

FORAGER

Issue 24 / Winter 2020

INSIGHTS FROM ORGANIC

Four organic strategies
relevant to all systems

WINTER FEEDING CONSIDERATIONS
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EDITOR'S NOTE

It's essential to continue to challenge business practices and find new ways to learn from the global farming network during lockdown.
Writes Aly Balsom.

Volatility, resilience, the "new normal", are words and phrases we've become all too accustomed to during the last few months.

While most will admit to experiencing a certain amount of fatigue from such statements, sadly they're sentiments we can ill-afford to ignore.

2020 has brought with it predictably unpredictable weather, leading to highly variable forage quality and quantity. A no-deal Brexit looms (has that not happened yet?) with crippling trade tariffs becoming more likely. At the same time Covid-19 means freedoms can change by the day and markets can be affected overnight. Feed prices are also heading the wrong way, meaning it could be an expensive winter for some.

Rather than putting business strategy into "lockdown" all these factors underline the importance of understanding your business' weaknesses and putting in place steps to address them.

As Nuffield Scholar, Geraint Powell says: "Every business is different, but everyone can ask how they can make themselves more resilient.... For me, it comes back to farmers taking ownership of their business."

He has taken the opportunity to learn from farmers both at home and abroad and challenge everyday thinking to adopt sustainable management practices that balance ecology and economy (page 28).

Jetting off around the world may not be feasible at present, but there's still opportunities to learn from others. To bring you a world view - without the quarantine - we've introduced a new "Over the Farm Gate" section. In each



edition we'll visit three, top forage farmers in the UK, Ireland and New Zealand.

There's also a whole host of webinars and virtual events happening across the industry, along with a wide network of farmers on social media platforms such as Twitter. Such platforms are vital in facilitating continued knowledge transfer and all-important social interactions during movement restrictions.

We also can't afford to pull back on the environmental gains already being made by the industry. Our lead feature (page 8-9) highlights the overlap between conventional and organic systems and how organic practices are relevant to everyone.

Introducing livestock to arable (page 18), planting nitrogen-fixing clover and planning are all vital components to any operation.

Planning forage stocks will be particularly important this winter considering the huge variability in silage quality and quantity being seen on farm. This is largely reflective of the variable weather patterns seen throughout the year. Nutritionists are emphasising the need to test stocks and plan feeding to ensure rations are balanced effectively (page 10). Rising feed costs make it even more important we maximise milk from forage as much as possible this winter.

Although many people will be keen to see the back of 2020, it's also important to see the positives from such a year. I've been proud to be part of an industry which has pulled together and continued to do what it does best every day, come rain or shine, global pandemic or political uncertainty.

Having said that, let's hope 2021 is just a bit better!

OFFERING FRESH GRASS TO HOUSED HERDS

Dairy robotics company, Lely is developing a way of harvesting and feeding fresh grass to housed livestock in a fully autonomous system.

The Lely Exos mows and transports fresh grass direct to the shed, bypassing the time and cost involved in producing silage, while also capturing the superior nutritional value of fresh grass. Generating a potential increase of 3-4kgDM intake per cow per day, it allows dairy farmers to produce more milk from forage.

The machine's lightweight, electric design and soil-friendly technology allows it to mow from early spring to late autumn. The Exos is still at concept stage. Prototypes are being trialled on test farms prior to further development and commercialisation.



NUFFIELD FARMING SCHOLAR TO STUDY FORAGE AND GRAZING

NUFFIELD FARMING SCHOLARSHIPS TRUST



Dorset farmer, Ian Baggs has been awarded a Nuffield Farming Scholarship to study alternative forage and grazing techniques.



Ian returned to his family's dairy farm in Wareham, Dorset, following a successful career in civil engineering. Ian takes responsibility for the management of land, machinery and people, and is keen to ensure the long-term sustainability of the business. A major challenge he faces is changing weather patterns impacting his ability to grow plentiful perennial ryegrass. Ian is keen to investigate alternative forage cropping and grazing techniques, and how these can be incorporated into UK farming businesses.

AGRICULTURAL STUDENT OF THE YEAR AWARD

Germinal's Herbage Seed Production and Product Development Officer, Grace Welling was a finalist in not one, but two, of this year's Agricultural Student of the Year awards. She was shortlisted for The British Farming Awards and the Farmers Weekly Awards.

Grace graduated from Harper Adams with a BSc (Hons) in Agriculture with Crop Science earlier in the year and has since completed FACTS and BASIS qualifications.

Grace is based at the Germinal Research Station in Wiltshire, supporting the company's

on-farm field trials as well as offering agronomic advice to UK seed growers. Aiming to maximise high quality herbage seed production and continue Germinal's drive for innovation, Grace's work is set to benefit all dairy, beef and sheep farmers.





MYCOTOXIN RISK IN SILAGE

It pays to be extra vigilant with your silage clamp this winter to reduce the risk of mycotoxins. Many farmers were able to take advantage of the good weather this summer and ensile dry silage. This makes for better quality silage and means feeding out less at a time. The downside of this is it takes longer to work across the silage face, increasing the risk of air and bacteria entering the clamp.

Keeping the clamp face clean and tight is essential. Discard any obviously mouldy feed and consider using a mycotoxin binder in the diet before problems arise.

For more tips on a successful feed-out visit: <https://germinal.co.uk/are-you-making-the-most-of-your-forage-this-winter/>

WINTER LIGHTING IN DAIRY SHEDS



Now in the shortest days of the year with milking herds housed, it's worth checking the lighting in your dairy sheds. Are the lights clean and bright? Do any bulbs need replacing? If on timers, is the lighting set to come on and go off at the correct time? Aim to provide a 16-hour period of light at 200 lux throughout the shed, not just over the feed passage.

Research has shown milk yields can increase by an average 6-10% with

the right lighting. This is because light inhibits the effect of melatonin, a hormone produced in the brain found at increased levels during darkness. Melatonin influences other hormones impacting feed intake and milk yield. Reducing melatonin levels by lengthening the time cows spend in the light, helps maintain feed intakes and milk production for longer during naturally short winter days.

WHAT'S ON

HOW-TO WEBINARS FROM THE EXPERTS

"Knowledgeable speakers and good discussion", "excellent content" and "good examples given" are how participants have described Germinal's webinars. The successful how-to webinar series continues in 2021. It features Germinal's technical team, sharing their extensive knowledge and experience of forage, responding to questions during the session or by email if time is limited.

To register interest in attending these interactive webinars, go to www.germinal.co.uk. All webinars begin at 7.30pm, lasting approximately one hour.

DATE	TOPIC
Tuesday 9th February 2021	Making reseeds work for you
Tuesday 2nd March 2021	Choosing the right grass mixture for your farming system
Tuesday 30th March 2021	Boosting forage supplies using brassicas



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4

FORAGE INSIGHTS FROM ORGANIC SYSTEMS

There are numerous forage management strategies adopted by organic farmers that are just as relevant to conventional systems. Lauren Goringe speaks to a number of farmers to find out how they're benefiting from adopting a different approach.

Some conventional farmers might be relieved not to be paying organic prices for bought-in feed, but they could be missing a trick when it comes to using organic approaches to managing forage.

The costs of buying in energy and protein give organic producers a real incentive to produce as much home-grown, quality feed as possible. The good news is many of the strategies employed in the organic sector are equally useful to conventional systems, offering financial and environmental benefits. So, what can we learn?

1. Including clover

Clover is well known for playing an important role in organic farming. As well as having a high protein content, it also promotes feed intakes, breaking down well in the rumen so cows can eat more of it.

Conventional Borders farmer, Rob Beavan, adopted this organic principle when he moved his fully-housed dairy herd onto a grazed system two years ago. With grazed grass replacing a proportion of bought-in feed and having seen how his cows enjoyed swards containing white clover, Rob decided to try red clover as a way to increase protein content.

"Protein is the most expensive ingredient to buy, so I was keen to produce more of my own. I was intrigued by organic farmers' use of red clover and figured if it worked for them, it could work for me," says Rob. "I knew they also benefited from its ability to inhibit weed growth, which helps whatever system you use. Reducing the cost of weed control is good for the bottom line."

Red clover also fixes nitrogen at a rate of 150kg N/ha, reducing the need for nitrogen fertiliser, another plus when trying to drive down input costs. Environmentally, it plays a part by lowering ammonia excretion, an area of agriculture increasingly under the spotlight. By the end of this season, two thirds of Rob's silage area will include red clover in a mixed sward.



Rob Beavan

2. Planning Ahead

When it comes to forage, organic farmers have to be even better planners than conventional farmers as they can't use artificial fertiliser to give crops a boost or pesticides when a weed problem develops.



Charley and Andrea Walker

"Every year, the first people to order seed are the organic guys," says Ben Wixey, National Agricultural Sales Manager at Germinal. "They really look for a ley that will suit their system, they think about what they want and give themselves time to react to a changing situation."

Organic beef and sheep farmers, Charley and Andrea Walker, have fine-tuned their system in the Scottish Borders to maximise the amount of home-grown forage produced and the number of animals they can rear.

"Moving from set stocking to rotational grazing has been the big story for us," says Charley, who won the 2019 Farmers Weekly Grassland Manager of the Year Award. "Adopting this system over the last four years has increased our stocking rate by 30% and generated a 48% increase in output without increasing operational costs. It has also made life easier when planning ahead."

