KELVIN CAVE LTD

KnowHow

Home-grown feed processing and preservation

SUMMER 2020

Focus on Productivity & Profit

A wet winter, a dry spring and a pandemic that changed everything. Yet farmers can be resourceful, pragmatic and adaptable when they have the KnowHow, as this issue shows!

New trading platform helps drive UK food security

Coronavirus has affected everything, in more ways than we can possibly have imagined. On an emotional level, our hearts go out to those whose health and family lives have suffered in the crisis.

And from a practical perspective, if there's one lesson we as producers have had reinforced by the pandemic, it's the need for food security. Never, in most of our lifetimes, have supply chains been so disrupted, and to witness this now – in an era of technology and prosperity – provides a salutary lesson in our food systems' vulnerability. Of course, it's a refrain we at Kelvin Cave have been espousing for as long as we can remember and the overarching ethos of our company has always been to 'grow it at home'.

As more and more growers and livestock producers take on board this advice (and there are several featured in this issue of KnowHow including Rob Crowe on page 4, Geoff Roddam on page 10 and Andrew Watkins on page 18) it reminds us of the wisdom of keeping systems simple and supply chains short, and reducing our reliance on influences and inputs outside our control.

As a company, we continually search for innovations which allow more livestock feed to be grown on the farm, or at least encourage trade between farmers within the UK. For this reason, we welcome a new initiative which helps farmers do exactly this – trade with one another in a simple, transparent and straightforward process.

Continued on page 2

Please check our website for details of any shows that we may be attending later in the year.

Also in this issue:

Farming with a finger on the pulses - page 4

Hadrian's Wall is no barrier when it comes to making better forage - page 10

The sweet smell of profitability from improved ensiling practice - page 18

Continued from page 1

The initiative, called Farm to Farm (**farmtofarm.co.uk**), is an online trading platform, founded by Northamptonshire farmer, Tris Baxter-Smith *(pictured)*. Although originally established in 1987 as a paper publication with a focus on farm machinery, it has now added a feature to allow trading of crimped grains alongside other fodders and feeds. This allows buyers and sellers to trade with confidence; it deals with the collection of AHDB levies, and can arrange haulage if required.

Growers who have already converted to crimping need no reminding of its benefits. But most of these growers are livestock producers, crimping feeds for their own on-farm use.

However, Farm to Farm has helped open up opportunities for arable farmers to produce crimped grain for sale either to livestock farmers or for anaerobic digestion. There's plenty of flexibility within the process as once the grain is combine-harvested, it can either be crimped on the grower's farm or shipped to the end user and processed there directly after harvest. There are plenty of contractors who have the required equipment with whom we can put you in touch.

For the grower, there are agronomic benefits including an earlier harvest which helps spread the use of labour or contractors and machinery, control the spread of black-grass and open a wider window for autumn cultivations. There's also a yield and nutritional advantage in terms of dry matter per hectare over dry cereals. And of course, there's no drying required.

These and other benefits will be particularly attractive this year, when the acreage of spring cereals – with their potentially tight margins and later harvest – is high. Crimping these cereals can certainly help boost their margins and bring crop rotations back on track.

For the user, who needs no specialist storage, the benefits extend to better livestock health and performance when compared with dry rolled grain and any black-grass seeds the crimp contains will not be viable for germination. Independent nutritionists widely endorse crimp for its rumen-friendly credentials (such as on pages 7 and 20).

As a company specialising in many forms of feed and forage preservation, we are delighted to wish the owners of Farm to Farm well with their trading platform and hope many farmers will use it to trade crimp, amongst other home-produced feeds. Please notify them of any demand, as well as supply! The more livestock feed we can produce in the UK, the more we cut imports, food miles and costs of production, while at the same time, improving profitability, traceability and food security.

Crimped grain

- Combine-harvested around three weeks earlier than dry grain
- Processed through a roller with CrimpSafe 300 preservative applied
- Easy storage in a clamp or plastic tube with no drying required
- Better for livestock health and performance than dry grain
- Remains stable for over a year for use in livestock rations or AD

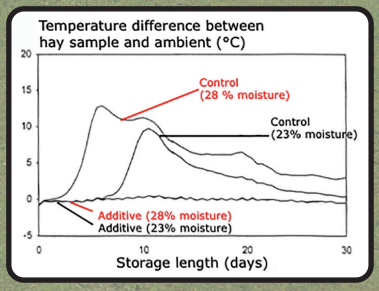
KEEP IT SWEET!

PUT AN END TO MOULDY FORAGE BALES

BaleSafe is a hay, haylage and straw preservative that will put an end to spoilt and dusty bales. It is designed to retain the nutritional and hygienic quality of forage in any conditions and particularly comes into its own in a catchy weather season.

Capable of preserving the quality of hay and straw at up to 25% moisture, **BaleSafe** will also preserve wrapped haylage at 50-75% dry matter. Its unique blend of non-corrosive ingredients includes propionic and benzoic acids together with human food-grade preservatives which have been independently proven to stop the development of yeasts and moulds in their tracks.

No one likes to open mouldy bales like the one pictured *(above left)*, and this product will ensure the waste associated with moulds and yeasts becomes a thing of the past.

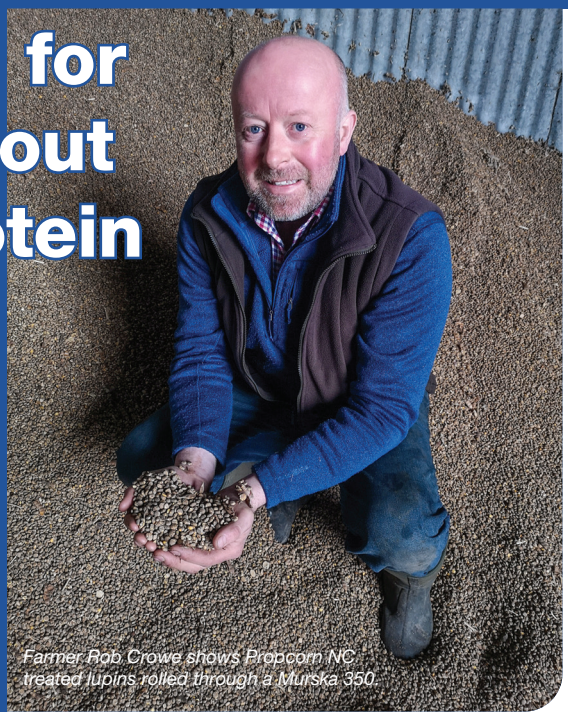


Auerbach 2010 unpublished

Ideal for testing the moisture content of hay and haylage, the **Wile 25 forage moisture meter** takes the guesswork out of deciding when a crop is ready for baling. The dish probe *(shown left)* allows crop moisture levels to be quickly and accurately assessed in the field. An optional interchangable bale probe is also available.

