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Today's Farm

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Cover | Despite COVID-19, the grass will still grow. Michéal Kelly, who farms close to Slievenamon says that the number of grazings per paddock (he's aiming for 10 in 2021) is crucial to getting the most from grass. Michéal will 'eyeball' his paddocks to determine covers but regularly cuts and weighs grass to 'keep his eye in'.

COMMENT

Mark Moore
Editor,
Today's Farm

An ill wind that might blow some good

Since this time last year, when COVID-19 made its unwelcome appearance, we've been bombarded with information on vaccines and viruses. We are all even more aware than usual of the constant battle between infectious organisms and their targets, be they human or animal. Soon, a wave of newborn calves and lambs will arrive and face their individual battles with viruses and bacteria. In this edition, we offer some advice on how to tip the balance in their favour.

Is olc an ghaoth nach séideann maitheas éigin

Ón am seo anuraidh nuair a tháinig an diabhal COVID-19 ar an bhfód tá muid plúchta le heolas agus faisnéis maidir le vacsaíní agus víris. Tá muid ar fad níos feasaí anois ar an gcath atá ag leanúint ar aghaidh gan stad gan staonadh idir orgánaigh thógálacha agus na daoine agus na hainmhithe a bhíonn á n-ionsaí acu. Is gearr go dtiocfaidh glúin nua laonna agus uan ar an saol agus beidh orthu troid ar a son féin in aghaidh víris agus baictéir de gach sórt. San eagrán seo, tugaimid roinnt comhairle ar na bealaí ar féidir a chinntiú go mbeidh cóir na gaoithe leo.

events

TILLAGE MONTH

'Tillage Month' (https://www.teagasc.ie/tillagemonth/) runs from mid-January to mid-February and includes:

Spring tillage seminars webinars

Tuesday 19 January 2021

- Event time: 11.30am.
- Venue: online.

A live interactive webinar with Teagasc tillage specialists and advisors who will cover the following:

- Spring cereal varieties: variety selection and availability.
- Carbon incorporation scheme: existing farmer experience and research.
- GLAS and biodiversity on tillage farms: farmer experience and look forward to new schemes.

There will be a variety of contributors sharing their expertise and experience including tillage specialists, advisors and farmers from their farms across the country. Attendees will be able to ask questions and interact with the contributors each day.

21 January 2021

- Event time: 11.30am.
- Venue: online.

A live interactive webinar with Teagasc tillage specialists and advisors who will cover topics such as:

- Brexit: impact for the tillage industry.
- Optimising the use of organic manures.
- Beans – grower experiences

There will be a variety of contributors sharing their expertise and experience including tillage specialists, advisors and farmers from their farms across the country. Attendees will be able to ask questions and interact with the contributors.

National Tillage Conference

The 2021 National Tillage Conference also takes place virtually, split over two days.

- **Session one: Wednesday 3 February**

The first session will provide an insight into the strategic research which Teagasc is completing in oats agronomy, BYDV diagnostics, generating high-value breeding material, the potential of rye and beans agronomy.

- **Session two: Wednesday 17 February**

Session two will deal with more immediate issues, detailing the continuous need for integrated pest management approaches to mitigate against the problem of grassweeds and STB of winter wheat while also discussing the impact of results from the ongoing Teagasc systems trial.

COLLEGE OPEN DAYS

A series of open days are planned as follows. Due to COVID-19 restrictions, etc, please confirm closer to the dates.

Open day date/time	College
Wednesday 3 March 2021 Tours start at 9.30am, 10.30am & 11.30am	Mountbellew Agricultural College, Mountbellew, Co Galway, H53 WE00 Phone: 0909 679205 Email: bernie@mountbellewagri.com
Friday 5 March 2021 10am to 1pm Tours ongoing	Teagasc, Ballyhaise Agricultural College, Ballyhaise, Co Cavan, H12 E393 Phone: 049 4338108 Email: ballyhaise.college@teagasc.ie
Friday 5 March 2021 Tours start at 11am and 12pm	Teagasc, Clonakilty Agricultural College, Darrara, Clonakilty, Co Cork, P85 EK80 Phone: 023 8832500 Email: clonakilty.college@teagasc.ie
Friday 5 March 2021 Tours start at 10am and 11am	Teagasc, Kildalton College, Piltown, Co Kilkenny, E32 YW08 Phone: 051 644400 Email: reception@kildaltoncollege.ie
Wednesday 10 March 2021 10.30am to 12.30pm Tours ongoing	Gurteen College, Ballingarry, Roscrea, Co Tipperary, E53 TP93 Phone: 067 21282 Email: info@gurteencollege.ie
Thursday 11 March 2021 12 noon to 3pm Tours ongoing	Teagasc, College of Amenity Horticulture, National Botanic Gardens, Glasnevin, Dublin 9, D09 YV29 Phone: 01 8040201 Email: botanic.college@teagasc.ie
Thursday (to be confirmed) 11 March 2021 10.30am to 12.30pm 10.30am to 12.30pm	Salesian Agricultural College, Pallaskenry, Co Limerick, V94 V8N3 Phone: 061 393100 Email: info@pallaskenry.com

CALFCARE EVENTS

Calfcare Virtual Week will run from 18 to 21 January and will cover all aspects of calf care from being prepared in advance right through to weaning.

If you want to see what is happening during Calfcare Virtual Week go to www.teagasc.ie/news--events/national-events/events/calfcare-calvingseason (see also article on p6-7).

SIGNPOST SERIES WEBINAR: ORGANIC FARMING

What steps are involved if a person is considering converting their farming enterprise to an organic system. A look at organic production and opportunities in Ireland.

- **9.30am, 22 January**

FORESTRY

The Teagasc Forestry Development Department will run a series of workshops on forest establishment on the Zoom platform from 15 to 26 February. These workshops are made up of several modules, with each module focusing on a specific topic. These virtual forestry workshops will be hosted by each of the Teagasc forestry advisors.

All courses are free but pre-registration will be required. All interested landowners are welcome. This is an ideal opportunity to receive first hand independent information on forest establishment.

For further details, please check www.teagasc.ie/forestry or contact your local Teagasc forestry advisor.

SOCIAL MEDIA TAKEOVER

There will be a social media takeover on spring grassland management and grazing and fertiliser plans on John Ryan's farm in Co Tipperary.

- Venue: Social media.
- All day on Tuesday 22 January.

SHEEP

2021 Virtual Sheep Conference

Conducted by webinars on two nights

Tuesday 26 January

- Nicola Fetherstone, Teagasc, INZAC study, on comparing Irish and New Zealand genetics
- Paul Kenyon on New Zealand guidelines for growing lambs to target live weights on herbage.

Thursday 28 January

- Aine O'Brien, Teagasc, on mothering ability and viability.
- Ben Strugnell, veterinary consultant from the UK on laryngeal chondritis, known as "Texel Throat".
- Both webinars start at 8.pm and will run for 40 minutes plus 20 minutes for audience questions.

Details on how to view these virtual events will be advertised on www.Teagasc.ie closer to the event.

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Cleanliness key to calfcare

It's vital that the utensils and containers used to feed colostrum are free of contamination

Stuart Childs
Dairy Specialist,
Teagasc Animal and Grassland Research and Innovation Programme

Picture the scene, you enter a restaurant (COVID-19 restrictions allowing…) sit comfortably and order your favourite dish from the menu. The staff of the restaurant start to prepare the table for your meal and suddenly you realise that cutlery and glasses are far from sparkling. There's a layer of scum on everything.

What do you do? Make up some excuse and get up and leave or take a chance and eat what you ordered anyway and hope that it won't end badly?

Now, imagine you are a newborn calf. Assuming the colostrum is good enough to be fed, how is it going to be delivered? The majority of the farms in a 2017 study by John Barry, Teagasc Moorepark (see page 7) were fed with a bottle and teat, a bucket and teat or stomach-tubed. But what were the hygiene practices related to these feeding utensils?

The study carried out swab sampling of feeding utensils and found that the cleanliness of calf feeding equipment could have definitely been improved, particularly during the second half of the calving season when people start to take the foot off the pedal following the very busy first six-week period.

Other studies have found that poor hygiene practices for feeding equipment can result in bacterial contamination of colostrum, and numerous studies have reported a negative association between colostrum bacterial content and the transfer of immunity to the newborn calf.

The 2017 study found that stomach tubes and the bottles and teats being used to feed colostrum were among some of the dirtiest equipment on the farm. This means that all the effort of trying to deliver on the colostrum 1-2-3 protocol was possibly being undone by poor hygiene.

Improved levels of hygiene around feeding equipment can reduce the risk of bacterial contamination of colostrum, and further increase the rate of passive immunity achieved on commercial dairy farms which would subsequently improve calf health and reduce the workload associated with sick calves.

Therefore, it is clear that all feeding equipment must be kept clean. It should, at a minimum, be rinsed after every feeding period and should be fully washed and disinfected with hot water and detergent regularly. This should be done at least once a week and preferably more often. Bottles and stomach tubes being used to give the first feed of colostrum should be cleaned after every use.

Good cleaning practices will prevent the buildup of milk scum (a biofilm) which will contaminate the fresh milk or milk replacer every time it is being fed. Essentially, this scum is "feeding" harmful bacteria directly into the stomach of the calf. Eliminating this can only be a positive for calf health on your farm.

How to wash calf feeding utensils

- Rinse (be careful not to use water that is too hot for the first rinse).
- Soak in hot water (55°C) and use a liquid detergent.
- Scrub.
- Wash with 50°C water.
- Rinse (consider including a sanitiser).
- Leave to dry.

Clearly, you need significant volumes of hot water to follow the protocol. Therefore, if you are currently short of hot water, you need to do something about this in advance of calving 2021.

A procedure should be put in place for washing calf feeding equipment and this should be clearly described and visible, perhaps on laminated sheets on notice boards or walls, so that whoever is washing the utensils can see exactly what is expected.

While this is another job on top of an ever growing list of jobs during the very busy calving season, it has the potential to save you time in the long run, time that you will have no choice about as sick calves will have to be treated.

Calfcare events

Normally, there would a significant number of Calfcare events throughout the country in conjunction with Animal Health Ireland. However, like so many other events, this is moving online for 2021 due to the ongoing COVID-19 issue.

Calfcare Virtual Week will run from 18 to 21 January and will cover all aspects of calfcare from being prepared in advance right through to weaning. If you want to see what is happening during Calfcare virtual week go to www.teagasc.ie/news--events/national-events/events/calfcare-calvingseason.php

Calf feeding hygiene

Unlike in humans where placental transfer occurs, conveying immunity to a newborn baby, calves are born completely naïve and are very vulnerable to infection. They must get their protection against infection from colostrum.

So, when a newborn calf hits the ground, a race begins between bacteria in the calving environment and colostrum. These are in direct competition with one another for the absorption sites along the lining of the calf's stomach. The 1-2-3 rule of colostrum management was developed to try to ensure that colostrum wins the race to fill all the absorption sites along the intestinal lining and therefore preventing bacteria from getting into the bloodstream. If bacteria win this race, the potential for illness in the calf increases significantly.

A study by conducted by John Barry in 2017 examined practices at calving such as timing of colostrum feeding, colostrum quality and feeding equipment cleaning practices among other aspects on 47 commercial dairy farms across the country.

The study found that colostrum quality in Irish dairy herds is generally good. However, significant variation exists. This variation and the issues associated with it could be overcome by assessing colostrum quality, a practice currently conducted on only approximately 15% of Irish dairy farms.

This involves the purchase of a relatively cheap refractometer (€25 to €30) which can be used to assess colostrum quality on farm and allow for informed decisions around whether or not the colostrum being tested is appropriate for that ever so crucial first feed.

Making a success of contract

Gordon Peppard
Collaborative Farming Specialist, Rural Economy Development Programme

Contract heifer rearing involves the movement of the replacement heifers from the owner's farm to another farm for rearing under a contract agreement. Individual agreements can differ greatly.

How does the dairy farmer benefit?

- **Increased milk production and profitability:** Where heifers were previously reared on the milking platform, this land can now carry more milking cows.
- **Additional land, labour and facilities:** The contract rearer is, in effect, providing additional labour to the dairy farmer. Animal housing, slurry storage and silage holding facilities are also provided on the contract rearer's farm, reducing the need for capital investment.
- **Ease of management:** With only one group of animals (dairy cows) to be managed on the dairy farm greater efficiency is possible.

What are the advantages for the contract rearer?

- **Cashflow and income:** having an agreed fee per head per day gives the contract rearer a guaranteed monthly income and independence from an uncertain beef price. They can make plans and commitments based on a stable monthly cashflow.
- **No investment in stock:** The need for stock loans and the risk of paying high prices to purchase livestock are eliminated. Rearing agreements can include the rearer keeping a certain level of stock of his/her own.
- **Potential to be more profitable:** In an efficiently run contract-heifer rearing enterprise, where grass and silage management are very good, healthy profits are possible.

What's involved in a contract heifer rearing agreement?

There should be a written legal agreement between a heifer owner (dairy farmer) and the contract heifer rearer. The agreement should be signed and dated by both parties and witnessed.

The basic details that must be included in an agreement are:

First schedule

- Date the heifers will be moved to and from each farm.
- Fee agreed and payment process.
- Details of the land to be used by the contract rearer.
- Breeding procedure, methods involved, who's responsible for each action such as synchronisation, heat detection, ordering of AI straw, calling the AI service technician, etc, and the number of weeks that breeding is to be carried out.
- Bonus/penalty clauses if applicable.
- Arbitrator, should a dispute arise.

Second schedule:

- List and tag numbers of all heifers.
- Vaccination protocol and who is responsible for supplying and administrating.
- Weighing schedule and targets.

What are the costs involved?

Each contract heifer rearing agreement will be different; therefore the fee per head per day will vary.

The highest cost periods for the contract rearer will be during calf rearing and winter housing periods. Some of the main questions are:

What age are the calves moved to the contract rearer at? Fourteen days old versus weaned calves?

When will they return to the dairy farm? Before or after the second winter? Who will pay for the veterinary (vaccination, dosing, TB test, etc,) and breeding costs?

What happens if there is an outbreak of TB?

This is a very common question in contract heifer rearing scenarios.

- **Reduce the risk:** Ideally, contract rearers would only take in heifers from one source farm. Assess the TB history of the farm to ascertain if there is a higher risk of a repeat breakdown.
- **Follow the recommended protocols:** Ensure good fencing exists between neighbours to avoid nose-to-nose contact. An excellent bio-security protocol in both herds is essential. Feed animals in raised troughs, not along the ground. Fence off badger sets and and ensure farm buildings are badger-proof.
- **Have a plan should a TB outbreak occur:** Ideally the contract rearing farm should have facilities to manage calving, feeding and milking of the replacement heifers in the event of a TB outbreak.