Animals are kept in large groups and moved regularly, allowing lengthy rest periods before re-grazing to promote better plant root development and growth, improve soil structure and sequester more carbon.

The couple measure grass fortnightly in the grazing season to accurately budget their pasture using Pasture-Plus software. This also helps them know when to start feeding silage to the cattle in the autumn and ensure they don't eat into what the ewes need over winter. In the event of extreme weather events, such as the 2018 drought, Charley uses the FARMAX software to model scenarios. This highlights the financial impact of buying-in feed versus growing additional crops

or selling stock for example. "2018 was an anomaly, but the data on grass growth allowed us to see what was coming. We reacted early and sowed forage rye in September which helped us through the winter," says Charley.

3. Forage cropping rotations

Including legumes in a rotation is a useful way for organic farmers to drive production and reduce the need for fertilisers and pesticides.

As part of their six-year cropping cycle, Charley and Andrea Walker grow an arable silage crop each spring, such as Duet barley & pea mix, on previous grass silage ground, which has been out-wintered (and therefore fertilised) by their cattle. The crop is undersown with a new grass ley. "The barley has a strong root system and really helps hold the new ley together and prevent weeds," says Charley.

Dorset dairy farmers, Stephen and Sonia Raymond, took on an organic farm 13 years ago and have a similar rotation using spring barley and peas as a break crop. This is followed by two years of red clover leys for cutting, another barley/pea crop and then around four years of white clover, multipurpose leys. "While winter wheat would have a slightly better feed value, we find we can control weeds better with the spring barley. It gets away as soon as it is in the ground and keeps ground clean of weeds," explains Stephen. "With fewer quick fixes available, we always try to grow plenty of forage so we can buffer feed in a dry spell. We also soil sample the whole farm every three years and apply lime as required to maintain that all-important pH."

"PROTEIN IS THE MOST EXPENSIVE INGREDIENT TO BUY, SO I WAS KEEN TO PRODUCE MORE OF MY OWN. I WAS INTRIGUED BY ORGANIC FARMERS' USE OF RED CLOVER..."

ROB BEAVAN



Stephen and Sonia Raymond

4. Muck and slurry

Slurry is clearly a valuable resource for all farmers and Stephen Raymond is careful to maximise this input on his farm.

When the ground is dry enough, he applies 10,000 litres per acre of dirty water/slurry to silage ground before first cut, and then half this rate after every cut. "I think the organic farmers were a bit ahead with this, but awareness is now growing about the benefits of spreading slurry 'little and often'," observes Stephen. "In the grazing fields, I tidy up the weeds with a flail topper after every second grazing - which stops the docks spreading their seeds - before applying 10,000 litres dirty water to every 3 acres; I find this gives the grass a good kickstart to grow again."

"Even if I wasn't on an organic farm, I would still farm in this way now," he concludes. "Visitors regularly comment on how few weeds we have and how good the grass looks ahead of our cows. The cropping rotations and way we manage forage just make sense, whatever system you run."



Forages are hugely variable this season so analysis is even more important to understand exactly what's in the clamp.

FORAGE VARIABILITY & FEED COSTS MAKE FOR CHALLENGING WINTER

Finding ways to make the most of forage stocks will be essential this winter in light of rising feed costs. Aly Balsom finds out more.

The winter looks set to provide a 'triple whammy' of escalating feed costs, reduced straw availability and variable forage quality, meaning that careful ration balance will be a must to keep costs down.

With both quantity and quality of forage stocks varying hugely across the country, nutritionists are urging farmers to test supplies and plan ahead.

Dairy Nutritionist Hefin Richards of Rumenation Nutrition Consultancy says: "Ultimately it comes back to whatever forage you've got, you've got to get it analysed and see what you've got on farm."

In the South West, most farmers were able to build good forage stocks after the initial dry spell at the start of the season. This puts most in good stead for the winter. Maize crops also look promising in the West. However, in the South East, some farmers are facing forage shortages following a challenging season.

Hefin has seen big variation in forage quality - a trend also picked up by Independent Beef and Sheep Nutritionist, David Hendy. "I'm seeing big variation in quality with no huge rhyme nor reason," David says. "The problem this year is that there's no absolute answer. The critical thing is to get everything analysed and test dry matter to see what's in the clamp."

This will enable farmers to plan rations for winter housing. Hefin believes this season provides a big lesson in the value of forward planning. Any farmers that did not forward-buy feed have been hit with big feed bills following an increase in feed protein costs of around £70-90/tonne over a 4-6 week period in September-October. This has the potential to add 1ppl in costs on dairy systems, Hefin says.

Optimising forage utilisation

With that in mind, he advises against "carrying passengers" in the herd and making sure diets are formulated correctly to avoid wastage. Any savings in feed costs are likely to come from management and specifically, accuracy of feeding and storage.

He adds: "Think outside the box and look at the role of other supplementary feeds that might optimise the utilisation of forage."

This could include feeding yeast or fibre digestibility enhancers. For those farmers with plenty of forage availability, getting cows to eat more forage and use it more effectively could help efficiencies. "If we can get more forage in, maybe we don't need to feed chopped straw to the milkers. And less energy will be needed from bought-in concentrates as you're getting it from forage," says Hefin.

Ensuring feed and water troughs are kept clean and feed is pushed up regularly will help encourage forage intakes.

For those farmers that haven't forward-bought, alternative feeds such as brewer's grains could be worth considering as an alternative to rape. Their attractiveness will vary depending on location. When thinking about these types of products it's important to do the maths and work out the cost per unit of dry matter. Whether they can be stored effectively on farm is also worth considering.

AVERAGE GRASS SILAGE ANALYSIS RESULTS 2020 (Source: Trouw Nutrition)

	EARLY FIRST CUT	FIRST CUT	SECOND CUT
Number	660	3,733	1,724
Dry matter (%)	35.5	36.5	35.0
Crude protein (%)	14.6	14.3	14.4
D value	71.5	70.3	67.3
ME (MJ/kgDM)	11.4	11.3	10.8
NDF (%DM)	44.1	44.8	47.5

STRAW CONSIDERATIONS THIS WINTER

With straw reportedly selling at over £100/tonne in some regions, it's well worth thinking of ways to optimise its use on farm.

Dairy cows

Dry cows should remain a priority when it comes to allocating straw supplies. Maize and grass silages are relatively high in dietary cation anion balance (DCAB) and pose a milk fever risk for dry cows. When trying to save on straw, consider targeting dry cows with low digestibility silage or haylage, but always ensure an appropriate balance of anionic salts to counteract high potash levels.

Beef

David urges beef farmers to "look outside the box" when it comes to feeding straw alternatives. He believes straw savings could be made with the dry cows. Other forages should then be targeted towards growing and finishing stock. With cows generally entering the winter in good condition, they can afford to lose a bit of weight, he says. Pea haulm - which is produced from combinable peas - could provide a high fibre feed for dry stock that's halfway between straw and hay, with "a bit of feed value." Be careful when scrimping on straw bedding, as this can create issues with dirty cattle and animal health.

Focus on growers and finishers

However, with by-products not as readily available as in the past, David suggests beef farmers consider feeding barley grain instead of wheat grain to growing cattle. This could save about £40-45/tonne. Ultimately, he says it's about ensuring that growing and finishing cattle are provided with a balanced ration and continue to perform. Feed cost savings are more likely to be realised in the dry cows (see 'Straw considerations this winter' box).

Sheep

In general, David believes things are looking positive for sheep farmers as they head into the winter. "Things are looking fairly good. Sheep are in good in condition. There's plenty of grass, and forage crops are looking good," he says.

When lambing approaches, forages will need to be tested to ensure ewes' nutritional needs are met and lambing goes well.

"Think outside the box and look at the role of other supplementary feeds that might optimise the utilisation of forage," says Hefin Richards.





An autumn block proved attractive to Sarah and Duncan Howie for its ease of management and money-making potential

MOVE TO AUTUMN BLOCK SECURES FAMILY FARM'S FUTURE

Improving long-term business resilience was at the heart of the decision to move to a grass-focused, autumn block calving system at Welbatch Farm, where milk from forage sits at 4,000 litres a cow. Aly Balsom finds out more.

When Duncan and Sarah Howie returned to Sarah's family farm, they realised they needed to move away from the middle ground and go to one extreme or the other to secure the farm's future.

At the time, the herd was 280, all-year-round calving Holsteins, yielding 8,000 litres a cow a year. Everything was grazed, but high yielders were always housed at night and fed during the summer.

Duncan says: "There was a realisation we needed to go either intensive, housed or grazing focused. If we were going to have the costs of an intensive system, we had to hit higher yields."

Sarah's parents, David and Helen Kent always viewed grazing as important but uncertainties over whether their children would return to the farm had halted any major investment in grazing infrastructure.

Duncan and Sarah decided to move back to Shrewsbury and commit to dairy farming in 2016. At the time, the pair worked as surveyors in Essex. Sarah had studied Land Economy at Cambridge University, while Duncan, originally from

a family farm in Essex, studied Rural Land Management at the RAC. With David and Helen still involved in the business, Duncan and Sarah set up a surveying business to run alongside the farm. Both are now involved in the farm, but Sarah does more of the day-to-day work.