Pulses grown for greening cut out bought-in protein

An innovative approach to growing and preserving peas, beans and lupins has cut out bought-in protein from almost all livestock rations while also meeting greening rules on a Durham farm.



Farmer Rob Crowe shows Propcorn NC treated lupins rolled through a Murska 350.

When Durham farmer, Rob Crowe, started his search for a new mill for rolling cereals, he could not have imagined it would be the prompt for a whole new cropping rotation which would cut out bought-in protein from his livestock feeds.

But this is essentially what happened at Bishops Close Farm in Spennymoor, near Durham City, where Mr Crowe and his family farm 450 acres (182ha) of beef, sheep and arable and have replaced almost 10 tonnes per annum of bought-in soya with home grown peas, beans and lupins.

The process began when his search for a feed mill took him to the Royal Highland Show in 2016 where he purchased a Murska 350 from Kelvin Cave Ltd.

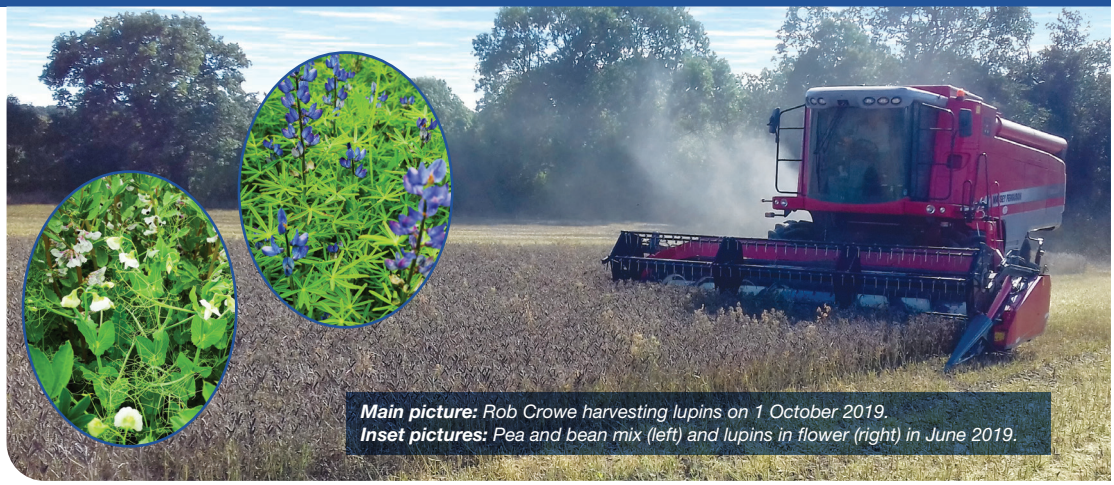
“I bought the mill to roll barley, but I had a conversation with Michael Carpenter [Kelvin Cave’s northern area manager] about growing our own protein and being self-sufficient in feed,” says Mr Crowe.

“I had grown peas and beans before but had sold them commercially, dried to 14% moisture,” he says. “But Michael suggested we could grow peas, beans and lupins to harvest early, at around 22% moisture, roll them through the mill, preserve them using Propcorn NC and feed them to our sheep and beef.”

Mr Carpenter explains: “The Murska 350 has tempered-hardened steel, fluted rollers which are capable of gripping and rolling large seeds such as pulses. By fitting the mill with an applicator and treating with the non-corrosive [NC] form of Propcorn in the same process, Rob could eliminate his drying costs and safely store his peas, beans or lupins in a pile in a shed. And, because harvest would be 3-6 weeks earlier, he could also get a head start on autumn cultivations.”

A further benefit of the pulses was that they could satisfy the farm’s compliance with the Basic Payment Scheme’s greening rules as an EFA [Ecological Focus Area].

“But this meant I couldn’t use any sprays on the crop so Michael suggested we grew the peas and beans together as they’d be more successful without any herbicide if they were



Main picture: *Rob Crowe harvesting lupins on 1 October 2019.*
Inset pictures: *Pea and bean mix (left) and lupins in flower (right) in June 2019.*

a mixed crop," he says.

Roger Vickers, chief executive of PGRO (Processors and Growers Research Organisation) explains: "The two crops complement each other well since the peas help provide earlier ground cover than the beans, which helps to smother weeds, while the beans provide a strong scaffold which helps keep the peas standing later in the season.

"Trials indicate that mixed crops regularly produce more than the crops grown individually, and because the beans support the peas, the whole crop should remain standing for harvest."

In fact, Mr Crowe said he would have expected a yield of 1.4-1.5 tonnes/acre (3.5-3.7t/ha) from either of the single crops when grown without chemical inputs, but in practice, this increased to around 2t/acre (5t/ha) when the crops were grown together.

Whilst the yield was potentially bolstered by the complementary growth habits of the two crops, the earlier harvest would have also typically given slightly higher yields.

Mr Carpenter explains: "When harvest is taken earlier, there's not just higher freshweight yields but also higher dry matter/ha. This is because the crop is taken in optimum condition before seed losses from birds and pod shatter."

"A local beekeeper also put two or three hives in each field and that helps greatly with pollination," adds Mr Crowe. "I'm convinced that by doing this we have more pods further down the plant.

"There's also no need for desiccation with the higher moisture harvest, so this keeps the crop

Continued on page 6

Continued from page 5

within the EFA compliance and saves another process and cost," he adds. "And of course, first wheats also tend to be higher yielding after a legume than other break crops."

