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Today's Farm

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contents

Marie Flynn of Teagasc and Jack Kearney of Rathcormac, Co Cork, admire LESS slurry spreading.

Today's farm is a bi-monthly publication produced in a joint venture between Teagasc and the Agricultural Trust, publishers of the *Irish Farmers Journal* and *The Irish Field*.

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COVER: Monaghan wheat producer and processor Mark Gillanders with his daughters Clara (10), Martha (7) and Lana (12). \ Mark Moore

COMMENT

Mark Moore
Editor,
Today's Farm

Organic production on the increase

The organic sector in Ireland is small, but dynamic. In our cover story, we feature two farmers who are producing organic wheat and beef in Monaghan's rolling Drumlin countryside.

There is scope for more farmers around the country to enter organic production. The Government added €5m to the Organic Scheme in the recent budget, which means it will be open to applications again in 2022. A good basis for considering a future in organic production is the 25-hour QQI Organic Principles course, which is delivered by Teagasc organic specialists (and is also offered by NOTSkillnet). If you are interested in learning more about organic production, or want to put your name down for the course, contact your local Teagasc office.

Méadú ag teacht ar an táirgeadh orgánach

Is earnáil dhinimiciúil í an fheirmeoireacht orgánach in Éirinn, cé gur beag í. Inár scéal clúdaigh feicimid beirt fheirmeoirí atá ag táirgeadh cruithneacht orgánach agus mairteoil orgánach i gceantair thuaithe dhroimneacha Mhuineacháin. Tá deis ann do níos mó feirmeoirí ar fud na tíre dul isteach sa táirgeadh orgánach. Chuir an rialtas €5 mhilliún leis an Scéim Orgánach sa bhuiséad le déanaí, rud a chiallaíonn go mbeidh sé oscailte d'iarratais arís in 2022.

Bunús maith le machnamh a dhéanamh faoi iontráil sa táirgeadh orgánach amach anseo is ea an cúrsa QQI 25 uair an chloig sna Prionsabail Orgánacha a gcuireann speisialtóirí orgánacha de chuid Teagasc ar fáil é (tá an cúrsa ar fáil ó NOTSkillnet). Más spéis leat tuilleadh a fhoghlaim faoin táirgeadh orgánach, déan teagmháil le d'oifig Teagasc áitiúil. Is féidir leat do spéis sna Prionsabail Orgánacha a chlárú ag https://www.teagasc.ie/rural-economy/

Digging for data

When you think of farm equipment, what usually springs to mind? Tractors? Balers? Ploughs? What about drones flying over crops and fields, robotic milkers, smart collars on cows, iPhones and farming apps? Digital technologies are being used more and more in farming and Ireland is no exception.

Sensors, drones, robotics, and GPS trackers are just a few examples of digital methods that can help farmers to increase efficiency and decrease labour on their farms. These technologies have a wide range of uses, like tracking animal health, animal behaviour, crop health, farm finances, land use and so on.

While you may hear about these technologies in the news or see videos of them in action, something you probably don't often hear about is farm data. Digital farm technologies are constantly generating and collecting data on the farm, which can be used in many different ways by a wide variety of groups and organisations.

When lots of different farm data is grouped together, it becomes 'big data', which is used by groups like policy makers, scientists, and farm machinery companies to influence their decision making and business plans.

The way that this farm data actually gets collected, shared, and turned into 'big data' is not a clear process, and brings up important questions: Who owns the farm data? Who can use this information? What rights do farmers have to the data? What makes information private versus public? These questions are not just specific to farm data – the same types of questions about data have relevance to any of us that have ever used our smartphones to search Google, scrolled through social media apps, tapped our loyalty cards in the shops or used our Revolut cards to make payments.

Netflix documentaries like *The Social Dilemma* and *The Great Hack* have made us aware of how important it is to consider these questions and recognise how our data is being collected and used.

These questions link to an idea that we will all need to become more familiar with in our increasingly digital and connected world – data governance. Data governance covers the rules and relationships around how data is shared and used, including the decisions that are taken to manage data, and issues like ownership, privacy, and security. GDPR is an example of good data governance. Good data governance practices can help protect farmers and make sure they are getting benefits from sharing their farm data.

Farmers of the future will need to become more comfortable with analysing and interpreting data, as the farming landscape is changing and becoming more data-oriented. There is huge value in using digital technologies to help improve the economic, social and environmental sustainability of farming – however, farmers need to be reassured that good data governance practices are in place when using these technologies.

Agrisnap, a new smartphone app, developed as part of the EU Horizon 2020 NIVA project, is one example of a data-based technology that aims to improve the way that farmers manage their paperwork. In a relatively novel approach to developing new farming technologies, Agrisnap was co-designed by app developers, social scientists and different people in the farming community. Involving end-users in the design process like this helps to make sure the end technology is more user-friendly.

The app gives farmers and farm advisers the option of uploading geo-tagged images of their land to the Department of Agriculture, Food and the Marine, whenever the Department has a query relating to scheme applications. Instead of farmers having to submit paperwork responding to Department queries, which may cause frustrating payment delays, AgriSnap deals with farm data more efficiently by submitting this information through a smartphone app.

So far, the app has been tested by more than 400 farmers and farm advisers in the Republic of Ireland, who have positively reported that it has the potential to speed up payment claim processes and greatly reduce the need for an in-person farm inspection visit. As a result, farmers have reported that the app has the potential to make them feel more empowered and increase their trust in the farm inspection process.

Involving farmers and farm advisers directly in designing and testing the Agrisnap app helps make sure that this digital technology is actually user-friendly and can help people on the ground in their day-to-day farming.

This type of co-design method for developing digital farm technologies is important for good data governance practices, as it can point out areas in the design where it might not be clear how the data will be used, where it goes and what privacy permissions are needed.

Protecting farmers and their data should be essential to the design of any new digital agriculture technology, and using good data governance practices and co-design methods is a great place for researchers to start.

– Claire Brown, Ursula Kenny & Áine Regan, Teagasc

Teagasc National Dairy Conference

The Teagasc National Dairy Conference takes place on:
•Tuesday November 23 in the Rochestown Park Hotel, Cork.
•Wednesday November 24 at the Hodson Bay Hotel, Athlone.

There are many technical, economic and environmental challenges facing dairy farmers in the coming year. Implementing best practices and adopting research innovations in relation to fertiliser use, grazing management, clover establishment and herd genetics, will play a big part in meeting these challenges at farm level.

Our dairy conference will provide an excellent opportunity to debate and discuss the issues with fellow farmers, researchers and industry representatives.

We look forward to meeting you there. Details of the conference programme and bookings will be available from mid-November on www.teagasc.ie/events.

Winter housing farm walks

- **Date:** 5 November 2021.
- **Event time**: 10:45am.
- **Venue:** Farm of Thomas Kennedy, Ballinahallen, Ballycarney, Co Wexford. Eircode: Y21 FR64.

Beef farm walk, on the farm of Thomas Kennedy, hosted by the Teagasc South East Advisory Region.

- **Date:** 10 November 2021.
- **Event time:** 10:45am.
- **Venue:** Seamus Hayden, Old Leighlin, Co Carlow. Eircode: R93 CX95.

Beef farm walk on the farm of Seamus Hayden, hosted by the Teagasc South East Advisory Region.

Topics to be discussed on both farms include:
- Winter dosing programme.
- Nutrition – silage quality and supplementation.
- Winter housing – adequate space and ventilation.
- Health and safety on-farm.

ADVERTORIAL

Metabolic Disorders: Prevention Beats Cure

Maeve Regan, Head of Ruminant Nutrition

When costs associated with metabolic issues are assessed alongside the time and labour involved, prevention is always better than cure.

Body Condition Score (BCS):

It is best practice to dry off cows at, or very close to the same condition that they should calve down in (target BCS 3.0-3.25). Therefore, the nutrition of the dry cow should just maintain condition over the 60-day period (thin cows should ideally be dried off early to allow for recuperation of condition).

Where a percentage of the herd is below target, it is more cost effective to build condition while the cow is producing milk, as opposed to building condition over the dry period. Also, be mindful that over-conditioned cows at calving are more likely to suffer with metabolic issues. Therefore, cows should be condition scored prior to drying off to make a tailored plan for the herd, which may include grouping cows according to BCS.

Dry Cow Minerals:

Most Irish silages lack the required mineral levels to get the cow through the dry period, therefore feeding a dry cow mineral is essential to build up mineral reserves and give the cow the best possible chance of calving down without any issues.

Research indicates a single case of milk fever is estimated to cost circa €312 when veterinary costs and consequential production losses are accounted for, with sub-clinical cases being estimated to cost > €100. It is also estimated that for every clinical case of milk fever that manifests itself on farm, a further 6 sub-clinical cases go undetected, highlighting the importance of providing the cow with the macro and trace elements required to avoid such issues.

Cost of Metabolic Disorders (clinical cases)	
Metabolic Disease	**Estimated Cost Per Case**
Milk Fever	€312
Clinical Ketosis	€190
Retained Afterbirth	€392
Displaced Abomasum	€515
Mastitis	€262
Acute Lameness	€312

Feed Facilities:

Minerals can be offered via a diet feeder where it is being used on farm. Alternatively, where top-dressing minerals at the barrier and space is limited, offer the mineral twice daily (half rate am and half rate pm) to ensure all cows have access to the correct daily rate.

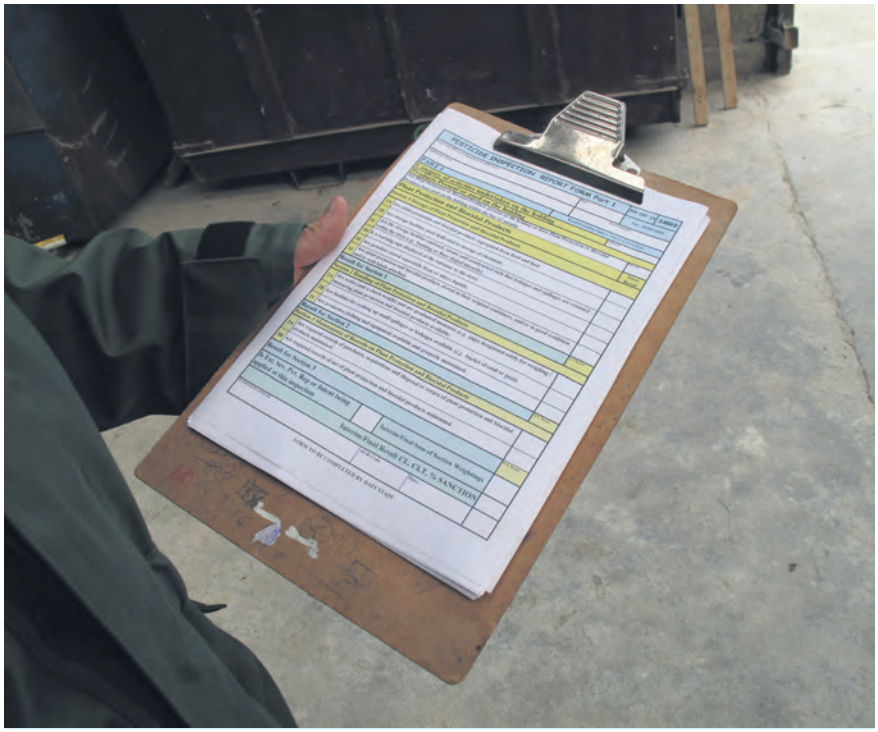
Ten ways to avoid a winter injury

Using the HSA Risk Assessment document to carry out a seasonal review of hazards on your farm is good advice. We highlight some of the key areas to consider

Francis Bligh
Teagasc health and safety specialist

John McNamara
Teagasc health and safety specialist

Penny Gavin
Teagasc/HSA Walsh Scholar



1 Check your machinery

Health and Safety Authority (HSA) data shows crush injuries in farmyards are a major contributing factor to deaths with tractors and farm vehicles. Make sure your handbrake is working and that you use it. It is also important to check starter motors and batteries on tractors and farm vehicles.

If they are performing poorly, it is very important to replace or repair them. Preventing farm workplace injuries involves having safe and well-maintained equipment and, vitally, adopting safe behaviours.

Operators of agricultural machinery should drive with caution and make sure loads are secure. Increase visibility by using lights and beacons, especially during bad weather or when light is low. Avoid busy roads whenever possible. Keep windows washed and clean.

2 Beware of livestock

Pay particular attention to bulls and cows around calving. Never enter a pen with an unrestrained bull and protect yourself from freshly calved cows.

3 Give yourself a break

It is more difficult to maintain concentration levels when tired, wet, cold or hungry. Always take breaks, have a good diet, wear suitable clothing and always carry a mobile phone.

4 Prevent falls

Try to have clear routes around farm buildings, and have a stock of gritting material and salt readily accessible. A slip or fall can have devastating consequences. Take action to divert water away from routes that are used regularly. Something as simple as a channel to divert surface water can make a big difference.

5 Prevent falling objects

The collapse of bales from a shed store or bale stack can have devastating consequences. It is vital to ensure you avoid danger zones, such as adjacent to raised loaders holding bales. Always move bales safely.