Where there is a concern about animal welfare, prior permission from DAFM should be sought to move animals under licence.

Further information on TB management in contract heifer rearing herds can be viewed at: https://www.agriculture.gov.ie/animalhealthwelfare/diseasecontrol/bovinetb/

DAVID GUIRY: CONTRACT

Farming outside Fethard, Co Tipperary, David Guiry combines his contract heifer rearing enterprise with his full time role as an area sales manager with Farm Relief Services, Cahir.

David is contract rearing heifers for a number of different dairy farmers. "Each dairy farmer's heifers stay together and don't mix with other stock," says David. "This allows each group of heifers to be managed to the owner's requirements and helps reduce the health risks."

Most of the heifer calves arrive on David's farm at two to three weeks of age. They are reared on milk replacer, meal and forage up to weaning. Following their first season at grass, supplemented with concentrates, they are housed on good quality, meals and minerals for their first winter.

The yearling heifers are turned out to grass early in the spring for their second grazing season to maximise their gain from grass and shorten the expensive winter housing period.

Most of the heifers leave the farm around the beginning of November to return to their parent farm well in advance of the calving season. "We house heifers for one farmer for the second winter and these return to their home farm around 1 January a couple of weeks prior to calving down," adds David.

heifer rearing

REARER'S VIEW

What are the costs involved?

In most situations David is providing the land, labour, facilities, silage, straw, meal and management while the heifer owner is covering the cost of the milk replacer, some meals, veterinary and breeding inputs.

"As the calf rearing and wintering housing periods are the most expensive stages, the cost of each stage is worked out for each farmer and averaged out over the full rearing period so that there is a flat daily fee for every day that the heifers are on the farm," says David.

"Terms and conditions and the inputs supplied vary from one arrangement to the next, so for each agreement we sit down and thrash out targets for performance, mortality, etc."

The fee must allow the dairy farmer to get a well-reared, in-calf heifer in good condition returned to his/her farm, at a cost that provides a worthwhile margin for David.

"Owners should be welcome to call and check on their heifers at any time," says David. "This allows clients to see that the weights are being achieved; the body condition of their heifers; the quality of the grass in front of them and the general management of their stock. This all helps develop a good strong relationship.

"Each member of the agreement must accept that things may change and things will occasionally go wrong. It is during these times that you need to be able to have an open and honest discussion to come up with a plan to rectify issues as they arise."

Key messages

For contract heifer rearing to be a success a level of trust, honesty and flexibility must exist between both parties. Nonetheless a written agreement is essential so that all parties are in no doubt as to their responsibilities.

For further information on contract heifer rearing, contact your local Teagasc advisor.

A booklet on guidelines for contract rearing of replacement heifers can also be viewed on the Teagasc website.

Designing a sheep handling unit?

Edward Egan, who wrote the Teagasc book "A Guide to Designing a Sheep Handling Unit", outlines 12 key areas to be considered when building a sheep handling unit

Semi-circular forcing pen with three backing gates.

Edward Egan
Teagasc Navan, Meath

Behaviour

Bear in mind five basic behaviours to make handling sheep easier:

Vision – Locate see-through penning so sheep can see each other or escape routes that draw them forward. Use non-see-through penning to avoid distractions.

Flocking – Sheep want to be together.

Following – Sheep are followers, so avoid stalling points.

Flight – Using the flight behaviour requires a clear escape route. That's why entrance and exit gates of the race should be see-through.

Learning – Handlers often find difficulties moving sheep through a new unit during the early attempts. Sheep will learn a route through a handling unit after three to five goes.

Location

The location must:

- Be convenient for the handler.
- Be easy to walk sheep to.
- Have vehicle access.
- Prevent pollution.
- Have water and electricity.

The two locations most often considered are:

- The farmyard beside the sheep shed. This makes vaccination, footbathing and condition scoring easier and allows sheds, yards etc to act as collecting pens.
- Central to the main grazing area. This minimises the walking distance for sheep.

Collecting pen

Allow at least enough capacity for regularly collected groups – 0.5m²/lowland ewes without lambs and 0.65m²/lowland ewe with lambs. Adjoining paddocks, sheds or roadways can act as holding pens for larger groups.

Collecting pen shape and width

Long, narrow, rectangular-shaped pens make it easier for one person to drive sheep forward. The ideal width is 3-4.6m. Any wider and sheep will retreat past the handler.

Collecting pen gates

Entrance and exit gates should be the same width as the collecting pen, so sheep don't have corners to run into. Pens should be interconnected with gates. This allows different batches of sheep to be recirculated within the unit.

Forcing pen

Its job is to let a steady flow of sheep into the race. Ideally, the forcing pen will be in line with the collecting pen. Avoid 90-degree turns from the collecting pens into the forcing pen. It should hold about 20% of the collected flock, 0.35m²/lowland ewes without lambs.

Forcing pen shape

Three options most often considered:

- **Funnel-shaped** – Cheap and easy to build. Entry angle to the race should be 30 degrees.
- **Circular forcing pen** – More expensive. Two backing gates keep sheep pushed up. A 3.6m diameter pen holds 30 ewes.
- **Semi-circular forcing pen** – Cheaper to build and easier to drive sheep into. Use three backing gates.

Drafting race

The drafting race is central to many jobs. It can be set-up to sort two, three or four ways. Most one person units prefer simple two-way sorting. Sheep can go through again for further sorting.

Drafting race location

Ideally, locate the race toward the centre of the unit. This allows drafting both left and right. Never locate it against a wall. This limits drafting to one side or to the end of the race.

Drafting race size

Should be 0.35m²/lowland ewe with-

out lambs. A 6.1m x 0.5m race holds eight unshorn ewes. Sides should be 850mm high when handling from outside the race. Having it over 850mm makes it harder to reach sheep when their heads are down. The race should be at least 6.1m long. A longer race reduces the refilling time and allows more time to assess sheep coming towards you.

Race floor
The floor of the race should be concrete. The concrete should extend at least 600mm beyond the sides of the race. This gives the handler a firm and level walkway.

Sorting gate
Locate the sorting gate at least 5m from the race entrance. Gates along the race side should be 1.2m long for easy exit and should be non-see through to reduce stalling. Sorting gates at the end of a race should be see-through to draw sheep forward.

Drafting gate handle
Handles should be at least 120mm long for a full hand grip. Handles should be 150mm back from the front of the gate and at elbow height. A plastic cover avoids handling metal during cold weather and reduces vibrations.

Footbath
A well designed footbath is key to lameness control. It must be easy to use. A permanent footbath encourages regular use. A tap close by makes filling and cleaning easier. Allow tractor and tanker access for empting and filling.

Footbath size
Bath size should be based on intervals of 250l, as most treatment products come in 25kg bags. It should hold at least the same number of sheep as the race/housing pens. Allow 0.4m²/lowland ewe.

Footbath depth
Many baths are not deep enough. The minimum solution starting depth is 5cm. Some start with a depth of 7.5cm.

Footbath location
Footbaths located in the race become soiled and size is restricted. A standalone footbath is preferred by most. They can be made bigger, allowing longer stand-in times.

Footbath shape
The ideal shape is a long and rectangular bath 1.5-3m wide. Locate it to prevent pollution. It must never flood and it must never be in the way. The after treatment standing area should hold at least four times the number of sheep as the footbath. A concrete floor is ideal.

Dip tub
Always locate and build it to prevent pollution. Dig a trial pit to check ground water. Tubs must not have a drain hole. Use manufactured one-piece units. Two options to get sheep into the tub are:
- **Side entry from race with a slide:** Popular with frequent dippers and larger flocks as less labour intensive.
- **Lifting sheep into the tub**: Popular with flocks of less than 100 ewes, or if dipping is infrequent. It's labour intensive.

Dip tub size
- 1,050-1,250l suits flocks of 100-250 ewes.
- 1,818-2,000l suits flocks of 250-500 ewes.

Dip tub cover
Unsupervised dip tubs must be covered with a locked childproof cover. Galvanised steel covers are ideal.

They last longer and are less slippy compared to timber.

Draining pen and filter
The draining pen's job is to collect and drain all dip back to the tub. Allow 0.5m²/lowland ewe in it. It should have a concrete floor sloped 1:30. A pulley-operated gate keeps handlers away from wet sheep. Draining pens should have a collection channel to divert dip back to the tub via a filter.

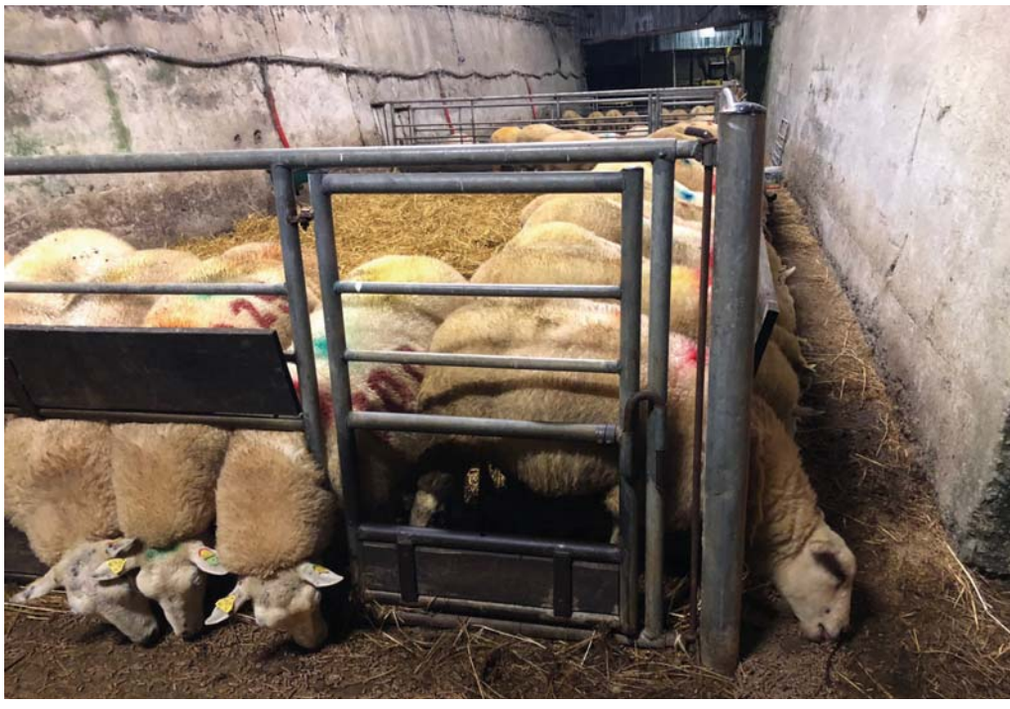
Handler gates
Handler gates are important for handler safety. Locate them along the pathway the handler takes through the unit. They avoid climbing and lifting over penning. Handler gates should be 500-550mm wide.

Dosing line
Dosing packs should be hung from a dosing line 1.85m above floor level. This makes dosing quicker and easier, as the handler is freed from carrying the pack and gun.

Pulleys
The use of pulleys and counterweights reduces the amount of walking and lifting the handler has to do when opening gates. Enclose counterweights so they do not come into contact with the handler or sheep.

Top 10 tips for an easier lambing season

Michael Gottstein
Head of Sheep KT Programme, Teagasc Animal and Grassland Research and Innovation Programme



Lambing time is the busiest time of year on sheep farms. Research has shown that a quarter of the annual workload occurs at lambing time. Some simple management tasks can greatly improve lamb survival and reduce your workload.

1 Prevent ewes getting thin: Monitor ewe body condition and adjust feeding levels for sheep that are losing or gaining too much body condition.

2 Minimise stress and prolapse: Provide adequate feeding space so that all ewes can eat concentrates at the same time. For most farms, this will require 500-600mm per ewe to ensure that shy feeders get equal access to feed. When calculating trough space, ensure that you only calculate available space – deduct 600mm at corners where the sheep are feeding at right angles.

3 Reduce lambing difficulty: Adjust late pregnancy feeding according to litter size and lambing date. This will reduce the number of excessively small lambs (resulting in higher mortality) or excessively large lambs (greater lambing difficulty). Target birth weights are: singles (6kg), twins (5kg) and triplets (4kg).

4 Boost colostrum quantity and quality: Feed pregnant ewes 100g of soya per day per lamb carried for the last two weeks of gestation.

5 Reduce lameness: In non-slatted winter accommodation, use adequate bedding to keep the lying area clean and dry. Apply ground or hydrated lime where the sheep stand and feed twice weekly before applying fresh straw bedding.

6 Prepare for lambing: Have stocks of all the products you need at least a week before the ewes start lambing. Gloves, lubricant, iodine for navels, antibiotics (subject to vet advice), syringes, needles, glucose, colostrum, lamb milk, bottles, teats, stomach tubes, marking spray, Calcium injection, thermometer, jugs, whisks, water/feed containers, disinfectant for lambing pens etc.

Log onto http://www.sheepnet.network/ for other useful tips and tricks.

7 Have adequate lambing pens: Have at least one lambing pen available for every 10 ewes due to lamb. This will allow ewes and newborn lambs to be held inside for longer periods, particularly during adverse weather.

8 Bedding and disinfecting pens: Use adequate bedding in lambing pens and clean and disinfect lambing pens after each occupancy to reduce the disease challenge to newborn lambs. You will require approximately four 4x4 round bales of straw per 100 ewes for bedding.

9 Adequate colostrum: Ensure that all lambs receive adequate colostrum in the first six hours of life. Colostrum provides newborn lambs with nutrition, but also antibodies to fend off disease. Every lamb should receive 50ml/kg birth weight of ewe's colostrum. If using artificial colostrum or cows' colostrum, always include some colostrum from ewes.

For example, if a ewe with triplets only has 300ml of colostrum, then each of her three lambs should receive 100ml of ewe colostrum and the deficit should be made up of either colostrum substitute or cows' colostrum where there is no alternative source of ewe colostrum available.

10 Establish a strong mother/offspring bond: When lambing indoors, it is essential that the ewe and her lambs are given time alone to bond. Aim for a minimum residency period of 24 hours in the individual lambing pen for each ewe/lamb combination. Ideally, this should be followed by a few days in a group pen, or a small sheltered paddock with some other ewes and their lambs.

James Mullane and Michéal Kelly.

Top management in Tipp

Using PastureBase Ireland (PBI) to maximise grassland management in the premier county

Mícheál O'Leary
Teagasc Animal and Grassland Research and Innovation Programme

James Mullane
Teagasc dairy advisor, Clonmel

In 2017, dairy farmer Michéal Kelly had a health scare that changed how he looked at and managed his farm. "I was diagnosed with Hodgkin's lymphoma, cancer in my lymphatic system. From May to December 2017, I went through chemotherapy and radiotherapy. So how did this help me? It made me take a step back and see how I could manage my farm and my grass more efficiently and effectively.