Once the crop was harvested (last year on 1 October), Mr Crowe rolled it through his mill and applied the Propcorn NC in the same process.

He says: "The beans came in at a higher moisture than the peas but both seeds rolled well through the mill. The beans rolled into a nice flake but the peas were more shattered, so with the benefit of experience, I may have harvested the crop a week or so earlier and aimed for their moisture at closer to 25%."

Mr Crowe used the mix in rations for all types of livestock, from his 400 in-lamb ewes and their growing and finishing lambs to the 60 head of beef which he sells at 13-16 months, either as stores or fat.

He also uses the 10 acres of lupins he grows as a single crop, harvesting these separately but on the same day as the peas and beans, also rolling and preserving with Propcorn NC.

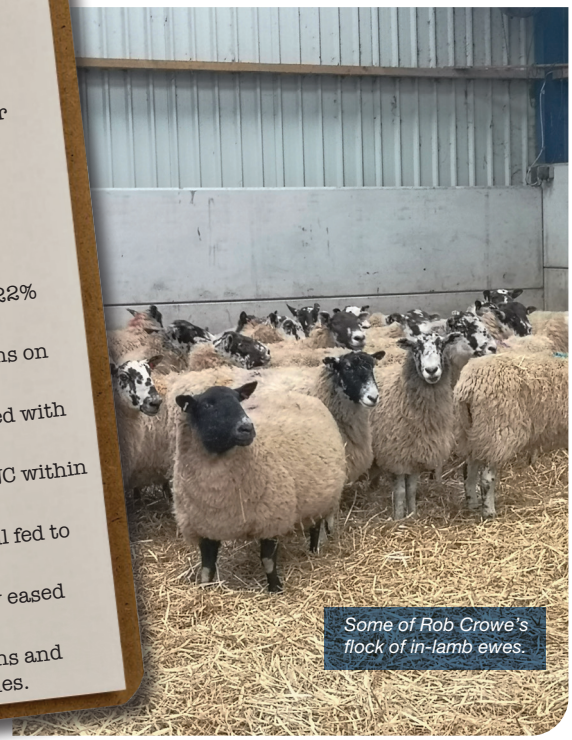
Rations vary for different types of stock but a one tonne mix for the ewes comprises 200kg whole oats, 50kg rolled lupins, 150kg rolled bean/pea mix, 20 litres of molasses and the remainder rolled barley.

With lupins analysing at over 30% crude protein and peas and beans in the mid to high 20%s, he says the mix can readily supply sufficient protein. Although more of the protein in the home-grown crops is rumen degradable compared with the soya, the lupins have a more favourable amino acid profile than peas or beans and help lift the level of digestible undegradable protein (DUP).

"I can't say the stock do better than on soya, but they certainly do just as well," says Mr Crowe. "But more important, we like the mix we're feeding and know exactly what's in it

Growing a mixed crop of peas and beans at Bishops Close Farm

- Ploughed up wheat stubbles over winter ready for 15 acres of peas/beans.
- Drilled peas and beans on 1 April 2019 using combination drill.
- Power harrowed in front of drill and harrowed behind to give fine tilth.
- Combine harvested pea/bean mix at 22% moisture on 1 October 2019.
- Also combined adjoining field of lupins on same day at 25% moisture.
- Processed through Murska 350 fitted with Propcorn applicator.
- Rolled and treated with Propcorn NC within two days of harvest.
- Stored in shed for up to a year until fed to sheep and beef.
- Earlier and wider harvest window eased farm's workload.
- Extra time for autumn cultivations and improved first wheat after legumes.



Some of Rob Crowe's flock of in-lamb ewes.

and we like the security of having enough in storage to keep us going through the year."

The upshot is that a feed bill for two tonnes of soya every month at around £360/t has been replaced by the growing costs for pulses. These have been calculated at £123-£168/t *(see panel)*, with zero food miles, improved food security and, unlike soya, no risk of habitat destruction across the Americas and no genetic modification.

"I appreciate the system might not be for every farmer, but for our mixed farm it seems to work really well," says Mr Crowe. "It's important to me in the current climate that we aim to be self-sufficient and this is helping us achieve that goal. We actually ran out of our home-grown pulses last August and had to buy in just 1.5 tonnes of soya. But now we have taken on extra land, we plan to grow more pulses in the years ahead which will hopefully mean there's little need for bought-in feed at all."

Growing cost £/acre	Pea/bean mix	Lupins
Seed	38	53
Ploughing	18	18
Combi-drill	20	20
Rolling	8	8
Combining	35	35
Rent	70	70
Growing cost £/acre	**189**	**204**
Yield per acre	2 tonnes	1.5 tonnes
Growing cost £/tonne	**94.5**	**136**
Processing cost £/tonne		
Milling	8	8
Propcorn NC	21	24
Processing cost £/tonne	**29**	**32**
Total cost to feed £/tonne	**123.5**	**168**

MILLS MAR DEM

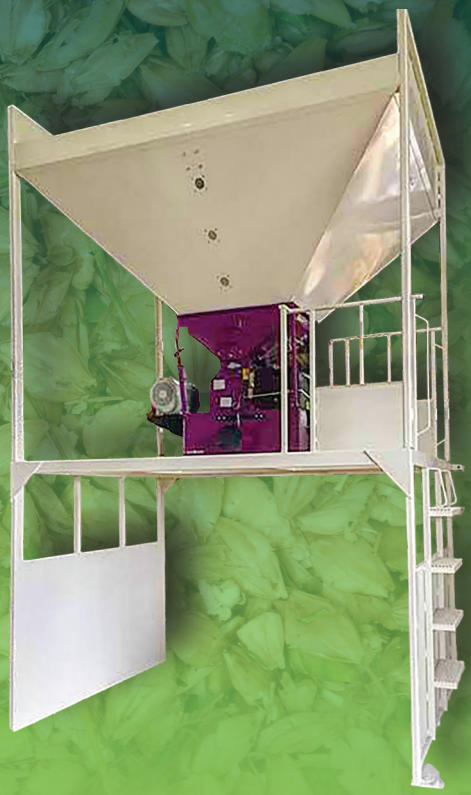
When it comes to supplying roller mills and crimpers, we at Kelvin Cave Ltd have always been proud of our reputation for listening to and meeting the demands of our customers.

