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FORAGER

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**UNDERPINNING
PROFITABILITY**



Page 5: Next Generation: Investing in homegrown forage has allowed this issue's Next Generation sheep farmer to create a business that operates above the subsidy line.



AIGLE

Wellington boots winners

Congrats to the survey winners from the Winter 2019/20 issue of Forager.

John Paterson of Argyll and Charlotte Bowser of Lincolnshire are the lucky winners of Aigle wellington boots!

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

Editor's NOTE

The government's new Agriculture Bill further underlines the role of homegrown forage in sustainable agriculture.

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So it's official – direct payments are being phased out and replaced with a new “public money for public goods” scheme.

The main headlines from the government's long-anticipated Agriculture Bill are of no big surprise considering the substantial run up to its (second) publication. It does, however, mean that there's now no avoiding the inevitable.

Between 2021 and 2027, direct payments will go and English farmers will then be paid for providing environmental benefits through the new Environmental Land Management (ELM) Scheme. Reducing environmental pollution, measuring and reducing climate change and encouraging wildlife will be some of the areas in which farmers will be rewarded. Soils are also mentioned, with the potential for financial assistance to protect and improve soil quality.

Against this background, well managed, homegrown forage is more important than ever. Farmers are quickly realising that to survive into the future, producing more on farm is the answer. Just ask “Next Generation” farmer, Rich Thomas (page 5). He knew he had to change to survive without direct payments and has subsequently begun reseeding and rotational grazing. That's helped improve grass quality and reduce cost of production by 15%.

Cheshire farmer Ian Norbury has also not been afraid to make changes, reducing cow size and out-wintering on kale to help drive efficiency gains. Out-wintering in particular has helped save housing and input costs (see page 8).

The need to reduce reliance on bought-in feed to lower dairying's environmental footprint was a big topic at the recent Dairy-Tech event at Stoneleigh Park. Figures presented by Promar International showed that eliminating soya from the diet could potentially save 89 tonnes of CO₂e and bring a saving of £3,780 to a 125 cow herd.

Soya is a huge influencer to a farm's carbon footprint. In fact, additional Promar data showed that soybean meal made up 7% of the straights fed on systems in the lowest 10% for carbon footprint, versus 63% on farms in the highest 10%. Those in the lowest 10% also had a lower feed rate per litre.

Reducing silage waste in the clamp and improving ration utilisation were identified as other ‘quick wins’ to help reduce farming's environmental footprint. Paying attention to consolidation on the clamp is one way to help reduce losses. That's why we've profiled some of the machinery available to help achieve a good pack on the clamp in this month's issue (see page 24).

With the Agriculture Bill also specifically referencing soil management, looking at practical ways to protect them and prevent nutrient run-off is a must. With that in mind, leaving maize

stubbles bare over winter will become increasingly unacceptable. We highlight new maize overseeding work in this week's issue (page 18) to identify practical ways to overcome the problem.

May's Grassland & Muck event (page 29) will also prove a useful day out if you're looking for practical advice on improving soils, boosting silage quality or simply learning about the latest thinking around grassland

management. With direct payment phase out beginning next year, there's no time to waste in ensuring your business is resilient and sustainable. 

Reducing silage waste in the clamp and improving ration utilisation are ‘quick wins’ to help reduce farming's environmental footprint.



Next generation



As part of the Next Generation series, Aly Balsom meets Herefordshire sheep farmer and forage convert, Rich Thomas.

Experimenting with a red clover and perennial ryegrass mix and splitting the field in two proved the catalyst for change for Rich Thomas.

“We finished so many on the second draw – about a third of lambs. We'd never done that before. I had to take half to market as they were out of deadweight spec,” he recalls.

He quickly realised that the way to improve lamb performance as cost-effectively as possible was to fully invest in rotational grazing and grass reseeding. Since then, every bit of spare cash has been put into buying fencing and putting in infrastructure for water. Rather than set-stocking a paddock for about a month, sheep are now moved roughly every 2-4 days. Google Maps is used to split fields using GPS and locate fence lines.

Rich farms Risbury Court with father, Robert, who Rich admits has given him “a long rein.” Over the last five years, the Suffolk Cross and Texel x Mule flock has been replaced with a mostly New Zealand Romney x Aberfield flock, which will get the most from a simple, forage centric system. Last year was also the first that ewes lambed outdoors.

Grassland has been reseeded using herbal leys including various species such as Aber High Sugar Grasses, timothy, chicory, plantain and AberClaret red and white clover. The varieties add diversity to the mix and suit the farm's ground, which is prone to drying out.

The mixes, combined with rotational grazing, proved their worth during the drought when fields remained greener for longer compared to neighbouring ground. Better grass quality has also enabled concentrate to be completely cut from the system. Next on the list is reevaluating what height covers are grazed at and adopting a leader/follower system with the cows and sheep.

IN THE HOT SEAT

Name: Rich Thomas **Age:** 40
Farm: Risbury Court, Leominster, Herefordshire

System: 142ha (350 acres), 330 mostly Romney x Aberfield ewes put to Focus Prime tup. Lambs sold DW, mostly to Tesco. 50 pedigree Hereford cows, 12ha (30 acres) apple orchard, 81ha (60 acres) arable.

Sum up your farming ethos in three words
“Could do better” – like my school report.

What's been your greatest business achievement?
Maybe that's yet to come, but one of my proudest moments was winning a bottle of champagne for the best speech from the floor from the Oxford Farming Conference debate in 2009.

What's the next thing on your list for improvement?
More fencing, more diverse swards, more subdivision of fields and trying to get a better work/life balance by looking at things holistically.

If you had one piece of advice for a new entrant, what would it be?
Stop and think and speak to lots of different people before you make any decisions. Work out why you shouldn't do something first.

Rich says all of the changes have been focused on creating a more sustainable business. “It's having a system that can survive without basic payments - that's the goal,” he comments.

“There's nothing you can put in a bag that's better than good, fresh spring grass – that's one of the phrases that goes round in my head.”

The move is proving its worth with cost of production reducing by 15% in the first year of rotational grazing. Lambs are also finishing sooner with very few now remaining at Christmas and 90% in spec. 

Forage wagons reduce machinery, fuel and labour requirements at harvest.



Comparing forage harvest options

A growing contingent of farmers and contractors are using forage wagons instead of precision chop forage harvesters for silage making. Aly Balsom looks at the pros and cons.

Less labour and reduced costs are just some of the selling points of forage wagons, but before rushing to the machinery dealership, it's important to consider your individual farm's situation.

A forage wagon – or commonly named, forage box – combines the task of chopping and collecting pre-mowed grass into one pass. As a result, machinery and labour requirements are reduced, specifically in carting silage from the field to the clamp.

Independent forage consultant, Dave Davies – who wrote a Farming Connect factsheet on precision chop versus forage wagons – says the decision to use either should not purely be based around cost. Instead it's about considering the "value" of the process to "your" specific business.

The cost of using a forage wagon to cut first cut is estimated to be nearly £30/hour less

compared to a forage harvester (see "The Numbers"). However, this cost saving will be influenced by travel time to and from the clamp and how good you are at making silage.

Dave explains: "The biggest cost difference is how well you do the job and what your losses are. If you're doing the job well with a forage wagon, it will be cheaper."

Shropshire contractor Steven Bowen cuts around 1,012ha (2,500 acres) a year with the business's two Pottinger forage wagons and has experience using forage harvesters. Dave and Steven run through their key considerations when comparing the two:

1. Labour

Labour is the number one benefit of using a wagon. "One man and one tractor can hook up to one forage wagon and you can silage on your own, as long as it's raked up," explains Steven. "With a forager, you

need at least two or more tractors and trailers, depending on distance." On large acreage, another wagon can be added to the process, which takes labour to a similar level as forage harvesting. One wagon can then be leaving a field as the other arrives – as long as the clamp is not too far away (see "Cost considerations").

2. Chop length

Forage chopped through a wagon will be longer and less even versus that harvested with a precision chopper. A longer chop is now being favoured by some farmers and nutritionists for rumen health. However chopping too long should be avoided as this can lead to sorting and increased risk of acidosis.

The longer chop from a wagon will create challenges at consolidation – the second most important determinant of silage quality after harvest (see page 24). Good clamp

consolidation practices can deliver similar silage density with both harvesting methods. However, in practice this may not always be achieved with grass cut using a wagon. This could increase the risk of butyric silage, yeasts and moulds.