"I have a really good friend who walked my farm every Monday and did my weekly grass measurements. Some days I was able to go with him; other days I was laid up due to the after effects of the chemotherapy. There were days in the hospital when I would log into Glanbia Connect and PBI, and I knew exactly what was going on and could make decisions. This gave me confidence and control over my grass management."

Michéal farms three miles from Clonmel in the townland of Ballyvaughan. Tipperary's iconic Slievenamon forms the backdrop for the farm. On a 40ha milking platform he milks 115 cows. Dairy replacements are reared on a newly leased 27ha block.

Michéal attended Kildalton Agricultural College to earn his Green Certificate in 1999 to 2000 before starting his full-time farming career in 2002 alongside his father Jerry, who also worked off-farm. Michéal is married to Serena and they have five children: Emma (20), Sean (10), Darragh (eight), Aoibhinn (four) and Tadgh (one).

Table 1: 2020 physical performance

Cow numbers	115
Total area farmed	67
Milking platform hectares	40
Milk solids production per cow	504kg
Milk solids production per hectare	1,411kg
Tonnes of grass grown per hectare	13.7t
Supplement fed per cow	800kg
Chemical nitrogen fertiliser usage	165kg

When did you start focusing on grass?

"I got interested in grass management as far back as 2011 through my discussion group, "Slievenamon". I started measuring by cutting out a square of grass with a clippers and I now "eye ball" the paddocks.

Since quotas were abolished in 2015 Michéal has been steadily increasing cow numbers while keeping a close eye on grass performance. 2020 has been his best year yet.

"I walked the farm 53 times during the year, and I find that the PBI Grass app makes grass budgeting so much easier."

Why did you start measuring grass?

"I feel my investment in cow genetics will be worthless if I am not feeding the best feed. Without measuring I would lose a lot of money from poorer production and a higher meal bill. It is also important not to be going into heavy covers in the summer and wondering: 'why are my cows not milking better?' On the other hand it's also vital to not run out of grass."

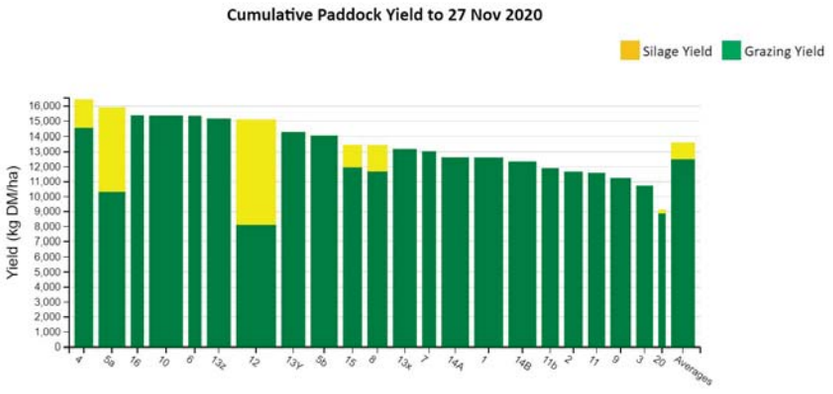
Reaping the rewards: what can we see from Michéal's data?

In 2020, Michéal's farm grew 13.7t of grass dry matter per hectare while also achieving 8.6 grazings and 0.4 cuts of silage per paddock. This exceptional performance is 1.1t/ha above 2019. In 2019 Michéal achieved only seven grazings per paddock. This shows the importance of getting as many grazings from each paddock as possible.

»Continued on next page

»From page 13

Figure 1: 2020 annual tonnage report for Michéal's farm



Another key performance indicator is the average pre-grazing yield across the whole year. Ideally, this figure should be between 1,400kg and 1,600kg DM/ha. Michéal's data shows the pre-grazing yield averaging 1,470kg DM/ha. His cows are grazing very high-quality grass and producing high-quality milk solids.

On some farms which are growing high volumes of grass the average pre-grazing yield is too high, at more than 1,800kg DM/ha.

Building on the information: why use PastureBase Ireland?

"The amount of data I have recorded on PastureBase Ireland (PBI) is increasing year on year," says Michéal. "At the beginning, grass cover and graze dates were the only data I recorded. Now this is being complemented with milk information coming from Glanbia after every collection, the most recent soil test results, and fertiliser/slurry applications.

"In the past, I could tell you the total fertiliser I purchased and how much it cost but I could never tell you how much N, P and K that I had applied on each paddock. All this information is in PBI now and it is helping me make day-to-day decisions."

Over the last 12 months, there has been a big focus on reporting in PBI. This has resulted in the creation of a number of new reports: farm cover, farm summary and the grass report. All these reports can be found in the "Reports" section on the website. Data can be extracted quicker and easier.

Conclusion: what advice can you give to farmers around grass measuring?

"I think all farmers need to stop looking for excuses about why they don't measure grass up and look at all the advantages. Take grass out of my system, I wouldn't be dairy farming. Grass is around so long that we are taking it for granted. In any other business, do you think companies do not measure their inputs? Farming should be no different!'

To me, the most important job on my farm is to ensure that the cows are milked. This is closely followed by weekly grass measurements. When you measure your grass you can manage it."

Jerry, Serena, Tadgh and Michéal Kelly with Slievenamon in the background.

Grass10 groups

There are 40+ Grass10 discussion groups with more coming on stream in 2021. Michéal Kelly joined the Clonmel/Carrick-on-Suir Grass10 group in 2019 and is one of 23 members who hail from Clonmel, Ballyneale, Grangemockler, Mullinahone, Newcastle and Poulmucka. John Murray, Ballinderry, Carrick-on-Suir, was the host farmer in 2019.

The group was set up and facilitated by Mícheál O'Leary (PastureBase Ireland) and James Mullane (local Teagasc dairy advisor). This was the beginning of the grass journey for Michéal Kelly. "Looking back at it now I learnt a lot from going to John Murray's farm each month.

"This really opened my eyes to the benefits of early spring grazing and grazing down to 4cm. It made me realise I needed to up my game, so spring grazing was an area I really focused on in 2020.

"A good bit of planning was needed and often 10,000 steps was hit before breakfast each morning, putting up a back fence, creating spur roads and allocating three-hour grazings. But the reward was well worth it by producing more kilo of milk solids per cow and lower feed costs. It also highlighted to me that some roadways need to be extended/constructed in the future to maximise the number of days at grass."

> "It made me realise I needed to up my game, so spring grazing was an area I really focused on in 2020

Due to COVID-19, we were restricted from holding some meetings and we used Zoom and WhatsApp instead. It is great to share advice from the lads from time to time."

Over 3,500 farmers use PastureBase Ireland, the grassland management tool which is available to all Teagasc clients. If you would like further information on PastureBase Ireland please contact us by email support@pbi.ie or 046-9200965. Alternatively, contact your local Teagasc office for more information.

Making weight count in Mayo

Alan Nolan
B&T Advisor, Teagasc
Ballinrobe

Catherine Egan
Beef Specialist, Teagasc
Animal and Grassland
Research and Innovation
Programme

As we start a new year, we often make resolutions to exercise more or lose some weight. In a beef enterprise our aim is to maximise weight gain by stock.

A review of 2020, indicates that some 27,088 farmers participated in BEEP-S. Action 1, which was compulsory, required the farmers to weigh unweaned calves and their dam on the same day. This provided:

- The average weight of the suckler cows.
- The average weights of heifers and their daily weight gain from birth.
- The average weights of bulls and their daily weight gain from birth.

There are a few questions to ask yourself:

How did your herd perform in 2020?

The Teagasc targets indicate that in a spring-calving herd bull calves should weigh 345kg at seven months of age, having achieved 1.3 – 1.4kg average daily gain (ADG). Heifers should weigh 295kg at seven months age having achieved 1.1 – 1.2kg/day ADG.

In an autumn-calving herd bull calves should weigh 425kg at nine months of age by achieving 1.3 – 1.4 kg/day ADG. Heifer calves should weigh 365kg at nine months of age after achieving 1.1 – 1.2 kg/day ADG.

What factors contributed to achieving this performance in 2020?

Breeding and genetics in the herd are among the key factors influencing ADG. Breeding has a huge influence on the milk the cow produces, and the genetic potential of the weanling to maximise weight gain.

Good grassland management is key to realising the genetic potential of the animal. It's vital that the weanlings are getting fresh grass and are rotated in a paddock system. Good grass is the cheapest possible way to increase animal output.

Obviously, grass growing conditions were impacted early in 2020 with most of the country suffering from drought conditions. However, the weather in late summer and into early autumn lead to increased grass growth and favourable grazing conditions for livestock.

Following a herd health plan from birth to weaning makes sure that there is no issue arising from parasites or ill thrift to impact on the animal's performance.

How can you increase or maintain performance in your herd for 2021?

After reviewing 2020 you'll know if your herd achieved the targets mentioned above, exceeded them, or achieved less than these targets. If the latter is true this is something for you to focus on in 2021.

Focusing on your breeding, herd health and grassland management on your farm will guide you in the right direction. "If we don't measure then we can't manage" is a saying you have probably heard at Teagasc events. This also true when it comes to weighing stock. Without weighing you don't know how they are performing.

Putting it into practice

One farmer putting this into practice is John Francis Heneghan who farms near Partry, just 10km outside Ballinrobe in Co Mayo. John completed the Teagasc Green Cert in 2010. He is an enthusiastic young farmer and after taking over the running of the farm from his father Michael in 2015 he was keen to make improvements.

As the holding is small, John works full-time as a lorry driver for Cummins & Sons, a local hardware and feed supplier. Any changes or improvements to the farm would have to accommodate his off-farm job. Compact and easy calving were two important issues for John.

The farm consists of 16ha of mainly free-draining land near the shores of Lough Mask and is divided in to two main land parcels. This is a typical

west of Ireland suckler farm in terms of scale and land type.

To make the farm more viable John firstly needed to avail of all possible scheme payments. The farm is currently in GLAS, BDGP and BEEP-S.

John has increased suckler cow numbers from 10 cows in 2015 to 21 in 2020. He has done this over a number of years, while maintaining a high herd fertility performance. The most recent ICBF calving report shows a calving interval of 358 days and calves/cow/year figure of 1.02. John uses a five-star Limousin stock bull which he is very happy with as he is easy calving and is producing quality calves.

"Recently I've been focusing on improving the weight and quality of weanlings sold each autumn," says John. "Weighing as part of the BEEP-S scheme means I know which cows are performing best and producing the heavier calves. In 2020, bull weanlings achieved 1.46kg/day and the heifers achieved 1.03kg/day before meal was introduced."

Maximising weight gain on the bull weanlings is important in order to increase output on the farm, particularly from the weanlings John sells.

Achieving weight targets on the heifers allows John to target for heifers to calve at 24 months which he has managed to achieve in recent years. "Once you achieve the weaning weights it means the heifers are on the right track for calving at 24 months," he says.

To accommodate the increase in

Alan Nolan and John Francis Heneghan assessing the winter fodder plan.

stocking rate from 1.07LU/ha in 2015 to 1.74LU/ha in 2019, John has made substantial improvements in the grassland management of the farm. "I repaired and rebuilt existing stonewalls on the farm to ensure they became permanent barriers and sources of shelter," he says.

"I hung new gates and installed new drinking troughs in locations which allowed me to split all fields into smaller paddocks. This summer we used a rotation system with 20 paddocks where once the farm was grazed as five big fields. I'm delighted with the results. We have definitely grown more grass and animal performance has improved."

John's target is to increase cow numbers further to 25. As a big focus over the past few years was on increasing stock numbers and making grassland improvements, a greater emphasis in the future will be placed on the performance of each individual cow in the herd.

In 2021, John intends to further improve the quality of weanlings sold by using some AI on his replacement heifers and early-calving cows and by culling cows producing the lightest weanlings.

Weighing the cow and the calf will provide John with vital information in this regard. It will also assist John in knowing which cows are performing best and which cows to keep replacements from.

"I'm very aware that from a farm sustainability perspective we will need a herd of suckler cows that are fertile, milky and capable of producing a quality weanling that will fetch a strong price each autumn," concludes John.

Have you listened to the Beef Edge podcast?

Podcasts are free audio shows that anyone with an iPhone, Android phone or computer can listen to. You can listen anywhere and anytime. The Beef Edge podcast is celebrating its first anniversary.

In the last year over 25,000 farmers have tuned in to hear timely technical information and the latest research and advice from Teagasc and industry stakeholders. Presented by Teagasc beef specialist Catherine Egan, the podcasts cover the latest news, information and advice to improve your beef farm performance.

Over the past year there have been regular updates in relation to grassland management throughout the year, making quality silage and fertiliser use.

Key breeding tips, using AI and heat synchronisation options have also been discussed on previous podcast episodes.

Animal health topics such as parasite control have been discussed on previous episodes of the podcast at the appropriate time. With the launch of a number of beef schemes in 2020, such as the Beef Environmental Efficiency programme- suckler (BEEP-S) and the Beef Finishers Programme (BFP) Catherine asked the key questions to find out the requirements and details you as a farmer needed to know.

In September, the Beef Edge Masterclass was launched with regular monthly updates from expert farmers explaining their system.

First in the series to discuss his system was Niall O'Meara, a suckler farmer from Co Galway who operates an autumn-calving suckling to weanling system. Niall is achieving all the key targets from birth to weaning and he explains just how he does it.

In the second series JP Hammersley a farmer in Co Tipperary, explained his system whereby British Friesian bull calves are brought to beef as steers at 24 and 28 months.

Updates

There are also regular updates from the Derrypatrick Teagasc research farm at Teagasc Grange and research carried out at Johnstown Castle and Newford demonstration farm. The Beef Edge also provides information on education courses and updates from the agricultural colleges such as Kildalton and Gurteen Agricultural Colleges.

Teagasc offer a full suite of podcasts such as the Dairy Edge, Ovicast, Pig Edge, Tillage Edge and research field which can be seen on the website www.teagasc.ie/podcasts.

You can catch up on all the shows and interviews from the Beef Edge podcast on the Teagasc website at www.teagasc.ie/thebeefedge , or you can listen on Apple and Google podcasts, as well as Spotify.

Don't forget to rate, review and subscribe to the podcast so you never miss a show.

Newford Farm 2020 review

What is the Newford Farm all about?




Iarlaith Collins **Micheal Fagan** **Padraig French** **Matthew Murphy**

Teagasc Animal and Grassland Research and Innovation Programme

The Newford Farm is a suckler calf-to-beef demonstration farm situated in Athenry Co Galway.