When we introduced the Finnish grain-crimping system to the UK back in 1997 we realised that many farmers who wanted to adopt the system would not wish to invest in machinery, preferring to use a contractor who could process their grain through a large, very high-output crimper. This requirement was met by the big Korte 1000,1400 and 2000 machines and has been the driving force that has seen the growth of crimping and on-farm grain processing across the country every year since then. We continue to supply several of these bigger units every year.

However, farmers soon realised the versatility of the machines, with their ability to crimp high-moisture grain, roll dry grain and process beans, peas, lupins and maize grain across a wide moisture range. As a result, many decided that owning their own machine would enable them to deal with all their home-grown or bought-in grain as, and when, they needed to, without being reliant on contractors who could be busy with many other operations during the year.

This has seen a steady growth in demand for smaller and medium-sized machines, such as the Murska 220 SM, Murska 350 S2 and Korte 700 S2 HD, with outputs ranging from 1.5 to 16 tonnes per hour. Built in Finland to the same exacting standards as their bigger stablemates, and available in PTO- or

MEET
KET
AND



3-phase electric-driven formats, these models have an enviable reputation for reliability and simplicity of operation. Furthermore, overall running costs over the many years' lifetime of these machines average between £2 and £3 per tonne of grain processed.

We've recently added an even smaller model to our versatile range; the single-phase KC Mini-Flaker which, with its 500-600kg per hour output, is ideal for equestrian and smallholder use.

In addition to the standard machines already mentioned we have continued to develop our bespoke design and build service. Our team of experienced engineers can build mobile or static mill/mix units with the ability to incorporate protein supplements, minerals and molasses to the processed grain to meet your individual requirements, or static mill set-ups that allow removal of processed grain from beneath the mill with a loader bucket. Based around the models already mentioned, and engineered to the same high standard, we can build a unit that will give reliable and economical service for many years to come.

Visit **kelvincave.com/equipment/grain-processing/grain-crimpers-dry-grain-roller-mills** to see pictures of some of the bespoke options available and then contact us on **01458 252281** to discuss your specific requirements.

From time to time we have pre-owned fully refurbished machines available. Contact us for details.

Better forage is central to a new way of farming

Just like many cattle farmers across the uplands of England, Geoff Roddam used to feed his stock on grass silage and bought-in concentrates. He kept as many cattle as his 800-acre (324ha) farm would support and used some of the barley from his 200 acres (81ha) of arable land to supplement their rations as required.

But over his 27 years of farming as a tenant at Blackcarts Farm, in Hadrian's Wall country, just north of Hexham, it gradually began to dawn on him that there was a better way.

If he made higher quality forage, he could cut out bought-in concentrates altogether, finish his cattle on home-grown feeds and sell them to a premium market. At the same time, he could lower his stocking rate and increase his farm's environmental credentials, taking part in Higher Level Stewardship schemes which would see ground-nesting birds, rare plants which thrive on Northumberland's Whinstone rocks and native British cattle breeds return to the farm.

Better still, the less intensive system would require lower labour inputs so he could keep all the daily, routine work within the family. Working with his daughter, Laura, the part-time help of his wife, Vivien and recently joined by his school-leaver grandson, Jay, the theory was that they could all enjoy a high quality of life at a slower pace.

Best of all, the benefits to the environment in which they farmed and the lifestyle the family

A typical Simmental x Luing cow at Blackcarts Farm.

would enjoy could all be achieved while they made better profits.

And so, a new type of farming was born on the Roddams' partly upland farm, which stretches from 200 to 700 feet above sea-level, is bisected by Hadrian's Wall itself, and over half of which is classified as a Severely Disadvantaged Area.

One of the driving forces to the change of direction was to cut out risk and one of the first steps in this process was to introduce home-grown protein to the crop rotation.

"We started whole-cropping beans about 10 years ago," says Mr Roddam. "We didn't get it right straight away, using bacterial inoculants to preserve them at first, but they didn't do the job 100 percent.

"The silage face would get warm and you could see the ration heating up in the troughs and it obviously was not that palatable. There was quite a lot of waste and the troughs had to be cleaned out fairly regularly."

Keen to stick with the plan, he sought the advice of Michael Carpenter, Kelvin Cave's northern area manager, who knew the best way to manage the challenges presented by wholecrop beans was to ensure air is excluded from the outset and keep the clamp airtight, and to knock out any potential contamination.

He says: "Beans can become dry and stemmy so they need really good compaction and ensiling practices. So we added side-sheets and covered the top with oxygen-impermeable O_2 Barrier 2in1, and weighted it down heavily.

"And because they're harvested in autumn, there's also a risk of soil contamination as well as the growth of yeasts and moulds.

"So, rather than leave the fermentation to chance, I'd always recommend using a good quality preservative which will eliminate potential microbial contamination and promote a quick and clean fermentation," he says.

So Mr Roddam also switched to Safesil Pro – the top-of-the-range product which contains human food-grade preservatives – and saw the transformation.

"It preserved the beans much better," he says. "They stay cold and do not spoil, and there is no heat or wastage at all."

Geoff Roddam (right) with grandson Jay and daughter Laura.

Buoyed by this success, he started conserving wholecrop cereals, which he ensiled in a plastic tube, and was unhesitating in choosing to preserve them with Safesil Pro.

"We aim to cut our wholecrop early, when the straw is still green and the grain fairly milky and cheesy," he says. "We find this makes us the best wholecrop and if our silages are good – with high enough starch and protein – we've found we can grow and finish our beef on grass and forage alone."

In fact, Mr Roddam is unusual in the area for finishing youngstock at all, with most on similar farm types selling their cattle as stores. But the

Continued on page 12

Continued from page 11

progeny from his 150 suckler cows – which include a nucleus herd of Luings and a commercial herd of Simmental x Luings which are bred to an Angus as a terminal sire – will all sell direct to the abattoir, mostly destined for the M&S Select Farm Scheme.