The HSA has an information sheet on working safely with bales, which is available at www.hsa.ie.

6 Get your electrics checked

Winter is a good time to have farm electrical installations checked by a competent electrician. Ensure that residual current devices (RCD) are in working order. Testing is essential to ensure that the switching mechanism in the RCD is working properly. Further information on safety with farm electrics is available at www.esb.ie/esbnetworks/en/downloads/ESB_Farm_Safety.pdf.

7 Install good lighting

Lighting in the farmyard and sheds will help improve productivity, time, safety and security. Replace blown bulbs and clean light covers.

8 Take care with heights

A safety platform with edge protection should be used when accessing

heights. If using a ladder, it should be sound and be secured at both the base and a height.

9 Fire safety

Check that hay and straw is stored separately from other buildings, particularly those housing fuels, agrochemicals and machinery. Fire spreads very rapidly and evacuation could be hazardous.

Have fire extinguishers at the ready and if a fire occurs, get to a safe area as quickly as possible and call 112 or 999 without delay.

10 Get organised

Good organisation leads to better time efficiency and safety, meaning that farmers can reduce the time taken to do a job.

Rushing to get a job done leads to injury, so taking time to plan your work week and prepare will not only help with work efficiency, but also help to reduce the chance of an accident occurring.

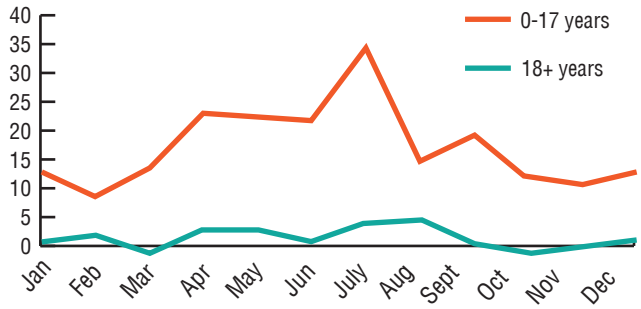
Long hours and busy times of the year lead to tiredness and rushing. This has an impact on how alert the farmer is and can lead to serious consequences.

Using contractors at busy times of the year or booking a relief worker is important in managing your workload.

Ensuring that the facilities are in good condition and the gates are hung properly will reduce the likelihood of an injury or an animal breaking out. Now is the time to get better organised.

Think about how you could be more organised, so that you can make the most of your time and allow for more time off.

Figure 1: Work-related fatalities by month, 2011-2020.



Be winter ready has produced a booklet entitled Be Winter-Ready, which includes advice. This booklet is available at http://winterready.ie.

Targeted Agricultural Modernisation scheme

There is a wide range of farm safety equipment and facilities that are grant aided under the Department of Agriculture, Food and the Marine (DAFM) Targeted Agricultural Modernisation scheme (TAMS).

To claim a TAMS grant, it is mandatory that all applicants have, prior to the submission of their claim for payment, the half-day farm safety code of practice or the FETAC Level (Green Cert).

Your claim for payment will not be processed until evidence of completion of the course is provided. Teagasc is currently taking bookings for half-day farm safety courses.

Winter milk diets need careful formulation

James Dunne
Teagasc dairy specialist.

As winter milk herds finish calving and grass disappears from cow's diets, thoughts turn to the winter feed plan. Given the 20% increase in concentrate costs in recent months, it is vital to focus on the economics of diet formulation.

The winter feed plan must take into account forage quality, herd milk yield and calving pattern (proportion of stale versus fresh cows).

Fresh cow diets should promote high milk solid production and good body condition to improve fertility. All while ensuring stale cows are fed appropriately for their yield, thus maximising feed efficiency at a whole herd level.

Concentrate feed is the largest variable cost for winter milk farms. There's nearly always scope to improve. While average cost is around 6.0-6.5c/l, there is considerable variation around the average (4.5 to >12c/l) at farm level.

Larry Hannon and Ned Loughlin.

On paper, 1kg concentrate has enough UFL for 2kg milk. But this response to marginal feed is never seen in practice. Why?

Extra concentrate reduces forage intake (substitution) and lowers whole diet digestibility (called the associative effect). In short, the total UFL increase is less than the extra concentrate UFL fed (Figure 3).

The scale of this effect depends on cow type, days in milk etc. Feed responses appear better with low DMD silage, due to lower initial DMI, but total feed cost per litre will be higher.

For a given herd situation, break-even concentrate feeding rate will not change too significantly, due to a ±4c/l base milk price swing – milk response rate determines the economics to a greater extent.

» **Farmer Focus:** Larry Hannon, Fullerscourt, Ballitore, Athy, Co Kildare

How are you going to deal with rising concentrate costs this winter?

"Our winter diet has evolved into something that is relatively simple and delivers optimum performance.

"This hasn't always been the case. In the past, we have fallen into the trap of pushing the cows too hard, trying to maximise output per cow, with fertility and feed efficiency suffering as a result.

"In terms of concentrate usage, it's important to set out a diet plan that returns a high level of feed efficiency.

"The fresh cow diet is set around achieving optimum milk performance, but allowing the cow to retain body condition and go back in calf.

"Stale milking cows need to be fed efficiently for their level of production, avoiding overfeeding that will lead to excess body condition and unnecessary feed cost. Therefore, getting the base diet correct is vitally important, with cows topped up appropriately in the parlour thereafter."

Larry's winter diet

"The basis of the diet is high-quality home-grown grass silage and maize silage grown under contract."

Larry's silage analysis for three cuts can be seen in Table 4.

"I'm delighted with how the silage has tested this year. The first-cut is probably the best silage that has ever been made on the farm and makes up 40% of the total silage stocks.

"We'll start on the second- and third-cut and feed the first-cut when cows are coming near peak production.

"All the milking cows are run in the one group for simplicity. We feed a simple TMR as our base diet, which consists of 10kg DM of silage, 4.5kg DM maize silage and 3kg of a 24% CP balancing ration.

"Cows are then topped up in the parlour with anywhere from 1-6kg of a high energy 18% CP nut depending on whether they are stale or freshly calved. Stale cows would typically be doing 15-16l, with the fresh group peaking at 32l.

"The diet is balanced for protein at around 16.5% CP and overall energy density of the diet is 0.94 UFL per kg DM fed. I have realised how much time is taken up, and also the running costs associated with it, so I like to keep it simple and feed the TMR once a day. By the time we are looking at having to complete multiple mixes in the spring, we are heading to grass."

–Ned Loughlin

What are the cow's requirements?

When it comes to diet formulation, Table 1 outlines what the typical autumn calving cow requires at differing daily milk output levels.

Intakes of 20-22.5kg DM are required to meet the cow's needs. Quality forage is essential – target at least 60% of DMI as forage (13-14kg per day) and balance with concentrate.

Energy is the first limiting nutrient for milk – diet UFL per kg is constrained by the need for fibre in the diet. Meet the target UFL per kg with high-quality forage and high-energy concentrates.

High UFL energy per kg promotes good milk solids and body condition. Ensure you provide enough total PDI (protein) for target production. To maximize efficiency of energy and protein utilisation for milk production, it is important to match the PDI and UFL ratio of the diet.

Table 4: Silage analysis 2021.

	First cut	Second cut	Third cut
DM %	24.9	34.1	28.1
DMD %	79.8	71.3	72.8
CP%	12.7	13.4	16.4
UFL	0.91	0.80	0.82
NDF %	48.7	50.8	44.6

When the diet is balanced for protein fractions (PDIN and PDIE are similar), total crude protein level can be reduced to 15.5% (from the standard 17.5%), saving on feed costs. For example, a diet with 0.94 UFL per kg should have 94-97g PDI.

A total diet NDF (fibre) target of 30-36% will maintain rumen health and avoid acidosis – 24-28% should come from forage. Silage DMD and intake achieved dictate overall diet NDF.

However, excess NDF (>40%) from poor forage sources or straw reduces DMI and milk yield. Use quality digestible fibre sources if forage intake/quality is limited.

Are you buying the correct quality ration?

Winter rations are often solely purchased on crude protein content, but they should be bought on the basis of quality ingredients.

High crude protein rations are not necessarily better quality, high energy content is needed too. Excess protein is wasted if energy is lacking, but too-low protein can reduce feed intake also.

Choose high energy (0.94+ UFL/kg as fed) rations, then pick the level of protein to suit the forage.

As can be seen in Table 2, two rations with equal crude protein can have very different performance potential due to their energy (UFL) content. Premium18 contains many moderate-to-low UFL ingredients (soya hulls, maize gluten, sunflower, wheatfeed).

Hannon Herd performance

Larry notes how herd performance is continuing to improve year-on-year.

"We have placed a large emphasis on improving both the fertility and milk performance of the herd through the use of EBI over the last number of years," he adds.

Herd EBI stands at €162, which places the herd in the top 15% of herds nationally. Milk solids output stands at just over 550kg per cow.

It's difficult to put an exact split on the figures, but the estimate is that the autumn cows are delivering 600kg milk solids and their spring counterparts deliver 530kg on meal inputs of 1.8t and 1.3t respectively.

"We calve approximately 50 cows in the autumn in a six week block starting in mid-October. The reminder of the 170 cows calve from mid-January across 12 weeks, with 86% calving inside six weeks.

–Ned Loughlin

Continued on p10

Figure 1: Milk yield distribution Jan/Feb 2017.

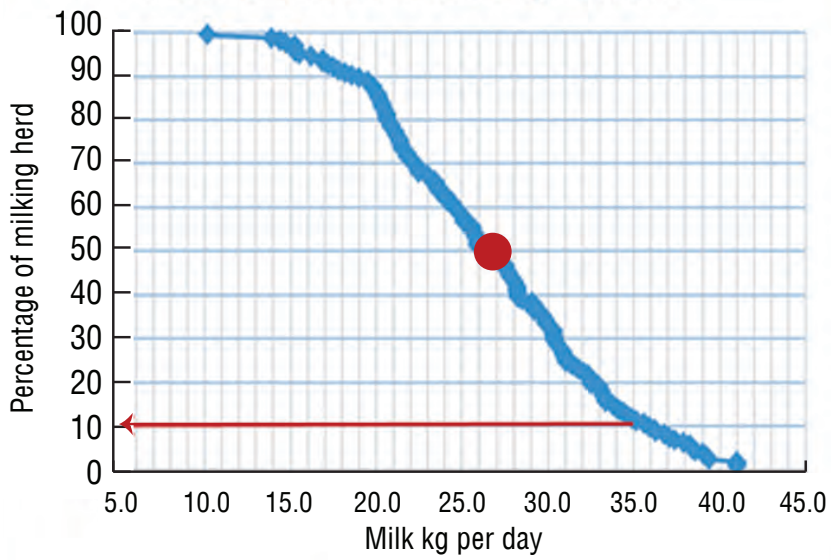
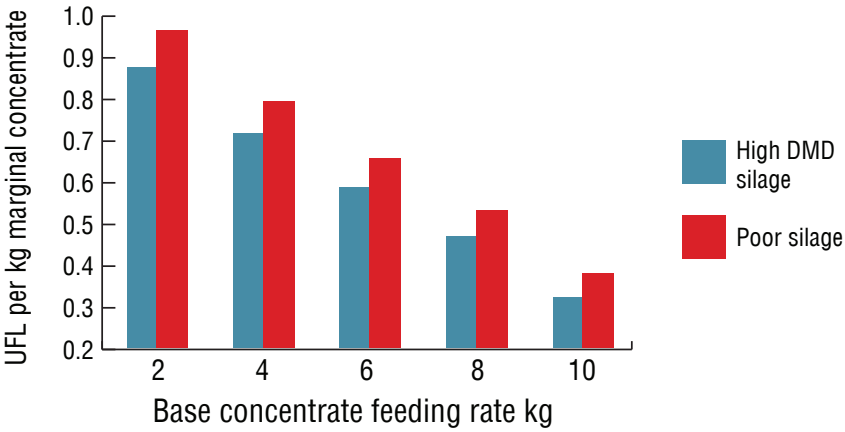


Figure 3: Total UFL increase per kg meal fed



From p9

Although the crude protein is 18%, the UFL value is only 0.89/kg as feed. This is a poor-quality ration for milking cows. Dairy HE 18 uses good-quality ingredients in the main (barley, beet pulp, soybean meal, maize, distillers). The UFL value in this case is 0.97, making it a premium ration for milking cows.

Dairy HE 18 would be expected to support an extra 220-260l of milk per tonne fed, depending on silage quality and feeding levels. The value of this milk is often greater than the difference in purchase cost between the rations.

This shows that feed quality cannot be decided based on crude protein content. Ensure when buying winter concentrates that they have a UFL value of 0.94 or greater per kg fed.

What level of concentrate does the diet require?

The benefits of higher DMD silage are well proven – increased forage intake, more milk solids and milk from forage, better rumen health and lower concentrate feeding levels.

Average silage quality on farms remains similar, year -on-year, at 68 DMD, thus explaining the wide variation in the level of concentrate fed at farm level.

Table 1: Nutritional requirements at differing production levels.