The farm was established by Teagasc and Dawn Meats, with the support of the *Irish Farmers Journal* and McDonald's in 2015. The 100-cow suckler calf-to-beef demonstration is being run on 68ha across four blocks.

The Newford herd consists of first-cross Aberdeen Angus and Hereford cows, bred from the dairy herd.

All indications to date are that this breeding policy along with careful ICBF terminal sire selection for high carcase weights is performing well due to a combination of excellent milk production and cheap liveweight gains in their offspring.

The project is in the final year of its seven-year term. The weather was favourable in 2020 in the west and cows and calves got out to grass in early February.

The midsummer drought which parts of the country experienced during June, did not affect the west and the autumn 2020 was one of the best since the project started, with most of the animals remaining at grass until mid to late October.

How was breeding season 2020?

The breeding season started on 26 April and lasted for 10 weeks, finishing on 6 July. The herd was run in two groups of 50 cows. The main tools used during the breeding season were two teaser bulls which were fitted with a chin ball harness and all cows were tail painted.

Once-daily AI was used and all cows were inseminated at midday. If a cow was artificially inseminated at 12 noon and was still showing signs of heat that evening, she was artificially inseminated again the next day at the same time. Scanning results showed that 83 cows proved to be in-calf out of 93 cows that were bred. They will start calving from 1 February 2021.

How did the weanlings perform?

All the 2020 weanlings were weaned from their dams during September and the average weaning date for the 96 weanlings was 12 September. At weaning all weanlings were weighed

Table 1: Weanling performance birth to weaning 2015-2020

Year	Weaning date	Average daily gain kg/head/day	ADG heifers
2015	10 Oct est.	1.24	1.15
2016	16 Oct	1.26	1.19
2017	21 Sept	1.30	1.22
2018	4 Oct	1.24	1.18
2019	17 Sept	1.26	1.21
2020	14 Sept	1.39	1.30

Table 2: Heifers and steers average sales performance 2020

	Heifer sales	Steer sales
Conformation score	R =	R =
Fat score	3 =	3 -
Carcase weight (kg)	299	350
Liveweight (kg)	570	640
Kill Out %	52%	54%
Age (mts)	20	20
Value	€1,188	€1,389
Price/kg	€3.97	€3.96

and the male weanlings had an average daily gain of 1.39kg from birth to weanling.

Castration of the males took place on 7 July and the heifer weanlings had an average daily gain of 1.31kg from birth to weaning.

Prior to weaning, all the weanlings were creep grazing ahead of the cows and were receiving 1kg of meal and after weaning this was increased to 2kg when the weanlings returned to grass.

How does this weight gain compare to previous years?

2020 has been the best year on Newford Farm with regard to weight gain achieved.

As shown in Table 1 the comparison of the weanlings' liveweight gain from birth to weaning over the last six years highlights bulls achieved 0.13kg/head/day and heifers achieved 0.9kg/head/day more than in 2019. Newford herd average weaning percentage (%) relative to the cow weight was 55%.

Overall, how did the weanlings perform from birth to housing?

All the weanlings were housed on 30 October, we had hoped to keep them at grass until mid-November, but unfortunately the poor wet weather conditions in late October meant they had to be housed. The bull and heifer weanlings achieved 1.28kg/day and 1.23kg/day, respectively, from birth to housing.

How did the steers and heifers perform this year?

There were 59 beef heifers and 46 steers on Newford farm to be slaughtered this year and all of these were sired by five-star terminal bulls such as; Fiston, Gamin and Mullary Intrepid, Tow Thorpe Dubai and Elderberry Galahad. The 59 yearling heifers were turned out to grass on 23 March at an average liveweight of 411kg.The first two heifers were sold off grass with no concentrate on 16 July at 17 months of age. They graded U-4 with a kill-out of 54 % and an average carcase weight of 280kg.

Unfortunately, in late July 2020 the Newford Farm had an outbreak of coccidiosis and all the heifers had to be treated. Due to the withdrawal period of the drug used our sales date was delayed until early October. On 6 October, 26 heifers were drafted for slaughter with an average liveweight of 563kg at 19.5 months of age. These heifers were 197 days at grass before slaughter and achieved 0.67kg/day with no concentrates being provided.

These 26 in-spec heifers graded R=3, with an average carcase weight of 288kg and a 51% kill-out. The factory base price on the day was €3.70 and all of the 26 in-spec heifers qualified for the extra 20 c/kg through the Quality Assurance Scheme. The average sale price was €1,127.

The remaining heifers received concentrate at grass from 4 September and were housed on 27 October. From housing these heifers were getting 5kg of 16 % coarse beef ration along with good-quality (75 % DMD) ad-lib silage. The remaining heifers were drafted for sale as they came fit. One lighter heifer will be sold in January 2021. Table 2 shows the average performance of the heifers slaughtered in 2020.

The steers were turned out to grass on 22 March at an average liveweight of 437kg. They had achieved an average daily gain of 0.75kg over the winter period. The first three steers were sold off grass at 675kg liveweight at 19 months of age with no meal fed.

Fiston heifer calf born on 10 February.

They were 164 days at grass before slaughter on 2 September and graded R = 3 - with a kill-out of 55% and an average carcase weight of 369kg. The remaining 43 steers, received concentrates at grass from 4 September until they were housed on 2 October.

From housing, the steers were offered 6kg of 12% protein coarse ration along with good-quality (75% DMD) silage ad- lib. They achieved an average daily gain of 1.39kg from housing to slaughter. The remaining steers were drafted for sale as they came fit. There are two lighter steers on the farm and they will be sold in January 2021. Table 2 shows the average performance of the steers slaughtered in 2020.

The farm team are pleased with the average steer carcase weight of 350kg given the average age of slaughter was just 20 months. The farm is focused on achieving the best balance between outputs and finishing costs and at present there is no benefit in feeding additional concentrates to hit higher carcase weights.

The farm is making the best use of grass and this will help to reduce Newford Farm's environmental footprint.

Grass key in the Royal County

James Fitzgerald
Teagasc Greenacres Programme

On the outskirts of Navan, Co Meath, Aidan Maguire farms 62ha, 14ha of which is forestry.

Aidan's system involves rearing 80 spring and 30 autumn-born calves sourced from local dairy farms. They include dairy-bred males; Hereford and Angus males; and Hereford and Angus females.

"The mix of calf types and birth dates helps to broaden the range of marketing dates of cattle. I prefer not to have all my eggs in one basket," Aidan notes. There is one basket that Aidan is putting his full faith in as he builds a sustainable and profitable farming system: high-quality and high-quantity grass.

Grassland management

As well as being a participant in the Teagasc Green Acres Calf to Beef Programme, Aidan is a member of a local grassland management discussion group, co-ordinated by John Douglas and the Teagasc Grass10 campaign team.

The farm is divided into a total of 45 paddocks with permanent single-strand fencing. Water troughs are carefully located to allow each of these paddocks to be further divided in half using temporary wire.

Grass measuring and budgeting is completed every week of the grazing season to assess grass levels on the farm and maintain a high standard of animal nutrition. On-off grazing and spur roadways are used to maximise the length of the grazing season by utilising grass early in spring and late in the autumn, practices more common on dairy farms.

"The type of stock being grazed does not matter. Good grassland management is basically the same for all farm types," Aidan says.

In the year gone by, the grazing season began on 24 January with the yearling cattle turned out by day and housed by night to maximise the use of grazed grass and the high level of weight gain it generates.

To keep sward damage to negligible levels, Aidan offered a fresh area of ground to the cattle each morning so that they would have grazed out to 4cm by housing time that evening.

These cattle had been housed on 13 November, giving a total grazing season length of 294 days. Achieving a similar turnout pattern in the spring of 2021 will reduce the winter housing period, where animals are without grazed grass in their diet, to just 72 days.

Silage

This has the knock-on effect of reducing Aidan's silage requirements far below that of similar herds with longer winter housing durations. "With less volume of silage needed, I'm able to focus on silage quality and not so much on quantity," says Aidan.

There is no set area of silage ground closed on the farm for first- or second-cut. Instead, the entire farm is fertilised for grazing, in accordance with the nutrient management plan, and grazing the whole year round is an option. "We make bales of silage from the paddocks which are surplus to requirement for grazing – a total of 470 bales of silage last year," says Aidan. "The majority of the slurry is spread on silage paddocks to replace the nutrients taken off."

This ensures that no overly heavy or stemmy cuts of silage are made and all silage is high-quality, averaging in the mid-seventies for DMD. It also has the knock-on effect of improving the quality of the grazed grass consumed by the herd as there are more paddocks of varying covers to choose from when deciding which paddocks to graze next.

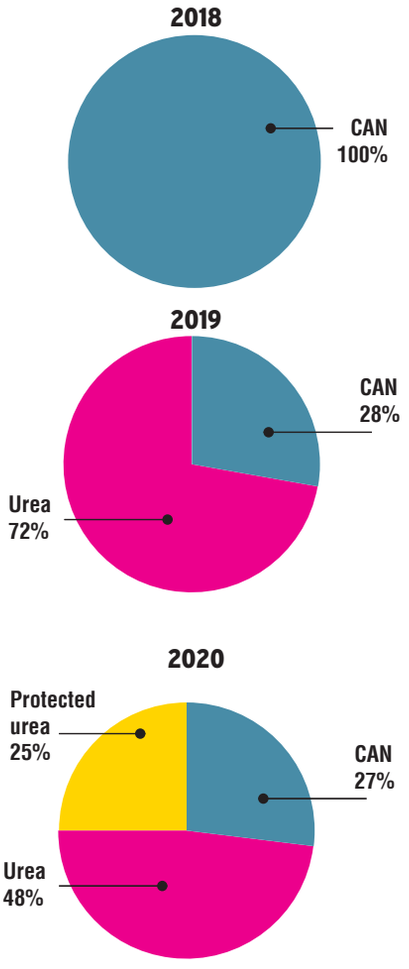
Some of Aidan Maguire's autumn-born calves.

Soil fertility

In total, 56% of Aidan's land is at the


Aidan Maguire.

Figure 1: Change in fertiliser forms 2018-2020: calcium ammonium nitrate (CAN), urea and protected urea



correct soil fertility for pH, phosphorus and potassium for growing grass. "This is impressive when compared with the national average of just 5% being at the correct soil fertility for all three," says local Teagasc advisor David Argue.

"The key to having healthy fertile soil is to first know how much lime your ground needs and getting it spread, then making sure you're getting the right amount of P & K out to feed the grass after that," says Aidan.

As part of Aidan's Green Acres farm plan, all of the spring-born heifers and autumn-born steers are to be killed off grass at 19 and 24 months old, respectively.

This means that half the animals sold each year will be finished at grass at a relatively young age, doing away with the need to house these animals for a second winter, and maximising the kilos of beef sold from grazed grass.

"These animals need to be turned out of the shed in the spring of their second grazing season at the correct weight and ready to achieve a daily weight gain of 0.9kg to 1kg/day at grass to reach the carcase weight and fat cover we want to market them at," says Aidan.

"The earlier in spring we can begin to graze and the longer the grazing season, the more weight and fat cover they will have at the end of the grazing season."

The same theory applies for the spring-born steers, which will be finished in the shed over the course of the winter. The more advanced in weight and fat cover the cattle are when entering the shed at the end of the grazing season, the shorter the indoor finishing period will be.

"The winter finishing period is at best a break-even exercise due to the cost of the diet and machinery costs associated with winter feeding," adds Aidan.

"To be able to shorten the winter finishing period by having the majority of work done at grass earlier that year saves money and frees up shed space to carry more young stock."

Focusing on sustainability

Over the last two years, Aidan says he has been putting more thought into the fertilisers he spreads on his farm in order to get the best value for money and to do something to reduce environmental impact.

"I've been moving away from using all CAN based straight fertiliser to using more urea and protected urea based fertiliser," he says.

"In 2018, all of the nitrogen that was spread on the farm was in the form of CAN. In 2019, I cut back on CAN and used more urea to reduce costs."

In 2020, some protected urea was used in mid-summer, replacing the summer applications of CAN of years previous.

Aidan remarks: "I was very happy with the response I got from the protected urea and the amount of grass the farm grew compared to using CAN fertiliser.

"I will probably always spread a certain amount of CAN based fertiliser since almost all of the compound fertilisers have CAN in them. Still, replacing the majority of nitrogen spread with a form that does the exact same thing, is cheaper and better for the environment is an easy decision to make."

How soil tests can make you money

Mark Plunkett
Teagasc Crops, Environment and Land Use Programme

Over the coming weeks, fresh soil samples will be taken and soil sample results will be available to plan lime, organic manure and fertiliser applications.

Comparing these new figures with those for your last tests will reveal how your soils have responded to lime, phosphorus (P) and potassium (K) applications.

Soil type is key. Light soils can change relatively fast, while heavy soils take longer.

Soil K levels will increase more quickly than P levels.

Lime advice

The first feedback to be acted on is the lime advice.

Lime should only be applied based on a soil test report. Maintaining the optimum pH on mineral soils will help maximise the soil N supply during the growing season, reducing the need for bagged N.

Correcting soil pH to the optimum, pH 6.3 on mineral soils, will release up to 56 units N/ac, worth €28/ac/year.

P, K & Mg results

The next place to look is at the soil P, K and Mg results which are reported in mg/L and soil index. The soil test results show the availability of P, K and Mg.

Table 1 shows the soil P, K and Mg index system, the response to fertiliser and the recommended fertiliser strategy.

Soils at index 1 or 2 have a very low, to low, nutrient supply and respond well to applications of either P or K. At index 1 and 2 additional P and K is required to build soil nutrient supply (to Index 3) and generally takes a number of years depending on the soil type.

Soils at index 3 (the target index) have a good nutrient supply and require maintenance rates of P and K to replace nutrient removed in either meat or milk. Index 4 soils are very fertile.

For P, the advice is to omit P for two to three years and re-test to check soil P changes.

For soils at Index 4 for K, skip K applications for one year and revert to Index 3 advice until the next soil test. Soil Indexes for peat soils are different to mineral soils as shown in Table 1.

Cost of soil analysis

Soil sampling is very good value for money and provides information tailored to the soils on your farm. A standard soil test costs circa 0.60c/ac/year.

It is very important that the soil samples are taken correctly to ensure results are reliable. Teagasc provides a soil sampling service from preparing soil sample maps to taking soil samples to delivering farm nutrient advice.