Dave says the pick-up reel in a forage wagon also tends to push it into the wagon in a roll, which means it can come out in lumps. "That means you do need to shake it out more with the buck rake," he explains. In addition, due to the larger capacity of forage wagons, it is important that sufficient space around the clamp is available to ensure even layer depths can be placed into the clamp during filling.

3. Speed of harvest

Harvesting with a wagon will take longer than with a forage harvester. For example, Steven says he cut 600t of silage off 40ha (99 acres) in 18 hours with a wagon. With a forage harvester, he estimates this could have taken about 10 hours – depending on the size of machine.

Slower speed could be beneficial for those working on the clamp who can struggle to keep up with the fast delivery speed from forager harvesters. Having more time to work on consolidation could be beneficial to silage. However, having the clamp open for longer increases the risk of oxygen penetration, so top notch management is even more important.

4. Servicing and investment costs

Less moving and fast parts on a wagon versus harvester means there's less to go wrong and less to service. Depending on size of machine, a smaller tractor can also be used to tow a wagon. For example, some can be towed by a 50-60hp tractor. However, smaller wagons tend to be older models which can deliver a poorer chop, which can have a negative impact on intakes.

Investment costs are also less than buying a harvester. Steven estimates that a wagon also uses roughly 50% less fuel compared to a harvester and trailer set-up.



Good consolidation of longer chop forage harvested using a wagon is possible, but greater attention is needed on the clamp.

5. Soil compaction risk

A forager set-up will result in two sets of wheel marks in the field from the harvester and trailers. With a forage wagon, it's just one set. Wagons are also more likely to have floatation tyres and steering axles/more advanced running gear than tractors and trailers and

weigh less, which could reduce soil compaction risk. Compaction can be reduced with a harvester by adopting controlled traffic farming.

See the Spring 2019 Forager for information on how to adopt Controlled Traffic Farming. foragermagazine.co.uk

Cost considerations

The distance of fields from the clamp has a bigger impact than acreage on the cost-effectiveness of forage wagons, believes contractor Steven Bowen, who charges a wagon at £108/hour.

For example, if the clamp is 4-6 miles away, along windy roads, the time spent on the road makes it less cost-effective. This is particularly the case if only one forage wagon is working as harvesting stops when it travels back to the clamp.

If the contractor drops their price when they're travelling on the road, it might be more cost-effective or if a farmer was doing it themselves, they might not mind the added time. A contractor that charges by the cut may also reduce the cost, particularly if yields are low. The key is to weigh-up the costs for your specific farm.

The Numbers

£101.25/hour	the cost of using a forage wagon on first cut
£130.42/ha	the cost of a precision chop forage harvester, including carting and clamping (Costs: Nix Farm Management Pocketbook 2017)
-50%	estimated fuel savings from using a wagon instead of a forage harvester
£185,000	estimated cost of a tractor and wagon that can take 10-12t silage (could buy cheaper tractor)

Out-wintering small cows brings cost savings

Reducing cow size and out-wintering cattle on kale are just some of the ways AHDB Strategic Beef farmer, Ian Norbury is driving big efficiency gains, reports Aly Balsom.

In Ian Norbury's mind, big 800kg suckler cows that eat a lot and require housing for five months of the year make no sense to the bottom line.

Over the last seven years he's taken steps to drop cow size on his Cheshire farm to improve feed efficiencies and enable stock to be out-wintered on kale, without wrecking soils. The housing period has subsequently reduced to 5-6 weeks, reducing labour and management costs. Weaned calves are also rotationally grazed (see "The strip grazing learning curve"). Last year they didn't receive any concentrate and were housed for just 10 weeks on grass silage.

"The main driver for the changes was to reduce costs massively and strip costs out. You're insulating yourself against a drop in (beef) price," says Ian. "My aim is to calve all cows in a short period, get them out ASAP, outdoor wean and keep calves going round the grazing block and target the best grass at them."

Ian runs 120 sucklers across 101ha

(250 acres) at Dairy Farm, Mobberley. Half of the herd are pedigree Aberdeen Angus and the rest, Simmental cross Aberdeen Angus or Sussex cross Aberdeen Angus. Everything is put to an Aberdeen Angus bull.

Cow size has been reduced by introducing smaller, traditional Aberdeen Angus genetics and calving heifers strictly at two years old.

In the past, big cows would have produced framey stores which required lots of grain to put finish on. Now calves are not as framey, which suits a changing market that now requires smaller steaks and less fat. Most animals now go at 350kg DW and R3 compared to 380kg and R4L previously.

"I get a lot more cattle in spec and send them earlier so I'm recovering money quicker and not putting extra cost into them," says Ian.

As the farm is ex-dairy, grass quality is very good which can mean cows can get over-fat. Part of the plan for out-wintering on kale was to take

a bit of weight off them, although they have in fact maintained.

Ground earmarked for a grass reseed is now put into Maris Kestrel kale, rather than barley.

The old grass ley will be burned off and then mown and baled. These bales will then be stacked at the side of the field to provide low quality forage during out-wintering. The 4ha (10 acres) of ground will then be sward lifted and direct drilled with kale. "My main focus is to keep that mat of grass there. I want as much fibre and structure in that soil so it can stand cows well," comments Ian.

Two challenging seasons and delays in drilling this year meant the kale hasn't yielded as well as hoped at 3-4.5tDM/ha. This year the aim is to sow earlier and graze it with even more stock to maximise performance off that area. Ian's calculated that it costs 50p/cow/day to keep them on kale, compared to an estimated £1.50 a day when housed. It also saves time. "The kale is saving me loads. I can be in and out in 15 minutes," he says.



By stripping costs out, you're insulating yourself against change, believes Ian Norbury.



Cow size has been reduced to improve feed efficiencies.

Last year, the kale ground was drilled with a short-term silage mix of Italian and hybrid ryegrasses. As the field had a high dock burden, weeds were left to grow and were then sprayed off and a 'crumbler' used to create a seedbed. Grass seed was then drilled. The mix was chosen for rapid establishment in the hope it would

out-compete any weeds.

"It's just like magic grass. You graze it and it's back again behind you," says Ian, who believes the muck from out-wintering is bound to have helped.

Most of the farm is planted with Aber High Sugar Grasses, which Ian believes are highly palatable.

"They seem to do very well on

Aber High Sugar Grasses. They're dead palatable. Cows like them and they analyse well."

All in all he thinks changing to a more forage focused, efficient system makes for a more sustainable future.

"I think I'm in a much better position and I can still see opportunities to make it better," he says. 

Efficiency improvements

- Saved £17.40 per animal on minerals by blood testing animals and targeting minerals using a bolus, rather than buckets.
- Tightened calving from 21 to 15 weeks by using more bulls (one bull per 60 cows).
- Ring fenced whole farm to enable quick movement of mobile electric fencing for strip grazing.
- Set up mobile water trough system to deliver water when strip grazing.
- Regularly weighs and uses EID to check animals are on target.
- Targets wormers based on faecal egg counts (FEC).
- Allocating different quality silage to appropriate stock groups.

The strip grazing learning curve

Ian admits that rotational grazing is a learning curve and takes plenty of practice, but once you see the benefits "it's addictive."

"You're not going to get it right every day, but you're getting better all the time and learning different management skills," he says. "It's all about getting out there and learning all those tricks."

Having worked in construction, Ian first saw rotational grazing on some of the dairy farms he worked on, putting in parlours and general infrastructure. He brought those lessons home seven years ago and put an end to set stocking.

Ring fencing the farm has proved hugely beneficial, enabling temporary electric fencing to be moved quickly and easily. Ian opts for three temporary fences to split a field – two, one day breaks ahead of stock and a back fence. Back fencing has proved the big breakthrough as grass is not being trampled. "The recovery of grass and the regrowth of grass is unreal," he says.

After not hitting the cattle growth rates he desired in the first year of strip grazing, he's also learnt a few things about residuals. "I was maybe pushing them too hard and not giving them enough and making them take it down too low. 1,500kg DM/ha is too low for a finisher group," Ian explains. Last year he opted for residuals of 1,700kgDM/ha and achieved growth rates of 1kg/day at grass. This was also helped by improved management in the preceding autumn and better allocation of grass.

Cows and calves are also strip grazed, but not as regimentally. They are moved every 3-4 days.



Tips for introducing clover

So you established a new reseed last year and want to stitch in white clover this year – how should you do it? Germinal GB's William Fleming provides his top tips.