Requirements for 600kg cow at 4.1% fat and 3.4% protein			
Milk / day	25 kg	30 kg	35 kg
UFL / day	17.2	19.4	21.6
PDI g / day	1675	1930	2238
UFL / kg DM	0.90	0.94	0.97
PDI / kg DM	90	94	98
DMI (kg)	19.1	20.7	22.5

Table 3 outlines the concentrate feeding levels required for different levels of milk output, depending on the silage quality available.

For example, the typical 600kg cow will require 7.5kg of concentrate to produce 30kg of milk, whereas that requirement would be 10.0kg should the silage be 65 DMD. Typically, every five unit drop in DMD will need 1.0-1.5kg extra concentrates to compensate for the lower energy level.

Where silage quality is poor, forage intake levels will reduce. Therefore, it's important to monitor NDF levels in the diet and where shortfalls are identified, extra fibre sources should be fed. There are significant challenges in meeting energy requirements in these situations.

Analyse herd level performance before setting the feed plan

Farmers should check the milk yield distribution for their own herd using winter milk recording data before setting their feeding strategy.

Following analysis of milk recording data for a high-yielding herd (8,000kg), with 40% of the herd calving in the autumn, Figure 1 shows the typical milk yield distribution per cow for the months January and February for a herd of this type.

The average yield for the herd was 27kg. This high-yielding herd has 9% of cows over 35kg.

Figure 2 details the breakdown of the total daily herd milk supply. The total milk output from the highest yielders accounts for 14% of total output, while the marginal milk produced (milk produced >35kg by these cows) equates to 1.2% of daily output. Therefore, 86% of daily milk output comes from the standard base cow within the herd.

The strategy should be to ensure the basis of the diet is formulated to a herd level and not that of the 'best' cows based on the herds own performance. Individual high yielders can be managed as a sub group thereafter.

Johnstown Castle winter milk herd

For the Johnstown Castle winter milk herd, the aim is to have a good-quality base diet that will work well for high-yielding and lower-yielding groups alike. This simplifies feeding in the yard. The parlour is used to top up the

Table 3: Concentrate feeding levels at different levels of silage quality.

Silage quality			
Milk yield	65 DMD	70 DMD	75 DMD
20l	5.5kg	4.0kg	3.0kg
25l	8.0kg	6.5kg	5.5kg
30l	10.0kg	8.5kg	7.5kg
35l	12.5kg	11.0kg	10.0kg

high-yielding group with additional concentrate.

The feed ingredients used for the basic milking diet are:

•9kg DM of good-quality grass silage (74% DMD).

•5kg DM of high-quality maize silage (33% starch).

•3kg of a high protein (23% crude protein) coarse blend fed as part of the forage mix (this contains barley, soybean, beet pulp and distillers grains). This diet provides enough nutrients for approximately 20kg high solids milk as a base level. Lower-yielding cows receive a further 2kg parlour ration. Fresh cows receive up to 6kg additional parlour concentrate, bringing their daily dry matter intake to 21.5kg on average.

This covers the fresh group with enough energy (UFL) and protein (PDI) for a group average milk yield of 31.5kg, which is our target for December/January. Parlour concentrate is formulated for high energy at 18% crude protein equivalent and contains full minerals and vitamins.

Figure 2: Breakdown of total daily milk

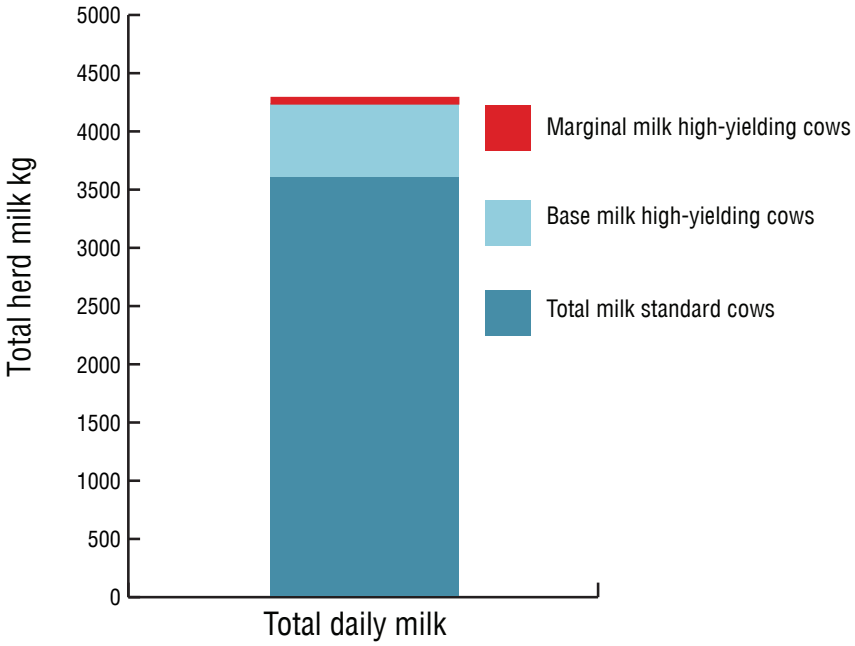


Table 2: Example of two 18% CP rations.

	'HE' 18%	Premium 18%
Ingredients	Barley, beet pulp, soya meal, maize, distillers, rapeseed, molasses, fat, mins + vits	Barley, soya meal, soya hulls, maize gluten, wheatfeed, sunflower, molasses, maize, mins + vits
Feed Value (per kg fed)	0.97 UFL / 114 PDIE	0.89 UFL / 112 PDIE

Underappreciated: The balance sheet

The balance sheet deserves as much attention as its more popular neighbour, the profit and loss statement

Kevin Connolly
Teagasc Rural Economy Development Programme

When you receive your yearly farm accounts around the annual income tax pay and file tax deadline, you will see included a statement entitled 'balance sheet'. This statement often gets barely a second glance. This is understandable, since some of the figures in the balance sheet report can be hard to relate back to the day-to-day situation for the farm.

Also, the terms used in the balance sheet are less familiar than some of those on the profit and loss statement. Put simply, the balance sheet shows what you own and what you owe at a point in time – usually the end of the accounts year.

That end-of-year position is your starting point for the next accounts year, so it is like a financial line in the sand – showing your finishing position after the last financial year, and giving the starting point for the next year.

The balance sheet is like a photograph of the business's financial status on a particular date. If you compare the "before" photograph (i.e last year's end-of-year balance sheet) to the "after" balance sheet (current end-of-year balance sheet), the differences can be identified and teased out.

The balance sheet gives you an indication of what changed financially on the farm during the year. The changes are partly reflected in the profit and loss statement, which shows what was produced and sold off the farm as well as the costs.

There will be changes from alterations in the value of machinery and buildings. This could be due to new investments, perhaps some sales of assets and the depreciation (or wearing out) of the assets that you held onto.

Just looking at a single end-of-year balance sheet can reveal some useful information. The balance sheet lists your assets showing all items that are owned by the farm business.

This could include land, buildings, machinery, direct payment entitlements, livestock, stocks of feed, fertiliser and unsold farm products on hand, and cash and money in the bank at the balance sheet statement date.

The balance sheet list of liabilities, shows debts owed by the business to lenders, suppliers of farm inputs and others.

These liabilities are usually taken on in order to finance the purchase of some of the previously mentioned assets, or to cover a cash shortfall during the year.

Taking the value of the liabilities from the value of the assets gives the net value of the business that is owned, debt-free. This is known as the net worth of the business.

An awareness of the business net worth figure at a given point in time could be regarded as just a 'nice to know' figure, as it doesn't mean a lot unless you are going to 'cash out' – that is, sell everything, pay off what is owed and exit the business.

A much more valuable exercise is to take the net worth figure from the most recently completed year end and then compare that with the net worth for the year end of the previous year.

A quick subtraction will give the change in net worth. This change is a useful indicator of the direction of

Figure 1:

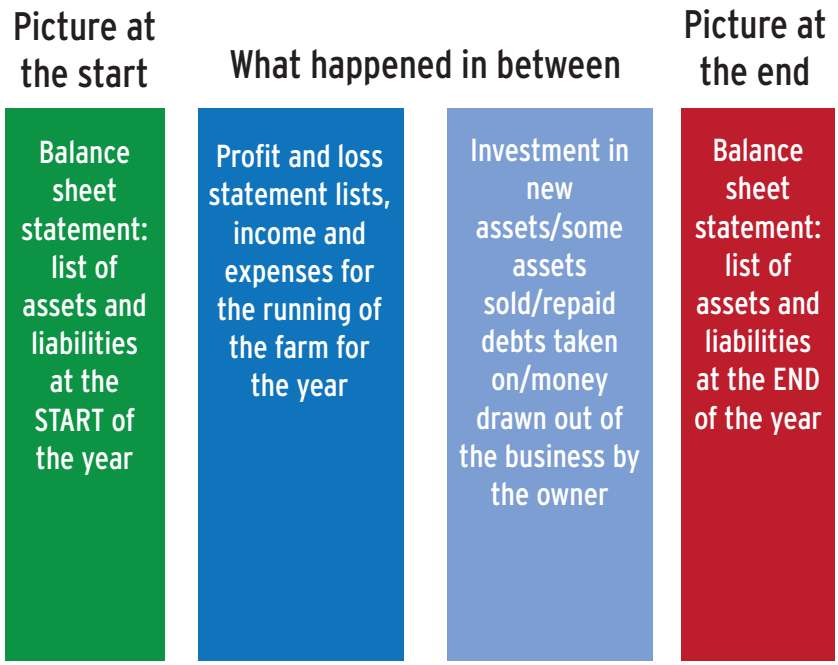
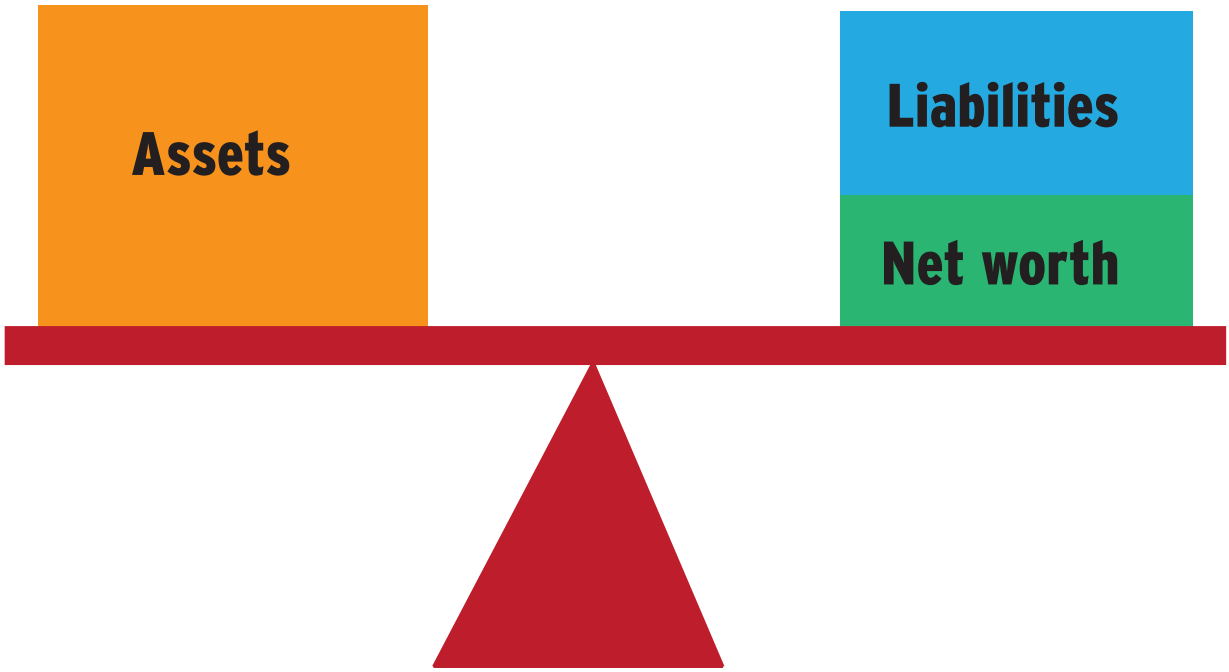


Figure 2: Assets = liabilities + net worth



the business – is it growing or shrinking, adding value for the owner or destroying wealth?

Once the change in net worth is established, then the next obvious question is – what is driving the change? The first place to look for an answer is the profit and loss statement. A profitable business has a greater chance of showing a positive change in net worth, as profit will feed through to the balance sheet.

There could be extra cash in the bank, increased investment in assets such as land, buildings, machinery or livestock, or decreasing overall farm debt levels through reducing short-term creditor debt or paying off bank loans.

A declining net worth could be traced to a low profit year, where there was no scope to replace assets that were wearing out, or where cash reserves had to be tapped into to partly cover the running expenses for the farm for the year. It's worth finding out what is driving the change in net worth and deciding whether it is something that can be sustained or needs to be corrected.

The balance sheet can also give valuable insights on issues such as the farm's ability to cover its obligations in the short-term (referred to as business liquidity) and in the long-term (referred to as business solvency) – these measures will indicate whether the business could withstand a downturn.