Researching systems

Having decided to return home, the Howies started assessing different system types. The grazing-focused, block calving set-ups with smaller cows stood out for their ease of management and money-making ability. Autumn calving suited the free-draining farm best, considering its tendency to burn-up. It would also be less of a shock to their traditional Holstein base and suit their Tesco milk contract. To develop their knowledge, the pair joined the Sward Masters grazing discussion group and the BGS Grazing Mentors project (see box).

System overhaul

In January 2017 they began moving the herd to a spring and autumn block. This split block continued until 2020, when the herd calved purely in the autumn for the first time. Breeding-wise, there was no clear plan, other than to reduce cow size from 650kg to 550kg. Now the team has decided to stick with Kiwi Friesian and Kiwi cross bulls.

In their first spring Sarah and Duncan bought 3,600 concrete sleepers, put in

water troughs and divided fields into 3.2ha (8 acre) paddocks. This stopped cows being moved across previously grazed ground. An entry and exit point was put in each paddock to limit poaching.

Sarah adds: "Before, it was such a headache to do something which is now so easy by picking up a bungee."

Now, cows are grazed from mid-late February and housed in mid-October. Before they were out from April to September. The herd only receives grazed grass and concentrates through the parlour during the main grazing season. During this time grass is measured using a grass plate meter and the herd is rotationally grazed on 12 hour breaks.

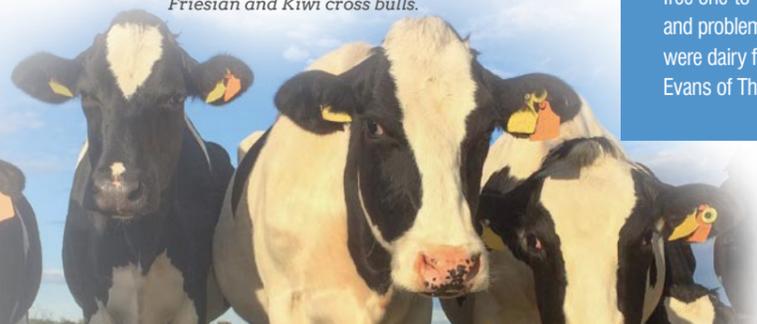
Grassland improvement

With grassland performance in mind, the farm has been soil tested and limed where necessary. Little work has been needed as David always kept soils in good condition. Duncan has also sent off soil samples for organic matter analysis to help identify any room for improvement. He adds: "I think payments might go towards soil structure and practically, soils are more resilient if structure is good."

The pair has reseeded, initially focusing attention on the grazing platform previously planted with wheat and maize. They have used a mix of late and intermediate heading Aber High Sugar Grass varieties such as AberGreen, AberGain, AberChoice and AberZeus. Autumn reseeds will include white clovers, such as AberDai.

All this has helped increase milk from forage to 4,000 litres a cow and reduce concentrate use. Duncan and Sarah believe the whole business model is more resilient. "The business is definitely in a better position. We're more aware of our costs. Grazing makes you look at the numbers," says Sarah. "It's less exposed to peaks and troughs."

Cow size has been reduced by using Kiwi Friesian and Kiwi cross bulls.



FARM FACTS

- 270 acres
- 300 cows - Holstein base with Friesian and Kiwi cross
- Farm run by David and Helen Kent, daughter Sarah and her husband, Duncan
- Duncan and Sarah also run a surveying business, Howie, Kent & Co
- 7,100 litres a cow a year at 4.12% fat and 3.3% protein
- Autumn block runs from mid-August to early November
- 4,000 litres per cow per year milk from forage
- 1.5 tonnes of concentrate per cow per year
- 26.34ppl Margin over Purchased Feed (MOPF) - increased by 3ppl over the last three years.

DISCUSSION GROUP HIGHLIGHTS ROOM FOR IMPROVEMENT

Benchmarking with the Sward Masters grazing discussion group has highlighted where the business can make profitability gains. At present, the business has a Comparable Farm Profit of 2.4ppl, but with similar systems achieving over 10ppl, Duncan and Sarah are keen to drive this higher. Duncan says: "Our power and machinery costs are too high. It's about reducing cash costs and the depreciation associated with the machinery from a higher yielding system."

This comes down to targeting inputs where they bring the biggest return. Benchmarking work has already highlighted the pair could improve grassland performance by using more nitrogen. This means ensuring the contractor applies fertiliser

regularly on all paddocks recently grazed and increasing application rates from 200kgN/ha to 250kgN/ha.

To reduce machinery costs, the Howies are experimenting with not using a mixer wagon and feeding cows with blocks of grass and maize silage. The blend will be cut, and cows will only receive cake through the parlour. If successful, this removes the need for a new tractor to power the wagon, forcing them to take fertiliser spreading and mowing in house; something they want to avoid.

R2 heifers will also be outwintered on deferred grazing and silage bales for the first time this season. If this works, this strategy will avoid having to tie capital up in a shed.

THE BRITISH GRASSLAND SOCIETY GRAZING MENTORS PROJECT

The Grazing Mentors Project, supported by the Prince's Countryside Fund, offers free one-to-one mentoring on setting goals and problem solving. The Howie's mentors were dairy farmer Matthew Ingram and Tony Evans of The Andersons Centre.

"It's been very useful as we were new to the whole thing. It gave us someone to go to for advice; whether about grazing or "it's really frosty, should I put the cows out?" Sarah explains.

THE LATEST IN CUTTING EDGE FORAGE RESEARCH

Herbal leys, coping with drought conditions and the impact of forage systems on the environment are just some of the areas currently being researched in the UK. Forager takes a look at some of the projects.

HOW TO MAKE THE MOST OF MULTI-SPECIES LEYS

Research shows including herbs in a grass ley helps increase forage quality and soil fertility, but very little of this research has been done in the UK.

The Germinal Research Station (GRS) in Wiltshire, is working to change this and establish what benefits each herb can bring. The research station's current trial is looking at the proportions in the sward, how well the herbs establish and how these change over the season and year(s).

Importantly for farmers looking to use multi-species leys, the trial is also looking at whether different fertiliser rates effect the composition and longevity. The trial plots were established in spring and have had four cuts on a 21 to 28 day rotation to simulate a grazing regime.

So far, significantly more herbs were found in trial plots established in spring compared to the plots established in autumn. This difference is being re-examined this year, but suggests the herbs taking longer to establish don't have time in the autumn to reseed before conditions deteriorate.

Repeated cutting has helped reduce the red dead nettle and chickweed seen in newly-established leys. With very limited chemical weed control options available, finding the best on-farm management tools is critical.

The grass component of these plots is also helping to knit the sward together,

increasing ground cover and reducing access to the light that the weeds need to germinate.

Over the coming months we'll be reporting on the trial's forage quality and yield and what this could mean for use in rotational and set-stock grazing systems.



A multi-species trial plot at the Germinal Research Station, Wiltshire.

MAKING SENSE OF DROUGHT CONDITIONS

This year has seen another season of limited grass growth from a lack of moisture, rather than genetics and taught us a thing or two, says Germinal Research Station Manager, Dr Jo Matthews.

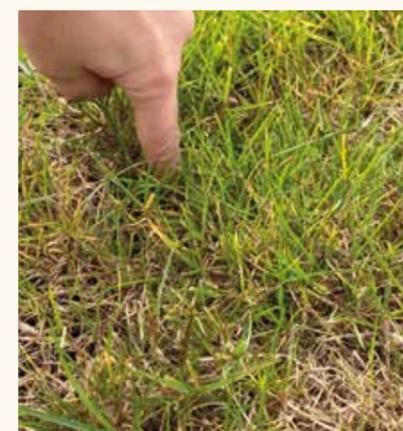
"The impact of drought seems to go far beyond the direct impact on yield. We saw higher disease pressures due to crops being under increased stress, exacerbated by lower nitrogen levels. And all species seem to slow down or stop growing, whether it's cocksfoot, tall fescue, ryegrass or bent grasses. As a result, we have set up a trial to look at this in more detail.

"Of course, this is a sure-fire way to guarantee next year and beyond are drought free, but we're looking at different species and their response to dry conditions. We're going to focus on AberRoot in particular. This is a festulolium with a perennial ryegrass

parentage, which performed better than others in the dry conditions," Jo explains.



Examples of species in drought conditions trial: AberZeus (top) and Rough Stalk Meadow Grass (below) showing greater regrowth in AberZeus following dry conditions.



measured from rumen fluid under lab conditions, but gives an indication of what happens in the field. And the difference becomes more meaningful when combined with a higher liveweight gain, suggesting less methane is produced per unit of production.

Ref: Wang C et al. Assessment of cutting time on nutrient values, in vitro fermentation and methane production among three ryegrass cultivars. Asian-Australas J Anim Sci Vol. 33, No. 8:1242-1251 August 2020. <https://doi.org/10.5713/ajas.19.0369>



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SIXTEENTH GENERATION CONTINUES INNOVATION

Scientists at Aberystwyth University's Institute of Biological, Environmental and Rural Science (IBERS) have just sown the sixteenth generation of intermediate flowering, diploid perennial ryegrasses since work began in 1980.