Limited clover-safe sprays for controlling weeds in new leys means stitching in clover once a grass reseed is established can be attractive.

This enables any existing, heavy broadleaf weed burdens to be well and truly controlled in the ley's first year, with clover introduced in the following season.

However, all too often farmer's good intentions to

introduce clover at a later date can go forgotten. It's vital you build this into your grassland action plan or you could be missing out on productivity gains. After all, clover helps build sward biodiversity, aids soil structure, increases dry matter intakes and performance. As a legume, its nitrogen fixing abilities are also equivalent to 150-250kgN/ha.

Think about the following when introducing clover:

- 1 Ensure broadleaf weeds are under control**
Make sure you have weeds well and truly under control. Work with your agronomist to ensure the correct sprays are used at the right time both before and after establishing the new ley.
- 2 Choose the right clover to suit management**
Always choose clovers from the Recommended Grass and Clover Lists (see page 28) and opt for a blend. If you're wanting to cut the sward for dairy cows, choose large and medium leafed varieties. For sheep, choose small and medium leafed clovers.
- 3 Introduce the clover when soils are warm and moist**
Stitch in clover at least six weeks after weed control to adhere to withdrawal periods. A warm, moist seedbed is vital (April-August, depending on location).
- 4 Ensure good seed to soil contact**
Over-sow after grazing or cutting the field to help soil to seed contact.
- 5 Opt for a slightly higher seed rate**
A slightly higher seed rate of 4kg/ha is recommended for over-sowing compared to a full reseed to compensate for higher seeding loss.
- 6 Carefully graze the sward to help clover establishment**
Under or over grazing is the enemy when it comes to clover establishment. Graze too hard and clover will be knocked back and graze too lightly and grass will outcompete the clover. The key is to graze down to a residual of 1,500kgDM/ha or 4cm so sunlight can get down to the clover. Graze lightly and for short periods until clover is well established.
- 7 Adopt good rotational grazing**
Once clover has established, adopt good rotational grazing to enable clover to rest and recover – always graze down to 4cm.
- 8 Think carefully about fertiliser**
Avoid application of nitrogen in early establishment as it will encourage grass to grow and increase the risk of clover being outcompeted. Ensure there is sufficient potassium and phosphate available in the soil for the young clover plant. 

Top Tip

Identify the fields you want to reseed this autumn now and put together a targeted weed control programme with your agronomist to nip weeds in the bud before establishment. Getting a good clean seedbed could mean you could include clover in the mix from the start which will reduce the costs associated with going in at a later date.



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Lucerne key to forage intakes

Could lucerne play a greater role in sustainable UK dairy farming? Matt Mellor finds out.

Often known by nutritionists as the 'magic' ingredient thanks to its positive impact on rumen health, lucerne is arguably one of the most under-utilised forages in UK dairy rationing.

Used correctly, it offers very useful buffering capacity and that all-important scratch factor. Together, they have the cumulative

effect of stimulating fibre digestion and enabling cows to increase their utilisation of all homegrown forages. It's also a rich source of protein, offering the opportunity to reduce reliance on bought-in soya and rape meal.

Unfortunately, lucerne has a reputation for being difficult to grow,

due largely to its preference for relatively light and free-draining soils and a soil pH of at least 6.2. As a result, it makes up less than 0.5% of the UK's temporary grassland area.

Germinal GB's Ben Wixey believes there are opportunities for far more lucerne to be grown.

"In the absence of an effective recommended or descriptive list in the UK for lucerne, I tend to advise farmers to look at the French listings," he says. "Lucerne is ranked on a scale of 0-12 for winter dormancy, with 0 being dormant and 12 being non-dormant. For UK conditions, we ideally want a dormancy rating of between 4 and 5."

These are semi-dormant varieties, which means the plant shuts down and is protected for the hardest part

of the winter and becomes productive from spring through to autumn. The dormancy rating will typically equate to the number of silage cuts that are possible in a growing season.

Ben stresses that establishment is a critical phase with lucerne, so all the usual conditions of a fine and firm seedbed are especially important.

"I would always recommend

using seed that has been pre-inoculated with the rhizobia bacteria essential for nitrogen fixing, and seed coatings including essential trace elements are also beneficial in promoting early seedling vigour," he explains.

Seed rate is also important and can be difficult to get right if sowing by weight (as seed sizes can vary significantly). Sourcing lucerne in pre-counted packs designed to achieve

optimum seed rate per hectare is the surest way to avoid over or under-drilling. Lucerne is a legume, so fixes its own nitrogen, and is also naturally drought tolerant.

Ben adds: "I believe lucerne can have a far greater role in future UK agriculture, not least for its fertility-building properties in cropping rotations and as a sustainable source of homegrown protein."

Case studies - feeding lucerne

Simon Gittins of Wykey Farm has been working closely with Germinal GB and growing the semi-dormant variety Timbale for several years.

Unlike most UK growers, who will cut and ensile the crop, Simon is cutting and carting the lucerne – like a zero-grazing system – and then dehydrating the crop on drying floors. Through this method, he is maintaining the integrity of the crop and maximising the capture of dry matter, and most notably the protein.

Energy for the drying floors is entirely sustainable, coming from surplus heat from the farm's anaerobic digester or from a ground source heat exchange system recently installed for the purpose.

Once dried, the lucerne goes into a specially designed hopper that gently feeds the product into a square baler. The resulting bales are a high fibre, 88% dry matter feed with 20-25% protein, which are now being sold into a receptive dairy farmer market.

Dairy nutritionist Andrew Henderson, who owns Independent Feeds, works with several dairy farmers that are already incorporating Simon's lucerne bales into their milking rations.

"Lucerne really is a rumen-friendly feed, having high buffering capacity and a good scratch factor," he explains. "Used at relatively low inclusion rates of around 1kgDM/cow/day, it will promote more efficient fibre digestion, allowing greater intakes and utilisation of other homegrown forages."

Andrew views it as a good alternative to something like sugar beet pulp. However, because you only require around one-sixth the amount to achieve the same result, it does not take up rumen capacity or replace other forages.

The crop is also a good source of protein, with high levels of essential amino acids, and will therefore reduce reliance on bought-in soya and rape meal.



Independent nutritionist Andrew Henderson says lucerne is the magic ingredient that can unlock the potential of homegrown forage.

Andrew adds: "From what I've seen of Mr Gittins' product, it is higher in protein and energy than imported lucerne products, so his approach to maintaining crop integrity is effective. Significantly, it's a British product, sustainably produced, and if you consider the importance of having a lower carbon footprint, I think that's going to be increasingly important for UK farmers in the future."

Leicestershire milk producer Mark Truman has been including the dried lucerne product in his dairy ration since August last year, having previously grown his own crop for ensiling.

Fed at 1.5kg/cow/day, he includes it for its buffering capacity and believes the dried product is more effective than the ensiled lucerne he has used previously.

"It certainly helps with the acid loading and is effective in improving rumination," he says. "We're not looking to replace other forages, but to enable cows to utilise our homegrown forage better."

Based near Melton Mowbray, and trading as V W Truman & Partners, Mark has 220 cows in milk all year round, with a herd average of around 12,000 litres per cow per year. **P**



Milk producer Mark Truman is a long-term user of lucerne and says the dried product is a more effective ingredient than ensiled silage.

Germinal GB's Ben Wixey (right) has worked closely with Simon Gittins on growing lucerne, which is now being turned into a high value dried product for sale to dairy farmers.

To optimise grass output and keep costs low, Cathal McAleer focuses on soil health and fertility.



Soils underpin profitability

A combination of good soil health, nutrient management and reseeding means one Northern Irish dairy farm is producing 14tDM/ha, as Laura Wise reports.

"We are not chasing yield – we're chasing profit," states Cathal McAleer, farm manager for Omagh Dairy Farm.

The business model for the 200ha (494 acres), Northern Irish farm business keeps a firm grip on costs by optimising output for as little inputs as possible. The farm milks 300 spring block calving, crossbred cows, split between two milking platforms.

According to Cathal, this means taking a holistic approach to cow and grassland management to safeguard financial performance from preventable inefficiencies.

"Within our herd, this means keeping a more moderate sized cow that has been bred using genetics from EBI bulls selected primarily on fertility and maintenance sub-indices," he explains. "We run two spring calving herds with a target of more than 80% calving within the first six weeks of a 12 week calving period."

