a multi-cut system.

James share farms with his wife, Lucy, and parents-in-law, Stephen and Leslie Brandon. In addition to the home farm, they began a 25-year tenancy last April on a 124ha farm on Harrowby Estate. The autumn-calving herd includes both externally sourced cows as well as another 100 brought in from New Buildings Farm.

"We run a simple system and it's all about making the best quality grass. Grass is a cheap and controllable cost, so we rely on it as much as possible and focus on driving efficiency," James explains. "The devil is in the detail, so we measure grass weekly and monitor cow performance closely to gauge feed efficiency. Other farms may produce more milk, but we're able to keep our costs very low."

His NZ Friesian-cross herd is rotationally grazed from February to late November.

Each paddock is split into two sections of 12-hour breaks with back fences to facilitate regrowth. The cows are followed in the rotation with fertiliser to a total of 200-220kgN/ha/year. "We need to put the best grass in front of the cows," he comments. "To make decisions as timely as possible, we use a management app to track supply and demand in every paddock." Under-performing paddocks are reseeded with high-performing ryegrasses - AberGreen, AberBann and AberGain. The whole farm is soil-tested every three years.

In 2020, grass production yielded 11 tonnes DM/ha, down 3 tonnes from 2019 growth due to a dry spell in May and June. This year, turnout at New Buildings Farm was a bit later than normal and initial grazing was good, but in early April when the rain stopped grass production fell by up to 60% of normal yields.

"During the second rotation the growth rate dropped to 27kgDM/ha, when normally it would be in the 50s or 60s. Luckily, we had enough grass in front of the cows that they could stay out day and night, but we did have to feed 4kg of 14% cake through the parlour."

Cows on both farms are fed grass-only silage, with their multi-cut silage system gaining four or five cuts/year from the grazing wedge. Excess grass is used for silage with all paddocks having at least one cut to reset grass growth. There isn't any silage ground as such but rented land less easily grazed is used for additional silage.

The cows come in towards the end of November, receiving silage and 3kg concentrate. Once dried off, they are given silage only until January when 4kg chopped straw is added. Once calved, the cows are on straight silage again, plus concentrate in the parlour. Pending weather and ground conditions, they're turned out during the day as soon as possible and, when ground is dry, out permanently from mid-March. Heifers go on to grass from March on 24-hour rotation breaks and serving begins in late April.

James comes from a farming family but had a career outside agriculture before he and his wife moved back to join her family's farming business. "The farm pioneered use of the New Zealand system and I've learnt a huge amount in a short period of time," says James. "As well as learning from my father-in-law, I really value being part of a grassland-focused farmer group. It's great not being alone when dealing with issues."

The new site has kept them busy ahead of the herd's arrival. They've built the infrastructure from scratch with substantial investment in facilities and re-seeding of fields. On completion of a new water system the cows went out on 20th March, but less-than-ideal growing conditions saw them brought back in and fed silage in the evening for the second rotation.

Another change this year is the use of 100% sexed semen to breed all their heifers and selected cows in late April. "We've always kept our calves and sold beef on to a family member, but we feel the time is right to make the change. We're proud Arla farmers and very much on board with the cooperative's decision. There's a lot of potential for us to take advantage of our best genetics by front-loading the heifers, and hopefully we'll see good results," concludes James.

NEW BUILDINGS FARM

- 420 spring-calving New Zealand Friesian-cross cows
- 226ha, with a 166ha grazing platform
- 553kg milk solids/cow (1,425kg milk solids/ha)
- 6,350 litres per cow per year
- 70% milk from forage
- Replacement rate = 22%

SHAW WOOD FARM

240 autumn-calving New Zealand Friesian cross cows

124ha, with a 100ha grazing platform

SUPPORTING EXCELLENCE

Germinal recognises excellence in grassland management and the role of farmers as custodians of the land. It is proud to sponsor the Farmers Weekly Grassland Manager of the Year award, helping to lead the industry to higher standards and a sustainable future. The award celebrates farmers using best practice and their expertise in grassland management, striving to gain the most from their farms sustainably.

The shortlist for the 2021 award is due to be announced on 18th June, with the results revealed in an awards ceremony on **7th October 2021**.