Perennial ryegrass is the most important species in the UK, accounting for 65% of seed used. Diploids are used where good ground cover and persistency is required. Each generation is better than the last with a clear progression seen through the improvements in successive varieties. This method is unique in grass breeding and forms the cornerstone of Aber variety production.

The Institute's emphasis on quality forage and livestock performance led to the development of the Aber High Sugar Grass varieties, with similar innovation seen in both white and red clovers.

SHIFT TO FORAGE-BASED COW DIETS BENEFITS ENVIRONMENT

Beef farmers could reduce their carbon footprint by 3.5% by feeding suckler cows on a purely forage-based diet, according to recent research.

Modelling work carried out by Alltech E-CO2 on behalf of The Stabiliser Society found that removing concentrates from cow diets after bulling age had a big effect on a model farm's environmental impact.

The life-cycle analysis work was based on an average beef suckler farm taking calves from birth to slaughter.

Performance and input figures were taken from AHDB's Stocktake report. This showed suckler producers fed cows an average 130kg of concentrate per animal per year. The model worked on the assumption this concentrate was made up of homegrown barley. As a result, the carbon efficiency gains could be even greater on systems feeding concentrates made up of bought-in soya and rape-meal. Systems with larger cows and higher concentrate requirements would also have larger savings.

Seth Wareing from The Stabiliser Society says although the modelling work shows the biggest environmental gains are made following numerous small improvements, a focus on forage is likely to bring some big wins.

He says: "Focus on the quality of forage going into cows because it will improve fertility metrics and reduce wintering costs and we now know that it will reduce our carbon footprint as well."

MODEL FARM OVERVIEW

- 750kg average cow weight
- Spring calving
- Three year age at first calving
- 15 week calving period
- 16% replacement rate
- Cows housed for six months of year and fed a 10ME grass silage. Dry matter intakes of 10kgDM/day
- Cows grazed for six months - achieving 17kg dry matter intakes of grass with cows at foot.

MOVING TO ROTATIONAL GRAZING BRINGS BIG REWARDS

Transitioning from set stocking to a rotational grazing system involves significant investment in both time and money, but for beef producer Ianto Pari, the long-term rewards were far too good to ignore. James Marshall reports.

The Pari family are true grazing converts having almost doubled the production of their Welsh beef farm since adopting rotational grazing.

Their commitment to measuring grass, moving cattle regularly and investing in infrastructure has paid dividends. Without expanding their original 110ha (272 acres) platform at Fferm Carreg Plas in Aberdaron, the family has already increased the provision of high quality grass to such an extent their herd size has increased from 120 to 140 Stabiliser suckler cows.

They have also moved away from intensive indoor finishing of bulls to more cost effective finishing on grass. Traditionally heifers were also sold once in-calf, but now they and their progeny are reared on the farm, significantly increasing stocking levels.

"It all began in 2018 when I attended a Grass Master course hosted by Farming Connect," explains Ianto Pari. "It was here I gained the practical and management advice needed to start practising with rotational grazing, particularly from the team at Precision Grazing. The following year Farming Connect offered me the chance to take part in a TechnoGrazing trial with specialist input and advice from a range of advisors. We fenced off 26 hectares for rotational grazing."

Grazing set-up

Grazing two mobs of 40 cows (and the subsequent progeny these cows produced), the initial hectarage was split into four lanes. Each contained around 45 grazing cells, with water pipes run

between each lane to ease access to water. The cell system was designed to provide plenty of flexibility so cattle could be given access to a different number of cells, depending on conditions and grass availability.

Grass levels were recorded every week or two using a plate meter and the data then uploaded to FARMAX farm management software.

"FARMAX has been a really helpful tool for getting to grips with managing a rotational system," says Ianto. "I can input our data and then play around with predicted grass growth and grass availability, depending on a range of scenarios."

In their first year, cattle were moved between cells every two days and data indicates the farm produced an average of 10.5tDM/ha from grass. With a change in approach and the inclusion of further 29ha (72 acres) and 17ha (42 acres) blocks into the rotation, Ianto is on course to produce an average 13tDM/ha in 2020.

"We had a dry spring this year and also had the family home due to Covid-19 restrictions, so we made the most of this extra labour and moved the cattle every day to see if that would help alleviate pressure on the grass," says Ianto. "When the weather improved, we couldn't believe the benefit this approach had made to grass growth, so we have carried on moving cattle every 24 hours. I am being constantly shocked by how good the grass growth has been as we increase the scope of our rotational system."

Upping stocking rates

In fact, the Paris' rotational grazing system has now become so effective, they are struggling to keep up with grass growth and will need to increase stocking numbers next year.

Their transition to a rotational grazing system has also taken off much of the pressure the Paris felt during the winter, when feed stocks were stretched during the housed period. With greater grass availability, the aim now is to keep steers and heifers out at grass until December and move lighter animals back outdoors in late February.

Beef steers are now finished predominantly on grass. A total of 49 out of 58 steers were finished achieving an average deadweight of 330kg, with age ranges between 16-18 months. Most were produced by the initial 80 cows that ran on the 26ha (64 acres) trial plot.

While the system requires more day-to-day management - and he is quick to acknowledge initial infrastructure costs - for Ianto and his family the transition to a rotational system has been overwhelmingly positive.

"I think we have easily doubled the productive potential of the farm and we are looking forward to improving our rotational management and getting even more out of the system in the future," Ianto concludes.

TECHNO GRAZING TRIAL

The TechnoGrazing trial is run by Farming Connect. It aims to demonstrate the transition from set stocking to a rotational grazing system and highlight practical considerations. Originally managed as an arable enterprise, Fferm Carreg Plas was split into seven permanent fields, totalling 111ha. One 26ha field was initially split into grazing cells of 40 suckler cows and calves each, allocating three cells per day in a 30 day rotation. Grazing cells took into account animal movement, topography, water availability and aspect.

Ianto was provided with specific training, including efficient use of temporary fencing, water systems and the use of a plate meter. Regular support and advice were provided throughout the trial and data from weekly grass growth measurements helped guide the management of the grazing rotation.

"I AM BEING CONSTANTLY SHOCKED BY HOW GOOD THE GRASS GROWTH HAS BEEN AS WE INCREASE THE SCOPE OF OUR ROTATIONAL SYSTEM."

IANTO PARI

ARABLE FARM GETS A BOOST FROM SHEEP ON BRASSICAS

One Aberdeenshire arable farmer has seen an uplift in spring barley yields and reduced fertiliser use since grazing sheep on brassicas as part of the rotation. Aly Balsom reports.

Grazing sheep on brassica and turnips as a break before spring barley has proved beneficial to soil organic matter and is helping crop yields at Blairfowl in Fyvie, Aberdeenshire.

Alan Wyness has been taking sheep on tack from a local shepherd for four years and believes introducing stock to the arable rotation will assist farm performance in the long run. He sows about 12-24ha (30-60 acres) of a mix including the rape/ kale hybrids,

Swift and Redstart, Maris Kestrel kale and Appin stubble turnip every year. This usually fits after oil seed rape and before spring barley in the rotation. As a "one-man band" the drilling date for brassicas fits into his farm system well.

He explains: "This is a field I can take out and I can drill it myself in the month of July when the pressure is not the same. Plus, it's a break from the cereals and the stock leave something in their wake which makes a significant difference."

Alan believes the sheep muck helps boost soil organic matter; something he puts "a bit of weight on" in terms of its impact on crop yields. "It does show up in the following crops," he says. "There's a notable uplift in the spring barley. You can see the crop is heavier and stronger."

This has allowed fertiliser application rates for the barley to be pulled back, equating to a 15-20 units of nitrogen saving per acre. "It would make a difference financially. It must be a good £5-7 an acre you save on the following crop. Every little helps," Alan adds.

The brassicas receive 40kgN/ha each of nitrogen, potash and phosphate in a 16:16:16 compound at drilling. They are then topped up with about 42.5kgN/ha as the crop becomes established. The crop does not require any weed control as the brassicas quickly outcompete any weeds.

Around 200-300 lambs will graze the designated field each year. This year, 300 lambs went on to 12ha (30 acres) of the crop in early November. They will

graze until mid-January when they will be sold finished.

The farm's free-draining, sandy-loam soils make it ideally suited to outwintering. Stock are provided with a stubble run-back or a grass field, depending on the field location. They will be fenced if necessary. The shepherd then pays Alan per head per week.

Moving forward, Alan is considering drilling the crop about 1-2 weeks earlier and potentially putting on more nitrogen to increase yields and allow lambs to be carried for longer. He will discuss options with Germinal Area Sales Manager, William Fleming.

FARM FACTS

- Blairfowl, Fyvie, Aberdeenshire
- 162ha (400 acres)
- Arable rotation includes spring barley, winter barley and oil seed rape
- 12 predominately Simmental suckler cows
- 12-24ha (30-60 acres) of brassicas drilled annually following a full plough
- Brassica mix: 0.75kg Swift, 0.75kg Redstart, 0.65kg Appin, 0.10kg Maris Kestrel
- Brassicas grazed by lambs from November to January.

CALCULATING BRASSICA GRAZING REQUIREMENTS

Taking the time to plan how much crop you allocate to stock will help make the most of winter brassicas. Forager finds out more.