To develop a herd with high metabolic efficiency, fed predominantly on a forage diet, mature cow weight is targeted at 550kgs. With Irish and New Zealand

Friesian breeding making up most of the genetic base, Jersey sires will be used on any cows more than 600kgs to reduce liveweight, or on any cows with low milk quality.

Operating on a milk yield contract with quality premiums, cows average 6,000 litres per cow per year at 4.4% butterfat and 3.65% protein. The herd achieves 3,500 litres from forage and receives one tonne of concentrate a head.

Looking after soil

With a reliance on forage production to keep feed costs to a minimum, improving soil health has been one of the farm's biggest priorities to optimise grass performance. According to Cathal, soil is managed with the same philosophy the farm uses to maximise production from the cows – fertility is everything.

"If you don't feed your soil, you're not going to reach your forage production potential. We aim to have a pH of 6.5 or greater on all paddocks, with phosphate and potassium at high index 2's. Soil potassium levels are difficult to

increase so we have to spread some MOP (potash) on the steep parts of the farm if we want to maintain or build indices," says Cathal.

Nutrient application has significantly helped increase forage production. Since 2014, soil samples have been taken every year to determine P and K distribution and pH levels. The farm also blanket spreads slurry twice a year in the spring and autumn and has recently started nutrient testing. This tailored approach to uplifting soil fertility through efficient nutrient application has resulted in the farm increasing forage production from 10tDM/ha in 2013 to 14tDM/ha in 2019.

Managing forage production

Operating on a rotational grazing system, cows are introduced into a paddock at 2,800-3,000kgDM/ha and moved out at 1,550kgDM/ha.

"To manage the grazing wedge, anything over 3,100kgDM/ha is baled for silage," explains Cathal. "To maintain high grass quality, we aim to keep within a 16-18 day rotation during the mid-season to

maximise grass quality."

Around 105ha (260 acres) of grassland is cut for silage each year before being used for youngstock grazing. The first two cuts typically yield 4,000kgDM/ha with an ME of 11.5 MJ/kg and 14-15% crude protein. The third cut will yield 4,500kgDM/ha with an ME of 10.5 MJ/kg and 13% crude protein and is only fed to dry cows.

To maintain grass growth and quality in both grazing and silage platforms, implementing a robust reseeding and nutrient application programme has been paramount. With 85% of the farm in reseeded grass, the bottom three performing paddocks each year are reseeded with AberGain, AberChoice and AberClyde varieties to maintain grass growth and quality levels. The soil type of the paddocks being reseeded dictates which varieties will be used.

"We want late-intermediate or late grass varieties that are ranking the highest for quality on the Pasture Profit Index (PPI). Where



Grass yields are monitored and the bottom three performing paddocks are reseeded every year.

more than one variety is used in a mixture, heading dates of the varieties used must be within seven days of each other. Before we invest in a specific variety, we want to see what research has gone into them and how they have performed in on-farm grazing trials," explains Cathal.

25-30kgN/ha is applied between each grazing rotation. For silage ground, 125kgN/ha is applied in a combination of slurry and fertiliser,

along with 30kgP/ha and 110kgK/ha.

"If we want to increase and maintain forage tonnage and quality, we must feed the soil and the crop – failure to do so will drop our tonnage very quickly. Paddocks growing more than 14tDM/ha are using a high level of soil N, P and K. We have to make sure we are feeding the soil so we can sustain this level of growth in years to come," concludes Cathal. 

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Making the cut

A new mower conditioner, due for launch at Grassland & Muck 2020, has already proven its worth as a prototype for one busy south Wales contractor, reports Luke James.

Reliability and consistent performance in a wide variety of conditions are top of Elgan Bowen's list of requirements when he chooses a mower conditioner.

He cuts over 809ha (2,000 acres) of grass in a typical season as part of a silage contracting operation that harvests a total of 1,416ha (3,500 acres) around Crymych in Pembrokeshire.

With both dairy and beef farmer customers increasingly aware of the importance of quality forage, Elgan says the pressure to deliver is as high as it's ever been.

"When it comes to mowing, the priorities are for a clean cut and a well-conditioned swath," he says, "and we'll soon hear about it if the job is not done to the required standard.

"Timeliness is also critical, more often than not. Farmers want to harvest the grass at the optimum growth stage or take

advantage of good weather windows, so we need to maintain high work rates and avoid any delays that may result from breakdowns."

Trading as K T and A E Bowen, the contracting business focuses mainly on grass during the summer months, with a five man team covering the entire operation where required, from mowing through to harvesting for clamp, round or square bales. Two mowing outfits are currently used, one being a triple gang, or 'butterfly' configuration, and the other a front and rear mounted combination.

The newest machine into the fleet is Kuhn's FC 3115 D mower conditioner, which has been used as a prototype as part of Elgan's front and rear mounted combination for two years prior to its official launch in 2020.

This 3.1 metre machine gives

an operating width of 6 metres when used with a front mounted unit and includes all the latest cutter bar technologies and drive line engineering to ensure the efficiency and reliability required by the busiest contracting business. It is also vertically folding, which adds the significant beneficial features of compact transport, great manoeuvrability and reduced loading on the tractor's rear wheels.

"One of the challenges we can face as contractors is access to fields, particularly getting in through narrow gateways, so in addition to the operation of the mower itself, we have to think about transport and manoeuvrability," Elgan adds. "The vertically folding feature on this mower conditioner gives it added value when it comes to tight gateways and narrow lanes. But that's only relevant if the machine is reliable and produces the required level of performance in the field."

Kuhn builds its top of the range mower conditioners with both large-scale livestock farmers and busy contractors in mind. They include a number of key features designed to deliver the combination of performance and reliability that are so vital when forage quality is on the line.

Lift-Control suspension is an exclusive feature on Kuhn mowers and mower conditioners and is key to the FC 3115 D's in-field performance. In conjunction with powerful and constant pressure control, this technology allows precise ground following to ensure a clean cut and minimal soil contamination of the forage. This also provides an effective safety mechanism, whereby the machine moves backwards and upwards if hitting an obstacle, before moving swiftly back into work. This minimises damage, whilst maintaining efficiency of work.

The FC 3115 D also features Kuhn's patented OptiDisc cutter bar, which has an asymmetric disc design that combines a quality cutting performance with high crop flow characteristics that help maintain efficiency of operation whatever the conditions. OptiDisc also includes features

such as large diameter gear wheels and Kuhn's Protectadrive safety within the disc bearing housings. This ensures the machine is robust in work with minimal maintenance requirements.

Replacing wearing components is an inevitable part of any contractor's routine and, with mowers and mower conditioners, that first and foremost means the blades.

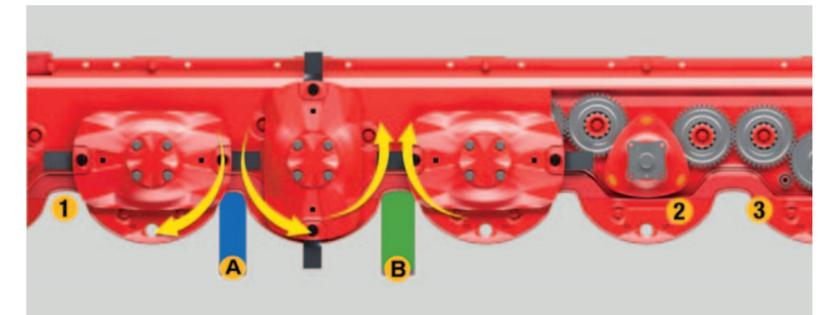
On the FC 3115 D, Kuhn's Fast-Fit system is a standard feature, which Elgan sees as a major advantage.

"Maintaining a good set of blades on the mower is critical to its performance," he says, "so the ability to change them with a simple lever as opposed to using spanners to loosen and tighten nuts and bolts will save us hours and hours over a season."

The conditioning unit on the FC 3115 D is a heavy duty pivoting steel finger system. Conditioning intensity is easily adjustable by switching between two rotor speeds and/or setting the conditioning hood in one of five positions.

"It's important to be able to set the conditioner according to crop conditions or customer requirements," concludes Elgan. "Again, if this is a quick and simple operation, it saves time and allows us to get on and do the job more efficiently." 

Technological gains



1. The asymmetrical shape and arrangement of the discs on Kuhn's OptiDisc cutter bar creates increased knife overlap when discs are forward rotating (A) and larger crop evacuation space when discs are rearward rotating (B). **2.** Three-point skid attachment protects the disc bearing housing. **3.** Large diameter gearwheels lead to less stress under transmission loading.