Table 1: Grassland soil P, K and Mg index system, soil supply and fertiliser response and strategy

Soil Index	Soil P (mg/l)	Soil K (mg/l)	Soil Mg (mg/l)	Soil Supply	Response to Fertiliser	Fertiliser strategy
1	0 - 3.0	0 - 50	0 - 25	Very low	Definite	Build-Up
2	3.1 – 5.0	51 - 100	26 - 50	Low	Likely	Build-Up
3	5.0 – 8.0	101 - 150	51 - 100	Adequate	Unlikely	Maintenance
4	>8.0	>150	> 100	Sufficient	None	Omit

Mapping soil fertility

Cathal Somers
ASSAP advisor

Owen Power
Dairy advisor, Waterford

Conor Beausang is dairy farming with his father, Philip, on moderate to free-draining loam soil near Grange in southwest Waterford. Conor is keen to continually improve the farm and make it as sustainable as possible.

"Soil testing is very cheap and provides me with valuable information when planning fertiliser and slurry application. The alternative is going out and spreading blindly, not knowing if you're spreading too much or too little. I work closely with Owen Power to ensure soil fertility meets grass nutrient requirements. We're stocked at around 2.5 cows/ha and growing 15 tonnes of grass/ha.

A nutrient management plan (NMP) is designed for the farm each year and followed to improve the pH, phosphorus (P) and potassium (K) levels in the soil.

Farm soil fertility % (2015-2020)

Soil pH and P and K index	2015	2018	2020
pH >6.2	26%	100%	40%
P - 1 & 2	51%	45%	28%
P - 3 & 4	49%	55%	71%
K – 1 & 2	52%	38%	21%
K – 3 & 4	47%	62%	79%

Cathal Somers and Conor Beausang.

y improvements

As the farm has increased grass production the decision has been made to soil test every two years in order to monitor soil fertility changes and tailor nutrient applications based on soil and crop requirements.

Key management practices on the farm

- Slurry is targeted to silage ground and the remainder spread on fields with P index 1 and 2.
- Compound fertiliser such as 18:6:12 is targeted to fields between March and June.
- Additional P is applied to build soil P fertility levels.
- A colour-coded map of the farm (Figure 2) is up on the wall of the dairy and at a glance cattle slurry can be targeted to the right areas
- Index 4 soils are identified and do not receive chemical P.

Figure 1: Phosphorus status map, white and blue colours are index 1 and 2 paddocks, the greens are index 3 and 4.

Making a fertiliser plan: what are the benefits?

Alan Nolan
Drystock advisor, Ballinrobe

Kevin Madden
Catchments Advisor, Ballinrobe

Kevin Feeney farms near Ballinrobe in south Mayo. He runs a dairy calf-to-beef system and a mid-season ewe flock on 25ha including some marginal land. Like a lot of farms in Mayo it's fragmented, with seven separate land parcels.

In 2015, Kevin changed to a dairy calf-to-beef system from a suckler system. "I found the winters getting longer each year with cows on heavy land so I opted for a lighter type of animal to suit my farm," explains Kevin.

Kevin farms in the Cregduff Catchment, which is part of the Agricultural Catchments Programme.

As a result, Kevin has followed an intensive soil sampling and Nutrient Management Planning programme for over seven years now.

This involved taking soil samples from each individual field every three years and the preparation of a nutrient management plan.

In 2013, 21% of the soils had a pH > 6.2, while in 2019 80% of soils had a pH of > 6.2.

Traditionally, high N fertiliser products (27s and 24s) were applied but over the last six to seven years the fertiliser programme comprises 10-10-20 and 18-6-12.

"I now have swards which grow more grass and faster re-growths," says Kevin.

"Even on old swards there's better early grass production and sward density where soil fertility was improved. I can now get cattle to grass earlier in the spring, shortening the winter feed period and reducing costs."

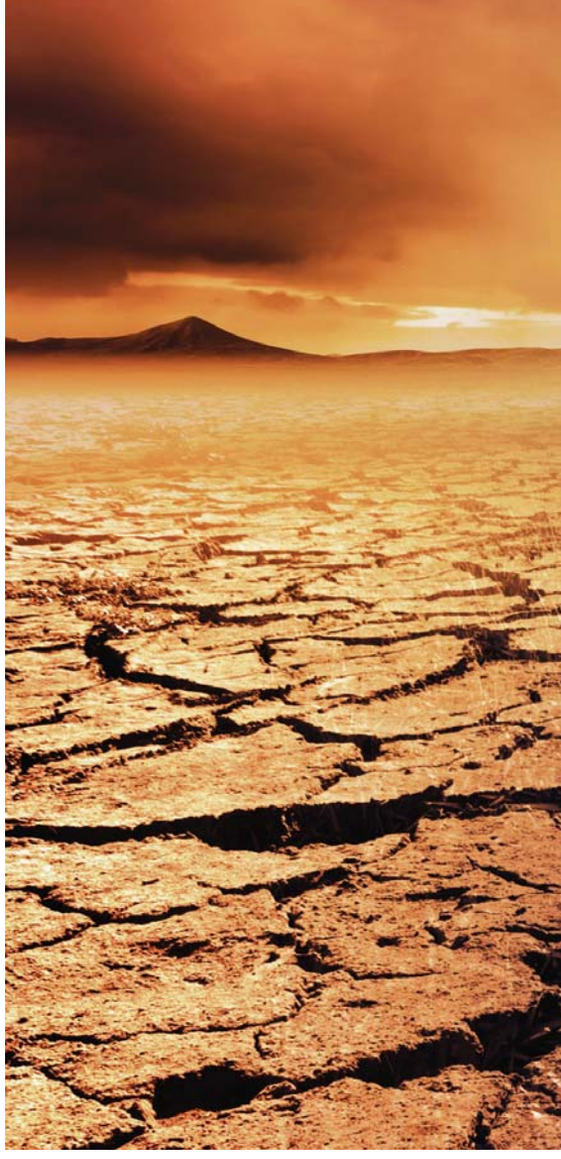
Stocking rates increased from 1.5LU/ha in 2015 to 2.2LU/ha in 2019. Beef output has increased dramatically to 1,350kg/ha in 2019. As a result, the farm is now generating a healthy margin from the beef enterprise despite the current low beef prices.

The key lessons from Kevin's story are the importance of regular, accurate, soil sampling and following a detailed Nutrient Management Plan.

Kevin Feeney and Kevin Madden.

environment

There's no vaccine for climate change



We are all too aware of the impact of the COVID-19 pandemic. Climate change is another major global risk which requires our attention, if it is not to cause even greater havoc. Feeding the world while taking climate action will require an industry-wide effort involving farmers, industry stakeholders, Government and consumers.

Tom O'Dwyer
Head of Signpost Programme*

In December, EU leaders agreed to reduce climate emissions 55% by 2030. In the same week, the Department of Agriculture, Food and the Marine published the Ag Climatise roadmap. Its aim is to deliver on the 2019 Climate Action Plan and develop a climate neutral food system by 2050.

In short, there are significant ambitions to reduce emissions from agriculture in the coming years.

The reason is global warming. According to the United Nations, 2020 was the warmest year since records began. Linked to this warming there has been a rise in extreme weather events, including wildfires and hurricanes; ice at both poles is melting at a worrying pace.

Business as usual is not an option. This is highlighted in the Ag Climatise roadmap: "If Ireland wishes to remain a world leader in the production, management and marketing of low-carbon, high-quality sustainable and traceable food, then significant efforts will be required…to maximise production efficiency while minimising the effects on the climate and reducing the environmental footprint of agriculture."

However, we can face the challenge with confidence as we have seen how agriculture has responded to previous challenges. The sector has increased food production to levels once believed impossible. We all can play a part in limiting further climate change.

The global agriculture sector now has an opportunity to make yet another major contribution, to produce healthy, nutritious and wholesome food in a more sustainable manner.

What is sustainable agriculture?

Sustainable agriculture means meeting society's present food and textile needs, without compromising the ability of current or future generations to meet their needs.

In my experience, Irish farmers have a deep desire to leave their farm in a better state for the next generation. But it can be a struggle to balance the demands for economic and environmental sustainability.

What are the consequences when these competing demands are out of sync? When farming practices are compromising the ability of future generations of farmers to farm through a loss of biodiversity, a reduction in water quality or excessive emissions?

Gases

The three greenhouse gases (GHGs) are: carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_20); the main agricultural GHGs are CH_4 and N_20. Ruminants have bacteria in the rumen which produce CH_4 during the digestion process. Soil emits N_20 when microbes in the soil break down urine, faeces and fertilisers; a key driver of N_2O emissions is nitrogen surplus (N inputs minus N outputs).

In addition, ammonia gas (NH_3) is an air pollutant, which has an adverse effect on human health and the environment. Agricultural activities account for over 99% of our national ammonia emissions.

Research has demonstrated how farming can reduce the "emissions intensity" of food production. The first step is to produce food as efficiently as possible. In Ireland, for livestock production this means a grass-based diet, good genetics and healthy, thriving animals. There are additional actions that farmers can take to reduce on-farm emissions (see panel).

What one change will you make on your farm in 2021 to reduce emissions (or reduce nutrient losses or improve biodiversity)? Some of the practice changes are straightforward, e.g. switching N fertiliser source, while others will require upskilling and significant changes in management practices, e.g. establishment and man-

What change will you make?

The move to more sustainable farming practices will always start with the first step. This time of year is often used for planning and decision-making. What one change will you make on your farm in 2021 on your path towards a more sustainable farming future? Some suggestions:

- Inform yourself of the facts behind global warning (caused by GHG emissions) and ammonia emissions.
- Check out your farm's carbon footprint figure on the Bord Bia Farmer Feedback Report (beef and dairy farmers), and compare your performance against industry benchmarks.
- Talk with your farm advisor to identify actions to reduce your carbon footprint in 2021.
- Select one action that you can make happen – write it down, and commit yourself to doing it.

agement of clover in pasture.

There is a range of proven practices, which if widely adopted by Irish farmers, will reduce agricultural emissions. That is a fantastic starting point – there are tools in the emissions reduction toolbox. Finally, Teagasc is committed to working with farmers, and agricultural sector partners, to enable farmers adapt their farming practices to reduce agricultural emissions.

New appointment: *Teagasc has appointed Dr Tom O'Dwyer, as head of the Signpost programme. Tom began his career with Teagasc as a REPS planner for north Tipperary in 1995, before taking up a role as a Dairy Specialist in 1998. In 2007, he was appointed Area Manager for Donegal and spent three years managing the advisory service in the northwest before returning south as Head of Dairy Knowledge Transfer, based in Moorepark, in 2010. Teagasc will launch the Signpost programme early in 2021, and is committed to working with farmers to enable them to take actions to "lighten the load" of farming on the land.

What are the mitigation options?

Teagasc has identified the following practices as being key to reducing agricultural emissions. The best options for each farm will vary depending on factors such as the farm system, location and the level of farming intensity. Many of the options (though not all) can combine profitability gains while contributing to meeting sustainability challenges.

- **Liming to increase soil pH to its optimum range (reducing the need for N fertilisers).**
- **Optimisation of the amount, timing, and placement of N fertilisers (and for some farms, a reduction in the amount of N fertiliser used)**
- **More efficient use of slurry and animal manures (reducing the need for N fertilisers).**
- **Switching to protected urea as a fertiliser N source.**
- **Applying all slurry using Low Emission Slurry Spreading (LESS) equipment (dribble bar, trailing shoe or injection).**
- **Improved pasture management (to increase grass utilisation, without increasing N fertiliser).**
- **Incorporation of clover into swards (replacing N fertilisers).**
- **Reduced crude protein levels in supplementary feeds for grazing ruminants (maximum of 15%).**
- **Better breeding – continued focus on use of high EBI, high DBI and high Eurostar index bulls (providing more carbon efficient animals).**
- **Milk recording and weight recording (for better breeding and management decisions).**
- **Reduced energy usage.**
- **Improved management of hedgerows and incorporation of trees on the farm (as hedges and trees grow, they store carbon in trunks, branches, leaves, and roots).**

Biodiversity – a growing part of your business

The Teagasc National Farm Survey is investigating indicators of biodiversity. Biodiversity is an important indicator of agricultural sustainability

John Finn
Teagasc Crops, Environment and Land Use Programme

Trevor Donnellan
Teagasc Rural Economy Development Programme

Brian Moran
Teagasc Rural Economy Development Programme

The recently launched EU Green Deal and Farm to Fork strategies set out ambitious plans to improve EU agriculture in a range of areas, including the way in which agriculture affects the environment.

A key part of the strategy is to develop more ways of measuring the positives and the negatives associated with food production.

Whereas in the past the focus in data collection was mainly on reporting the income levels of farmers, EU member states will now be asked to produce a broader range of measures of sustainability.

It is tempting to consider that raising farm incomes, striving for a better lifestyle and better protection of the environment might be conflicting objectives in agriculture, but increasingly it is argued that these goals should be achieved together.

This is because consumers will be choosing foods that have been produced in a way that protects the environment, ahead of foods that have been produced in a way that has no regard for the environment.

Investigating the measurement of habitat quantity on Irish farmland

In Ireland, we are ahead of many other EU member states in collecting data to measure farm sustainability. The range of sustainability measures continues to expand, particularly in the environmental area.

The newest environmental measure under development in the Teagasc National Farm Survey is for farmland habitats that support biodiversity, e.g. species-rich grasslands, heathland, peatland, hedgerows, woodlands, rivers, streams, and ponds.

Certain habitats are better able to support particular species. This means that if we quantify the amount of available habitats on our farms we can begin to understand whether farmland habitats for biodiversity are getting better or worse.

> As part of the EU SmartAgriHubs project, new technology allows the process of habitat measurement to take place at a desk in an office

How to measure farm habitats without visiting the farm

Traditionally, habitat surveys relied on an ecologist visiting the farm to document what the entire farm looks like. A full national survey of every farm would be time-consuming and expensive.

As part of the EU SmartAgriHubs project, new technology allows the process of habitat measurement to take place at a desk in an office.

Satellite imagery of Ireland can be combined with electronic maps (the Land Parcel Identification System – LPIS) of each farm.

By studying these maps on a computer, the ecologist can remotely identify the different habitats on each farm.

We are also exploring how farmers can help the process by taking their own photographs on the ground, using their smartphone.

A smartphone app then allows the farmer to upload these photographs to the internet, so that the ecologist can see them and help further verify the habitat type. The photos can also be included in a customised farm habitat report.

As part of the project, the farmer can receive information on the level of habitat diversity on their farm. A map of the farm can be produced showing the various habitats identified on the farm and their area (see Figures 1 and 2).

Farmers can also receive tips relating to the habitat, advising them on how the farm's habitat biodiversity can be maintained or improved. The process could then be repeated at some future point to determine whether each farm's habitat areas had remained the same or changed.

The assessment method identifies the type of farmland habitat, which can be broadly associated with low, medium and high levels of biodiversity (see Figures 1 and 2 for an extract from a sample farm report).

The Irish countryside contains many types of farmland habitats.