The balance sheet can be used to examine total farm assets and total farm liabilities per hectare, per cow or per livestock unit.

These can be used as gauges of how the business is structured or funded – again. a useful indicator of whether the farm's financial foundations are solid.

Teagasc upgrades Profit Monitor benchmarking system for 2022

For 2022, Teagasc has upgraded its Profit Monitor financial analysis tool. The revamped system will allow a more comprehensive analysis of the balance sheet.

This will require some extra farm financial detail to be captured for the Teagasc Profit Monitor analysis, but the information to be recorded will be minimal once the initial position on the farm assets and liabilities is established.

As part of the regular inputting of costs, which Profit Monitor users will be familiar with, the calculation of depreciation of machinery and buildings can now be carried out by putting values on some of the main machinery and building assets on the farm and letting the Profit Monitor system calculate a depreciation figure.

This has the advantage of giving a more accurate calculation of the depreciation cost and has the added benefit of building up a picture of the value of the investment in machinery and building assets.

These asset values automatically feed into the balance sheet, along with information on livestock assets and detail on the liabilities or farm debt.

Stacking the income and expense information alongside a full balance sheet will give you a clearer indication of the farm business's financial status.

The Teagasc Profit Monitor Balance Sheet Report will compare your last two balance sheets, calculate some important measures, such as any change in net worth, and present some of the main ratios using figures from both the balance sheet and the profit and loss statements.

Think before you dose

Don't dose ewes unless there's proof they need it… and other tips to prevent resistance to wormers

Ciaran Lynch
Teagasc Sheep Specialist

Internal parasites, especially gut worms, are a serious challenge to sheep flocks. One of the major issues we face in controlling them is the development of anthelmintic resistance, i.e. where parasites survive a dose that should kill them.

We largely depend on dosing animals with a product containing an active ingredient from either: Group 1-BZ: Benzimidazoles (white), Group 2-LV: Levamisole (yellow) and Group 3-ML (clear) to treat stomach worms but many farms now have resistance to one or more of these products.

Teagasc, along with industry partners, has focused efforts on promoting four key actions that will help maintain a susceptible worm population and prolong the efficacy of commonly used anthelminthics.

The first key action in this initiative is to not dose adult ewes for stomach worms unless there is a demonstrated need.

Adult ewes have good immunity to stomach worms, though there are a number of circumstances where dosing may be warranted which we will discuss later.

Unfortunately, dosing ewes with wormers either directly or through unintended use, has become common practice on many farms.

Why is dosing ewes an issue?

Firstly, each time we dose ewes (or lambs) with an anthelminthic (wormer) we are also exposing the worm burden in the ewes to this product, that's what they were intended to do.

Ideally, this would kill every single one the worms present, but as the population of the worms is continually exposed to these treatments they begin to develop genetic resistance to the effects of the wormer.

Over time, a proportion of them are able to survive the dose and the level of resistance increases.

The genetic resistance the worms have developed varies depending on which anthelminthic class they are exposed to.

When we treat sheep with an anthelminthic that the worms have begun to develop resistance to, all the susceptible ones will be killed and only the resistant ones will be passed out onto pasture.

This gives the resistant worms a competitive advantage over the susceptible ones on the pasture. Gradually, the population of worms on pasture will change as we continually dose with ineffective products.

This poses a major challenge for lambs grazing these pastures as they will pick up more and more resistant worms. These worms won't be killed off by the wormer and lamb performance will suffer.

This brings us to our second point: We need to manage the population of worms in refugia i.e. the worms not exposed to the dose or our susceptible worms.

Now this may seem to fly in the face of trying to get rid of all worms, but we actually need to keep these susceptible worms active on pasture as they are key to maintaining how effective our wormers will work in the coming seasons.

There are two main sources of refugia on farms (a) on pasture and (b) undosed ewes. We now need to start considering how we manage pasture to help maintain a susceptible worm population, i.e. keep a population of worms that the dosing products we use on farms are still effective against.

So why are ewes being dosed?

Direct use: there is often a perceived performance benefit to dosing ewes. For healthy adult ewes this is not true. However, there are circumstances where dosing, using an effective

Table 1: Summary of flukicide activity

Chemical actives available to treat for liver fluke in sheep	Liver fluke stage		
	Early immature	Immature	Mature
Triclabendazole	+	+	+
Closantel		+	+
Rafoxanide		+	+
Nitroxynil		+	+
Oxyclozanide			+
Albendazole			+

product, is justified:
• As part of a quarantine programme for purchased or incoming stock on to the farm to avoid buying in resistant worms
• Lactating yearling ewes are compromised while rearing lambs and may warrant a dose at similar time points to their progeny up until the point of weaning
• Thin/compromised mature ewes may warrant a dose. If mature ewes need routine dosing consult your vet/advisor as there may be an underlying nutrition/health issue. Theses ewes should be selected for culling.

Unintended use: ewes can often receive a wormer when the intention was to treat for a different parasite. For example, treatment against fluke through the use of combination fluke and wormer products.

These products have a role in quarantine programmes and, in some circumstances, the treatment of lambs during the latter part of the year where both the active wormer and flukicide are effective. But, in many circumstances, their use is problematic:
• Firstly, their use in adult ewes excluding the quarantine process exposes ewes to an unnecessary wormer.
• If the wormer contained in the combination dose is already showing signs of developing resistance on your farm administering it is only speeding up the development of resistance, that applies to its use in both ewes and lambs.
• Is the flukicide contained in the combination dose appropriate for the time of year and type of fluke you are aiming to treat? During the autumn and early part of the winter the main liver fluke issue is immature fluke. Not all flukicides are effective at treating this stage of fluke. The information in Table 1 is a guide to the various stages of fluke each of the active ingredients are effective against.

The second unintended use is during treatment against external parasites. With the arrival of injectable 3-ML macrocyclic lactones products provided an effective, easy to administer means of treating ewes for scab and other external parasites.

But this also exposes ewes to a wormer that they don't necessarily need which, in turn, promotes the development of anthelminthic resistance.

Again, these products have a role in quarantine programmes and the treatment of individual adult sheep, but their widespread use is a problem.

Key messages

- Anthelminthic resistance is a major challenge. We need to change our approach to help maintain a susceptible worm population and prolong the efficacy of commonly used anthelminthic products.
- Adult ewes have good immunity to stomach worms and do not require routine treatment.
- If mature ewes need routine dosing consult your vet/advisor as there may be an underlying nutrition/health issue.
- Target liver fluke with an effective flukicide appropriate for that time of the season.
- Consider using one of the alternatives when treating ectoparasites on sheep.

Alternative treatments

Instead, producers should consider using the alternative treatments available:
• **Plunge dipping:** correct plunge dipping is a highly effective means of controlling a broad range of sheep ectoparastites. Best practice needs to be followed in relation to dip use and disposal. For those who don't have suitable dip facilities there are mobile plunge dipping contractors providing this service.
• **Topical applications:** there are a number of Cypermethrin or Deltamethrin based products that can provide effective treatment against lice and other external parasites. Best practice should be followed when applying these products.

How to manage beef

Catherine Egan
Teagasc beef specialist

Charlie Devaney of Teagasc takes a silage sample. Both he and Roscommon farmer Shane Keaveney build winter feed planning on the analysed quality of the silage.

As the grazing season comes to an end, the focus turns to winter management as stock are housed. There are always a number of different groups of cattle housed, such as cows, weanlings and finishing stock, with each requiring different management.

As winter is the most expensive period on most cattle farms, it is important to find the balance between maximising animal performance and keeping costs under control.

Silage quality

Silage quality is key to good animal performance, reducing winter feed costs and increasing profitability during the housing period. Grass silage is the basis of most winter feeding systems in this country and satisfactory animal performance is largely dependent on the adequate intake of good-quality silage.

The level of meal feeding on your farm is determined by the quality of your silage. Therefore, knowing your silage quality must be the starting point when making decisions on concentrate supplementation.

Silage quality needs to be analysed in a lab. A visual assessment or date of cutting may be an indicator, but is not sufficient on its own.

Winter feeding

Suckler cows calving next spring should be fed to appetite on 65 DMD silage once they are in good condition. First and second calvers should be penned together, if possible, and fed 70 DMD silage/65 DMD and 2kg meal. Savings can be made when feeding dry suckler cows with 70-75 DMD silage, as they can be restricted to 80% of intake.

Weanlings/stores ideally need to be gaining 0.6-0.7kg liveweight gain per day. To achieve this target, ad-lib 70-75 DMD silage and 1-2kg of a 14-16% crude protein concentrate should be fed. Winter finishing of beef animals requires a combination of high-quality silage (75 DMD) and a high energy, low protein (12% crude protein) concentrate.

If high-quality silage is not available, it is more cost efficient to feed ad-lib concentrates and a clean source of roughage such as straw.

A fast finish over six to eight weeks is the most efficient for forward beef animals. Start with 2-3kg, gradually building up to 5-6kg, depending on the sex, breed, and conformation of animal being fed.

The aim is to have finishing animals gaining a minimum of 1kg liveweight gain per day, which will translate into 0.5-0.60kg carcase weight per day. It is essential that cattle are assessed regularly as they come close to slaughter.

Ideally, this should take place in the crush, checking the flesh cover on the tail, loin, rib, brisket, flank (and cod, in the case of bulls).

Concentrates

Weanlings fed at higher levels of meal over the winter will weigh heavier going to grass next spring, but compensatory growth with cheaper grass will not be as evident.

If you want to maximise compensatory growth next spring, meal feeding should also be frontloaded – that is, fed at higher levels after housing and allowed to decrease for the last two months of housing.

If cattle are to be finished from the shed, the target ADG for steers is 1.1–1.2kg for the whole period. Bulls can achieve much higher levels of average daily gain.

Table 1 indicates the concentrate feeding rates for weanlings required at different qualities of silage fed to gain 0.6kg/day.

Table 1: Concentrate feeding rates for weanlings required at different qualities of silage fed to gain 0.6kg/day.

	Poor	Fair	Good
(Silage DMD)	62	68	72
Continental steers / bulls	3.0	2.0	1.0
Continental heifers	2.6	1.7	0.9
Friesian steers	2.6	1.7	0.9

Parasite control

Housing is one of the best times of

cattle for the winter

the year for treating cattle against some of the more common internal and external parasites.

Liver fluke, stomach worms, lung worms, lice and mange are the main parasites that cause ill health and poor thrift in cattle.

Clipping the backs of cattle will help stop them overheating and will keep animals cooler. It will also help control lice infestations. There has been a lot of faecal sampling carried out this autumn by participants in the BEEP-S. This data should be utilised when planning your fluke treatment programme. Dosing correctly means using the right product, at the right time, using the correct dose rate and administering it in the right way.

Ventilation

The climate in sheds is determined by ventilation, temperature, humidity, draughts and dust. Many farmers undervalue the critical role that good ventilation in cattle housing plays in achieving good animal performance, as they are less likely to develop respiratory infections or pneumonia.

Observe and assess air movement and freshness during the housing period. Ventilation supplies fresh air, removes gases, odours, dust, bacteria and removes heat and moisture generated by the housed livestock.

Housing

Suckler cows housed in slatted houses require 2.5-3.0m²/cow, while finishing cattle weighing 550kg-650kg require 2.2-2.5m²/animal and 700kg-800kg animals require 2.6-2.9m²/animal respectively. In order to get the most liveweight gain from your cattle over the winter months, it is advisable to group animals in accordance with weight.

Weanlings should be housed with comrades of similar size and weight to avoid bullying in the pen and at feeding. The number of stock in the pen should allow each animal to lie in comfort when all stock are lying down.

For youngstock weighing 220-300kg, a lying space of 1.2-1.5 m²/animal on slats and 1.8-3m²/animal on straw is recommended. Feed space is also very important to maximise intakes and weight gain, as outlined in Table 2.

Having enough head space is not always an accurate indicator of sufficient lying space, especially if feeding both sides.

As animals like to eat together, this should be facilitated as far as possible. Finally, it is important to clean water troughs regularly, as cattle forced to drink dirty water will not drink enough, which will supress their appetite and subsequently thrive.

Table 2: Requirement for feed space (mm/animal).

Feeding regime	Cow	Finishing cattle	Light store cattle	Weanling
Concentrates	600 - 700	600 - 650	500 - 600	400 - 500
Ad-lib roughage	400 - 500	400 - 500	250 -300	225 - 300

Farmer focus

Future Beef programme participant Shane Keaveney farms with his wife Grainne and three children, Aaron, Neil and Annie in Ballinlough, Co Roscommon. They operate a spring-calving Saler X, Limousin X herd with a suckling-to-finishing system – bulls are finished under 16 months and heifers that are not kept for breeding are sold as breeding replacements.

The management of the weanlings over the winter is an important part of the system. As all the heifers calve at 24 months on the farm, their target weight gain of 0.6kg/head/day must be achieved, along with putting them out to grass again the following spring to ensure they are at least 390kg at breeding time. Bull calves were introduced to concentrates a month prior to weaning and were fed 2kg, 14% crude protein ration up to housing.