Changing blades is quicker and simpler on the OptiDisc cutter bar due to the Fast-Fit technology.



Kuhn's FC 3115 D mower conditioner prototype has proven successful for clean cuts and well-conditioned swaths ahead of its launch at Grassland & Muck 2020.



Drilling, and not broadcasting, when maize is at the 6-8 leaf stage has been shown to be the most effective method of under-sowing.

Under-sowing maize for improved soil health

Pressure to avoid leaving maize stubbles bare over winter is growing. Luke James reports on a project to develop successful methods of under-sowing.

Establishing a cover crop that avoids bare maize stubbles over winter offers significant soil health and wider environmental benefits as well as the potential for additional forage production. The problem is, success from drilling post-harvest is by no means guaranteed for the majority.

Sowing into standing maize, to create a crop that is already established as the maize comes off, is a far better solution. However, methods such as broadcasting seed directly onto the ground, or broadcasting and tine harrowing, have proven relatively ineffective.

Following collaborative development work involving Field Options, Wye & Usk Foundation, and Herefordshire contractor Roy Price, new methodology is now proving its worth, with an increasing acreage being successfully under-sown in Herefordshire and Monmouthshire.

At the heart of the project is a specially developed inter-row drill, but success is as much about timing, tailored agronomy and

using the right cover crop species as it is about the machinery, says Field Options' Nick Duggan.

"Trials and development work have been ongoing since 2016, so we now have quite a lot of knowledge and experience of the practice," he explains. "Optimum timing for drilling is when the maize is at the six to eight leaf stage – or one week after the last herbicide application. By this stage the maize is established, so able to cope with competition from the cover crop. There will also be minimal effect from any residual herbicides."

Drilling the cover crop in rows between the maize means there is space between plants, again minimising the effect of any competition. Using an effective double disc opener and press wheel arrangement also delivers the required seed to soil contact that ensures germination in what can be dry conditions.

Nick adds: "To date we've found that the most effective cover crop is an Italian ryegrass blend, as it has



Nick Duggan of Field Options in an Italian ryegrass crop established from under-sowing.



Ben Nott in a cover crop of Italian ryegrass in January, established by under-sowing in maize in the previous July. The good root structure of the grass helps with water infiltration.

the vigorous growth characteristics required for successful establishment in the conditions. It will then provide a crop that can offer out-wintering potential and/or good spring grazing."

The team are continuing to evaluate other species, including legumes, herbs and vetches. Mixed species mixtures are also available. However, the Italian ryegrass blend has proved nearly 100% successful and produces up to 3t/ha DM by the end of March, at 12ME and 12% protein. This equates to approximately 1,500 ewe grazing days, or 300 heifer grazing days, per hectare, so valuable extra production.

The extra forage produced

should more than cover the cost of the operation, which as an all-in contracting operation through Field Options is estimated to be £80-£100/ha. The environmental gains could also provide a far more significant payback.

Compliance

Although future agricultural policy remains uncertain, there is little doubt that there will be greater imperative to farm with high levels of environmental responsibility. The common view is that it will become mandatory to avoid bare ground over winter.

As a catchment adviser for the Wye & Usk Foundation, Ben Nott's

role is to work with farmers to achieve the good agricultural practice that ultimately keeps silt and sediment out of rivers. However, his approach is more about promoting the benefits of good soil health.

"Establishing a cover crop certainly helps to avoid soil run-off, and that is about protecting the farm's greatest asset," he says. "With foliage on the surface, you are reducing the impact of rainfall, and then the roots under the ground create channels to allow effective water infiltration."

"With live root structures in the soil, the organic matter increases and there will be higher levels of microbial activity, and that will mean more earthworms which in turn return more organic matter to the soil. A healthier soil is not only better for the environment, but it's also more productive, so cover crops really are a win:win."

Top Tips for under-sowing maize

- Avoid fields with heavy grass weed burden.
- Inter-row drill, not broadcast.
- Drill at 6-8 leaf stage.
- Work with an experienced agronomist.
- Use a proven cover crop mixture.

Case study - Trevase Farm, Hereford

David Pursey, who farms at Trevase Farm, south of Hereford, grows around 200ha (494 acres) of maize each year, primarily as a feedstock for his 499KW anaerobic digester.

For the past five years, he's successfully under-sown around a fifth of this area with an Italian ryegrass blend. This has created an effective overwinter cover crop and valuable grazing for ewes and lambs from early January.

With maize yields typically in the region of 50-60t/ha, even when under-sown, David reports no detrimental effect on the primary

crop, and now sees the practice as an integral part of his system.

"We'll invariably under-sow the maize we are growing at home, if the ground is going back into maize the following year, and expect the cost to be covered by the value from the grazing," he says. "It's important that we're looking after the ground, and – apart from the extra grazing – the cover crop provides an area where we can spread digestate from the AD plant over the winter."

Apart from some changes in the use of post-emergence herbicides, the strategy has had no impact on

the way maize is grown. However, maize grown on rented ground will not be under-sown as there is no guarantee they will have the land for the following year.

David adds: "The extra grazing is certainly welcome and, if anything, we can often have too much grass. It's not practical to mow it as the ground is usually rutted, so we're not afraid to spray off the surplus if we have to."

If maize is not under-sown, David does sometimes have the option of using a combi-drill post-harvest, but this is substantially more expensive. **i**

Forage research update

Now heading into its second season, The Germinal Research Station in Wiltshire is yielding some interesting results. Dr Jo Matthews provides an update on some of the trials.

1. Fodder radish - resistance to flea beetle

Fodder radish appears to have some inbuilt resilience to flea beetle or good early vigour, which makes it less susceptible to attack.

The New Zealand variety Endurance is being trialled alongside varieties of hybrid brassica and kale to determine its suitability as an overwintering crop in the UK. The crops were planted in September to expose them to high flea beetle challenge, which is an issue at the site. Endurance had significantly more plants/m² and less total flea beetle damage.

The crops will be planted again in June and their nutritional value assessed. If results prove interesting, this will be rolled out to field scale, animal grazing trials.

2. Winter growth variability

Early indications from a five year trial suggests there are marked



Fodder radish appears to have some inbuilt resilience to flea beetle.

differences in winter growth between grass species and varieties, which should benefit spring yields.

Jo explains: "We've seen impressive winter growth in an Italian ryegrass. The Festulolium AberNiche is also really kicking on in the winter and overall the perennial ryegrasses are really responding to the winter we're having. The others aren't

moving at the same rate."

The trial is looking at weed species ingress and how weed grasses such as tall fescue and Yorkshire fog effect the overall quality and nitrogen response of the sward.

3. Plantain grows well through winter

Plantain growth kicked into gear in January 2020 – ahead of chicory and perennial ryegrass grass-based plots.

Plantain and chicory are being grown as part of a grazing simulation trial looking at their nutrition and growth patterns. They are either being grown on their own or together with AberGreen and compared to Aber HSG3 grass mix. Leys were established in September 2018 and were cut every 21-28 days.

Results from 2019 showed that the inclusion of chicory and plantain in mixtures had no detrimental impact on yields.

4. Promising clovers

Eleven "unknown" annual clovers from around the world are being assessed to see how they respond to the UK climate and what they can offer us.

The clovers were first drilled as monocultures in September 2019. Significant variation in plant content and seedling vigour have been seen. One Berseem clover has performed particularly well, producing significantly more plants/m². The plots will be cut in spring to assess yields. They will also be replanted in spring to see if they are more suited to early season drilling.

5. Brassica regrowth and grazing height

More research needs to be done into the grazing height of brassicas considering accidental results, which show improved regrowth when the crops are left higher.

Six varieties of hybrid rapes and forage rapes were planted in July 2019 and cut to replicate winter grazing. Yield, quality and regrowth were assessed. The plots were cut at 13-15cm, but the cutting method meant the edges of the plots were cut higher at around 18cm. It's these edges that regrew stronger. As a result, future trials will focus in on grazing residual heights. **P**



The Germinal Research Station

- Located at Vernon Farm, Melksham.
- Fertile, silty clay loam soils; pH 6.9, Index 2.7 P & 4 K.
- Set-up in 2018.
- Includes 4.5ha (11 acres) of dedicated field trials split into plots.
- 1.2ha (3 acres) of field scale trials also underway.
- 20 trials currently being carried out.
- Run by Dr Jo Matthews (who also owns Vernon Farm), assisted by trials operator, Elena Francis.