"When M&S do their annual audit they always like the traceability of the feed and particularly like the fact that we are not buying in any GM [genetically modified] proteins, which is almost inevitable if you're feeding soya," he says.

Calving everything in an eight to nine week block in April and May and finishing all of his stock at 22-24 months, he says the Angus x Simm-Luing heifer carcases weigh 300-330kg, steers are 320-360kg and Simm x Luing steers a little higher at up to 380kg.

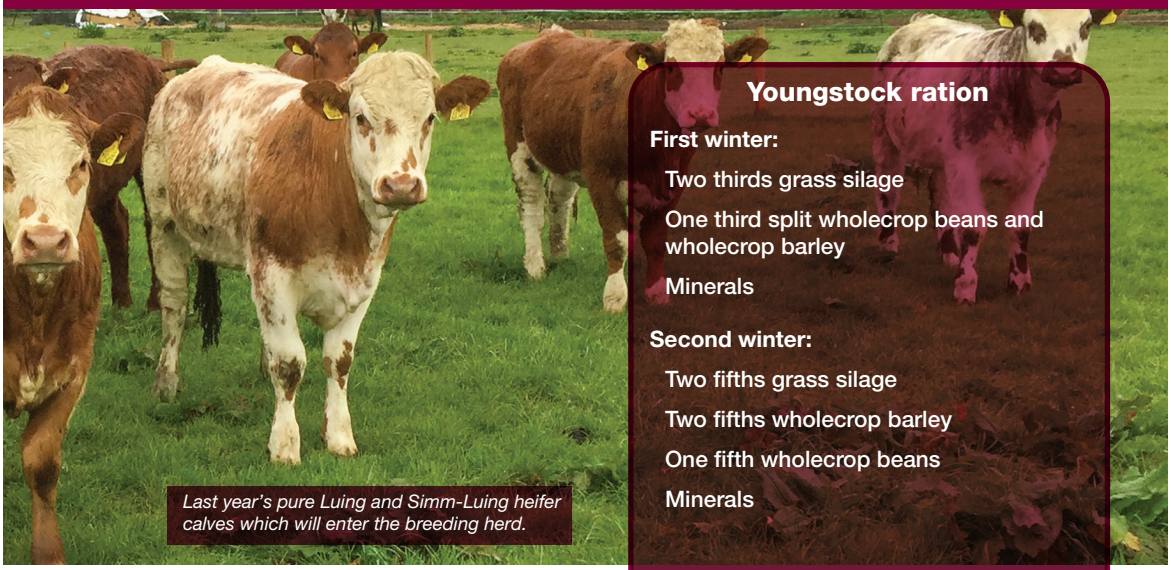
"They'll generally grade at R4L; the premium for going any higher is not worthwhile," he says.

Not content to rest on his laurels, Mr Roddam has sought to improve his forage further by upgrading both his grassland and his grass silage.

"We're in Northumberland National Park and because of Hadrian's Wall archaeology we are not allowed to plough some parts of the farm," he says. "But we can direct drill so we have introduced red and white clover to our swards and that's increased the protein of our silage and allowed us to reduce our nitrogen use.

"We've increased the percentage of fields sown with clover each year and we like to cut

Enjoying the home-grown finishing ration.



Last year's pure Luing and Simm-Luing heifer calves which will enter the breeding herd.

Youngstock ration

First winter:

- Two thirds grass silage
- One third split wholecrop beans and wholecrop barley
- Minerals

Second winter:

- Two fifths grass silage
- Two fifths wholecrop barley
- One fifth wholecrop beans
- Minerals

early to keep silage quality high. We know clover is harder to preserve than normal, so this year we've decided to use Safesil on the grass for the first time," he says.

"Years ago, before we started growing wholecrop, we farmed just like everyone else around here," he says. "But now, we have stopped spending money buying feed inputs, we only have the stock we can manage ourselves and we're selling most of the barley we combine as we no longer need it at home, only using a small amount for calves at weaning."

As a result, profits are up, the lifestyle is enjoyed and the family is secure in the knowledge it can survive on the farm's own feed inputs, whatever is going on in the world outside.

Quality from the start.

Key drivers for change at Blackcarts Farm:

- ✓ To reduce risk
- ✓ To improve the environment
- ✓ To keep labour in the family
- ✓ To be self-sufficient in feed
- ✓ To enjoy the lifestyle
- ✓ To improve profitability

The changes they made:

- ✓ Whole-crop protein crops (beans)
- ✓ Whole-crop cereals
- ✓ High clover, high quality grass silage
- ✓ Higher Level Stewardship
- ✓ Reduce stocking rate
- ✓ Switch to largely native breeds
- ✓ Finish cattle at home on forage
- ✓ Sell cattle to premium market (M&S)
- ✓ Sell home-grown cereals off the farm

Options for rye as an energy crop

Wholecrop rye is increasing in popularity for good reason. But users growing it for anaerobic digestion are also starting to crimp the grain in some situations.

Hybrid rye is coming into its own, according to agronomy, bioenergy and feedstock preservation specialists. They say that, although the crop may take second place to maize when it comes to biogas per hectare, it still offers huge yield potential and many further advantages to its growers and the environment, and more flexibility for anaerobic digestion.

Today, some five million hectares are grown worldwide, and in the UK well over 20,000 hectares are grown specifically for AD. Almost all of the AD acreage is preserved as wholecrop rye silage, a massive yielding forage which offers numerous agronomic advantages over maize. These include its long drilling window which can run from September to early November, ground cover over winter which protects against soil erosion, simple agronomy and, perhaps most important of all, a far earlier harvest, generally in July.

But there's another way of using rye, according to Charlie Bowyer who offers independent nutrition advice for AD plants through Biologic Biogas Solutions Ltd.

He says that although the freshweight yield of wholecrop rye is huge – reported to approach 50 tonnes/ha (20t/acre) on some farms – and its biogas yields impressive, at 200-250 cubic metres per tonne of freshweight which is on a par with forage maize, the crop's usefulness and flexibility can be extended even further.