Photos courtesy of Farmers Weekly

CHEWING THE CUD

It might be summer, but autumn grazing needs careful planning now. Forager asked LIC Pasture to Profit Consultant, Piers Badnell, to chew the cud on successful grazing at the end of the season.

While the main goal for this autumn's grazing strategy is to set up the start of spring 2022 grazing, additional successful grazing days in the shoulder of the season is a bonus, reducing feed and housing costs. We don't know what the weather will be like in the early part of next season, but it is good to have grass available to graze if conditions allow. Doing autumn grazing right helps you do this.

Well-managed grass, at the two and half to three-leaf stage, in September, October and November still has an ME of 12MJ and crude protein of at least 20%. Dry suckler cows, weanlings or animals being outwintered must have good condition so monitor body condition scores on autumn grass and supplement as necessary.

Planning from August

Start setting up and planning both the quality and quantity of grass for grazing 2022 in August and begin building grass covers by lengthening the rotation. If you are not going to be grazing in late October into November, take some silage in August and September to bring average cover down. This avoids being left with heavy covers ungrazed going into winter.

Grass won't tend to grow much between November and February. To have grass available for grazing next February/March most of it needs to be grown this autumn and early winter. The date you close fields, and how you manage them in September, October and November, has a big effect on what's available next spring.

The final round of autumn grazing involves closing a certain amount of the farm each week until all areas are closed up and cows housed. The field closed first in the autumn is grazed first the following spring. On the day grazing finishes completely, you need a range of grass covers that reflect your grass availability next spring.

Autumn rotational planner

The autumn rotation planner is a very useful tool to take you through the autumn and deliver good grass for spring. A crude version would be to start the last round mid-September to early October and graze 2% of the grazing area every day for the first 30 days, then 1% of the platform for the next 40 days. If you don't want to graze until the end of November, increase the number of days at 2% and reduce those at 1%.

The exact date you start your last grazing round depends on when you intend to bring cattle in. Aim for your highest average farm covers, around 2,400 – 2,600kg DM/ha (depending on how long stock is out in the autumn), in mid-September/early October then start closing paddocks from mid to late September. Graze paddocks to a residual of 1,500kg DM and make sure any dead matter is cleared out to allow quality growth for next spring.

Don't sacrifice spring grass for the sake of a few extra days grazing in the autumn. It is crucial to measure grass and assess what you have. If grass availability looks tight, take some stock off the grazing area or supplement to keep the planner on target. AHDB's Forage for Knowledge service (www.ahdb.org.uk/knowledge-library/grass) publishes regular grass growth data from across the country.

Dry Matter

Autumn grass is still a very nutritious feed, but dry matter levels can vary from day to day depending on the weather so watch body condition. As autumn grazing management centres around body condition, prioritise your highest quality grass for weaned stock or for flushing ewes. For all livestock, it is important dietary changes are slow rather than sudden.

With autumn grazing, you have to be flexible. Demand is in your control and can be managed by supplementation, but growth is largely determined by weather. Keep measuring grass growth, know what demand is and adapt where necessary.

INFRASTRUCTURE

- **Have the right infrastructure** so grass can be used even on wetter days in the autumn
- **Make a plan,** graze the wettest you dare and protect vulnerable areas of paddocks
- **Use separate paddock entrance** and exits to avoid soil damage
- **Think laterally about allocation** to make sure water troughs are accessible and grass is grazed out
- **Use on/off grazing** if conditions are wet.

PLAN AHEAD FOR LATE SUMMER WEED CONTROL

Weed competition can still be significant in late summer and early autumn, so it's important to have your weed control strategy in place. Forager explores ways to protect your grassland from yield losses caused by weeds over the coming months.

SAFEGUARD YOUR AUTUMN RESEEDS

If you've chosen this autumn to reseed any poor-performing leys, make sure you protect them with the right weed control.

Late summer and early autumn can be a popular time for reseeding as yield loss is minimised and new seedbeds have plenty of time to settle and establish over winter. However, weed competition can be significant so to maximise the opportunity for young grass to establish and flourish, it's imperative you check new leys regularly for any signs of weed infestation and act quickly to control them.