Jo Matthews in one of the plantain plots which kicked into gear in early January.



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Finishing lambs off forage

Grazing hybrid brassicas can be an effective way to finish lambs without creep feeding. Matt Mellor reports from an upland unit where the crop fits in well with a forage-based system.

Self-sufficiency is the overriding aim of farm owner Gareth Davies and his manager Vic Walkden from Cwmgwilym Farm near Brecon.

The pair run 1,000 breeding ewes and 100 suckler cows across 218ha (540 acres). Despite challenging conditions, with variable soil types, some steep ground and land rising to 1,200ft, they keep bought-in concentrates to a minimum. In fact, they usually rely on nothing but homegrown feed to finish around 1,150 lambs on a Tesco contract, mostly before Christmas.

As importantly, they retain enough quality autumn grazing for flushing ewes, so maintain high levels of productivity across both the commercial Rouge x Beulah Speckled Face and pedigree Speckled Face flocks.

As well as sticking to a routine of reseeding around 12ha (30 acres) a year to maintain grassland quality, the farm grazes clover-rich leys, fodder beet and brassicas as alternative forages. In 2019, the

hybrid brassica variety Redstart was grown for the first time, with high utilisation of this rape/kale cross adding a new level of productivity. As a result, it is now set to be a mainstay of the late autumn grazing going forward.

"Our aim is to avoid creep feeding lambs, but we also have the priority of providing sufficient quality grazing for the ewes at tupping time," says Vic. "This inevitably creates competition for forage during the autumn months."

Routine reseeding helps to keep the grass leys productive, whilst the other forage crops have specific roles to boost productivity at key times.

The farm has around 6ha (15 acres) of red clover leys for fattening lambs, and 16ha (40 acres) of grassland, including large leaf white clover that provides high value grazing for both ewes and lambs. Lambs are also put on brassicas from late September. 5ha (13 acres) of fodder beet will support up to 300 ewes from November.

Last year, brassicas were drilled in

August, replacing an old grass ley. The fields were relatively steep, so after spraying off the old ley and applying farmyard manure, the ground was worked over twice with a power harrow before being drilled with a spring tine harrow.

The 8ha (20 acre) area was split between 5ha (13 acres) of Interval hybrid brassica, grown previously, and 3ha (7 acres) of Redstart hybrid brassica, grown at Cwmgwilym for the first time.

"Apart from 50 units/acre of a 22:6:8 compound fertiliser to give it a boost once it was out of the ground, the crop has had no other inputs," says Vic. "It established well and was very clean and ready for lambs to graze by the end of September."

The brassicas tend to be block grazed with lambs, using an electric fence to allocate about an acre at a time. This is generally enough for about 100 lambs for 7 to 10 days. As finished lambs are drawn off, they are replaced with a similar number, so the stocking density remains about the same.

Vic adds: "What was noticeably



Hybrid brassicas are grazed in one acre blocks, with fresh feed being allocated every 7 to 10 days.



Redstart hybrid brassica was grazed more completely, with stems being grazed to within a few inches and the crop supporting higher lamb growth rates.

different about the Redstart was the way the lambs grazed the entire crop, including the stems, right down to about two inches. There's clearly some feed value in the stems that we've not seen in other varieties, and this was reflected in the number of lambs finished.

"Overall, I'd say we finished around 200 off the Redstart, which was roughly the same number that we finished on double the area of other varieties grown. We calculated growth rates off the Redstart to be

150 to 200 grams/day, which is impressive by any standards."

With hybrid brassicas taking the pressure off the grassland at a critical time, they can prioritise the better grazing to flush the ewes. This, they believe, contributes to their productivity, which for the commercial flock typically means a lambing percentage of 190% and, for the purebreds, 175%.

Again, the aim is to minimise bought-in feeds, with the pre-lambing ration based on clover-rich silage and

homegrown oats, with only soya coming in from off the farm. After lambing, some blocks are used to supplement the ewes with any other concentrate being a last resort should grazing be in short supply.

"Up until six years ago we were farming organically, and as a result we're used to managing in a low-input environment," explains Vic. "We also understand the value of rotational farming and break crops, with these principles now at the heart of our forage-based approach." 

Growing hybrid brassicas for lambs helps to ensure there is sufficient quality grass available to flush the breeding ewes.



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Kit to help clamp consolidation

Consolidation is the linchpin to producing quality silage. Aly Balsom looks at some of the kit available to help deliver a good pack in the clamp.

Consolidation makes or breaks a good silage crop, which is why many farmers are turning to specialist machinery to achieve target silage density.

The kit available is usually a weighted unit for front or rear mounting on a tractor or a stand-alone self propelled machine adapted for the purpose of consolidation. The advantages of these systems over using a tractor are weight and speed. Consolidating across a whole tractor width, rather than a tyre width, speeds the process and means the guy on the pit is more able to keep up with speed of delivery.

The theory behind consolidating the crop is sound; pushing out oxygen helps promote silage fermentation and helps boost silage quality, significantly reduces losses and aids intake potential. Get it wrong and there are numerous negative consequences:

- 1. More oxygen in the clamp** - this allows more plant respiration of sugars, reducing the availability of energy and increasing the risk of secondary clostridial fermentation. This leads to a greater risk of butyric silage.
- 2. More micro-organisms** - such as yeasts can grow. This reduces nutrient availability and increases the risk of aerobic spoilage.
- 3. More air ingress** - increases the risk of mycotoxins and moulds which have a negative effect on rumen microflora and animal health.

There are a number of clamp consolidation options available as an alternative to simply using one tractor on the clamp. Opting for two tractors on the clamp is a good starting point.

Some of the compactors available are shown in the table opposite:

Silage consolidation equipment (*Information provided by manufacturer. Inclusion does not imply recommendation.)

Name	What is it?	Key attributes*	Weight	Cost	Contact details
Stego-Pro Silage Packer (Holaras)	Steel cylinder with specially manufactured chamfered design with a 0.9m diameter. Front or rear mounted.	<ul style="list-style-type: none"> Variable weight adjustment - roller can be filled with water or sand. Available in 5 different widths - from 2 to 5m. Two bearings to grease - eases maintenance. LED lighting, hydraulic off-set and side arm roller and attachment to loader available as extras. 	About 1.2-5.5t (depending on size)	£6,400 to £18,800 + VAT (depending on size)	WM Agri. Tel: 0777197 2092 or 01362 687 260. wmagri.co.uk
Silapactor	Cylinder made from retired train wheels, for rear mounting.	<ul style="list-style-type: none"> Claims to increase silage density by up to 40% versus a tractor alone. Available in 4 widths - from 2.1m to 4m. 	2.5-6t (depending on size)	£5,950 to £8,950 + VAT (depending on size)	Kelvin Cave. Tel: 01458 252281. kelvincave.com
SW Silage Rollers (Saphir)	A 950mm roller with 12 rings. Can be front or rear mounted.	<ul style="list-style-type: none"> 3m width. Optional hydraulic 600mm offset both ways available to get into corners. Roller and frame can be filled to add weight (e.g. with water). Optional silage edge compactor can be added. Full road lighting kit available. 	2.8t up to >3.7 tonnes when filled	Starts at £9,500 + VAT (Retail)	Suffolk Farm Machinery. Tel: 07747 188565 or suffolkfarmmachinery.co.uk
PistenBully PB300 (Kassbohrer)	Specially modified, used, snow groomer (tracked machine).	<ul style="list-style-type: none"> Low centre of gravity and large track surface area makes it safe to operate at height. Designed for working in steep sided environments. Maximum downward pressure from five guide wheels and vibration caused from 6sqm of track. Fuel usage of 11-13litres/hour. Good visibility. 12 way blade or silage fork ensures even, thin distribution of silage. 	13t (including 2t of additional weight)	£100,000-£120,000 (+VAT)	Off-Piste Agri. Tel: 07717 860196 offpisteagri.co.uk



SW Silage Rollers (Saphir)



Silapactor



PistenBully PB300 (Kassbohrer)

Key considerations

Independent forage consultant, Dave Davies shares his considerations when choosing a silage compaction method:

- Two tractors working on the clamp is better than one and can help achieve good consolidation.
- Using a Silapactor achieves better density within the clamp than two tractors, in my experience.
- A snow groomer type machine is unlikely to be economically viable on most dairy farms.
- It is possible that the steel disks on some of the compactors may 'cut in to' the silage as they work – this could potentially allow air to get into the silage and negatively impact fermentation.
- If you're doing a better job at compacting – make sure your clamp walls are up to it or they may collapse!