Careful allocation and management is a must in order to realise the substantial cost savings on offer from grazing winter brassicas.

Germinal's William Fleming says taking the time to calculate daily grazing requirements is well worth the effort.

"Ideally, crops should be strip grazed and the fence moved daily to provide stock with a specific area depending on the crop's production and stock requirements," he says. "Careful grazing will also help hit crop utilisation targets of 85-90%."

Assessing the dry matter yield of the crop will allow accurate feed planning. Speak

to your local crop advisor for expected yields (also see table 1).

Alternatively, you can assess the crop's dry matter yields yourself:

- Cut each plant about 10cm from the ground within an area of 1m²
- Weigh the crop in a bag
- Multiply the fresh weight per m² by 10,000
- Then multiply this figure by the expected crop dry matter percentage (see table 1).

TOP TIPS FOR GRAZING BRASSICAS

- 1 Introduce them slowly** - Introduce livestock to brassica gradually over a 7-10 day period
- 2 Provide a run-back and provide protection** - Runbacks are essential for animal welfare and crop utilisation.
- 3 Strip graze** - Long, narrow breaks are best to enable all stock to access the crop at the same time and prevent localised poaching. The fence should be moved daily.
- 4 Feed plenty of supplementary fibre** - Fibre should make up about 30% of intakes.
- 5 Provide appropriate minerals** - Brassicas tend to be high in glucosinolates which can negatively affect iodine and vitamin E uptake. They are also low in copper, iodine, phosphorous and magnesium.

HOW TO CALCULATE CROP ALLOCATION

Example based on a 270kg weanling requiring 8kgDM/day	Your livestock and forage crop requirements
1. Livestock total intake estimate (Total daily intake on the basis of a dry matter requirement of 3% liveweight)	8kgDM/day
2. Brassica % of diet (How much of the diet will be grazed brassica?)	70%*
3. Brassica daily requirements (1 x 2)	5.6kgDM
4. Number of livestock	25
5. Daily requirement from brassica (3 x 4)	140kgDM
6. Estimated crop DM yield/m ² **	0.8kgDM/m ²
7. Total daily grazing area required (5 ÷ 6)	175m ² of brassica
8. Length of feed face	120m
9. Fence to be moved (7 ÷ 8)	1.5m/day
* Maximum of 30% of diet DM for lactating cows	
** Based on crop yields of 10tDM/ha (1kg/m ²) x 80% utilisation	

For more information, see the Winter 2019 Forager at foragermagazine.co.uk

Table 1:

EXPECTED CROP DRY MATTER PERCENTAGE		
CROP	Dry matter yield (kg/ha)	Dry matter (%)
SWEDES	9-14,000	10-12%
KALE	11-12,000	12-15%
STUBBLE TURNIP	6,500	9-12%
HYBRID BRASSICA	7-10,000	12-14%
FORAGE RAPE	4-5,000	11-13%



Brassica crop

MEET FORAGER'S NEW CONTRIBUTORS



In our new 'Over the Farm Gate' feature we follow the progress of farmers from across the world. Each has been chosen as an innovative grassland manager, running dairy systems under different climatic and agronomic conditions. In this issue, we introduce each farmer.

ROBOTIC SYSTEM FOCUSES ATTENTION ON HOME-GROWN FORAGE

Tony and Michael Ball, Vernons Oak Farm, Sudbury, Ashbourne, Derbyshire

Introducing a robotic system has focused Tony and Michael Ball's attention on producing more forage on farm, reducing their need for cereals and bought-in feed.

The brothers moved away from autumn block calving in 2014 to a robotic, all-year-round system to relieve pressure on labour requirements. They milk 500 Holsteins, with high yielding cows housed all year and low yielders grazed in summer.

When changing to robots, Tony and Michael set an average milk yield goal of 10,000 litres a cow a year, which is now being achieved with 3,000 – 3,500 litres from forage.

Tony uses several Aber High Sugar Grasses reflecting his need for large amounts of high quality silage and good rotational grazing. The Aber HSG 4 dairy mix suits his need for a couple of early silage cuts before returning those areas to the grazing rotation. He also uses Aber HSG 2 multi-cut and usually takes four cuts with good levels of protein. He has successfully increased the home-grown forage protein in the ration by growing a legume/barley wholecrop and introducing AberClaret red clover into his multi-cut silage leys. Reseeding is an important part of Tony's grassland management. He has put 38ha (95 acres) of grass seed on the farm this year, both in reseeding and to bring previous arable ground back into forage production.

Tony Ball milks 500 Holsteins with brother Michael.



FARM FACTS

Farm run by brothers Tony and Michael Ball

- **300ha** (750 acres). Includes 162ha (400 acres) grass leys, 73ha (180 acres) maize, 32ha (80 acres) wheat and 16ha (40 acres) pea/vetch/wholecrop
- **500** all-year-round calving Holsteins milked through robots
- **10,000** litres a cow a year at 3.9% fat and 3.3% protein. 3,000-3,500 litres a cow from forage
- Cows fed zero grazed grass, grass and maize silage and wholecrop silage
- Setting up another 200 cow, autumn block calving system on an additional 134ha (330 acres). It is being run separately from the main unit, operating through a contract farming arrangement with a young former employee.

The variable weather has proved challenging this season. Tony adds: "The very wet winter followed by a dry spring resulted in a good volume first cut silage, but re-growth for the second cut was hampered by the dry weather. The farm is relatively dry and free draining, accentuating the dry conditions. The second cut was taken after some rain and the grass grew well again for the third cut. We stopped zero grazing for six weeks during the summer, allowing the grass to grow away again well."

A RETURN TO TRADITIONAL FARM PRACTICES



Andrew Barlass

FARM FACTS

Andrew Barlass

- **800ha** (1,977 acres)
- **1,500** cows spring calving in August and September
- **4,730** litres a cow a year at 5.34% fat and 4.11% protein
- **445kg** milk solids per cow per year
- Unirrigated farm, all stock reared and overwintered on farm
- No supplements imported.

Andrew Barlass, Methven, Canterbury, New Zealand

New Zealand dairy farmer Andrew Barlass is turning his attention back to pasture, focusing on soil health, alternative forages and home-grown feed to improve farm profitability.

"We are in the business of growing grass first and producing milk second. The quality and quantity of milk is only as good as the forage we're providing our stock," says Andrew, who runs two dairy operations spread over 800ha (1,977 acres) and milking 1,500 cows.

The aim is to be self-sufficient in feed. Winter feed is rotated through the farm and used as a tool to enable re-seeding as pasture runs out. Catch crops are also used.

Being unirrigated, the operation is subject to climate variability. Silage is made from surplus grass, usually in spring, occasionally in autumn, and used to fill feed deficits.

Andrew adds: "The self-contained approach gives us a good level of

control, as we don't have to rely on supplementary feed sources and all youngstock is close at hand. We have a full picture of the entire operation at all times, helping us to understand our environmental footprint and manage issues proactively."

Soil health and nutrient use is a growing priority. Innovative, cost-effective forages are also an important part of Andrew's strategy to lift animal performance, while addressing environmental issues.

Germinal New Zealand's clovers and grasses have been part of the farm's permanent pasture mix for at least 10 years, as they withstand the region's cooler and unpredictable climate. The farm uses the Aber High Sugar Grasses, AberGain, AberGreen and AberMagic.

"We want to maximise the metabolisable energy produced per hectare, and the cows milk better off the High Sugar Grass," says Andrew. "Anecdotally, the cattle prefer the High Sugar Grass over other varieties, and we consistently achieve an even residual post-grazing."

GRASSLAND IMPROVEMENT UNDERPINS HERD EXPANSION

Brian Hogan, Horse & Jockey, County Tipperary, Ireland

Brian and Pat Hogan run a conventional grass-based dairy farm in County Tipperary, Ireland.

With a 140 cow, spring calving herd, the Hogans have committed to choosing top-performing grass varieties to achieve the most from their 39.5ha (98 acres) platform.

They have made a significant impact on the farm's overall productivity and profitability during the past eight years by increasing the herd size. This was achieved by concentrating on the genetic merit of the cows and incorporating management practices

directly impacting the bottom line.

Brian chose to expand slowly by bringing in good stock to complement the herd and worked on improving grass availability to help support increased cow numbers. He has concentrated on reseeding at a rate of 10% per year, initially focusing on the milking platform and improving soil fertility. He has picked the best quality grazing mixes to grow the most grass and achieve the best utilisation.

The Hogans are striving to improve grassland production from 13tDM/ha to 16tDM/ha. Achieving 15tDM/ha last year, poor-performing fields are being further improved. Brian is keen to introduce red clover into silage ground, consulting Germinal Ireland's Dermot Campion for advice.

A recent exploratory move was to sow straight AberGain tetraploid into some very wet ground. Tetraploids have a bigger seed and emerge quicker than diploids. Brian wants to take advantage of the

shorter waiting period for the grass to grow, thereby giving cows less time to damage the wet ground while grazing. Results so far this year have yielded 10 grazings since 6 April, despite a difficult early August.