Once housed, they are given 3kg per day (depending on silage quality) and built up gradually to ad-lib concentrates by the beginning of March.

They are then fed ab-lib silage until slaughter. The ad-lib period will vary from animal to animal, but is generally between 90 to 120 days on Shane's farm.

Silage quality plays a major role, with high-DMD silage of 72 DMD made last year. This year's sample has been taken, but there are no results back yet. Heifer weanling will be supplemented with 2kg per day, 14% crude protein ration during the housing period.

The suckler cows are penned according to calving dates and age. The second calvers will be penned with the first calvers and fed the best silage.

The older cows are fed the second-cut silage that was 68DMD last year. Pre-calving mineral will be introduced in late December, six weeks in advance of calving in February/March. Cow condition will be monitored to ensure cows are not in too good condition at calving, to avoid calving difficulty.

A good herd health programme is necessary, as animals cannot afford any setbacks in this system and need to achieve their targets. All weanlings were vaccinated for IBR, RSV and Pi3 prior to weanling. Animals are also dosed for lung and stomach worms prior to housing.

Their backs were clipped and treated for lice at housing. A follow up lice treatment will be given at the end of December.

Shane dung samples his cows for liver and stomach fluke and also monitors the beef health check report for animals that are slaughtered on his farm.

After considering both of these in consultation with his vet, he did not treat for liver fluke last year. This year, he is going to take the same approach.

Shane Keaveney.

Charlie Devaney and Shane Keaveny with some of Shane's Salers.

There is good ventilation in the main slatted shed, which is a five-bay single with a creep lie-back.

The change to Yorkshire boarding on the loose straw-bedded shed has improved the movement of air throughout the shed, where the weanlings are housed to avoid the impact on thrive over the winter.

–Charlie Devaney

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Kildalton
A CELEBRATION | 25TH JUNE 2022
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Teagasc Kildalton reaches its half-century

Alumni reflect on the excellent education (and food) they experienced at the college.

Gerard Griffin
Kildalton.

Tim Ashmore
Kildalton.

Claire Bambrick
Kildalton.

John Walsh, recently retired farm manager, with college principal Tim Ashmore.

"Thoroughly sound and modern systems of agricultural education must precede any considerable or rapid progress towards a high rate of efficiency in our chief industry,"'
–Sir Horace Plunket, 1901, pioneer of the Irish Cooperative movement.

The words of Sir Horace Plunket are as relevant today as they were 120 years ago. A sound agricultural education is the bedrock on which our largest industry is built.

Our farmers, who feed the nation and supply the demands of our export industries, more often than not, start the journey towards their future careers at an agricultural college.

The doors of Kildalton Agricultural College opened 50 years ago in 1971, when the Department of Agriculture purchased Bessborough House, with its 360ac, for 250,000 Irish pounds.

This was the year when Ireland introduced decimal currency (in February), RTE made its first coloured broadcasts and 29 young farmers made up the first intake of students in the country's newest agricultural college.

It was not the first time the building had welcomed students. Between 1940 and 1970, the Oblate order ran it as a seminary.

Over the three decades, 360 priests were ordained in Bessborough House, Kildalton. The Oblates had their own bakery and were keen farmers. They ran a dairy herd and kept cattle, pigs and sheep, along with poultry and tillage.

By 1970, the numbers joining the order had dwindled and the Oblates sold the facility. The order left behind ideal infrastructure for an agricultural and horticultural college, with accommodation, classrooms and a working farm. Kildalton Agricultural College was founded.

Later, in 1972, the Horticultural College opened with 18 students and in 1986, the Equine College opened with four students.

Weanlings grazing at Kildalton.

List of courses

- Certificate in agriculture Level 5
- Advanced Certificate in Crops and Machinery Management level 6
- Advanced Certificate in Dairy Herd Management level 6
- Professional Diploma in Dairy Farm Management level 7
- Certificate in Horticulture level 5
- Advanced Certificate in Horticulture level 6
- Certificate in Horsemanship level 5 (Equitation)
- Certificate in Horsemanship level 5 (Stud Management)
- Advanced Certificate in Horsemanship level 6 (Equitation)
- Advanced Certificate in Horsemanship level 6 (Stud Management)

Kildalton College facilitates Waterford Institute of Technology in delivery of:

- BSc in Agriculture
- BSc in Agricultural Science
- BSc in Land Management
- BSc in Forestry
- BSc in Horticulture
- BSc in Food Science

Kildalton College facilitates University College Dublin in delivery of:

- BSc in Agricultural Science (Dairy Business).

Fast forward 50 years, and Kildalton has in excess of 1,400 students coming through its doors.

Student life was a little different in the early days when compared to the experience of today's students. John Monahan, now a farmer in Co Carlow, was a student in Kildalton in the early 1970s.

"At the time, numbers studying horticulture were equal to the numbers studying agriculture, and horticulture modules were delivered to agriculture students, the college glasshouses being a new innovation at the time, and all students spent time looking at these new technologies.

"Students did farm specials in the evenings, rotating around the different enterprises; sheep, beef, pigs, tillage and dairy."

Irish agriculture has evolved rapidly over the past 50 years. This development was accelerated by Ireland joining the EEC in 1973, and the access to markets and supports which came with it.

Life in Kildalton has also changed over the years. The college has specialised in the main farm enterprises most relevant to students who attend, and the structure of the courses has changed to reflect the needs of modern agriculture.

Students' free time and social life has also evolved over the years. Nearby Waterford has a large student population and the strict curfews and lights out by 10:00pm are a thing of the past.

"My year in Kildalton Agricultural College put me on the career path that I have enjoyed so much in my professional life," says Andy Doyle, tillage editor with the *Irish Farmers Journal*.

"During my time there in 1973/74, I was encouraged to apply for a scholarship to study agriculture in UCD, which I did. I'm eternally grateful to Eamon Tully for his part in that.

"At the time, Kildalton was delivering primarily boarding, full-time courses. It was a combination of classes and practical experience and we were all allotted practical duties on the farm. The experience was broad – we were given access to all enterprises, including pigs and sheep, as well at crops, cattle and dairy.

"While people had their home-based preferences, the broader exposure gave us a better understanding of other opportunities and the shared challenges across agriculture. Having to do the work was good too. I will always remember the long walks to check on the mainly Texel sheep flock, which always seemed to be in the fields furthest away.

"Having come from a boarding school, two things hit me about Kildalton – the relative freedom and the good food. We received excellent tuition across all enterprises."

Mary Cahill (now Delaney), from Dunnamaggin in Co Kilkenny, won a scholarship to Kildalton from October 1976 until May 1977. She was the first woman boarder.

"Though we lived relatively close to the college, I had just finished my Leaving Cert and I think my parents Patrick and Philomena felt that staying there would encourage a sense of independence.

"There were some other women students who were not boarders and being a small minority certainly taught us how to stand our ground.

"The experience was great socially and academically, and while my preference was for all things to do with cows, we got an excellent education in all aspects of agriculture. The food was like you'd get at a top hotel."

After completing the course, Mary farmed at home with her parents. "Nothing could faze me after the year at Kildalton," says Mary.

She married Michael Delaney in 1986 and Patrick, the youngest of their four children, attended Kildalton for two years. He completed the Level 6 course in dairying in 2013. The family's dairy herd has grown from 30 cows in the 1970s to 100 today.

"There have been many innovations since I was there," concludes Mary. "But placement onto farms as a way to see leading farmers practising what is taught in the college is something which I see as hugely beneficial, as well as seeing the enterprises on the college farm."

To commemorate the half-century milestone in Kildalton's history, a celebration event is planned for the 25 June 2022.

Attendees will get the opportunity to walk through the five decades of education, both in the buildings where the life of students and staff will be displayed, and externally through the beautiful grounds showing life down through the decades in the agricultural, horticultural and equine units.

Reducing the risk of getting bovine TB

We know the COVID-19 virus is a cunning enemy, but bTB is a bacteria and is, if anything, a more devious and tricky opponent

Rosanne Greene
Department of Agriculture, Food and the Marine

Philip Breslin
Department of Agriculture, Food and the Marine

It's like someone just hit you hard in the stomach," says Paddy, a Munster dairy farmer describing what it's like to 'go down' with TB.

"It restricts you straight away and your entire year is upset with it."

It's a measure of the dread that these two letters can generate that we have obscured Paddy's identity while quoting him verbatim.

"The compensation for the reactor animal is OK, but the real difficulty it brings is the disruption to selling stock. Especially the bull calves, in my situation. And you are left wondering how many stock will be lost before the outbreak is cleared."

If eliminating TB was just a difficult problem, it would have been eliminated by the TB Eradication Programme, which began in 1954. In fact, it is what is known as a 'wicked problem' which means it is extraordinarily complex, with many inter-related factors leading to disease.

However, farmers are not helpless and there are specific steps you can take to significantly reduce the risk. Remember, Bovine TB (bTB) is an infectious disease and you have the power to reduce the risk of this disease spreading to your cattle.

The bug causing bTB is slow growing, evades the body's immune system and is difficult to diagnose. Infected cattle in your herd can appear healthy, but may be harbouring the disease and spreading infection.

Once infection gets well established in a herd, it can be tricky to eliminate. It is therefore critical to identify risk factors within the herd and remove them as soon as you can.

Preventing the introduction of bTB into your herd is crucial. Some people think that TB will never happen to them, but the fact of the matter is that there will be over 4,000 new TB breakdowns this year and the majority of them will be in herds that have been clear for some time. So, this advice applies to every herd in the country.

bTB breakdowns are primarily caused by;

- Infection from cattle remaining in the herd from a previous bTB episode.
- Introduction through purchased animals.
- Infection from wildlife, particularly badgers.
- Infection from direct or indirect contact with neighbouring cattle.
- Infection from the handling/housing/slurry environment.

TB testing

High-quality bTB testing reduces the threat to your herd. If an infected animal is present, the earlier it is identified and removed, the better. Leaving infected animals behind at the test will cause two problems – one short-term and one long-term.

The short-term issue is that the infected animal is more likely to spread disease to other cattle. This can make the difference between having a small breakdown or a bigger one.

\ Jerry Huysmans

A more ominous longer-term threat is that the longer an animal is infected, the more likely it will become 'anergic' or incapable of reacting to the TB test.

This will mean that 'sleeper' infected animals can go on to infect other animals within the herd for years.

"We had a cow who was judged clear over a number of tests and when she was eventually sent to the factory, she was identified as positive there," says Paddy.

"It's that kind of surprise that makes TB such a frustrating disease."

Ensure good-quality bTB testing facilities are available, especially a crush of appropriate size. Sufficient light and shelter are important. Provide the vet with any assistance required in order to do the job well.

Insist that your vet tests carefully; clipping, injecting and measuring any reactions exactly – a difference of even 1mm is important in diagnosing TB, i.e differences that you cannot easily see. The technique on both days of the test is equally important.

Reduce the risk of infection being left behind

Getting a good skin test is really important, but a small proportion of infected animals can pass it. Thankfully, research has helped to identify which clear animals are higher risk. So, cull any cattle that have ever

tested 'inconclusive' even if they subsequently re-tested negative.

Cull any cattle that were in a herd during a previous bTB breakdown – even if you are just exiting a bTB breakdown, you can immediately start a replacement policy that will have all of these animals removed within four or five years.

Keeping a young herd is always beneficial in terms of bTB, as older animals are less likely to react to the test if infected.

Reduce the risk of introducing cattle that are infected

Source cattle from herds that have not had a bTB breakdown in recent years. Ask to see evidence of a herd's bTB Herd History Risk. This is the risk category given to every herd in the country.

It has three parts. The first part is a letter, which is either 'C' indicating the herd is not currently restricted for bTB, or 'D' indicating it is a dealer herd. The next part is a number from 0 to 10. This indicates the number of years that a herd has tested clear for bTB.

The third part is a number in brackets, which indicates the number of bTB breakdowns a herd has had in the last 10 years.

So for example, C 10 (0) means a herd is clear of bTB for the last 10 years and has had no breakdowns in the last 10 years. While knowing the risk category can really help, even having a recent bTB test date means cattle are less likely to be infected. The date of the last TB test is displayed on the mart board and movement certificates.

It is also good practice to isolate purchased animals and carry out a post-movement bTB test to protect the rest of your herd.

Buy from fewer herds and maintain a closed herd if possible.

Reduce the risk from badgers

Look for evidence of badger activity on your land. Badger setts are mostly found in hedgerows, ring forts and riverbanks. Good farming land has the capacity to host badgers.

Large spoil heaps at the sett entrance are a tell-tale sign that it is a badger sett. They are capable of moving quite large stones.

Badger setts have openings of 25cm wide, whereas a rabbit burrow may have a wide opening, but the chamber itself quickly narrows. The presence of hay-like bedding beside a sett entrance is a definite sign that it is a badger sett.

Badgers root in pasture searching for food; they often overturn cow pats. They also form small pits about 12cm in diameter called snuffle holes. Badgers create well-worn paths about 15 to 20cm in width. These are easiest to see in the winter and spring.