See page 22 in the Spring Forager 2019 for Dave's top tips on achieving good consolidation in the clamp.

foragemagazine.co.uk



Stego-Pro Silage Packer (Holaras)



Understand your analysis to make better silage

A grass silage analysis doesn't just provide the basis for ration formulation. It offers clues to make even better silage next time around, as Forager finds out.

Farmers could be missing a trick by only looking at the nutritional quality of silage on their silage analysis reports and ignoring other important, less well known parameters.

Volac silage specialist, Peter Smith, says much of the attention is usually placed on parameters like metabolisable energy (ME), digestibility (D-value), protein, and % dry matter (DM). However, other figures – such as lactic acid, volatile fatty acids (VFAs) and the ratio between them – reveal how efficient the fermentation has been. These, together with pH, ammonia content and ash, are all important 'markers' in the report.

"A good quality silage combines good nutritive value with good fermentation characteristics," Peter explains. "No matter how good the silage is nutritionally, if it hasn't fermented well and isn't palatable,

animals won't eat it. This is why it's important to look at fermentation quality. But it also provides a 'diagnosis' that can be used to explain any issues with the silage, and help to improve silage next time it's made."

He outlines some of the main parameters to consider:

Lactic acid and volatile fatty acids

These provide an important measure of how efficient the fermentation has been. In an ideal fermentation, 'good' bacteria would convert sugar only into lactic acid with no wasteful byproducts. This retains the most energy and DM in the clamp.

By comparison, a poor fermentation occurs when undesirable bacteria convert sugar into a variety of products. These include carbon dioxide and ethanol, but also volatile fatty acids (VFAs).

Carbon dioxide is effectively wasted DM. VFAs are weaker at preserving the forage, and silages with high VFAs are usually less palatable.

Ideal target: Aim for a lactic acid : VFA ratio of at least 3:1 – i.e. 3 x more lactic acid than VFAs (higher if possible, e.g. 5:1).

How? This is where a proven additive, such as Ecosyl, comes in. Its 'good' bacteria drive the fermentation towards being dominated by lactic acid. By contrast, 'bad' bacteria from soil or slurry produce highly inefficient fermentations. An ash figure above 9% on a silage analysis indicates soil contamination. Minimise this by rolling fields and checking soil isn't being introduced by machinery – e.g. rakes and tedders set too low.

Bacteria in slurry and farmyard manure (FYM) can result in big DM losses and palatability issues. If you must apply slurry between cuts, do

it as soon as possible onto clean stubble before regrowth starts. This will maximise the amount of sunlight (UV) reaching the undesirable bacteria to help kill them off, and allow the fresh grass to grow up above the slurry.

Energy value – ME and digestibility

Metabolisable energy (ME) is the amount of energy available to the animal and is linked to digestibility (D-value): the more digestible the silage, the more the animal can eat and the more energy it provides.

Ideal target: Aim for at least 11ME and around 70 'D' or above for milking cows. A lower value may be required for other classes of stock.

How? As well as improving the fermentation to conserve more energy, younger leys are also higher in energy, and cutting date has a big effect: after heading the digestibility of grass falls by about 0.5% per day.

Sugar

Generally, the higher the sugar content (for energy), the better.

Ideal target: >3.0%

How? A low sugar content in silage may suggest an inefficient fermentation or low sugar grasses. Wilting concentrates sugars, but excessive wilting, especially in poor conditions, will allow the crop to respire and burn sugars up.

Crude protein (CP)

Crude protein is a measure of the total nitrogen in the plant – both the nitrogen in actual (true) protein that the animal can use, and any nitrogen fertiliser that the plant has taken up, but not yet converted into protein. Too high a protein content is not necessarily good because it buffers the fermentation.

Ideal target: Depends on the livestock. A good figure is 16-18%. Higher is achievable, but often indicates residual fertiliser still in the crop.

How? Grass cut younger tends to be naturally higher in protein, so if protein is low it may be a sign it was

cut too late, and/or that fertiliser input was too low. Low protein can also mean it was wilted for too long because enzymes in cut grass break down protein until it reaches a stable pH once ensiled. Because nitrogen fertiliser is not applied in clover swards, they can often analyse low for CP, but still perform well.

Ammonia (NH₃)

Ammonia is generally a measure of protein breakdown, but it can also be produced from excess nitrogen. The lower the value, the less protein breakdown has occurred, or the less bagged fertiliser is still present in the crop as residual nitrogen.

Ideal target: The lower the better. Definitely < 9.

How? Achieve a good fermentation and optimise nitrogen inputs and timings.

Dry matter percentage

If silage is too wet or too dry, animals struggle to eat enough of it – something that is particularly important with high yielding dairy cows.

Ideal target: 28-32% DM is the optimum for several reasons, including fermentation quality and effluent risk.

How? Look at factors such as stage of growth at cutting, since leafier grass is easier to wilt to the optimum %DM. Also, assess whether increased tedding may be needed to get grass to the optimum %DM within available weather windows.

pH

The more moisture the silage contains, the more acidic (lower pH) it will tend to be and so the greater the acid load on the animal.

Ideal target: Will depend on the %DM, because drier silages need less acidity to stabilise them, but look at pH 4.0 for silage at 30% DM.

How? Wilt to the optimum 28-32% DM to avoid excess acid loading.

Intake potential

This is a combination of several factors, including DM%, pH and fermentation quality, but also D-value (because the more digestible the silage, the faster it travels through the animal) and chop length (shorter chop lengths have a higher intake potential).

Ideal target: >100%.

How? Get the above factors correct. 



By looking at your silage's fermentation characteristics on the silage analysis, and not just its nutritional quality, you can learn a lot, says Peter Smith.

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Making the most of lists

When it comes to optimising homegrown forage production, varieties on the Recommended Grass and Clover Lists are held at gold standard. NIAB Forage Crop Specialist Ellie Sweetman explains why.

Want to ensure the varieties you're investing in are going to deliver the biggest return? If so, utilising the Recommended Grass and Clover Lists (RGCL) for England and Wales is paramount.

Developing a variety worthy of making it on the RGCL is not a short or easy task, says NIAB Forage Crop Specialist Ellie Sweetman. From the start of the breeding process to the variety making the lists, it can take in excess of 12 years. Within that time, varieties are independently assessed by NIAB (National Institute of Agricultural Botany) which requires three years of assessment per sowing, with sowing repeated every year a variety remains on the lists.

"There are four variety trials sites in England and Wales with two additional disease only trial sites. Assessments cover yield, feed quality, persistence, seasonal growth patterns and disease resistance to assess which varieties will perform best in the UK climate," explains Ellie.

For a new variety to make the RGCL, not only must it perform well in trials, but it must also perform better than the mean average varieties already on the lists. With it being such a competitive process, as few as one in 20 varieties of ryegrass tested will make the cut. This high rate of rejection cements the importance of selecting varieties from the RGCL that have been proven to perform in the UK. **F**

Using the lists

There are huge differences between the top and bottom varieties on the RGCL for key performance indicators such as total annual yield and D-value. When formulating a mixture, whether it is independently or with a merchant, varieties included should be selected based on how high they rank on the lists for traits required by the individual farm's unique circumstances.

To download the Recommended Grass and Clover Lists 2019/20 or to request a printed copy, visit britishgrassland.com

Pick up the latest RGCLs at Grassland & Muck in May.

Five reasons not to miss Grassland & Muck 2020

If you're looking for advice on how to make the most of grass in a bid to boost margins, then this year's Grassland & Muck in May is well worth a visit. Forager looks at some of the highlights.

1. Grass variety choice and expert advice

See and compare the latest varieties and mixes in situ in the growing plots – including flood and drought tolerant species. There will be over 100 plots on display, including clovers, herbal leys and hybrid crosses.

The technical forum programme will feature a host of experts offering advice on how to maximise grass yields and quality, regenerate your soils, make the most of manures and improve silage quality.

2. Working machinery demonstrations

With over 69ha (170 acres) of demonstrations on a purpose grown silage sward, see the latest machines from all the leading manufacturers, from forage harvesters, balers and mowers to muck spreaders, slurry tankers and injectors. A bespoke built, new silage clamp will feature grass handling machinery, with experts on hand to discuss how clamp design and management contribute to achieving the best quality silage.