Brian Hogan

FARM FACTS

Brian and Pat Hogan

- **99ha** (244 acres). Includes 39.5ha (98 acres) grazing platform
- **140** cow spring calving Holstein/Blue Friesian herd with some Jersey
- Calve from 25 January to 15 April
- **6,900** litres a cow a year at 4.45% fat and 3.68% protein
- **568kg** of milk solids per cow per year.



TREVASE FARM UPDATE: UNDER-SOWING MAIZE

In the spring edition, we learnt how Trevase Farm in Herefordshire, is benefitting from under-sowing maize. Forager revisits the site to find out about their new farm trial testing different grass varieties.

Different grass and clover mixes are being put through their paces as part of a maize under-sowing trial in Herefordshire.

David Pursey from Trevase Farm has been successfully under-sowing maize for the last five years. In doing so he is avoiding the environmental consequences associated with leaving ground bare over winter - something which is becoming increasingly unacceptable. The photo (below) clearly shows the consequences of rain post-harvest.

To further develop his under-sowing strategy, this year David has hosted some trial work, testing different grasses and festulolium with and without clover.

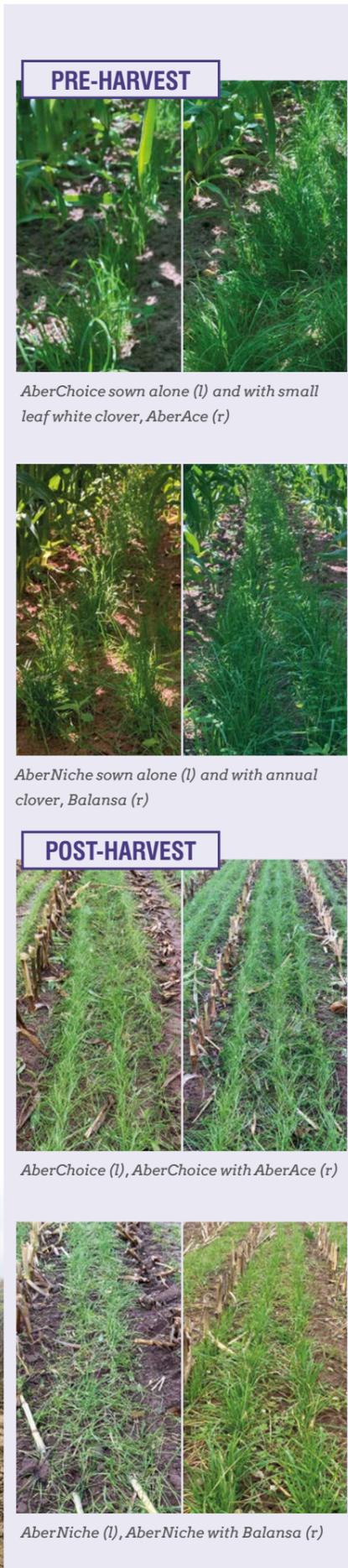
Most farmers use an Italian ryegrass for under-sowing as it establishes well and starts growing quickly. The festulolium

AberNiche performs in a similar way and also gives good cover with a deep root structure. It has been paired with a short-term annual clover, Balansa.

In contrast, AberChoice HSG is being trialled as a longer-term, more persistent High Sugar perennial ryegrass option, and grown with AberAce, a long-term, small leaf white clover.

Clover is being used to provide the grasses with a nitrogen boost; maize often absorbs the available nitrogen denying under-sown grass access to it. The pre-harvest photos (right) show the early grass growth benefiting from the inclusion of clover. But as with all good science, it's too early to draw firm conclusions yet so we'll be re-visiting Trevase Farm in the next issue to see how the grasses perform over winter.

Sloping field on a different farm showing the effect of rain immediately after harvest



PRE-HARVEST



AberChoice sown alone (l) and with small leaf white clover, AberAce (r)



AberNiche sown alone (l) and with annual clover, Balansa (r)

POST-HARVEST



AberChoice (l), AberChoice with AberAce (r)



AberNiche (l), AberNiche with Balansa (r)

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CAN YOU GROW MORE MILK FROM MULTI-CUT?

Choosing to adopt a multi-cut silage system need not be a compromise between quality and quantity following new research which shows the system can achieve the best of both worlds.

The multi-cut silage approach harvests grass younger and takes more cuts over a season compared to a more conventional system. This grass tends to be more digestible and higher in metabolisable energy for milk production. This in turn can help milk from forage. However, farmers have raised concerns that such an approach can lead to less tonnes in the clamp versus a three-cut approach.

With this in mind, working in a real farm situation, Volac's team of silage scientists compared a three-cut system with a five-cut system in the same field.

Because the farm was already making

multi-cut, they had to fit in with farm operations. This meant first-cut for both approaches was taken on the same date of 22 April, so both yielded equally at 3.78 t/ha of dry matter (DM).

But following this, while second-cut from the 'conventional' three-cut system, taken on 25 June, yielded an additional 7.72 t/ha of DM, second-cut from the multi-cut approach, taken on 23 May, produced less than half this – at 3.68tDM/ha.

Even when third cut was harvested using the five-cut system, its total DM yield still lagged behind. By this point, you would have been forgiven for thinking the multi-cut was disappointing, says Philip Jones, Silage Scientist for Volac. However, when all cuts from both systems had been harvested on 18 September, the multi-cut had delivered a total of

Multi-cut systems can deliver higher yields of better quality grass across the season compared to conventional systems, according to a recent Volac trial. Forager reports.

16.92tDM/ha – some 0.92tDM/ha more than the three-cut approach.

Nutritional results

"Clearly, these results showed that multi-cut in this farm situation would have put much more grass in the clamp," Philip says. "But where the experiment became even more compelling was when the nutritional results from the two approaches were compared.

"Analysis revealed that grass from the five-cut system was indeed more nutritious, with an average digestibility (D value) of 72.7 versus 69.7 from the traditional approach. This equated to it delivering 0.5 MJ more energy from each kilogram of grass."

More importantly, because the multi-cut yielded more, as well as being more



A key consideration with multi-cut is how best to conserve it, says Philip Jones

digestible, it was calculated to deliver 18,582 MJ/ha more energy over the season than cutting three times. Based on a figure of 5.3 MJ of energy being required to produce one litre of milk, this meant this particular multi-cut system had the potential to deliver an extra 3,506 litres of milk from each hectare over the season. At a milk price of 25ppl, this is equivalent to an extra £877/ha of income.

Although this was a clear increase over the more conventional approach, Philip acknowledges there would be extra costs involved in taking additional cuts of grass.

However, even after deducting the extra contractor costs involved, he says the five-cut system still had the potential to be £333/ha more profitable. Moreover, there can be further benefits from multi-cut, he adds.

"Another benefit we found from the fresh grass analysis was that average crude protein content from the multi-cut was almost 3% higher than with the three-cuts. This can happen because nitrogen assimilated into protein in younger grass has not yet been 'diluted' by extra growth.

"In addition, because younger grass contains less stem material, it can be easier to consolidate. Cutting grass younger can also reduce its growth stage variability across the field, leading to reduced silage variability in the clamp."

Consider conservation

Although multi-cut offers several

PUTTING A FINGER ON ADDITIVE BENEFITS

To better understand the benefits of the additive applied in the research, the Volac scientists used DNA fingerprinting to reveal the different bacteria present in the multi-cut silage. This was analysed at 0, 3, 7 and 91 days after ensiling.

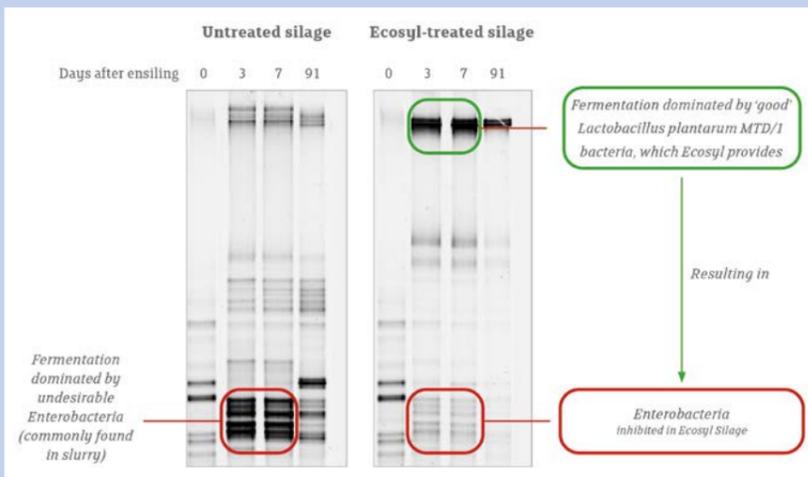
DNA fingerprinting is the same technique used in forensics. In this case it was used to produce an image (see picture) where horizontal bands represent the DNA of different bacteria. Darker banding indicates more of that bacteria present.

Where no additive was applied (left), results clearly showed that during the early part of the fermentation

in particular, the silage was dominated by undesirable enterobacteria commonly found in slurry.

By comparison, where Ecosyl was used (right) – which applies one million beneficial bacteria per gram of forage treated – there was very little growth of enterobacteria, as these 'good' bacteria dominated the fermentation.