In wet areas around gates or drinking troughs, you may see badger pawprints. The prints consist of a broad kidney-shaped pad with four or sometimes five toes visible in a straight line.

A latrine pit is where a badger digs a small hole and defecates into it and leaves it uncovered. Latrines are generally found close to a sett. Badgers have a territory that can range about 500m to 1km from the main sett, so even though you may not have setts on your land, badgers may well be active there.

If badger setts or latrines are present on grazing land, you should fence them off with electric fencing. Do not feed cattle concentrates spread on the ground. Feed cattle in raised troughs and avoid spilling feed on the ground, as badgers may consume it and contaminate any leftovers.

Use raised drinking troughs and badger-proof farm buildings by covering the lower part of access gates to sheds so they can't get through.

If you see evidence of badger activity on your land, contact the wildlife officer at your local regional veterinary office or use the app, available at www.bovinetb.ie.

Reduce risk of neighbourhood spread

Ensure boundary fences are well

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maintained to stop nose-to-nose contact with cattle from another herd. Avoid mixing groups of cattle that are normally managed on separate land fragments, as this can spread infection from a small group within the herd to the whole herd.

Reduce your risk through biosecurity

Some picture biosecurity as the boot dip at the parlour entrance, but biosecurity is all about keeping disease out of your farm or eliminating it if present. If you take steps to improve biosecurity on your farm, you will reduce the risk of bTB and many other diseases.

In addition to the cattle and wildlife measures above, ask yourself how can bTB be brought onto your farm? Through people, equipment or poor fencing? What steps have you taken to reduce this risk? Do you ask contractors to clean and disinfect slurry or manure spreaders before they come onto the farm? Do you clean and disinfect shared machinery after each use? The bTB bacteria can survive in the environment for several months.

High-quality bTB testing reduces the threat to your herd.

Effective cleaning and disinfecting of any areas where bTB-infected cattle were kept is essential and will reduce the risk of infecting other cattle.

Breeding to reduce the risk of bTB

When selecting bulls for breeding, choose ones that are genetically more resistant to bTB.

The Irish Cattle Breeding Federation (ICBF) now provides a score of genetic resistance to bTB for bulls. Farmers can use this to reduce the risk of bTB through selecting the right bull and increasing the level of genetic resistance in the herd.

See also *Genetic\resistance for bTB and Liverfluke Infection – ICBF.*

Deer

If you live in an area of the country, such as Wicklow, where deer are of concern, you can participate in the smart deer project by downloading the app from https://sites.google.com/ucd.ie/smartdeer-ire land/home and contributing to population knowledge locally.You can also liaise with your neighbours, formulating community deer management action plans, and if appropriate, apply for a Section 42 licence from NPWS (Department of Housing, Local Government and Heritage) on 01-888 2000 or at wildlifelicence@housing.gov.ie.

For more information, see www.bovinetb.ie for links to information videos and leaflets.

Sustainable equine farming

Dr Alan M Hurley
Equine specialist,
Teagasc Rural Economy
Development Programme

Grassland and nutrition specialist, John Corbett of Coolmore and the Hickey family who are Sport Horse breeders from Killarney, are actively reducing their impact on the environment while also enhancing biodiversity to create ever more sustainable equine enterprises.

At Coolmore, sustainable farming is at the heart of everything they do, according to John Corbett. Similarly, the Hickey family have a passion for sustainability.

David Hickey runs a progressive Sport Horse breeding business, as well as a beef farm, in partnership with his brother Stephen and his father Frank on 50ac in Killarney, Co Kerry. They have 15 horses and 40 beef cattle.

Biodiversity

The Hickeys have actively improved levels of biodiversity on their farm and create habitats for a diverse range of wildlife species.

"There are owls, bats and numerous bird species. We also have badger setts, which have been there for 50 years, foxes, deer, rabbits and hares as well as nesting birds of prey. We have erected owl boxes, bat and bird boxes around the farmyard as well as in the native woodland. Birdwatch Ireland recently visited our farm to evaluate the owls and other wildlife.

"My dad joined REPS in the 90s and undertook measures including fencing off streams and allowing areas of the farm to grow wild naturally. Native woodland species sown during that period included oak, ash, birch, horse chestnut and sycamore."

At Coolmore, there is also a huge focus on biodiversity, according to John Corbett. "We plant in excess of anything we remove and maintain hedgerows in accordance with guidelines. There are hedgehogs, rabbits, red squirrels and numerous birds on the farm. The high numbers of buzzards in Coolmore indicate they have plenty of prey," he says.

Stephen Hickey with some yearlings.\ Valerie O'Sullivan

Both enterprises advocate the planting and careful management of new hedges by equine farming colleagues containing native Irish species.

"Hedgerows should be managed for biodiversity," adds John Corbett "in particular, avoid cutting during the nesting season."

Pollinators

John Corbett comments: "To support pollinators, we now let many areas of the farm grow wild naturally. In previous years, these areas would have been well cut or sprayed."

A similar approach is implemented by the Hickeys: "Our dad originally established beehives on the farm and now our mother, Noreen, has taken on their management. We leave wildflowers grow and find flowering clover a great source of nectar for the bees."

Under the Agri-Food 2030 strategy, all farms are expected to retain quality habitats. The retention of existing habitats is vital, as they typically deliver greater ecological benefits than with newly created habitats. Consequently, equine farmers should aim to optimise the ecological quality of existing farmland habitats, before establishing new biodiversity or carbon initiatives.

Grassland management

To fulfil a horse's genetic potential, diet and nutrition must be managed to deliver the correct balance of

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Stephen Hickey.
\ Valerie O'Sullivan

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nutrients. Grass is the backbone of all activity at Coolmore and also for breeder David Hickey.

"At Coolmore, we use soil sampling and grass analysis extensively," says John Corbett. "Soil and grass analysis are continually monitored to ensure we are providing the correct nutrients to our horses – there is no guessing. We analyse our grass three times a year. The key to nutrition is to have excellent soil fertility."

"We make sure the soil is balanced in terms of nitrogen (N), phosphorus (P) and potassium (K). Lime is applied based on soil test results. We use the Teagasc Nutrient Management Plan (i.e fertiliser plan) to monitor and track all inputs in all paddocks. The fertility levels of each field are recorded, as well as tracking the quantity and location of all inputs spread. It's real-time farming," says John.

Effective grassland management at Coolmore has resulted in all beef cattle raised on the farm being completely grass-fed, with no concentrates.

"This is beneficial, as it also helps keep our P levels down," says John.

"At Coolmore, permanent multispecies swards predominate. Overseeding is done using three diploid varieties to maintain grass quality. Spot spraying is done to eradicate any weed issues, as we no longer blanket spray."

Alan Hurley (left), Stephen, Frank and David Hickey.\ Valerie O'Sullivan

David Hickey's brother, Stephen, is the grassland manager.

"Our nitrogen input is very low. Any fertiliser or lime inputs are based on results from a soil test and we test our soil every four years.

"We find that smaller paddocks are much easier to maintain and control grass quality. All our grassland consists of permanent multispecies swards.

"We top thistles once a year before they seed and we pull other weeds (e.g ragwort) as they emerge."

Mixed grazing

Both John Corbett, David, Stephen and Frank Hickey advocate mixed horse and cattle grazing to maintain grass quality. Mixed grazing works particularly well for horses, controlling parasites and keeping pastures clean and well grazed.

In 2020, French research confirmed that mixed grazing with cattle reduces strongyle worms in horses. With a few exceptions, gastrointestinal parasites of horses and cattle are host specific.

Thus, infective stages of horse worms ingested by cattle will not develop to adults (and vice versa).

Mixed grazing of horses and cattle leads to more sustainable agro-ecological parasite management strategies on equine farms, as an alternative to repeated chemical treatment, which raises serious resistance issues.

Mixed grazing at Coolmore. \ Coolmore

Water quality

"Water quality is a high priority at Coolmore. All water sources are evaluated regularly including testing of wells and drinkers for bacterial and nutrient contamination," John comments. "Buffer zones are strictly respected when applying organic or chemical fertilisers to prevent nutrients reaching watercourses. We plant hedgerows along waterways to help with this."

Likewise, Stephen Hickey says: "We have one stream running through the farm which is fenced off. We are very conscious of potential run-off issues. Slurry and farmyard manure are only applied when conditions are suitable."

Both enterprises see their manures as valuable sources of N, P and K and apply them using low-emission technologies.

Technology

At Coolmore, near-infrared (NIR) technology is fitted on all tankers and silage harvesters.

"This allows us to measure the key constitutes of slurry (dry matter, nitrogen, ammonium, P and K) and silage (dry matter content, fibre, protein, fat, ash and sugar content) in real time," John says.

"This allows better management of nutrients going into the soil and a reduction in unnecessary inputs."

\ Valerie O'Sullivan

Composting

Coolmore relies on their manure, which is all recycled on the farm and spread as compost. Their ultra-modern composting kills weed seeds and parasites and is of maximum benefit to the grasslands. The scientific consensus is clear – if we do nothing, our planet's natural cycles will be affected forever. Something has to change.

Both John Corbett from Coolmore and David, Stephen and Frank Hickey are showing how the equine industry can farm in an increasingly environmentally sustainable way.

signpost

Manageable steps to lower emissions

Emission reduction goals can be achieved by adopting a combination of feasible changes.

Seamus Kearney, Jonathan Herron, Laurence Shalloo, Marie Flynn and Richard O'Brien
Teagasc Moorepark and Teagasc Kilkenny

Advisor Marie Flynn and Jack Kearney inspect a field where slurry has been applied using LESS. \Mark Moore

Two of the three components of environmental sustainability, biodiversity and water quality, are highly 'relatable'. No farmer would object to greater numbers and diversity of birds, plants and insects on their farms, and I've yet to meet one who wouldn't like our waters to be pristine.

The third leg on the sustainability stool, reducing emissions of greenhouse gases such as carbon dioxide or methane, is a harder problem to grasp.

But while you can't see them, or smell them (you might smell methane, a serious greenhouse gas emitting from ruminants, but usually concentrations are so low it is scarcely detectable by the human nose), farmers are facing the challenge of significantly reducing greenhouse gas (GHG) emissions by 2030.

Farmers ask whether this means a cut in their stock numbers. Evidence shows that relatively straightforward management changes can achieve significant reductions on most farms without changes to stock numbers.

Jack Kearney and his father Larry are Glanbia suppliers and a Signpost farm in Rathcormac, Co Cork, farming 82ha. They were milking 138 cows in 2019, with a total of 203 livestock units (LU) on the farm. The overall farm stocking rate was 2.48 cows/ha.

Management changes made on the farm will deliver a 15% to 20% reduction by 2030. These changes have been modelled through the life cycle assessment model for farm emissions.

"In 2019, we had a 25% replacement rate for the dairy herd and meal feeding was 935kg/meal/cow," says Jack.

"Cows produced 6,422kg/milk/cow, or 515kg/milk solids/cow, which was within the top 10% of the milk suppliers within Glanbia for that year.

"We used 255kg/chemical N/ha and 70% of the chemical N was spread as CAN and the remaining 30% was spread as ordinary urea."

Cows were turned out full-time on the 17 March and were housed full-time on 29 October. Jack spread 50% of his slurry with a trailing shoe and the remainder with a splash plate.

When Jack and Larry carried out their sustainability audit with Bord Bia, the carbon footprint came out at 0.96kg/CO_2/kg/FPCM (fat and protein corrected milk). This compares with an average figure nationally of 0.99kg/CO_2/kg/FPCM.

"Our carbon footprint was slightly lower than the average figure for dairy farmers," adds Jack.

"The next step was to look at how

Table 1: Farm characteristics on Jack/Larry Kearney's farm

Stock	Numbers
Dairy cows	138 cows
Total Livestock Units	203 LU
Farm stocking rate	2.48 LU/ha
Milk production	6.422kg/milk/cow
Kg/Milk solids/cow	515kg/milk solids/cow

Clover is an increasing feature in the farm's paddocks. \ Mark Moore

we could reduce CO_2 emissions by between 15% and 20% by 2025 as part of the Signpost programme."

To do this, the farm was put through the carbon life cycle assessment model to examine different mitigations that Jack and Larry could carry out on the farm. The mitigation options looked at were:

- Moving to 100% protected urea for chemical nitrogen.
- A 25% reduction in N fertiliser application rate by incorporating white clover.
- A 150kg reduction in concentrates fed per cow.
- All slurry applied using low emission slurry spreading (LESS) and spring slurry applications.
- Increasing milk solids from 515kg/cow to 540kg/cow.
- Combination of all scenarios.

1 Move to 100% protected urea

This is the mitigation option that has greatest effect on GHG emissions reductions on the farm.

"We were shown how 100% protected urea could reduce the carbon footprint on the farm from 0.96kg CO_2/kg FPCM (Fat and Protein Corrected Milk) to 0.89kg CO_2/kg FPCM," says Jack. This mitigation option can lead to a 7.3% reduction in GHG emissions for the farm.

"By using 100% protected urea, we will need to use straight phosphorus (P) as protected urea products do not contain phosphorus," says Jack.