3. Soil and nutrient advice

Effective management of your soils and organic manures can make a huge difference to productivity and profitability. ADAS experts will be offering free advice, helping farmers interpret their soil test results, assess soil structure, improve drainage and solve cultivation or nutrient management problems.

4. Trade stands

Over 200 trade stands will be showcasing the latest products, equipment and advice, from slurry handling to livestock handling, cow mats to computer software and seeds to sward lifters. Whatever you are looking for, there will be someone on hand who can help you out.

5. Rotational grazing hub

New for 2020, the grazing hub will not only showcase a real time grazing demonstration, it will also host all the best grazing advice from leading experts in the Hub Discussion Tent. Hear how to set up and manage a rotational grazing system to not only boost production, but also improve soils. **F**

WHAT YOU NEED TO KNOW

When: 20-21 May 2020.

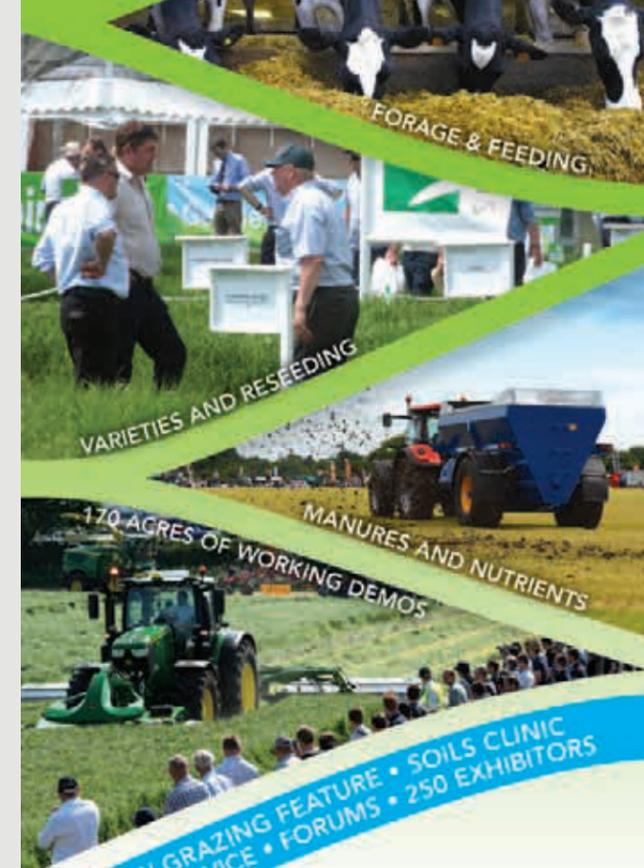
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CHEWING THE CUD

Leicestershire beef and arable farmer, Joe Stanley has been fighting the corner for British agriculture as it faces attacks from anti-meat documentaries, Veganuary and climate change activists. Laura Wise gets his advice on how farmers can communicate accurate, positive messages around farming.

LW: To get us started, what is your elevator speech about your farming system?

JS: We're a traditional English mixed farm in Leicestershire raising pedigree British Longhorns and arable that are integrated together. Livestock manure goes onto the arable land, and wheat and barley straw comes out of the fields to be used for the livestock.

We operate a low-cost system with 95% of cattle diets being conserved forage. We're currently on a set-stocking system, but are going to be transitioning to a rotational grazing platform to maximise grass production under the guidance of our new stockman.

LW: Why did you start communicating directly with the general public about what you do as a British farmer?

JS: I've been farming for 10 years, having done other things previously. For the first seven years, I never did anything off the

farm – I was completely lacking in any confidence that I was a person who had any worthwhile opinions or the ability to express them. Then three years ago, I listened to a catastrophically bad interview with a farmer on Radio 5 Live. I thought; "If I can't do better than that, then I'm in trouble and our industry is in trouble."

LW: How do you convey to the public what you're doing on farm and why you are doing it?

JS: I've found that the best way to communicate is to be open and honest about what we are doing. Ultimately, consumers want to hear the positive story that British agriculture has to tell. Nobody wants to watch or read things that make

them feel bad about their dietary choices. The brilliant thing about British agriculture is that we do have a very good story to tell. The majority of our livestock is raised mainly on pasture and we have very high standards when it comes to animal welfare and the environment – these are the things we work towards on a daily basis and are the same things that British consumers want to hear.

LW: What channels of communication do you use?

JS: Twitter is my major route to consumers, but I also write columns in five different publications. I'm frequently in the media, including Good Morning Britain, Farming Today, 5 Live and BBC News 24. This summer, we had BBC Breakfast here for three days broadcasting positive imaging from British agriculture.

LW: Wow, that's quite an extensive list. How did you get those opportunities?

JS: It is mainly because I've been putting myself in a position to be contacted by news organisations through Twitter. News organisations are on the lookout for people with something vaguely intelligent to say about a topic in the news. They don't tend to go through industry organisations to find sources – they go directly through social media. In a way, this is terrifying because a news organisation could pull anyone to be a source.

This is one of the reasons why it is important for farmers to put themselves in a position to be contacted, otherwise we'll be completely excluded from the conversation. If we don't have a farmer in the news talking about glyphosate or climate change, for example, then they'll most likely have an activist from an NGO who won't have our best interests at heart and probably won't have the best information to hand.

LW: How have you learnt to communicate with consumers and to hold composure during a media interview?

JS: Back in 2017, I did a media training workshop at my regional NFU office. There are other organisations, like Young Farmers, who have similar workshops. They are very useful if you're planning on talking to the media. It's remarkable how negative you can come across when you're talking about an issue. NFU and AHDB are also great resources for credible industry facts.

LW: What are some key takeaways from your training and experience in engaging with consumers or the media?

JS: Whether it is on Twitter, hosting a farm open day, writing in the public domain or doing a radio or television interview, it is important to keep positive and stay on message. Obviously, critique an opposing position, but don't fall into the trap of getting angry and ranting about the opposing position.

Being an angry farmer in the social sphere is not going to do the industry any favours – it will do the opposite. For example, using bad language or saying

things like "you stupid townies," isn't going to win farmers any points. The best thing we can do is ignore the extreme criticism that farming has faced and just be positive. The British countryside is spectacular, so we've got the backdrop. We have high welfare standards and environmental standards, and a low carbon footprint for our produce – focus on that.

In the last 12 months, 98% of households bought red meat. People don't want to be told that they can't eat meat, or they have to feel guilty about eating meat. I feel it's my job and other farmers' jobs to give the public permission to enjoy meat and not feel guilty for making a healthy dietary choice.

LW: Someone reading this is probably thinking; "There are enough people involved, I don't need to do anything," or "I'm not qualified to represent the industry." What would you say to them?

JS: First off, it's too easy to think it's somebody else's problem to deal with or that someone else will be better at it than me. But at the end of the day, if you think you can do better than the people who are currently representing agriculture, then do it. We need you.

Secondly, I'm just a farmer, I'm not in any official position in any farming organisation. But speaking out has given me some ridiculous

opportunities. I've been in private meetings with Michael Gove and other senior people making decisions that affect farmers and I've been able to tell them what I think. I also have an ongoing relationship with Ben Goldsmith at DEFRA.

I'm sitting there thinking, "What the hell am I doing here? What do I know?" I think it's important that farmers – who are experts in this area – are willing to put themselves in those positions. Even if they're uncomfortable, even if they are thinking that they don't know enough – you probably do. It's important that authentic farmers' voices are represented. I would encourage anyone who thinks they would like to contribute to do so. If you approach it in the right way, it's remarkable how much you can achieve. **i**

Joe Stanley's tips for effective communication

1. Share personal practices from your farm and why you do them.
2. Don't attack farming practices different from your own.
3. Focus on the positive messages surrounding British agriculture.
4. Stay on message.
5. Keep things simple.
6. Take advantage of media training programmes.
7. Use reliable sources when citing facts.
8. Proof-read posts for grammatical errors.

Follow Joe on Twitter: @JoeWStanley

/// In the last 12 months, 98% of households bought red meat. People don't want to be told that they can't eat meat, or they have to feel guilty about eating meat. ///

Joe Stanley was recently awarded the NFU's 2020 Meurig Raymond award for his commitment to, and promotion of, the British farming industry.