LOOKING TO THE FUTURE

Currently, the benefits to farmers from biodiversity provision are limited, and not especially related to habitat quality and the level of biodiversity being provided. Potentially, habitats could be used to determine a payment for the biodiversity status of the farm.

This would encourage farmers to make choices about farm management that are more likely to protect biodiversity. Having a biodiversity measure for Irish farming could also be an important tool that would lead consumers to choose food that has been produced in a way that is supportive of biodiversity.

A great benefit of conducting a biodiversity assessment on National Farm Survey farms is the ability to link that data with the other agronomic, economic, environmental and social data collected by the Teagasc NFS. This could be useful in learning more about the characteristics of farms and farmers achieving a range of habitat performance.

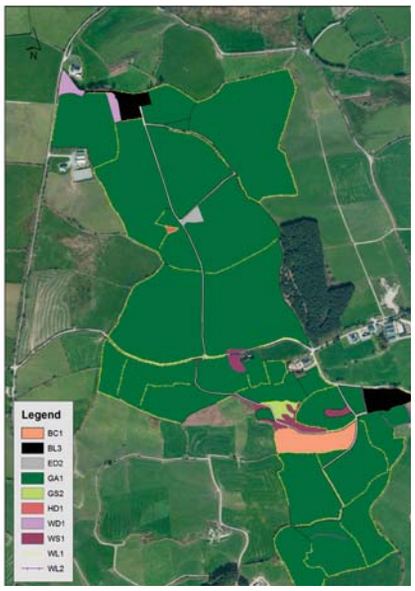


Figure 1: Habitat map from a more intensively managed grassland farm

Code	Habitat	Area (ha)	Length (m)	Relative wildlife importance
BC1	Arable crops	0.99		Low, but can be mitigated by management, and by wildlife habitats in adjacent areas
BL3	Buildings/artificial surfaces	1.06		Generally low, but old farm buildings and yards can benefit bats/birds
ED2	Spoil and bare ground	0.13		Generally low, transient habitat
GA1	Improved agricultural grassland	42.7		Low, but can be mitigated by management, and by wildlife habitats in adjacent areas
GS2	Dry meadows/grassy verges	0.21		Medium - high. Can vary considerably in quality, depending on management
HD1	Dense bracken	0.03		Medium-high, management dependent
WD1	Mixed (broadleaved) woodland	0.34		Medium-high, management dependent
WS1	Scrub	0.62		Medium-high, management dependent
WL1	Hedgerow		6,847	Low to very high, depending on hedge management. Important for wildlife, and their movement in landscape.
WL2	Treeline		545	Very high

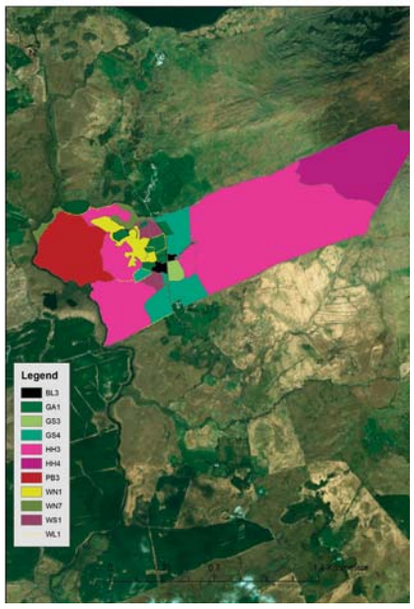


Figure 2: Habitat map from a more extensively managed farm with large areas of heathland

Code	Habitat	Area (ha)	Length (m)	Relative wildlife importance
BL3	Buildings/artificial surfaces	0.87		Generally low, but old farm buildings and yards can benefit bats/birds
GA1	Improved agricultural grassland	3.50		Low, but can be mitigated by management, and by wildlife habitats in adjacent areas
GS3	Dry-humid acid grassland	1.3		High
GS4	Wet grassland	12.1		Medium - high. Can vary in quality, depending on management.
HH3	Wet heath	84.3		High - very high
HH4	Montane heath	25.9		High - very high
PB3	Lowland blanket bog	17.5		Low – medium, management-dependent
WN1	Oak-birch-holly woodland	4.8		Very high
WN7	Bog woodland	2.5		Very high
WS1	Scrub	2.6		Medium-high, management dependent
WL1	Hedgerow		1432	Low to very high, depending on hedge management. Important for wildlife, and their movement in landscape

Farm roadways and water facing new regulations

Mark Treacy
Teagasc Dairy
Advisor, Clonakilty

New on-farm measures aimed at further reducing Irish farming's environmental footprint, with particular regard to water, climate and air quality, were signed into law by the Government on 20 November 2020 under SI No 529 of 2020. This new statutory instrument has introduced many new on-farm requirements, with effect from 1 January 2021. These on-farm requirements will vary from farm to farm depending on the farm's stocking rate in the previous calendar year.

A technical amendment has also been made to increase the nitrogen excretion figure for the average dairy cow from 85kg to 89kg of organic nitrogen which impacts on all dairy farmers, as well as beef farmers finishing dairy cull cows.

Measures relating to the prevention of direct runoff from farm roadways to "waters" applies to all farms, regardless of enterprise or stocking rate. For all farm roadways, there can be no sediment or nutrient run-off into "waters". This includes watercourses, rivers, drains, lakes, etc (including features which may carry no water for part of the year). This measure was discussed in detail in the last issue of *Today's Farm*.

Changes applying farms with a grassland stocking rate of ≥ 170kg organic N per hectare

Farms with a grassland stocking rate (GSR) of ≥170 kg organic N per hectare are now required to exclude bovines from watercourses and locate all water troughs at least 20m from watercourses. This means bovines cannot drink, or have access to freely enter or cross watercourses (clarified further below). Watercourses on your farm are defined as the solid blue lines on the OSI 1:5000 scale maps, viewable on this website https://store.osi.ie/index.php/osi-place-map.html (select Customise, A3, 1:5,000 and landscape). To comply with these requirements the following is required:

- Where watercourses are currently unfenced, a fence must be erected at least 1.5m from the top of the bank.
- Existing fences must be moved out to at least 1.5m from the top of the watercourse bank.
- An exception to this is where an existing roadway runs parallel to a watercourse. The existing fence will suffice provided there is a fence on both sides of the roadway and the roadway is cambered away from the watercourse, along with an earthen bank between the roadway and watercourse.
- Bovines are still permitted to cross through watercourses provided both sides of the watercourse are fenced 1.5m back from the top of the bank. Bovines cannot freely drink from the watercourse, and fences are in place to prevent bovines freely crossing or going up/down stream.
- All new and existing water troughs must be located at least 20m from watercourses.

While not a legal requirement at present, the provision of bridges over watercourses where regular crossing is necessary is still considered to be best practice.

Changes applying to 5,000 non-derogation farmers from 1 January 2021

Approximately 5,000 farms in Ireland export slurry to comply with the 170kg organic N per hectare limit and stay outside of derogation. In addition to the requirements already outlined for farms with a GSR of ≥ 170kg organic N per hectare, these farms with a whole farm stocking rate (WFSR) of ≥ 170 kg Organic N per hectare (excluding slurry exports) are now required to implement a number of additional new measures. These additional requirements remove most of the potential benefits at farm level of avoiding derogation.

These measures are:

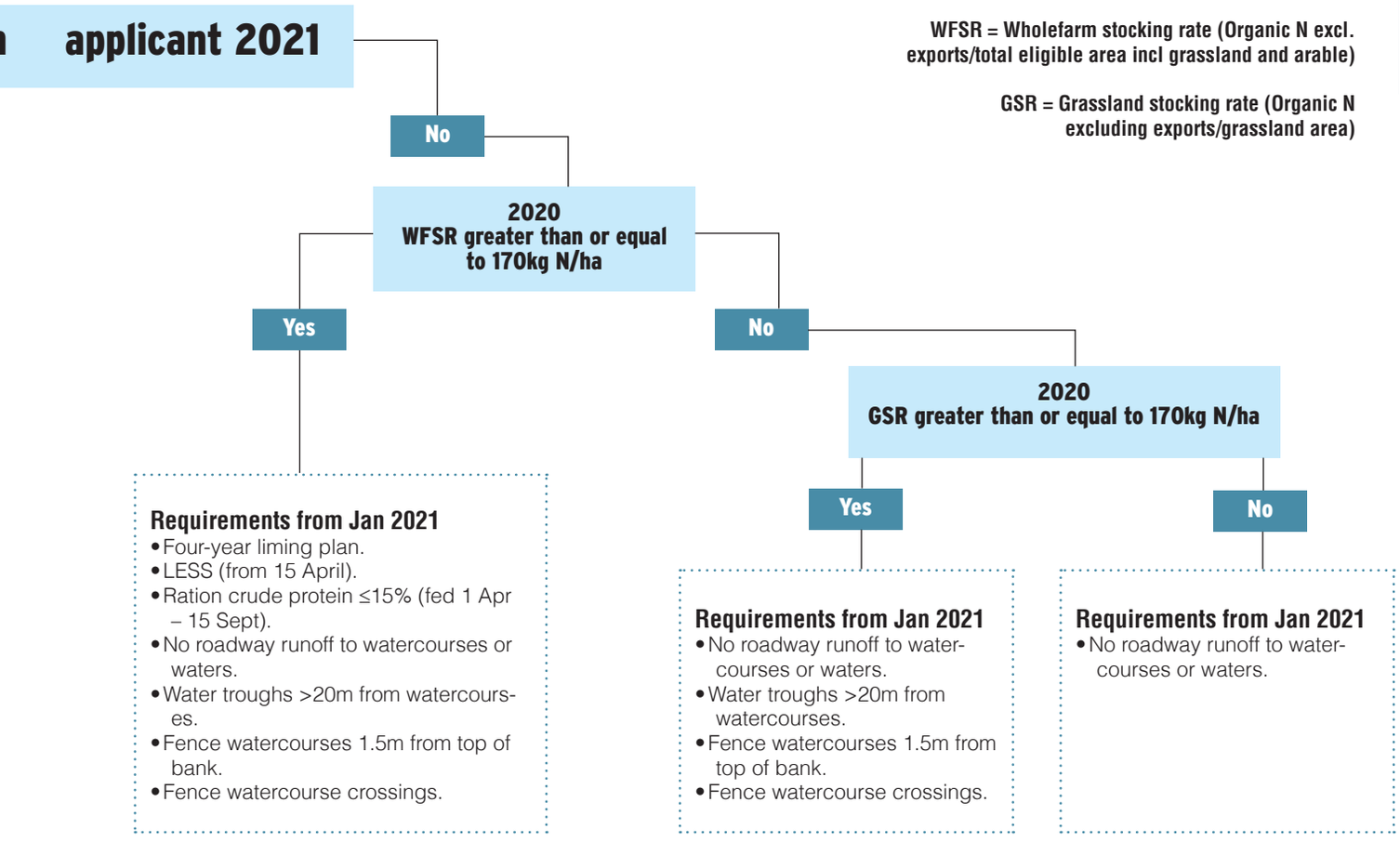
- A requirement to apply lime where soil analysis results show an agro-

Summary of new regulations
Effective from 1 January 2021

Derogation

Yes

Requirements from Jan 2021
- Four-year liming plan.
- LESS (from January).
- Ration crude protein ≤15% (fed 1 Apr – 15 Sept).
- No roadway runoff to watercourses or waters.
- Water troughs >20m from watercourses.
- Fence watercourses 1.5m from top of bank.
- Fence watercourse crossings.
- Grass measurement or training course.
- Sustainability and NUE courses.
- Clover in grass seed mix.
- Hedgerow management plan.



nomic need. A minimum of 25% of the total lime requirement needs to be applied each year.

• Limit the crude protein of ration fed to grazing bovines greater than two years of age to ≤ 15% during the period from 1 April to 15 September.

• Use Low Emission Slurry Spreading (LESS) equipment for all slurry applied from 15 April 2021.

The new regulations came into effect on 1 January 2021. The graphics on these pages will help guide you through the requirements. Contact your Teagasc advisor for additional information.

Course requirements

If you are one of the 2,500, farmers who recently completed the Environmental Module (Farming Sustainably and the Environment) as part of the mandatory derogation training courses with Teagasc, rest assured that the course you completed will satisfy the derogation course requirements.

Appendix 1

Terms	Whole Farm Stocking Rate excluding N exports ≥170 kg N/ha	Grassland Stocking Rate (GSR) excluding N exports
Definition	*Organic N produced by grazing & non-grazing livestock/ holding area (grassland + arable).*	*Organic N produced by grazing livestock on the holding / grassland area*
Use of LESS	Yes	
Liming programme	Yes	
CP 15%	Yes	
Fencing watercourses	Yes	Yes
Setback water troughs	Yes	Yes
Farm roadways	Applies to all farm (if farm roadways present on farms)	

Source: DAFM FAQs

Find out more For additional information, see DAFM Frequently Asked Questions located at https://assets.gov.ie/99153/ab347c89-9723-4397-9391-9d60d6e180b8.pdf and Statutory Instrument 529 of 2020 located @ http://www.irishstatutebook.ie/2020/en/si/0529.html

Maintenance pays off in paddock and parlour

Ensure that your animals have adequate, safe water

Tom Fallon
Farm Buildings & Infrastructure Specialist

Francis Quigley
Milking Machine & Machinery Specialist, Teagasc Kildalton

Field water troughs are often neglected on farms. January is a good time to ensure the troughs are clean before the busy calving season. They should have been drained when grazing finished, or during the winter, allowing them to be cleaned and any debris removed. A dead bird or animal in a water trough can lead to sick livestock after turnout.

January is also the time to get your plumber to do annual maintenance on water pumps; carry out flow tests, etc.

Farmers with a grassland stocking rate over 170kg organic nitrogen per hectare (before any export of slurry) will need to move troughs so that they are at least 20m from watercourses. This will require a decent, level, hardcore base under and around the trough with a dust finish – as for a roadway.

Placing geotextile under the stone will help to prevent the soil coming up through the stone. This type of work should only be done when ground conditions are suitable.

A 'flip over trough' is easy to clean (picture on left) but we also need at least an annual clean for outdoor troughs.

Figure 1: Configuration of

Components can be omitted to suit your own situation and isolation valves need to be added in. A water meter at the well and on the supply to the fields is useful for finding leaks.

Procedure for whole system disinfection (again assuming tanks and troughs are physically clean)

1 To 25 litres of water add one litre of a 5% w/v solution of sodium hypochlorite.
2 Pour half of the solution into the well.
3 Turn on the water tap that is furthest from the well and let the water run until there is a distinct smell of chlorine from the water. Then turn off the tap.
4 Turn on all other taps and let the water run until there is a distinct smell of chlorine from the water. Allow the troughs to fill then turn off the taps.
5 Pour the other half of the solution into the well. Turn off the well pump and ensure that the well is covered properly. Allow to stand overnight or for at least eight hours.
6 After at least eight hours reconnect the pump. Turn on all taps and let the water run until the strong smell of chlorine is gone.
7 Use as normal.