This can be done by crimping, a process by which high moisture grain (from 25-45% moisture) is rolled through a mill, treated with a preservative and stored – just like wholecrop – in anaerobic conditions.

Driving any switch from forage to crimp is the declining digestibility of wholecrop as the growing season progresses.

"Like any cereal, rye becomes more lignified as it matures, which means it becomes increasingly difficult for the straw and seed coat to be digested," says Mr Bowyer.

"This means the more mature the crop, the more challenging the rye can become in the digester, particularly where retention time is short or where there is no maceration."

Once the DM of the wholecrop increases to over 50% he says it is much more likely to cause these problems. These also include the formation of floating layers, which may have detrimental effects on mixing and efficiency.

"If your crop is approaching this level of maturity, I would recommend considering switching to crimping from whole-cropping," he says.

Kelvin Cave Ltd concur and say that crimping moist grain offers numerous advantages over harvesting it dry.

"Crimping is commonly used for wheat, barley and maize by livestock farmers and also used for maize for anaerobic digestion," says the company's MD, Kelvin Cave.

Advantages of crimping include the lack of a need to dry grain, an earlier cereal harvest and a higher nutritional value than dry grain.

"Crimp has been proven to be higher yielding than dry grain, not just because freshweight yield per hectare is higher but dry matter yield is higher too," he explains. "This is because the grain is harvested in better condition, usually before there's any disease or shrivelling, which also avoids the grain losses which can occur when the crop is dry."

The crimped grain is then stored in a plastic tube or clamp in a similar manner to forage.

"Whilst your yields will inevitably be lower than if you had harvested wholecrop, the energy value per tonne is massively higher and you have the by-product of plenty of straw. This could be chopped and ploughed in to return nutrients and structure to the soil or baled and sold," he says.

Crimped rye before clamping.

"Crimping will certainly overcome the problems of an over-mature wholecrop rye," adds Mr Bowyer. "The grain is an energy-dense feedstock with a shorter retention time than wholecrop rye so it gives more flexibility from the same crop.

"Although its biogas yield per tonne has yet to be calculated in practice, its composition is such that it is expected to be similar to crimped maize grain at around 500 cubic metres per tonne of freshweight.

"It certainly has a place in an AD plant with a short retention time or you could use it to complement feedstocks which may not be yielding as well as you'd hoped," he says.

Continued on page16

Continued from page 19

Preserving rye as wholecrop or crimp for AD

- High dry matter wholecrop silages present challenges in storage and in the digester.
- Ideally harvest at 35% to 40% dry matter and when the grain has the consistency of firm, cottage cheese.
- Make sure the harvester is fitted with a grain processor which is adjusted correctly to crack every grain.
- To expel air from the clamp, chop to 50mm and roll with a heavy, compacting implement such as a SilaPactor.
- This can increase dry matter density by up to 40%, eliminating air and reducing required storage space.
- Use Safesil Pro (rather than a bacterial inoculant) which has a proven track record of killing damaging micro-organisms.
- Use side sheeting and cover the clamp with oxygen-impermeable O2 Barrier 2in1, with its integral vacuum film under-seal.
- If wholecrop DM rises above 40% consider crimping rye grain as an alternative later in the season, usually by the end of July.
- Crimping involves combine-harvesting moist grain, rolling, adding Crimpsafe 300 and storing anaerobically in a clamp or tube.
- Well-preserved crimped grain will last in anaerobic conditions for over a year.
- Plentiful straw from rye can be incorporated in the soil or baled and sold.

Cutting edge contractor now crimping rye

West Sussex farmer and contractor across the south of England, Frans de Boer *(pictured above)* crimped hybrid rye for the first time last year.

As the owner of a 500kW digester he is already familiar with crimping cereals and maize and processes around 6,000 tonnes for himself and his clients each year.

So crimping rye was a logical progression which he decided to do when his forage stocks peaked last year.

He says: “We use wholecrop forage rye in our digester but if we feed too much it can be difficult for our technology and we can end up with a crust and problems in the tank.”

So it was a logical progression to switch from whole-cropping to crimping last summer, which he did when the grain reached 35% moisture.

He says: “We combined the rye in early July and applied Crimpsafe 300 at the time of rolling to preserve the grain.”

Using a Korte roller he says he was very happy with the freshweight yield of 5 tonnes/acre (12t/ha) and the look of the feedstock.

“It looks like a really attractive crop and although we have yet to have it analysed, we expect its biogas yields to be similar to crimped maize.

“We don’t plough any more but wanted to incorporate the straw to return nutrients to the soil but this was hard work so on reflection we may have been better off rowing and baling, especially when there’s a good market for straw.

“The grain produces at least 80% of the whole rye plant’s biogas yield so crimping the grain can definitely be a viable solution.

“If the crop gets too bulky and you have to haul a long distance, or if you need to shorten your retention times crimping can also be a better option than wholecrop.

“I’ve always been a fan of the process because of crimp’s high feed value, easy storage and keeping qualities,” he says. “I’ve never understood why you’d incur the fuel cost for drying grain when you are only going to make it wet when you either feed it to livestock or put it in the digester.

“Our customers tend to take delivery of full lorry-loads of crimped maize which may need to last them outside the clamp for a week to 10 days,” he says. “They report that the crimp keeps really well and stays cold – right down to the dregs at the end, so I have no hesitation in preserving rye in the same way.”

Crimped grains are ensiled to exclude air.

Better silage better farm

Perfecting the techniques of making maize silage on a Herefordshire farm has created knock-on opportunities which have lifted performance across the whole business.

Getting one job right on the farm can sometimes feed into another and so create a virtuous cycle, and this is the happy situation which has been experienced by brothers, Andrew and Mark Watkins, and their parents, Richard and Linda.

Farming around 600 breeding ewes and 150 head of cattle at Vineyard Farm in Walterstone near Hereford, the process started when the family decided to return to producing maize silage which they knew could be successfully grown on their 350 acre (142ha), slightly drought-prone, farm.

“Part of our reason for bringing in maize was to safeguard ourselves against a lack of forage in a drought situation as, with our south-facing slopes overlying rock, we can be without grass from June onwards,” says Andrew Watkins.