Some protected urea products do contain potassium (K), but in some cases, straight potassium (K) may need to be used.

Table 2: Nutrient use characteristics on Jack/Larry Kearney's farm.

Fertiliser	Rates
Total chemical N/ha	255kg/N/ha
CAN	70%
Urea	30%
Slurry trailing shoe	50%
Slurry splash plate	50%

2 A 25% reduction in N fertiliser application rate by incorporating white clover

This mitigation option means Jack and Larry reducing chemical nitrogen from 255kg/N/ha back to 190kg/N/ha, or a 65kg/N/ha reduction in chemical nitrogen use.

This mitigation option would result from improved soil fertility in the form of improved lime, phosphorus (P) and potassium (K) status. Or it could result from a reduction in chemical nitrogen due to the use of clover across the farm.

Soil fertility has to be corrected before clover will establish. The soil fertility or clover option will not happen overnight and will take time and planning on any farm. The reduction in fertiliser use of 25% could lead to a 5.2% reduction in GHG emissions for Jack and Larry's farm.

3 A 150kg reduction in concentrates feed per cow

The third possible mitigation action of reducing meal feeding levels by 0.5kg/cow/day over a 300-day lactation period would lead to a reduction in meal feeding of 150kg/cow.

This would happen in conjunction with improved grassland management and grazing top-quality grass throughout the year to keep the cows adequately fed at all times.

This mitigation option could lead to a 1% reduction in GHG emissions for the farm, a small but significant contribution towards the reduction target.

4 All slurry applied using low emission slurry spreading (LESS) and spring slurry applications

"We were already spreading 50% of our slurry with LESS in 2019," says Jack. By completely switching to LESS and spreading all his slurry in the spring, Jack could reduce the carbon footprint from 0.96kg CO_2/Kg FPCM to 0.94kg CO_2/kg FPCM.

If the Kearneys had been spreading all of their slurry by splash plate, then switched to LESS and all spring spreading of slurry, this would have reduced GHG emissions by as much as 4%, the proviso being that chemical nitrogen use would be reduced in line with the more effective use of slurry.

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5 Increasing milk solids from 515kg/cow to 540kg/cow

Jack and Larry's cows are already in the top 10% in the Glanbia catchment area, but by increasing the milk solids (MS)/cow by 25kg/MS/cow, they could reduce their carbon footprint from 0.96kg CO_2/kg FPCM to 0.94kg CO_2/kg FPCM.

This mitigation option can lead to a 2% reduction in GHG emissions, achieved through a continual improvement in the EBI of the herd. As a result, productivity (MS/cow) increases.

While this mitigation action reduces the carbon footprint per kg of milk, in order to reduce overall or total emissions, cow numbers would need to be reduced slightly (with a lesser number of more productive cows producing the same volume of milk).

In general, for every €10 increase in herd EBI, GHG emissions per cow are reduced by 1%.

6 Combining all scenarios

Some of the mitigation options chosen will have effects on each other. For example, if Jack and Larry reduce chemical nitrogen by 25%, then they will be using less fertiliser and the reduction in GHG emissions from using protected urea will be less than 7.2%. Some other mitigation actions will also affect each other.

When all five scenarios were run through the life cycle assessment model together, they reduced the carbon footprint from 0.96kg CO_2/kg FPCM to 0.81kg CO_2/kg FPCM for the farm. All of the mitigation options together can deliver a 15.6% reduction in GHG emissions for Jack and Larry's farm.

In summary, for Jack and Larry to reduce GHG emissions by 15% by 2025, they will need to implement the following mitigation actions:

- Switch to 100% protected urea.
- Introduce clover swards to reduce chemical nitrogen use.
- Continue to improve grassland management and maintain/reduce concentrates fed.
- Switch to LESS for slurry spreading and spread all slurry by the middle of May.
- Continue to breed better cows using EBI and continue to improve cow productivity.
- Examine other potential improvements on the farm, such as greater energy efficiency, adding forestry where feasible and enhanced management of hedgerows.

Larry Kearney and the herd head home for milking.\ Mark Moore

Figure 1: Kg CO_2 eq/kg FPCM

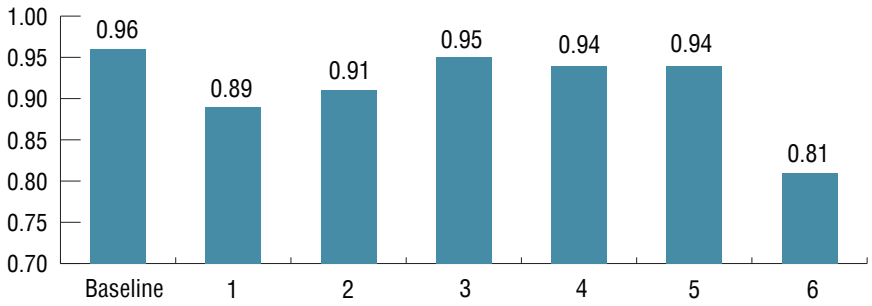

Table 3: Summary of projections for mitigation actions by Jack and Larry Kearney.

Mitigation Action	Percentage reduction in carbon footprint
0% to 100% protected urea	7.3% reduction
Reduction of 25% chemical N	5.2% reduction
150kg/cow reduction in concentrates fed	1.0% reduction
50% to 100% LESS and spring application of slurry	2.0% reduction
5% increase in milk solids/cow	2.0% reduction
Combination of all five scenarios	15.6% reduction

While Table 3 quantifies the percent reduction in carbon footprint for each action, some actions have a crossover effect in the total farm reduction effect.

Monaghan farmers lead the way on organics

Beef and tillage organic enterprises are thriving in the county

Elaine Leavy
Organic Specialist, Teagasc Rural Economy Development Programme

Jane McConnon
Teagasc Drystock Advisor, Monaghan

Shane Filan
Teagasc Drystock Advisor, Monaghan

Tillage is making a comeback in the Drumlins of Monaghan. With only 312 organic tillage farmers in the whole country in 2020, you might not expect to come across fields of wheat, oats and barley in the traditional grassy hills of Patrick Kavanagh's county.

But there are changes in the air and a renewed enthusiasm around the opportunities offered by organic farming. We feature two farmers, one in beef the other in tillage, who tell their organic story from initial conversion through to a new and thriving business.

An organic mixed-crop of beans and wheat in the rolling hills of Co Monaghan.

Sean Greenan

Sean Greenan's farm is located at Cremoyle in the heart of the county. Once a dairy farm, Sean always planned to build a suckler herd. Since 2008, he has established a herd of Stabiliser cows on the 30ha farm and recently reached a 100% pedigree Stabiliser herd.

"I always had an interest in organic farming," says Sean.

"Having seriously considered making the change in 2018, I felt the time was right in 2021. The uncertainty around getting into the Organic Farming Scheme delayed the decision." The farm entered organic conversion in spring of this year. Shane Filan, his Teagasc advisor, assisted with the applications to the Organic Certification Body and the Department of Agriculture Food and Marine (DAFM) Organic Farming Scheme (OFS).

"An organic conversion plan, a farmyard plan and a nutrient plan were all required," says Shane.

"In September, Sean was informed by the DAFM that he had been accepted into the OFS."

Even though the farm has only entered organic conversion in recent months, Sean says the farm was "three-quarters of the way to being organic. We were spreading very little fertiliser in recent years."

Sean says he wanted to farm in a more sustainable way by becoming more self-sufficient and reducing the costly inputs required from outside the farm gate.

The Stabiliser is an ideal breed for an organic system, as it is a composite breed developed by the crossing of Hereford, Red Angus, Simmental and Gelbvieh.

The aim is to harness hybrid vigour and produce a low maintenance suckler cow with easy calving traits, good milk, fertility and temperament.

Sean has a good market established for the pedigree bulls, as they are suited to both beef and dairy herds.

"I've been a member of a local Teagasc beef discussion group for a

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Advisor Shane Filan and Sean Greenan discuss grass covers and Sean's pedigree Stabiliser herd.

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number of years and topics such as incorporating clover into grass, soil fertility and breeding were discussed with farm visits to other group members, including Mark Gillander's organic farmer," says Sean. "I was very interested in what we saw there and it began to get me thinking about farming organically."

Changes made on farm

Sean is a firm believer that you don't learn anything until you do it. This is very evident from what he has achieved with his farming system in this, his first year of conversion.

Based on recent soil results and soil type, he drew up a cropping plan.

"The overall focus is to put a rotation in place that will allow Sean to grow cereals, maintain soil fertility and maximise production, with the inclusion of both red and white clover and multi species leys," says Shane Filan.

Given that one of the aims in organic farming is 'to feed the soil to feed the plant' Sean is acutely aware that soil fertility will need to be monitored to maintain optimum production.

The first step to improving soil fertility has already been carried out, with the application of 2t/ac of lime on over 75% of the farm in the springtime.

With Shane's help, an up-to-date nutrient management plan will be followed on an ongoing basis.

Moving to organics has given Sean the opportunity to establish a successful cereal enterprise alongside his already successful pedigree Stabiliser herd.

"In spring, we sowed 9ac of wheat to provide winter feed for the herd," says Sean.

"Along with a recently established red clover silage sward, this will provide a high-quality diet for the weanlings over the winter.

"I'd estimate the total cost of producing the crop of wheat was €222/ac, as I did a lot of the cultivation work myself. There were challenges in growing the crop. A cold May left initial germination slow, while during the summer, red shank established itself in the crop."

Come harvest time, Sean had to set the combine header a little bit higher than he would have liked to avoid the withering red shank.

However, he was happy with his first grain yield of 1.1t/ac and the crop also yielded 3.5 bales per acre of straw. He says if he were to purchase the same amount of an organic concentrate, it would cost him in the region of €5,000.

"We sowed a red clover silage sward this year in order to produce high-quality, high protein silage and to help build up fertility in the ground for cereal crops to follow," says Sean.

He has laid the groundwork in his first year of conversion to become a productive and profitable organic enterprise and says this has made him "excited about farming again."

Sean Greenan, Shane Filan, Jane McConnon and Mark Gillanders.

In the recently announced budget, there is an increase in the allocation of funding for the Organic Farming Scheme. There is an additional €5m in the scheme budget compared to last year which allows for the reopening of the Organic Farming Scheme to new entrants in 2022.

Further Information

- Teagasc www.teagasc.ie/organics
- Department of Agriculture Food and Marine (DAFM) https://www.gov.ie/en/publication/fc7c8-organic-farming/
- Irish Organic Association www.irishorganicassociation.ie/
- Organic Trust www.organictrust.ie/
- National Organic Training Skillnet (NOTS) www.nots.ie
- Local Enterprise Office (LEO) www.localenterprise.ie/

Mark Gillanders and Teagasc advisor Jane McConnon study a combicrop of wheat and beans.

Mark Gillanders

Mark Gillanders farms in Bellanagall just on the edge of Monaghan town.

"I began looking at organic farming as an option when the costs of concentrate and fertiliser in my high-input bull beef system had become prohibitive," says Mark. After attending local farm demonstrations and walks, I decided that organic farming could be a more profitable system."

There have been significant changes made to the farming system since entering organic conversion in 2009 and Mark continues to develop his farm for productivity and profitability.

Firstly, he built up a suckler herd and brought the progeny to beef. He then began to grow cereals, starting with oats, then experimenting successfully with combicrops (such as wheat and beans) and other cereal crops.

"We were able to do this by implementing organic farming practises such as planning crop rotation, maintaining soil fertility and careful nutrient management practices.

"After experiencing some success with growing cereal crops, we leased extra land and the area devoted to cereals increased."

While doing all this on the farm, he also completed a Masters in Organic Farming in 2019. The three year part-time distance learning course completed at SRUC College Aberdeen was supported by National Organic Training Skillnet (NOTS).

Red clover is a key crop in Mark Gillanders' rotation.

"The course opened my eyes to more than just farming, as it involved a wide range of modules on technical and marketing skills. I also enjoyed the mix of other people on the course."

Mark was also a participant in the Teagasc/DAFM National Organic Demonstration Farm Programme, which involves hosting national and local farm walks.

With his involvement in hosting, participating in meetings, and being a member of the IFA Organic Project team, he crossed paths with Micheál Rafferty, an organic beef and cereal farmer, farming organically since 2015.

Mark and Micheál have since joined forces and have set up an organic mill, milling the organically-grown wheat on their own farms into flour and selling it under their own brand 'Irish Organic Mill Ltd'.

"This all came about as we were both looking for alternative outlets for our organic cereal produce," says Mark.

"Most importantly, we wanted to have full control of the process and add value to our produce."

During the Covid pandemic, a lot of people's became more interested in where their food came from. With more people cooking and baking at home, demand for locally produced ingredients increased.

"We were confident we could grow a quality crop and get it into the shed," says Mark.

"Processing and marketing of the flour was where the challenge lay."

They contacted their Local Enterprise Office (LEO) in Monaghan, which has been invaluable in providing advice, mentoring and funding to them in the setting up of the mill and selling their flour.

In late September 2021, Irish Organic Mill Ltd brought Stoneground Irish Organic Wholemeal and Plain Flour onto the market.