Problem weeds such as chickweed and seedling docks pose a threat to grassland productivity, even in small numbers. They compete for space, light, nutrients and water and smother out nutritious grass. With new leys it's important to tackle these weeds early before they damage the ley's performance and become a more significant problem.

Controlling weeds is easier and cheaper when they are small, and the roots haven't propagated or had the opportunity to grow bigger and deeper. Weeds are best controlled in new leys when the grass is at the two-to-three leaf stage.

Many grassland herbicide products dictate grass should be established, i.e. over a year old at the time of treatment. However, products are available for use in new sown grass leys that can be applied from as early as the three-leaf growth stage.

Problem weeds such as chickweed can threaten grassland productivity

Envy from Corteva is a selective herbicide ideal for use in new sown leys. Its wide weed spectrum includes chickweed, mayweeds, buttercups, dandelions and seedling docks and has good grass safety when used on new sown leys. Envy is available in a 3-litre pack and can be applied any time between 1st February and 30th November at 1-1.5 litres/ha, making it ideal for autumn reseeds.

The new Corteva Forage App is now available to download and can help determine which weed control product is best for your situation.

REJUVENATING GRASSLAND

For fields where grass is losing out to weeds but is a permanent pasture where a full reseed is not possible, effective and long-lasting weed control, alongside a nutrient programme and grass utilisation plan, will transform the field's productive capacity.

Rejuvenating pastures with good weed control is quicker and cheaper than establishing a new sown ley and avoids potential issues with soil erosion and poaching. Forefront T, a high-performing grassland herbicide from Corteva, delivers on both counts. The product moves to the roots of weeds delivering long-term control of tough, broad-leaved weeds, while at the same time being very safe to grass.

Where tough perennial weeds, like docks, thistles, chickweed, nettles, ragwort, buttercups and dandelions are competing and winning against grass for light, nutrients and space, the yield losses can be considerable. A 10% weed infestation means 10% less grass growing for feeding livestock.

A 2-litre application of Forefront T can provide a fast solution to controlling weeds and put grass back on track. Forefront T can only be used on ground grazed by cattle and sheep, with stock returning seven days after treatment or when the foliage of any poisonous weeds such as ragwort has completely disappeared. For silage or hay fields, Forefront T can be sprayed after the last cut, when weeds have regrown to a size suitable to treat.

Forefront T needs to be prescribed by a BASIS-qualified agronomist to ensure compliance with the stewardship obligations guiding its use. Call our Hotline on **0800 689 8899** for more information.

Where weed infestations threaten yield, Forefront T can help.

AFTER WEED CONTROL

Taking out high populations of weeds can leave areas with little or no grass. Although grass is a great coloniser and removing weeds helps this, overseeding or stitching in new grass can be warranted when high weeds population infestations have been removed and you want more productive grass species to take over and drive productivity gains.

After herbicide applications of products such as Forefront T, an interval is required before re-seeding. Intervals vary by both by product and whether it is grass or clover being sown back in. Review the table below or read the label to make sure you plan any follow-up seeding at the right time interval:

Interval required between treatment and overseeding/stitching in

Product	Grass	Clover
DoxstarPro	4 weeks	6 weeks
Thistlex	6 weeks	6 weeks
Forefront T	4 weeks	16 weeks
Envy	4 weeks	12 weeks
Leystar	4 weeks	12 weeks

Dock removal can leave bare areas without grass

grow great grass

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Breathe new life into old pasture.

Forefront® T

HERBICIDE

Forefront® T is a high performance herbicide.

It is the most effective, broad spectrum weed control solution for grassland.

Use it on permanent pastures or grazing leys to control long established or high populations of weeds.

It is your cost effective alternative to a full re-seed, quickly increasing the amount of available grass.

Let your grass breathe again. Talk to your advisor or find out more at **corteva.co.uk**


Docks


Nettles


Thistles


Buttercups


Dandelions


Ragwort

CORTEVA™ agriscience

Discover more at corteva.co.uk
Technical Hotline: 0800 689 8899 E-mail: ukhotline@corteva.com

USE PLANT PROTECTION PRODUCTS SAFELY. Always read the label and product information before use. For further information including warning phrases and symbols refer to label.

Forefront® T contains aminopyralid and triclopyr.