“We knew we could grow maize here as we’d done it in the 1990s and we also felt it would be a great addition to our beef rations,” he says.

It was therefore with great disappointment that the first year’s crop failed to live up to expectations.

“You could see it heating in the clamp and the troughs, and it was obviously unappetizing, which was reflected in growth rates of the cattle and they weren’t content,” he says. “The silage pits were also dug into earth banks which were making the problems worse as water seeped into the forage, despite the side-sheeting.”

It was after this first season that Mr Watkins sought specialist help, and visited the Kelvin Cave stand at the Royal Welsh Show in 2017.

Kelvin Cave’s technical director, Andy

Strzelecki, took a holistic approach to the Watkins' situation when he visited the farm.

Offering wide-ranging advice on the foraging process, clamping and sheeting, he admits: "Before any other changes were made, I wanted the family to upgrade the clamps as the first priority!"

Bolstered in confidence by the advice, the team worked hard to build a concrete-shuttered clamp to take that autumn's maize silage. In the process, they followed the advice to treat the crop with a hi-spec preservative and make extra efforts to compact the clamp and prevent the ingress of air after sheeting.

"Maize silage ferments very easily but is almost always prone to instability in the presence of air," says Mr Strzelecki. "That's why I recommended strict attention to compaction, and sheeting with the impermeable polyethylene double-layered O_2 Barrier 2in1."

Also recommending treating with top-of-the-range preservative, Safesil Pro, he explains: "Amongst its ingredients this product contains high concentrations of the human food preservatives, sodium benzoate and potassium sorbate, which are proven to eliminate yeast and mould growth which would otherwise be expected to occur in the presence of air.

"This means that even after the clamp is opened, the preservative ensures long-term stability both at the face and in the feed trough."

The difference according to Mr Watkins was 'night and day'.

He says: "The following year we had a totally different sample. There was no surface waste and never any waste in the troughs and the cattle did really well."

In fact, he says he's very happy with growth rates achieved by stock on the rations, which for the finishers (450kg onwards) comprise 50:50 grass and maize silage with rolled barley, minerals, a little soya and straw.

"We didn't actually save our weight records before, but now we use the FarmIT 3000 system from Border Software we have a log of everything," he says. "This has shown the dairy-cross-continental finishers achieving liveweight gains averaging 1.32kg/day and the best achieving 1.8kg/day."

Pointing out that grass silage as well as the maize is also now markedly better than before, he says: "We used Andy's advice for the grass silage too and adjusted how it was made.

"We don't leave it to wilt for as long as before so it deteriorates less in the field," he says. "We aim to have it clamped within 24 hours, we treat with Safesil Challenge and compact, side-sheet and cover in the same way as we do with the maize.

"This has cut out the risk of a poor fermentation and the heating and waste and is helping the farm produce as much as we can from traceable, home-grown feeds," he says.

A further knock-on benefit has been bringing the silage-making completely in-house and the purchase of extra equipment, including a self-propelled forage harvester owned by Mark.

The new silage clamps at Vineyard Farm.

"We now have maize and grass headers for the forager which has given us control over our own silage-making," he says. "My brother runs his own contracting business so this has added an extra stream of income for his business."

Continued on page 20

Continued from page 19

With three concrete shuttered silage clamps now on the farm, the family is also able to look ahead for more home-grown feeds to conserve on the farm.

"This year, we had to sow a lot of spring barley because wet weather prevented autumn drilling, so we are now thinking of crimping spring cereals for the first time," he says.

This means he can harvest the grain early and preserve it without drying, using the preservative, CrimpSafe 300, before clamping, in a similar way to forage.

His nutritionist, Lizz Clarke, has been supportive of this move and says: "Crimped barley is processed slower in the ruminant than dry rolled grain and does not create a rumen acidosis load. Crimped cereals can be fed alongside rolled cereals, providing an extra energy source, allowing more cereals in total to be fed and making greater use of home-grown feeds."

Summing up the effects of the changes, Mr Watkins says: "We are completely focussed on what makes the money and this has transformed our farming and profitability without a shadow of doubt.

"We knew we had an issue before and we had it confirmed by Andy. We can see the evidence after the changes – and that speaks volumes," he says. "It's one thing to identify what's going wrong, but Andy has come on to the farm and pointed us in the right direction.

"What we are doing now is no more difficult than before, but we know what we want to achieve and are taking the right steps to get there," he says.

Main picture: *The maize clamp as it was opened.*
Inset: *Farming brothers Mark (left) and Andrew Watkins.*

Silage preservatives used at Vineyard Farm

- **Safesil Pro**, used on the Watkins' maize silage is formulated for use on high dry matter forage. It will inhibit the growth of undesirable micro-organisms, and is particularly effective at preventing the growth of yeasts and moulds.
- **Safesil Challenge**, used on the Watkins' grass silage is formulated for use on wetter forages where there is a risk of a poor fermentation and fermentation losses. It is particularly effective at inhibiting spoilage bacteria such as enterobacteria and clostridia.
- Both **Safesil** products contain human food grade preservatives which have been independently reported to guarantee prolonged storage stability in the peer-reviewed Journal of Dairy Science, 94:824-831.

COMPACTION
COMPACTION
COMPACTION

SilaPactor SilaPactor SilaPactor

Removing the air from a silage crop as the clamp is filled is essential to ensure a fast, efficient fermentation with minimal losses, make best use of available clamp space and reduce the risk of air penetrating the face during feedout.

Wholecrop cereal silage, which is, ideally, harvested at 35%-40% DM, is notoriously difficult to consolidate well using conventional tractor or loader rolling. This results in small pockets of air remaining in the silage mass resulting in the growth of yeasts, moulds and aerobic bacteria. At best this results in loss of dry matter and energy and a less than ideal lactic fermentation, and at worst the production of mycotoxins and silage that heats and spoils rapidly during feedout.

Silage-makers throughout the UK have proved that using a **SilaPactor** can save fuel, increase compaction density by up to 40% and leave a 'clean' face when cutting silage from the clamp.