Excitement returning to Donegal tillage

New varieties and outlets are encouraging grain growers in the county

Martin McCullough
Teagasc drystock and tillage advisor, Carndonagh

Growing cereal crops in Ireland can be a challenge at the best of times, but even more so in Donegal given our wetter climate and shorter growing season. The main cereal crops grown in the county are spring and winter barley, winter oats and some winter wheat. A small acreage of spring wheat is also sown, but mainly for wholecropping, as the grain maturity can run too late.

Alternatives such as beans are effectively a non-runner for the same reason. So, apart from oilseed rape and potatoes, our options are limited

Traditionally, Donegal cereal grains are for the animal feed market. Over the last 10 years, apart from exceptional harvests in 2012, 2018 and 2021 (when the green barley grain price was €200/t), an average grain price of €150/t has left a very small margin after machinery and fixed costs, such as hired labour, car, ESB, phone, and insurance.

If these crops were, as in most cases, grown on rented or leased land, it was really a case of minimising losses.

Liam Robb.

Agricare and Boortmalt

However, in the last couple of years, growing malting barley has become a viable option for Donegal growers.

This is due to an initiative led by Jim and Gareth Devenney from Agricare and Crop Specialists based in Newtowncunningham, Co Donegal, who, in conjunction with Boortmalt, planted Prospect spring malting barley in 2018 on a trial basis on a number of local farms.

The quality of barley produced from these trials for both brewing and distilling led to Pixel and Craft winter malting varieties being sown in autumn 2018.

The acreage sown and the number of malting barley growers involved has increased annually since then. For the 2021 harvest, 150ha of Craft winter barley and 300ha of Splendour spring barley resulted in 2,900t of grain reaching Boortmalt's brewing and distilling standards (50% distilling and 50% brewing).

All the grain was tested and collected at the Agricare facility in Newtowncunningham and transported to Boortmalt in Athy within 24 hours of delivery.

The area of winter malting barley sown this autumn has more than doubled, with 315ha of Vessel planted for the 2022 harvest. This is a dual-purpose variety with the potential to reach both the brewing and distilling standard.

"It is rewarding for growers to see all their hard work, from planting to harvest, produce a high-quality end product and this has put some excitement back into growing cereals in Donegal," said Gareth Devenney.

Potential and risk

A testament to the potential for growing malting barley in Donegal is the increase in the area sown and the number of growers involved annually over the last three years.

The financial risks of growing malting barley compared with feed barley are minimal. While the seed cost may be a little higher and yields may be marginally lower, the increased price for grain reaching the brewing or distilling standards more than makes up for the difference.

In 2021, when world and Irish grain prices were high due to adverse weather events across the EU, Russia and Ukraine, the price differential between feed and malting barley was in the region of €30/t.

There is little to no difference between malting and feed barley with


Peter Lynch and Gareth Devenney.

regard to straw yield and income.

In terms of actually growing a crop of malting barley, as opposed to feed barley, the only critical difference is the timing and rate of nitrogen application.

Looking to the future, a successful winter malting variety is vital for Donegal growers to spread the risk, as weather conditions can be challenging for spring crops.

"Malting barley is not going to replace feed barley as the main cereal crop in the country, but it is another crop option for growers to spread the risk on their farms. This is especially so in Donegal, where viable crop options are limited in cereal rotations."

Liam Robb

Liam and his brother Cieran of Drumbuoy farm, Newtowncunningham, are tillage farmers growing mainly spring and winter barley. They have grown spring beans successfully in the past, but lack of demand from local mills due to the small volumes available to them made the venture short-lived.

As part of their crop rotation, they grow some oilseed rape for Donegal Rapeseed Oil Ltd, as well as some fodder beet for supply to local beef and dairy farmers. As alternative crop options are limited in Donegal, Liam sees malting barley as a viable option to spread some of the risk in growing cereal crops.

"The husbandry is much the same and any yield penalty is more than made up for with the price differential between malting and feed barley.

"There is minimal risk in growing malting barley, because if the grain doesn't make the brewing and distilling standards, it goes to the feed market."

Peter Lynch

Peter is primarily a tillage farmer, but also has a beef finishing enterprise on his farm in Garshooey, Newtowncunningham. His rotation includes winter and spring barley, winter wheat, winter oilseed rape and potatoes.

He grew only winter and spring malting barley varieties for the 2021 harvest and sees malting barley as a means of minimising the financial risk of growing cereal crop.

"Malting barley is a viable option to increase the farm gate price for grain and it reduces my exposure to the feed market price.

"It is a no-brainer, because if it doesn't make the brewing and distilling grade, it can go for feed."

Peter has kept 30t of Splendour grain from the 2021 harvest for supply to the Crolly Distillery (Drioglann Chroithlí) for the distillation of their single malt whiskey.

The Crolly Distillery (Drioglann Chroithlí)

This new business venture began distilling whiskey for the first time in 2020, having refurbished the old Crolly Doll factory based in the Gaoth Dobhair area of West Donegal. This is the first whiskey distilled "legally" in the county in 180 years, since William Leatham's Burt Distillery ceased production in 1841 (as seen in the picture, the original chimney tower is still standing).

The Crolly Distillery will produce a single malt whiskey and a single pot still whiskey, which will be matured in ex-bourbon American Oak, Oloroso Spanish Oak, Pedro Ximinez European Oak or ex-Cognac French Oak casks for a minimum of three years before they can be called Irish whiskey.


Burt distillery.

Head distiller Julio Diana states that 35% of the barley used in 2021 was grown in Donegal, but their aim in 2022 is to increase this to 100%.

Kieran Davis, one of the three co-founders of the company, explains: "We are very keen on the provenance of local grain being used for local whiskey and we are very keen to build a working relationship with local growers facilitated by Jim and Gareth Devenney.

"Using Donegal-grown barley for Crolly Whiskey will be an important marketing tool and will also have environmental benefits in reducing our emissions and our carbon footprint."

Leaving a legacy

The many rewards of good forest management

Liam Kelly
Teagasc forestry development officer

Peter Reid is a forest owner near Clane, Co Kildare, who has developed a beautiful oak forest for himself and future generations to enjoy.

"A lot of hard but rewarding work has gone into the site to get it to where it is today," says Peter. "I want to leave something of real value to the next generation and beyond."

In Ireland, there are almost 23,500 individual forest owners like Peter. The vast majority have planted trees over the last 25 years or so. At present, the private forest sector comprises over 268,000ha of grant-aided forest. Broadleaves account for 29% of the area (DAFM, 2021).

Land owners plant their land for a variety of reasons. These objectives may include timber production, water quality and biodiversity enhancement, carbon sequestration, improved work-life balance or efficient use of out-farms.

In recent years, there has been increased interest regarding the planting of native and high nature woodlands and the adoption of 'close to nature' management.

High density start

In commercial forestry, trees are planted at high stocking rates, e.g 2,500 young trees per hectare in the case of conifers. With broadleaves, the number varies for different species, but ranges from 3,300 – 6,000 trees per hectare.

The aim, especially with broadleaves, is to induce competition among trees to encourage straight growth, facilitate lighter branching, natural pruning and to allow a better choice of quality trees when thinning.

At maturity in commercial broadleaf forests, the final crop may have just 150 to 200 crop trees per hectare, the other trees having been removed through thinning.

Thinning begins once the trees reach a height of 8-10m. Thinning is done regularly, every few years, once the canopy closes in again. Thinning allows more growing space for the better quality trees to develop. The result is a harvest of large diameter sawlog material suitable for high end uses.

Peter Reid.

The initial thinnings produce a lower-quality wood supply, which is terrific as fuelwood and also facilitates good broadleaf management.

As an advisor, it is heart-warming to come across a site that has been thinned appropriately and to see first hand how the crop has responded so well to the thinning intervention.

Decision to plant

In 1999, Peter and his late mother decided to plant some of their land. Peter said: "We were farming approximately 40ha (100ac), mainly in sheep and some tillage. Some of our ground was heavy and we were disillusioned with the returns from farming. We wanted to try something different on a proportion of our land."

In March 2000, they planted approximately half their farm, converting 19.2ha (48ac) into forestry. They planted 15.2ha of Norway spruce,

along with Ash (1ha) and Oak (3ha).

Peter has taken a strong interest in his forest since it was established. He was an active member of the the Kildare Forest Owner Group and sees his forestry as being very much part of his farm business. There is a planned pathway system through the forest, which facilitates recreational walking. Family, friends and canine colleagues regularly enjoy and appreciate this amenity.

The Norway spruce has grown very well and is now due a first thinning. Peter and his colleagues have the plot well laid out, with numerous inspection paths that assist access, monitoring and measuring of the crop. First thinning will be carried out as soon as the felling licence comes through.

The oak

The oak plot, which consists of 3ha is Peter's pride and joy – it is one of the best and finest broadleaf plots that I have ever come across. The oak was planted with a nurse species (European larch in every alternate line) with a stocking of 3,330 oak plus 1,250 larch per ha.

Nurse trees are fast-growing trees which provide shelter to smaller trees and plants as they grow. The larch helped stimulate the growth of the oak in the initial years and reduced the cost of establishment compared with planting pure oak. However, care has to be taken that the nurse species doesn't smother the oak.

One notable oak tree.

I visited this site for the first time in 2012. At that stage, the larch was beginning to compete with the oak. However, when I visited the site earlier this summer, I could not believe how well the oak had performed. The straightness and vigour of many of the oak stems was a joy to behold.

The oak had really benefited from the two thinning interventions it had received in recent years. In late 2015, the larch lines were completely removed by commercial machinery and sold for pulpwood.

A second thinning was carried out by Peter and his colleagues in 2017, when the oak stocking was reduced to approximately 1,100 stems per ha.

The top height of the oak is now approximately 12-14m. The inferior and competing oak trees were removed in this thinning to provide more growing space for the better-quality stems. Each of the remaining trees was also pruned up to at least a third of their height, which greatly adds to the beauty of the forest.

All the felled trees were cut into 2m lengths and stacked in the woodland. Keeping all of the logs up off the ground is important to facilitate drying. The logs are stacked in the woodland for six to eight months before the complete stack is brought into the farmyard by tractor and buckrake.

The logs are then cut up with a chainsaw and split, and are allowed to season for another few months in an open shed for further drying. The firewood is used to provide heating for Peter and his brother's house.

Peter is currently waiting for a licence to carry out a further thinning next year. The Norway spruce will be mechanically thinned by a mechanical harvester. The oak will be thinned again and will supplement the firewood supply for Peter's own use while also benefitting the crop.

Peter's strong interest in his forest and its active management is clearly yielding rich dividends.

Pots of glorious winter colour

The ingredients are simple but the effect can be impressive. Choose plants for colour and texture and they'll see you through until late spring

Chris Heavey
Lecturer at the Teagasc College at the National Botanic Gardens

Double flowered Helleborus in combination with ferns.

The colour pallet is up to you but the colour red tends to get "old" the minute the new year's bells toll. Consider purples and magenta teamed with lighter green foliage, which will last for weeks and weeks. Plant choices are easy because there are only a few to choose from and that takes the stress out of it.

Cyclamen is great for longevity, provided you deadhead. Deadheading is simple and it really encourages continuous flowering. Take out the faded flower right down to the base of the plant, taking off the faded bloom at the top. The stem can look unsightly so take the whole stem out.

Cyclamen are particular about your watering technique, preferring to be watered at the base, underneath the leaves, rather than from overhead. If you give them what they need they will repay you with continuous flowering until late spring.

I'm a big fan of using ferns in planters together with Cyclamen. Ferns provide a great backdrop to show off the colour of the flowers. Hellebores are also great companions as they can flower from late winter until late spring. Viola are a great filler plant and really get going in April, but plant them now so they can fill out.

Heathers are also a good choice but remember to use ericaceous compost and if you are living in an area where the water is limey use rain water instead of tap water and the heathers will be much happier.

Cyclamen in a winter interest pot.

Boost

Most composts have a three- to six-month feed and that's perfectly fine for overwintering plants. You can add a slow-release fertiliser to give the planter a boost as we come into April.

If you want to acknowledge the transition into spring then just plant in some early flowering narcissus to add more interest. Choose the smaller flowering varieties that won't overpower the display.

Smaller varieties of tulip, keeping the height to no more than 30cm, will also give added interest to a planting display. If you really want to get fancy, and provided the pots are large enough, you could use a half standard lollipop Taxus or Ligustrum and under plant with the Cyclamen, ferns and Hellebore.

Having a bit of height in a large planter can be hugely impressive and allows you to experiment with different plant combinations.

Keeping everything in a pot, healthy and pest free, can be a bit tricky but vigilance and keeping up with the watering will go a long way to keeping it all looking beautiful.

Narcissus 'Tete a Tete' or 'New Baby', Tulipa 'Fringed Fancy' or 'Sundance' and Crocus 'Ruby Giant' or 'Jeanne d'Arc' are ideal for a pot. A little drainage in the form of horticultural sand or grit will help. Plant at least three times the depth of the bulb.

Get the planters organised early as the colour choices get quite limited as we get the closer to December. You know what they say: "When they're gone they're gone."

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