Cleaning options

Prepare a simple safety plan (sodium hypochlorite is corrosive and there are risks with handling petrol, etc.).

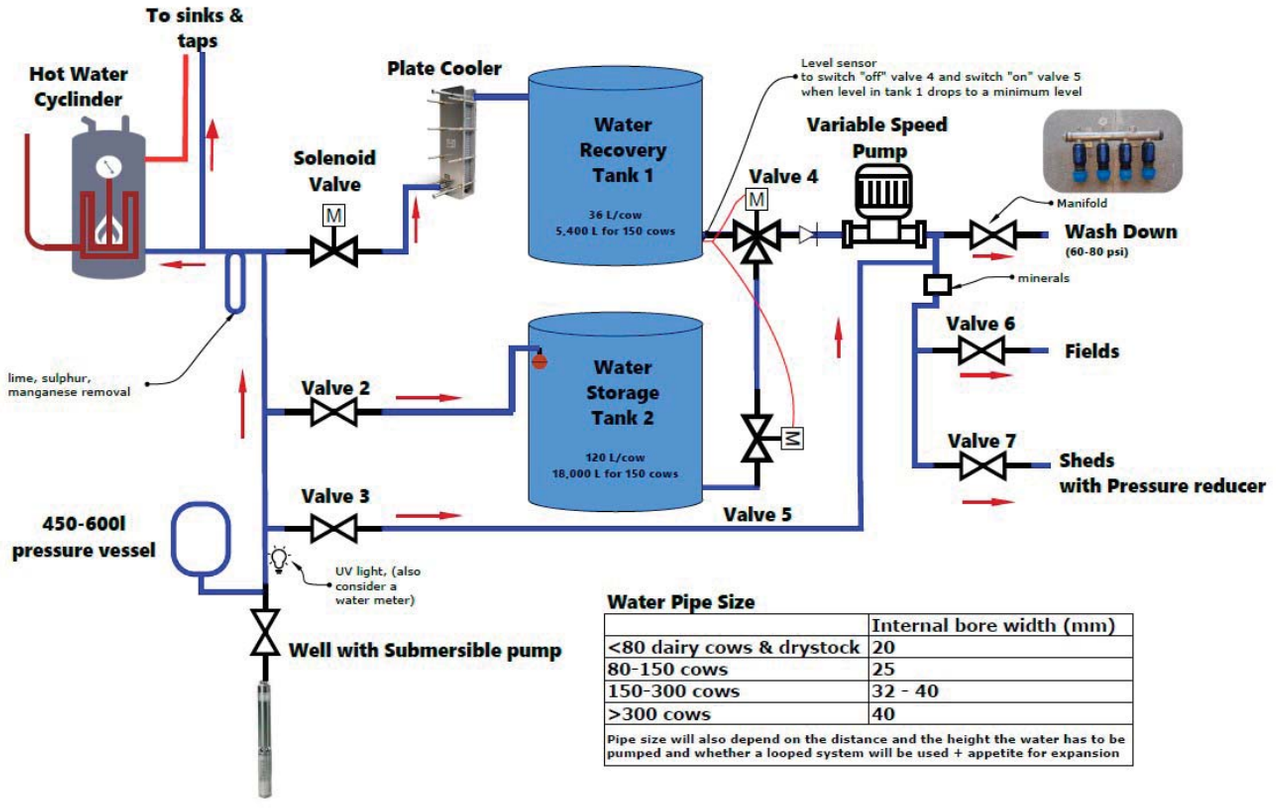
- Shut off the water supply to the paddocks.
- Empty water troughs. A pump with a petrol engine can be hired for approximately €40 per day including VAT.
- Clean out debris (scrub each trough with a brush) and clean ballcock valves.
- Spray all the sides of the water troughs with a 200mg/l strength solution of sodium hypochlorite (optional).
- Troughs can be re-filled with water after 30 minutes.
- Check ball cocks to ensure they have closed off correctly.

A 1/250 dilution of 5% hypochlorite will give you a 200 mg/l strength solution.

So for five litres water add 20 mls hypochlorite, etc, (to be really precise add 20mls of hypochlorite to 480ml of water.)

Suspending the water supply to the paddocks during the winter will prevent frost damage and water wastage due to leaks.

a water system for a dairy farm



Water Pipe Size

	Internal bore width (mm)
<80 dairy cows & drystock	20
80-150 cows	25
150-300 cows	32 - 40
>300 cows	40
Pipe size will also depend on the distance and the height the water has to be pumped and whether a looped system will be used + appetite for expansion	

Water system on a dairy farm

Figure 1 shows how a water system can be configured on a dairy farm. Some farmers like to have at least a day's reservoir of water to help cope with any interruption to supply. A tank of 120 litres per cow will be adequate.

Light should not be able penetrate this tank or you could get algal growth. It is important that water for washing the milking machine comes directly from the well in the same way that your kitchen sink receives a direct supply whereas the rest of the house is generally supplied via a header tank.

An inverter costing about €1,500 enables a high-output variable speed pump to operate on single phase electricity. Some farmers with large herds on single phase electricity, choose an extra pump to supply the field along with a washdown pump. This option can be useful if there is a big rise in ground on the farm. It is always good practise to check up on cows in the paddock about two hours after milking, when peak grazing and drinking occur.

A plastic or stainless steel manifold is now commonly used to distribute water for wash down. Typically, there will be a supply from the manifold to the dairy door, to both the front and the back of the pit, to a footbath, crush and the edge of the collecting yard.

Water for cooling milk

Using water to cool milk through a plate cooler is the first step to reducing the cost of cooling milk. Adequate water supply can be an issue but if it is fully reused this is no longer a problem.

Traditionally, water recovered from the plate cooler was only used for washing down because it was assumed that it wasn't suitable for other purposes. However, it can be safely used as cow drinking water provided it is not stored and was free of bacteria to begin with.

Figure 1 is configured with that in mind. Treating the recovered water with ultraviolet (UV) light is an extra safety measure. The recommended water flow through the plate cooler is two litres of water per litre of milk. The water recovery tank is sized for that purpose.

A 20-unit milking plant may have an output of 140 cows milked in an hour, or approximately 2,500 litres of milk, when cows are at their peak in April or May. Therefore, 5,000/60 =83 litres of water must be delivered through the plate cooler per minute. Your water system may not deliver this flow rate even if the supply pipe is adequately sized etc. The water recovery tank should be sized accordingly.

Plate cooling efficiency checks

- Does the water pipe going to and from the plate cooler have adequate diameter?
- Does the plate cooler receive well water?
- Is there a timer on the milk pump that will open the solenoid valve to deliver water to the plate cooler while milk is being pumped with a delayed closing of 20 seconds?

Some farmers with a variable speed milk pump work without a solenoid valve and simply turn on the water to the plate cooler at the start of milking and turn it off at the end. A working routine based on standard operating procedures (SOPs) or a written checklist in the dairy is useful.

- Ideally, the milk temperature post plate cooling = water temperature plus 5^0C.
- What is the amount of water recovered versus the volume of milk achieved in that period?

tillage

Giving rye a try

Ciaran Collins
Teagasc Crops, Environment and Land Use Programme

Conor Kavanagh
Teagasc Tipperary

Gerard O'Meara runs a tillage and beef enterprise with his father, Pat, near Clonmel. They grow feed and malting barley, wheat, oats, maize, beet, oilseed rape and, occasionally, beans.

Always substantial winter wheat growers, they decided in 2018 to look at alternatives as Gerard felt "the cost of growing a crop of winter wheat outweighed the financial return for the end product".

He was approached by Tim O'Donovan of Seedtech with the option of growing a crop of hybrid rye for use in a trial on pig diets at Teagasc, Moorepark near Fermoy.

The O'Mearas have significantly increased the area of rye they are growing this year as a result of the significant loss in winter wheat due to storms in August this year. "I felt the hybrid rye had significantly less head losses, although it did lodge which made cutting very slow," says Gerard.

"After the storms in August most crops in the area had either lodged or broken down, with significant yield losses, I feel the rye stood up better to the difficult weather than the spring barley and winter wheat."

Drought

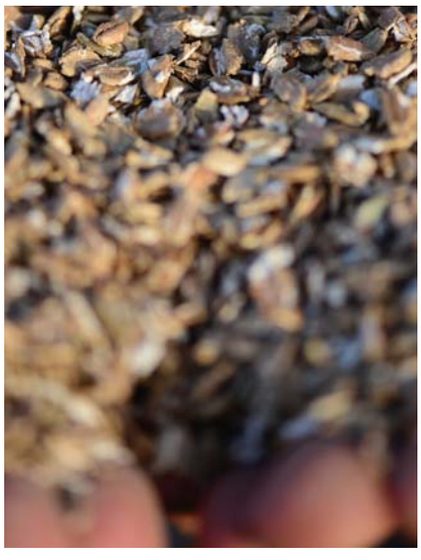
After the drought in 2018, low grain yields and straw shortages meant the O'Mearas were looking for a crop that will give good grain and straw yields. Rye offered a 25% better drought tolerance than wheat or barley and a 20% increase in straw yields.

"We're getting between 18 and 20 well-packed 4x4 bales per acre from the hybrid rye, compared to 12 to 16 from hybrid barley," says Gerard.

"The rye yielded 4.3t/ac of grain in 2019 and 4.8t/ac in 2020. The crop has good take-all resistance and it is highly competitive with grass weeds. It seems to work very well in our system."

With the loss of Redigor deter the O'Mearas won't start setting winter barley until after 10 October, with the hope of not needing an insecticide, whereas the setting window for the hybrid rye runs from mid-September to early November.

"The ability to sow the rye that bit earlier is a huge advantage as it's going in during good conditions and it's sown before we start the winter barley," adds Gerard.



Rolled rye is a feed option for finishing cattle.

Cheaper

"We find the hybrid rye significantly cheaper to grow than winter wheat with 30 units less nitrogen needed per acre and one less fungicide application Yet, we will get very similar yields to winter wheat with more straw.

"The hybrid rye will need an additional growth regulator. However, as it's a tall crop, three growth regulators are recommended. It's also much slower to cut due to the high volume of straw."

Gerard has always kept a load or two of his spring barley for feeding to finishing cattle, although given the good price for malting barley and the fact that all the spring barley passed for malting meant he was going to try feeding the hybrid rye to the cattle.

"I got some of the hybrid rye treated and rolled and it turned out very well so I'm currently feeding that to finishing cattle along with a balancer to ensure mineral requirements of the cattle are met.

"So far, the cattle seem to be performing very well on it."

Gerard O'Meara and Teagasc tillage advisor Conor Kavanagh examine a mid-winter stand of rye.

Rye production in Ireland

The area of winter rye in Ireland is low, just 476ha in 2020. The crop isn't new to Ireland and records show that rye was grown in Ireland in the late 1800s for distilling and the straw was used for thatching.

Recent interest has risen in two areas: the distilling industry and feed for ruminants and pigs. Rye is attractive for tillage farmers as it has high grain yields with a relatively low cost of production.

The top countries where winter rye is grown are Germany, Poland, Russia, China and Denmark. Many people point to Denmark, which has a similar, temperate, climate to Ireland, when making a case for increasing the production of rye here.

Rye production for animal feed in Denmark has increased substantially in the last few years as a result of a policy of more home-produced feed production. Much of the rye grown in Denmark is used for feed in its large pig enterprises.

Recent research carried out by Peadar Lawlor, research officer at Teagasc Moorepark, concluded that pig growth rates on rye were excellent and that it can be used in finisher diets. Based on the chemical analysis, the forecast value of rye in the diet is 94% of the value of wheat.

Most of the current rye varieties are hybrid and are capable of delivering yields between 10t/ha and 12t/ha. Unlike wheat and barley which are self-pollinators, rye is a cross-pollinator. As a result, rye has had issues with ergot in the past, but modern breeding techniques have reduced this risk by shortening the time taken for fertilisation to occur.

Resistance

Rye is highly resistant to the take-all fungus *gaeumannomyces graminis* and is a suitable crop to grow in a take-all slot but consecutive crops should be avoided as this will increase the risk of ergot.

One of the advantages of winter rye is that it gives growers the option of lengthening the rotation before returning to a break crop.

Another advantage of rye's take-all tolerance is that it spreads the workload in the autumn as it can be sown from mid-September. Like all cereals, rye is susceptible to BYDV and early sowing can also result in increased lodging risk after a growthy autumn, so it is important to strike the correct balance between sowing date and location.

Weed control is similar to wheat and barley and will normally be done in the autumn and research from the UK shows that rye does provide useful suppression of blackgrass.

One of the most striking features of winter rye is the height of the crop, it grows 30cm to 40cm taller than wheat. Root lodging is the most common form of lodging and can be an issue, especially in thin crops. Grower experience to date is that losses as a result of lodging are rare but harvesting is slower due to the additional two to three bales (4X4) of straw per acre.

Phosphorus and potassium application should be based on offtakes and nitrogen rate is 15% to 20% less than winter wheat. Disease control in rye is relatively straightforward compared to other cereals. Brown rust and powdery mildew are most common but are well controlled by azole/strobilurin mixtures.

Production costs of winter rye are comparable to winter barley but output is higher due to higher grain and straw yields. There are an increasing number of feed merchants purchasing rye but it is important to have an agreement in place before you consider the crop.

Don't miss the deadline to join a Registered Farm Partnership

Gordon Peppard
Collaborative Farming Specialist, Rural Economy Development Programme

Registered Farm Partnerships (RFP) are an excellent collaborative farming arrangement which provide a business structure where the profits are shared among the partners in a business.

With more than 3,000 in place they are clearly seen by many farm families as an attractive business model.

RFPs between family members (intra-family) are most common in Ireland but there are also inter farm RFPs in operation where non-family members come together to form a collaborative business arrangement.

RFPs provide a pathway for succession within the family; they provide all members with a say in the planning, decision-making and management of all of the farming activities; and they provide numerous social and financial benefits.

RFP applications can be submitted at any time during the calendar year. But if you are planning to submit an application to enter a Register a Farm Partnership in 2021, in order for the Department of Agriculture, Food and Marine to have it processed in time for submission of your Basic Payment Scheme application before 15 May 2021 under an RFP number, then all applications and supporting documentation for the RFP must be submitted before 26 February 2021.

There are five key areas to address when completing an RFP application:

1 The RFP bank account: A new RFP bank account to include all the names of the partners must be set up. All income and expenditure from the partnership goes through this bank account.

No farming transactions of the partnership should take place through individual partners' own bank accounts.

There is a one page form to be completed and stamped by the bank to verify that the bank account is set up and operational.