In the UK wholecrop densities at 40% dry matter are typically between 450kg and 500kg fresh weight per m^3 (source: AHDB). In clamps where a SilaPactor has been used, compacting in thin (15-20cm deep) layers, densities well in excess of 600kg per m^3 can be achieved, and, because a SilaPactor is working across its full width (2.1m to 4m depending on model), fewer passes have to be made to achieve this result and less fuel is used.

If 500 tonnes of 40% DM wholecrop was ensiled at a density of 450kg/m^3 1,111m^3 of clamp space would be required compared to 833m^3 if a density of 600kg/m^3 is achieved.

Furthermore, independent trials (J Conway 2008; Muck, Holmes 2001) show a direct correlation between compaction density and overall dry matter losses with a compaction improvement like this nearly halving those losses. Add in the proven effective preservative Safesil Pro and your wholecrop will give real improvements in animal performance as shown by the farmers who have featured in *KnowHow* over the last ten years.

More dry matter retained means more milk or meat from every mouthful and reduced expenditure on expensive concentrates. Make the most of what you grow!

When it comes to getting the most from your valuable home-grown crimped feeds ... we've always got your back!

Our comprehensive range of tried and tested products are at the forefront in every stage of preservation, processing and ensiling, helping you to retain the overall quality, digestibility and nutritional value of your crimped feeds.










Crimping Essentials

CrimpSafe 300
CrimpSafe Hi-Dry
Propcorn NC
Moisture Meter
Processing Machines
O_2 Barrier 2in1
ClampTiles
ClampNet
Silage Safe
KlampClips
Side Sheets

CrimpSafe 300 and CrimpSafe Hi-Dry

CrimpSafe 300 ensures a controlled fermentation and maximum nutrient retention for ensiled, crimped grain above 25% moisture. For effective preservation and ensiling of grain below 25% moisture content, use **CrimpSafe Hi-Dry**.

Propcorn NC

Propcorn NC is the proven, non-corrosive, successor of Propcorn. Safer to use, and with 70% less fumes than straight propionic acid, **Propcorn NC** is suitable for preserving whole, or rolled, grain and pulses with moisture content of up to 25%, in aerobic conditions.

Moisture Meter

The **Wile Crimping Moisture Meter** is the first (as far as we know) grain moisture meter that can give readings above 30% with any degree of accuracy. Available exclusively from Kelvin Cave Ltd, the **Wile Crimping Moisture Meter** tests whole grain, and will give accurate readings on all grain from 12% up to 50% moisture.

Grain processing machines

With proven versatility and performance across the range, Kelvin Cave Ltd has machines capable of processing between 500kg and 50 tonnes per hour, and a range of ancillary equipment and bespoke options to suit all applications.

O_2 Barrier 2in1

Applied as a single sheet which transforms into two on the clamp, **O_2 Barrier 2in1** comprises a protective, high-quality top layer covering a layer of very oxygen impermeable, polyamide vacuum film. It provides quick and effective clamp sealing with reduced workload, and up to a tenfold decrease in oxygen permeability compared to conventional sheeting systems.

ClampNet and ClampTiles

ClampNet is a 300g/m^2 heavy-duty green silage cover with hemmed, stitched edges to prevent fraying or unravelling. It offers added protection from attack by birds and vermin and also helps to maintain compaction.

ClampTiles are made from 90 per cent recycled material with a life expectancy of around 15 years and provide even weight and protection on crimped grain clamps. They are easy to handle and store and, unlike tyres, won't harbour rainwater or debris.

Silage Safe

Silage Safe is laid over silage sheets and incorporates integral tensioning straps that replace the need for weighting down with tyres or sandbags. It is installed in 2-metre widths from each side of the clamp and each overlapping piece is drawn together with tensioning straps.

KlampClips and Side Sheets

Made from stainless, spring steel, **KlampClips** are like an extra pair of hands when lining clamp walls with side sheets. Available in two sizes (100-150mm clamp wall width x 700mm long, and 200-300mm clamp wall width x 1000mm long), both are available in packs of 25.

Heavy-duty, 150µm, clear plastic **side sheets** are supplied in 50-metre rolls and convenient widths of 4, 5 and 6 metres.

Meet the Sales Team

Kelvin Cave
Managing Director
07977 252 661
kelvin@kelvincave.co.uk

Ian Hall
Sales Director
07977 252 663
ian@kelvincave.co.uk

Andy Strzelecki
Technical Director
07977 252 664
andy@kelvincave.co.uk

Michael Carpenter
Area Sales Manager
Northern
07817 977 701
michael@kelvincave.co.uk

Bryn Thomas
Area Sales Manager
North Wales & Cheshire
07739 323 322
bryn@kelvincave.co.uk

David Warner
Area Sales Manager
Somerset & West Dorset
07814 934 481
david@kelvincave.co.uk

Andy Lee
Area Sales Manager
Shropshire, Staffordshire,
Lincolnshire & East Anglia
07495 752 445
AndyL@kelvincave.co.uk

Mandy Mason
Area Sales Manager
East Dorset, Wiltshire & South Coast
07495 752 446
mandy@kelvincave.co.uk

Tim Frost
Area Sales Manager
West, South & mid-Wales
07801 200 546
tim@kelvincave.co.uk

Harvesting advice service via Video Link

Keeping you, your families and farm staff safe is important to us!

At the time of going to press the Covid-19 restrictions on travel and interaction with people outside our own households are still in place. This may limit our ability to travel to your farm to check crops and advise on correct harvesting times for wholecrop silage, crimped grain and any other of your valuable feed crops.

As part of our ongoing commitment to you our team will be available throughout the harvest season to look at your crops remotely via your smartphone.

If you want such advice please contact your local sales team member *(see contact details, left)* to discuss setting up a video call and book a time. Then go to the field at the agreed time with your phone and video call them so they can look at your crop with you.

You can also find a useful set of guidance videos that our Technical Director, Andy Strzelecki, made for EBLEX (AHDB) here: **https://www.youtube.com/user/EblexAHDBsearch?query=Andrew+Strzelecki**

KELVIN CAVE LTD

All you need to grow

t: 01458 252 281 e: info@kelvincave.com
kelvincave.com