Philip comments: "By inhibiting undesirable bacteria in this way, Ecosyl preserves more dry matter and nutrients. But you can't normally see this process happening. Using this technique, we wanted to make this more visible, so farmers could put their finger on exactly what a proven additive does."



potential advantages, an important consideration is how best to conserve it.

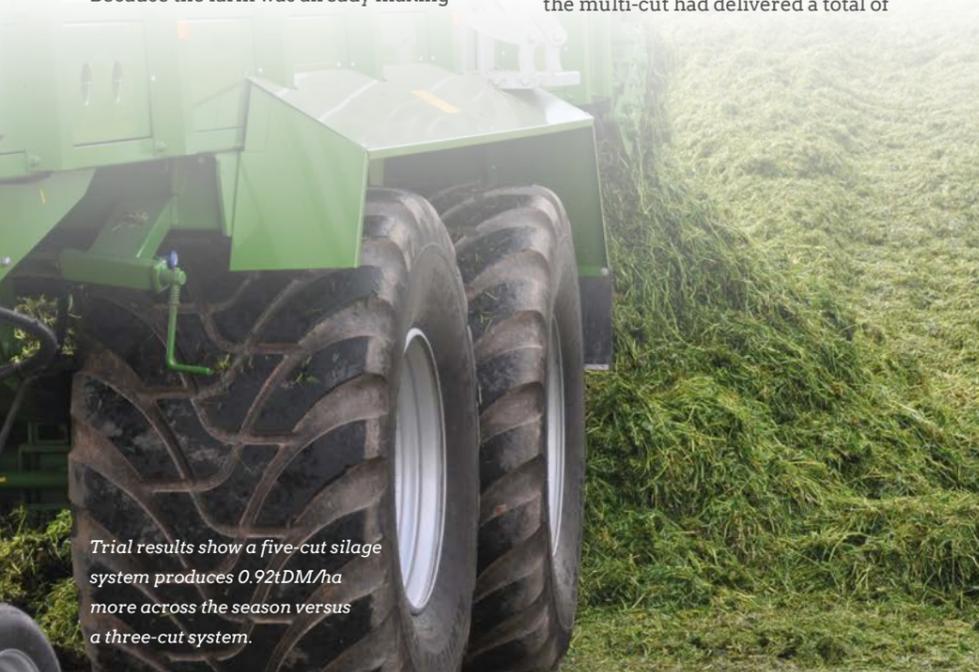
A higher protein content can, in theory, contribute to buffering of the fermentation, while shorter cutting intervals between slurry applications can lead to increased risks from slurry bacteria. The combination of high buffering and the action of slurry bacteria leaves silage at risk of DM losses. "To examine these challenges, we also conducted ensiling experiments," Philip adds.

"Where multi-cut was ensiled without an additive, we found that not only was the fermentation slow, but enterobacteria (the bad bacteria often associated with slurry) increased rapidly in number soon after ensiling. More worryingly, at the end of the experiment, the average DM loss

was nearly 10%.

By comparison, where multi-cut was ensiled using the additive Ecosyl, not only was the fermentation much faster, with the pH dropping rapidly, but the enterobacteria numbers in the silage were up to 100,000 times lower, and the average DM loss was virtually halved. There was also evidence that protein was better preserved.

"The conclusions from this work were that multi-cut had clear potential to improve milk production by delivering a higher yield of a more nutritious forage. However, if you're going to make multi-cut, you need to be aware of a few conservation challenges, to ensure its nutrients are properly preserved," Philip stresses.



Trial results show a five-cut silage system produces 0.92tDM/ha more across the season versus a three-cut system.

MULTI-CUT BENEFITS

- + 0.92tDM/ha more grass production over the season from the multi-cut system
- + 3,506 litres/ha more potential milk production from the multi-cut approach
- + £333/ha more profit on the multi-cut system

FARMERS WEEKLY GRASSLAND MANAGER OF THE YEAR 2020

All the finalists for this year's Farmers Weekly Grassland Manager of the Year are committed to maximising grassland performance through measurement and reseeding. Forager meets the impressive trio.



SAM CAREY, Rhiwlas Dairy, Bala, North Wales

Sam Carey first proved his grassland management skills through the successful conversion of his business partner's beef and sheep farm into a 480 cow, spring calving dairy unit.

The farm sits on challenging land up to 300m above sea level. Soil sampling and regular reseeding is an important part of Sam's ongoing grassland management strategy. The milking herd is managed on a rotational system at the home farm, with youngstock grazed on a separate 33ha (82 acres) grazing platform.

Soil fertility is important to Sam and he's keen to implement more sustainable methods across the farm. He uses a high proportion of multi-species leys, including red and white clovers, and a range of herbs. This ley choice increases plant diversity and activity, helping to improve soil health,

increase carbon capture and reduce nitrogen loss.

Brought up on a dairy farm in west Wales, Sam relishes the opportunities offered by a share-milking agreement. His exceptional grassland management has already been recognised when he won the 2019 Royal Welsh Agricultural Society Grassland trophy.

RHIWLAS DAIRY

- Share farming arrangement
- 80 NZ Friesian-cross cows
- Spring block calving
- 5,000 litres per cow per year (411kg of milk solids per cow)
- 12-14tDM/ha/year grassland production (2019).

SAM CHESNEY, Cool Brae Farm, Kircubbin, Northern Ireland

Sam Chesney is determined to maximise grass use on his suckler beef and sheep farm in Northern Ireland. He runs a spring calving suckler to beef system with 130 Limousin X cows and a spring lambing flock of 100 ewes.

The former Farmers Weekly Beef Farmer of the Year has two aims – to use and grow more grass and to increase production output from his 70ha (173 acres). His grassland comprises a 45ha (111 acre) grazing block and 25ha (62 acres) for silage, with grazing stock moved around a hectare block, five times a day.

Sam is a keen advocate of measuring grass, above and below the surface. He measures grass every week, soil samples regularly and has reseeded 4-6ha (10-15 acres) in each of the last two years. He uses multi-species herbal grass leys including clover, aiming to increase yield and quality and grows red clover for silage in a four-cut system. This produces more protein on farm and reduces bought-in concentrates.



COOL BRAE FARM

- 130 suckler cows
- 100 Blade Angus dairy-bred beef cattle
- 100 ewes
- 92% grass utilisation (2019)
- 13.2tDM/ha grassland production (2019).

Sam is also extending his grazing season by planting hybrid brassicas as a tool for successful outwintering.

Sam is a true custodian of his land, using data to drive every aspect of his grassland management.

JAMES MUIR, New Buildings Farm, Hopton, Staffordshire



Maximising milk from forage is a strong focus on New Buildings Farm where James Muir share farms with his wife, Lucy and her parents.

The farm is a pioneer of producing milk from grass, which James has developed further into a highly profitable system. In addition to the existing spring calving herd, James is starting an autumn calving herd on another farm, based on the same principle of making the best use of grass for milk production.

James employs a multi-cut system placing equal importance on grazing and

silage, using Aber High Sugar perennial ryegrasses. He takes 3-4 cuts a year by removing the surplus from the rotational grazing platform. Grass is measured weekly to inform all his grazing decisions. His strong focus on production efficiency is reflected in the farm achieving the 1-1 target for milk solids versus cow weight.

James worked outside agriculture before joining his in-laws' business, but was brought up on a dairy farm in Oxfordshire. His goal now is to grow a sustainable business for the next generation.

NEW BUILDINGS FARM

- 420 spring calving New Zealand Friesian-cross cows
- 550kg milk solids/520kg cow
- 6,350 litres per cow per year
- 70% milk from forage.

SUPPORTING EXCELLENCE

Germinal recognises excellence in grassland management and is proud to sponsor the Farmers Weekly Grassland Manager of the Year Award. The award celebrates farmers using best practice, striving to gain the most from their farms sustainably. **The winner is due to be announced in the new year.**



CHEWING THE CUD



Grazing is planned around grass recovery.

Farm Manager, Geraint Powell travelled across the EU and USA as part of his Nuffield Scholarship entitled: "Sustainable grazing strategies that meet ecological demands." Aly Balsom finds out how the experience changed his farming outlook.

GERAINT POWELL Farm Manager

- Brought up on a beef and sheep farm near Brecon in mid-Wales
- Studied at Aberystwyth University before travelling to New Zealand
- Shepherding jobs in Devon and the Cotswolds
- Started Nuffield (sponsored by AHDB Beef & Lamb) in 2017
- Became Farm Manager of Cabalva Farm in the Wye Valley in 2019
- Currently runs 146ha (360 acres) of permanent pasture and 40ha (100 acres) of woodland, 400 Easycare sheep and 40 Aberdeen Angus cows
- Sells ewe lambs, light lambs and stores. Beef sold as stores or finishers. Some pedigree breeding animals also sold
- Pottery, holiday cottages and Perry Pear orchards.

Why did you choose this topic for your Nuffield?

When I worked in the Cotswolds, we were managing a lot of land for other people. I could see prescriptive grazing wasn't working. When you are prescriptive and farm by date, you often don't get the outcomes you want. That's not helped by policy makers. We were certainly growing less volume of biomass every year which depletes the size of the solar panel which reduces the level of root exudates - these are the sugars available for the roots to absorb. I'd always wanted to do a Nuffield and it made sense to tie it into environmental management, which we're likely to get paid for in the future. It is about matching production with economy and ecology. I wanted to come out of it with healthier soils and greater plant diversity.