2 Establishing the herd number for use in the RFP: RFPs can be a single herd number partnerships or a multi-herd partnerships.

All income and expenditure from the partnership goes through this bank account.

Multi-herd number partnership:
Where two individuals currently have their own herd numbers and have been farming in their own right prior to the establishment of the partnership, then this will be a multi-herd partnership. No changes are required to the herd numbers and partners can nominate a dominant herd number to use for animal registration, herd health management, etc.

The Basic Payment Scheme (BPS) application will be made on one application form using the RFP number. Within the BPS application form, both herd number tabs will appear and lands associated with each herd number should be declared under the respective herd numbers.

Single herd number partnership:
Single herd number partnerships generally arise in a family situation where a son or daughter (minimum Level 6 agricultural qualification) are returning home to farm in conjunction with their father/mother in a registered farm partnership.

Consult the local District Veterinary Office (DVO) and agricultural advisor in relation to adding the son/daughter to the existing herd number or whether the new entrant should establish their own herd number.

In most cases, the son/daughter is added to the existing parent/s herd number using an ER1.1 application submitted to the local DVO.

3 Completing the on-farm and partnership agreements: These agreements are very important documents and require consultation with accountants, solicitors and agricultural advisors. The agreement forms the basis of a successful RFP where all workings of the agreement are clearly defined and very carefully drafted with expert independent advice.

All template agreements are guidelines and should be amended to reflect each individual partnership agreement.

4 Supporting documentation: Please ensure the following documents are included with your application for an RFP.

- Completed application form.
- Partnership tax reference number.
- Completed bank details document verified by bank.
- A signed copy of the farm partnership agreement
- Copy of on-farm agreement.
- Copy of folios and maps of all owned lands.
- Copy of leases and maps for all lands leased in.
- Stamp duty certificate from Revenue for all leased land.
- Evidence of agricultural qualifications (min. Level 6) for Category II partners.
- Completed checklist.

5 Submission of the application: Completed applications with all supporting documentation should be emailed to farmpartnerships@agriculture.gov.ie before 26 February 2021 in order to have an RFP number prior to the closing date for the BPS on 15 May 2021.

For further information on forming a RFP, please consult the Teagasc website or contact your local Teagasc office.

Discussion groups support health and safety adoption

Regular, brief, discussions of health and safety issues should be on all discussion group agendas

Dr Tracey O'Connor
Recent Teagasc –
HSA PhD Walsh Scholar

Farming is high-risk work, with a fatality rate greater than that of other occupations. Given the many "hats" each farmer must wear, it is essential that they are supported to reduce the risk of illness, injury and death for themselves, their families, and any staff they employ.

The farm risk assessment document has been shown to support adoption of good occupational safety and health (OSH) practices, and physical changes on farms to reduce risks.

Another OSH promotion strategy that has worked in other occupations, including healthcare, policing and construction, is peer-to-peer exchange of knowledge and practices in OSH-focused discussion groups.

Teagasc facilitates about 800 discussion groups across all farm enterprises. Discussion groups enable farmers to share practical solutions and, through the rotation of "host farm", see what strategies other farmers have implemented and how well they have worked.

Research

With support from Teagasc and the Health and Safety Authority, research was undertaken to investigate the outcomes of promoting OSH in farmer discussion groups. The research drew on the experiences of dairy discussion groups in Kildare and Offaly that had made health and safety part of their monthly agenda.

When the study was initiated in 2016, there were 301 Teagasc dairy discussion groups, with 4,669 dairy farmers, representing 29% of Irish dairy farms.

A key finding was that 96% of the 96 discussion groups participating discussed health and safety at least once in 2016. This was before the Department of Agriculture, Food and the Marine "Knowledge Transfer" programme, which required groups to take part in OSH promotion activities. The majority of the discussion groups focused on the causes of fatal farm accidents.

A number of important issues, including those related to chronic illness, such as sun and ear protection, received limited attention.

Based on these findings we determined to develop standardised discussion strategies. A collaborative design approach was taken, engaging farm advisors and knowledge exchange experts from Teagasc, to ensure the approaches developed would be engaging and feasible.

Two discussion approaches addressing four separate health and safety topics were examined. One in which the groups discussed all the topics in a single group meeting and the other in which groups covered one topic per meeting, for 20 minutes.

A number of advisors reported that groups enjoyed the "little and often" approach. Furthermore, the discussions were appealing to farmers in different life stages, and with different farming strategies and business performance goals.

Regardless of the number of years of farming experience a farmer may have, the farm performance and farm size, many of the risks farmers face within a particular enterprise will be the same.

The critical difference between life and death is how those risks are managed, and strong support networks that promote effective risk management, such as discussion groups, can help farmers to invest in preserving life and health.

Award-winning approach to

Steven Meyen
Forestry development department,
Teagasc, Donegal

"A managed forest is a valuable asset to a family and its future generations. Timber values outperform inflation. Forestry is better than many other investment asset classes and represents a low-risk, secure, pension." So says Ross Buchanan, the most recent winner of the RDS/Teagasc Farm Forestry Award.

Ross manages 48ha of diverse forest, planted in 2006 on an outlying farm in Glentogher, in the heart of the Inishowen Peninsula.

From traditional Donegal sheep farming stock, Ross continues to farm with his father on the main holding, over 30km away.

Prior to establishing his forest, Ross carefully considered his farm resources before deciding on the optimum mix of enterprises for the family farm. He set clear objectives and designed a farm forest in Glentogher to meet both economic and environmental goals. It contains 11 tree species, including 14ha of broadleaves and 10ha of diverse conifers.

About 40% of the forest is spruce. Within the spruce area, species such as Scots pine and birch were established on small hills to enhance the landscape and promote biodiversity.

Ross says: "The Sitka spruce area is an important component as it will deliver medium-term economic returns. These returns will support our future farm plans."

Recreation plans

Ross is investigating how best to develop the strong on-farm recreation potential, making best use of the beautiful natural landscape features present on the farm. The farm boasts an ancient oak woodland with a stunning 10m waterfall within it.

The oak wood is traversed by an ancient road, once an important link between the monastic sites of Donagh and Derry. Open areas have been retained, offering great views over Inishowen and out to the North Atlantic.

Ross has designed a series of walkways as part of forest road-building activity. Plans include the addition of log cabins and interpretive trails that will illuminate the fascinating history of the farm.

However, Ross does make the point that, "Our cabin venture will depend on arranging reasonable insurance cover. The current high insurance premiums inhibit access to some of the more interesting parts of Ireland for tourists and locals alike."

Management approaches

For Ross, forestry and timber are "in the blood". His maternal great-grandfather operated a sawmill in Carndonagh. His paternal grandfather emigrated from Ireland to North America in the 1920s and worked as a lumberjack in Alaska. Ross studied forestry at UCD and currently works as a forestry consultant.

Ross established the farm forest in 2006, using a range of silvicultural approaches, putting his experience working as a forest manager in Scotland to good use. A substantial area is planted with an oak/Scots pine/European larch mixture. He is currently in

Table 1: Area planted

Tree species	Area	%
Sitka spruce	19.6	40.58
Mixed broadleaves	7.1	14.69
Pedunculate oak	5.1	10.56
Common alder	2.6	5.38
Scots pine	2.5	5.18
Japanese larch	2.5	5.18
European larch	2.1	4.35
Western hemlock	1	2.07
Norway spruce	1	2.07
Ash	0.7	1.45
Lodgepole pine	0.6	1.24
Beech	0.4	0.83
Open ground	3.1	6.42
Total	48.3	100

farm forestry in Donegal

Ross Buchanan is the most recent winner of the RDS/Teagasc Farm Forestry Award. From left: Steven Meyen, Teagasc, with Ross Buchanan. Picture: Clive Wasson

RDS Teagasc Farm Forestry Award

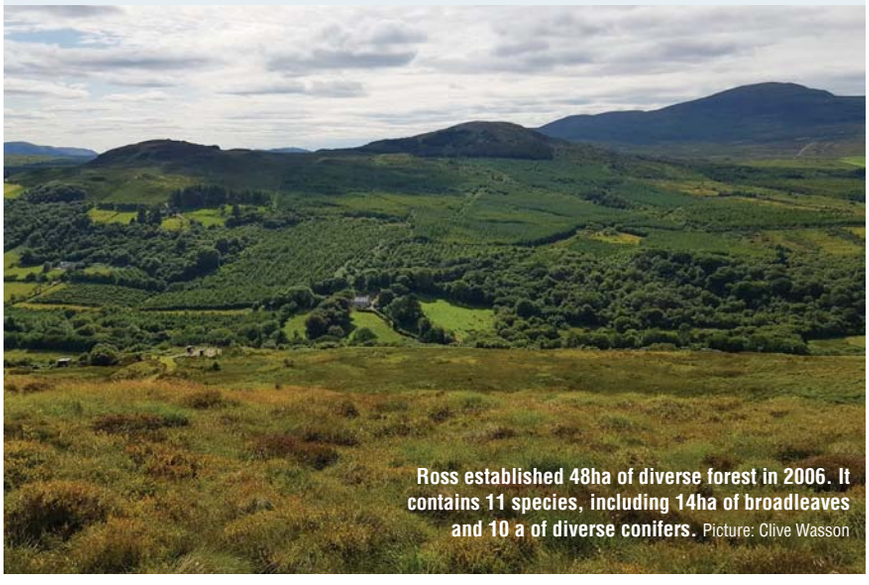
In July, the Royal Dublin Society announced that the winner of the 2020 RDS Teagasc Farm Forestry Award was Ross Buchanan. Patrick Rhatigan, Roosky, Co Roscommon, received the Special Commendation Award in the 2020 RDS Teagasc Farm Forestry category.

The award is usually presented in front of a packed audience in the RDS Concert Hall as part of the annual Spring Livestock and Forestry Awards. This year, due to COVID-19 restrictions, the award was made to Ross on his farm and forest near Carndonagh, Co Donegal.

In congratulating Ross Buchanan and Patrick Rhatigan on their awards, Professor Gerry Boyle, Director of Teagasc, said: "Teagasc is delighted to be associated with the RDS Forestry Awards through our sponsorship of the Farm Forestry Award Category.

This award recognises farmers like Ross and Patrick who are achieving sustainable integration of their forestry and farming enterprises. This will help farming families and the communities in which they live to build resilience by optimising the many economic, environmental, practical and social benefits that can accrue from farms and forests working together."

For more information on the RDS Teagasc Farm Forestry Award, visit www.teagasc.ie/forestry.



Ross established 48ha of diverse forest in 2006. It contains 11 species, including 14ha of broadleaves and 10 a of diverse conifers. Picture: Clive Wasson

the process of removing the conifers while selecting and shaping oak trees.

He recently completed construction of an extensive forest road network. This improved access allows him now to carry out a pre-commercial manual selective thinning of the spruce parcels. The next phase will be to prune selected trees to improve future timber quality.

In another area, he planted a mix of Norway spruce with numerous pockets of oak. The spruce provides side shelter to the young oak. The spruce will be removed gradually as a cash crop so that this area can develop into an oak woodland over time.

Some good advice

Ross strongly believes that it is a good idea to have a forest on the farm. "Many farms in Ireland have ground suitable for planting to meet a range of objectives, from production through to biodiversity and/or recreation.

"The premium offers a great short-term income that can be focused on expanding other parts of the farm enterprise while the forest itself represents a source of growing capital. In continental Europe, the farm forest is seen as a bank account where some timber can be felled and sold when machinery is required for the farm."

He adds a note of caution: "Owners don't always understand the value of forestry and what the timber is going to be worth. Too many sell off the farm forest once premiums are up allowing someone else to realise the value of the timber and for future rotations too."

Looking to the future

Ross's story shows how forests can be a valuable resource on the farm. His carefully designed forest and his innovative approach help to diversify income streams. This, in turn, has opened up new opportunities for farm diversification.

Forestry is now very much an integral part of the farm.

Growing experience at the Botanics

Our accelerated use of online technology means we can deliver better courses to a greater range of students than ever

Deirdre Walsh
Assistant Principal at the Teagasc College at the National Botanic Gardens

Teagasc students outline the message while studying planting strategies in Merrion square.

The year 2020 brought much that was bad but it also accelerated change in education delivery which will yield ongoing benefits. It transformed the learning environment in the Botanic Gardens, requiring us to adapt quickly to maintain the quality of the education that we pride ourselves on.

Traditional classrooms became virtual ones overnight. Staff and students made the digital leap, embracing new technologies and strategies to meet module learning outcomes. The online video communications platform Zoom is now being used to deliver lectures, arrange meetings and workshops with students, while Moodle, an online learning platform, hosts all the course material and assessments for the students.

Zoom proved invaluable in maintaining contact with our students, both at home and abroad. Students were able to see a familiar face from the college which kept them up-to-date with developments on campus.

These digital systems will outlast the coronavirus pandemic and help pave the way for increased availability of online programmes and greater access to courses. "Blended learning" made our courses accessible to students who don't have the option to study full-time. Students can now attend from a location of their choice for a significant part of the course.

As a large portion of our training is very hands-on, one of the main challenges we face is delivering practical skills remotely.

We have adopted flexible approaches to this by including active experimentations, problem-based learning techniques, numerous questions with detailed feedback, videos, and photographs.

Students, having prior knowledge of the tasks at hand, attend the college for practical training in small, physically distanced pods or groups (safety is always paramount with Government guidelines strictly followed). This multimedia approach has allowed us to teach practical hands-on skills effectively.

Field trips have always been a large element of horticulture courses. Although these have been geographically curtailed during the pandemic, the georgian squares in Dublin city centre were a destination for our third-year degree students in 2020.

Here, students were tasked with evaluating the different planting approaches in each of the squares and how they can be used to enhance our city environments in terms of biodiversity, ecology and sustainability.

Blended learning means students can combine online tuition in horticulture with skills training at the National Botanic Gardens, once that can be delivered in line with Government rules on COVID-19.

Planting

The importance of planting in our urban and rural environments has never been more important.

In an urban environment, planting is vital to mitigate against climate change and high pollution levels. For instance, tree planting can improve air quality, making our cities healthier places to live in.

For me, 2020 will be the year that I became assistant principal in the National Botanic Gardens. Originally from a dairy farm at the foothills of Slievenamon, Co Tipperary (a far cry from all the above-mentioned technology), I resisted obtaining a laptop or mobile phone until my mid-twenties.

I'm glad to say my initial reluctance wore off eventually and that before the pandemic, I was equipped with at least a passing knowledge of the software and media platforms that we now take for granted as a college.

So while we won't look back fondly on 2020, it accelerated our use of tools which I believe will continue to enhance the student experience as we move into a more "normal" year in 2021.

Teagasc
Agriculture and Food Development Authority

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