You sound like you took a lot away from your experience in the mid-West United States. What were the main lessons you learnt?

They're mimicking nature to produce a more resilient profit over time. They're doing that by changing and looking at practices and questioning social, financial and ecological responsibilities. They're planning their natural resources for 300 years into the future. That's water, soils, trees; all of the natural capital.

These livestock farmers were mimicking nature to produce at an optimum and not a maximum. A lot nearly went broke in the eighties. Now they're producing an optimum profit from what nature provides and matching genetics to that. It's about producing a maternal herbivore, not a terminal 'grainivore'.

They're lower cost and less reliant on inputs. With diversity in the system, they're more resilient. They were happy, empowered people. For me, it comes back to farmers taking ownership of their business.

What do you think UK farmers can learn from that?

Every business is different, but everyone can ask how they can make themselves more resilient. Farmers in the mid-West look at their business and look at what works and what doesn't. It's about changing the breed of the cattle to better fit their farm, thinking about plant diversity and integrating animals back into arable.

You talk about the value of planning grazing by the rules of the four ecosystem processes (water, mineral, energy, community dynamics), rather than date. Why is this important?

It's about observing and replanning and being less prescriptive. It's hard to change what you're doing and invite chaos into the system, but that chaos will give production and resilience. You have to be careful with change and take it slowly. Plan your grazing and the recovery period of the grass, rather than the time spent grazing.

How do you manage your beef and sheep grazing with this in mind?

I'm embracing the perennial system and encouraging diversity in permanent pasture. I'll be letting grass fully recover before grazing. I can lengthen or shorten my rotation as I have diversity in my permanent pasture. We've got a lot of cocksfoot, trefoil, sorrel and yarrow. It's

old permanent pasture, but it's diverse and forgiving. I can get a lot of grazing days off it.

How do you think new environmental policy should work to encourage diversity and ecological balance?

It needs to be simple. It needs to be done on a landscape scale so farms can join together. At the base of it needs to be ecosystem function, not managing the environment for single species outcomes. That's where we need to be grown up and realise nature needs boom and bust.

You talk about introducing livestock back onto arable farms. How important do you think that is to the ecological and economic debate?

Animals are the antidote to soils that are chemically farmed. You are recycling and enhancing biology on farm. There should be working relationships between arable and livestock. I think there's the potential to integrate animals from the west to the east of England. There's always issues with TB, but there are ways it can be done.

If there's a way and a means, we'll make it happen. That's what farmers are good at.

You talk about the negative impacts of chemical farming. Does that mean you think organic is the answer?

The answer is anything that empowers the farmer so they've got a better place in the market place and are able to improve resources for future generations. It's not necessarily organic. Every farmer has to develop and design a system that suits their individual farm.

As your farm is permanent pasture, do you have any plans to do any reseeded?

When I get towards my optimum level of livestock I'll think about reseeded. I'll be looking at diverse leys including Timothy, cocksfoot, fescue, herbs and delicates. I'll probably put in 17-24 species depending on what's in the existing pasture. I'll see what grows on farm and enhance that with similar species. We can plough, but I would probably overseed so we don't compromise soil biology.

Have you implemented any changes on your farm since your scholarship? If so, what?

We're putting together a natural resilience plan for the farm and are starting ecological monitoring. We are doing species counts and will put in improved infrastructure with fencing and water that will allow us to manipulate the recovery period through planned grazing. It's about planning the ground's recovery. Measuring grass is something I'll do more of in the future.

What would be your main take home messages for farmers following your Nuffield?

The most profitable place to keep a cow is where nature thrives. For too long we've been trying to create a productive environment and putting the cow into it, rather than enhancing the environment. It's about ecosystem function, optimising and empowering farmers so we come up with the solutions.

>> Read Geraint Powell's full Nuffield report at nuffieldscholar.org



"IT'S ABOUT MATCHING PRODUCTION WITH ECONOMY AND ECOLOGY,"

SAYS GERAINT POWELL.

PROFITING FROM FORAGE ON AUTOMATIC MILKING SYSTEMS

Quality forage should be placed at the heart of robotic milking systems to achieve the optimum balance between robot visits and feed costs per litre. Forager reports.

Provision of high quality forage should play a defining role on robot systems where feed costs can easily escalate.

While labour issues and time flexibility often prompt farmers to move to automatic milking systems (AMS), increasing milk yields and helping cows reach their full genetic potential are also high up on the list of motivating factors.

ForFarmers' AMS Specialist, Clive Slawson believes high-quality forage should play a defining role in these automatic systems. He urges producers to revisit diets to create the optimal balance of milkings per cow and feed costs per litre. Improving the digestibility of forage and driving appetite are important factors in driving profitability.

"What is fed through the robot will only support high performance if it is well balanced with the foundation diet fed down the feed barrier," says Clive. "A cow repeatedly visiting the robot and yet failing to achieve her potential is a good indicator that her base nutritional needs are not being met by forage and that feed is not balanced.



High quality forage should play a defining role in automatic systems, believes Clive Slawson

"Producers have to be very observant when running an automated system. Cows visiting robots every six hours or so have high nutritional and metabolic demands. What you often find in AMS systems is that the cows not having all their nutritional needs met don't show an initial drop-off in yield, but do suffer from rapidly declining body condition. This is

bad news in terms of long-term health, fertility and performance."

Feed barrier management

Establishing exactly what percentage of milk yield producers want to obtain from forage is crucial. This guides the management of concentrate feed and



Cows visiting robots every six hours or so have high nutritional and metabolic demands.

feed rates via robots. As in many high yielding systems, cows in an AMS need to gain about 60-65% of their nutritional requirement from forage in order to maintain rumen performance, health and profitability.

"Providing highly palatable, high quality forage, that can be easily accessed is key. We don't want to see cows wasting their time sorting feed and loafing around the feed barrier," says Clive. "Cows are also highly sensitive and ignore any old, mouldy or poor-quality silage, even if it is mixed with other feeds."

With the round-the-clock nature of robotic milking, good feed barrier management is essential to support high forage intakes throughout the day. High quality forage should be accessible to cows 24 hours a day. Walking surfaces should be comfortable and the provision of barrier space plentiful, in order to encourage cows to spend more time at the feed barrier and reduce the risk of bullying.

Future forages

For those AMS producers who are unable to provide the dry matter (DM) requirements of their cows from forage, the temptation is to make up the deficit via increased concentrate provision through their robots. This is not good practice unless balanced for acid loading. Rumen and metabolic acid loading inhibit the performance of the cow's rumen and the financial and health implications of such an approach are significant.

"Talking about the importance of high quality forage as part of an automatic system is one thing, but being able to produce it is another matter," says Clive. "Establishing the optimum forage yield

on your farm and maximising yield is crucial. If done right, high quality forage can be one of the most cost-effective feed sources, but done badly, it can turn out to be very expensive."

The availability of land on which to grow forage is likely to be relatively stable for producers, but there is a lot they can do with it to help increase productivity per hectare. Regular soil analysis, establishing a reseeding strategy and using the optimum fertilisers for specific forage varieties are all beneficial for maximising output.

"There is a strong correlation between the health of the soil, the quality of forage produced and the subsequent performance of cows using this forage," continues Clive. "Working to improve soil health therefore makes a lot of business sense, no matter what type of system you run. The winter period represents a good opportunity for producers to identify and start rectifying any deficiencies in soil health."

While AMS farms have the advantage of having a vast array of data to assess and help with benchmarking, Clive is keen to stress they will not provide all the data producers need to get the best out of their cows and optimise their overall feeding strategy.

"Information obtained outside AMS computers can provide a wide range of diagnostic data – such as fertility, rumen function and ration efficiency – to help assess the overall success of a diet," Clive concludes. "This feedback isn't directly available from robots and yet it can be key in balancing the overall ration and ensuring sufficient levels of high enough quality forage is being provided to cows on AMS systems."

TOP TIPS FOR AUTOMATIC MILKING SYSTEMS

- In order to maximise yields of high quality forage, focus on improving soil quality. Analyse soil, check panning, select forages that will perform well on your soil type and reseed as much as you can
- Analyse forages (including mineral content) using dry NIR and use the information provided to help balance the foundation diet
- When switching to an automated system, don't expect to have more 'free' time. Once freed from the milking parlour you will, however, have more flexibility and choice on how you spend your working day
- Make sure cows are receiving the feed allocated to them. Some robots' default settings will not dispense feed quickly enough for fast milking cows. If this is the case, manually adjust the robot's feeding rates
- Robots only have so much milking time per day, so make sure this time is targeted effectively within the herd milking profile. Ensure higher yielding cows have the time needed in the robot to fulfil their milk yield potential. Exclude lower performing animals via the access matrix, focusing on yield per milking and lactation length
- Using the data provided by robots, focus on the outliers and low performers in the herd. Identifying and solving problems inhibiting the performance of these cows will bring the biggest benefit to your herd.

"THERE IS A STRONG CORRELATION BETWEEN THE HEALTH OF THE SOIL, THE QUALITY OF FORAGE PRODUCED AND THE SUBSEQUENT PERFORMANCE OF COWS USING THIS FORAGE."

CLIVE SLAWSON

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