TEAGASC

November – December 2019 | Volume 30 | Number 6

Today's Farm

Business production environment and countryside issues www teagasc ie

Defining sustainability 11

Herd health key in the Kingdom 6
Things to consider when handling cattle 8
Long-term land leasing makes lots of sense 14
Teagasc education courses – frequently asked questions 17
Hedges fit for birds and bees 20
Conservation tillage 22
Weed control in winter cereals 25
Holding you to account 28
A golden pond 31
Calf housing 32
Investing in forestry knowledge 36
An additional link in the value chain 38

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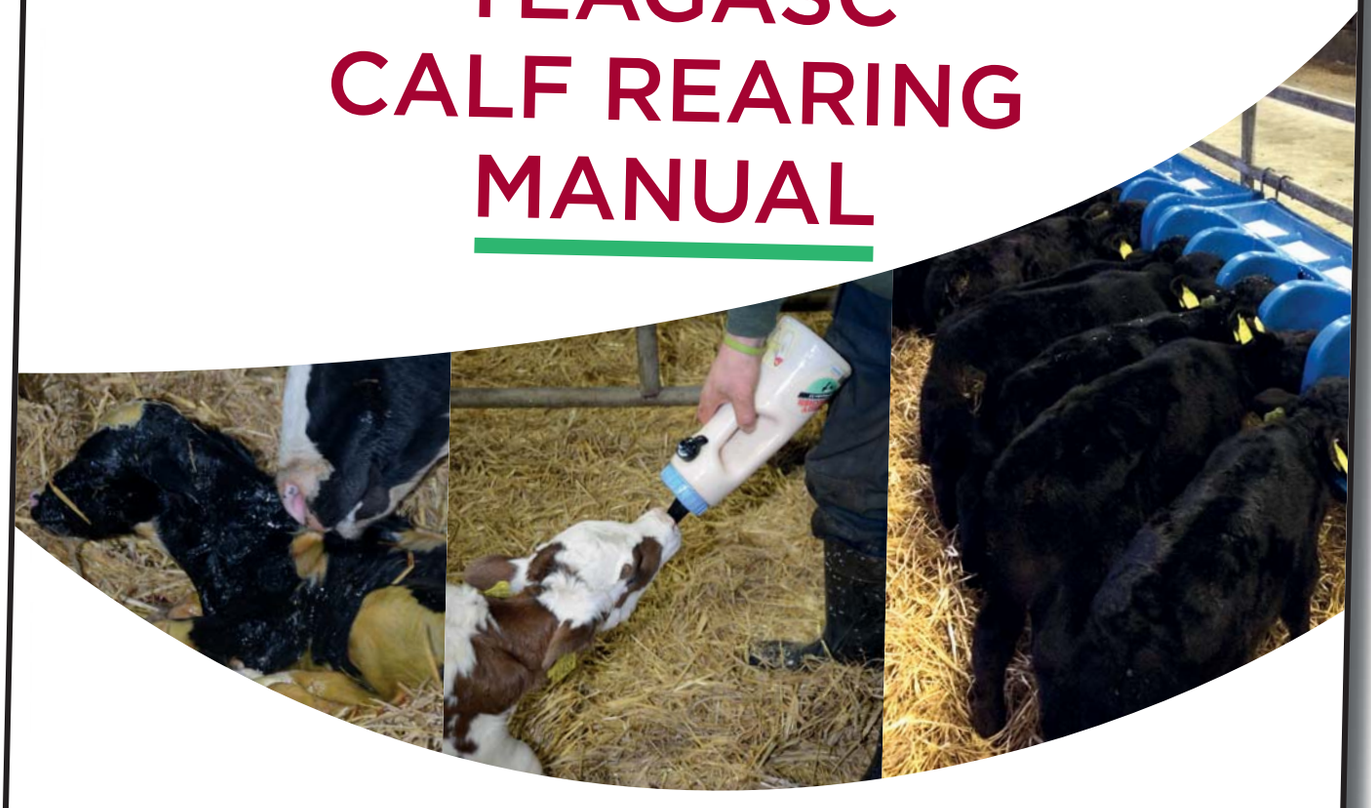
TEAGASC CALF REARING MANUAL



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Events
4-5 Events in November-December

Drystock
6 Herd health key to unlocking potential in the Kingdom
8 Five things to consider when handling cattle

Dairying
11 Defining sustainability

Farm management
14 Long-term land leasing makes lots of sense

Education
17 Teagasc education courses – frequently asked questions

Environment
20 Hedges fit for birds and bees

Tillage
22 Conservation tillage
25 Weed control in winter cereals

Farm accounts
28 Holding you to account

Botanic gardens
31 For a golden pond… you need to do a little maintenance

Farm buildings
32 Calf housing

Forestry
36 An investment in knowledge pays the best interest

Diversification
38 An additional link in the value chain

Dairy farm sustainability
What the word 'sustainability' actually means
>> 11-13

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

Editor: Mark Moore
Sub-editors: Regina Horan, Anthony Murphy and Mary Ryan
Cover design: Design at DBA
Imaging: Philip Doyle and Jerome Dunne
Printing: Boylan Print Group, Drogheda, Co Louth

All editorial enquiries to: Teagasc, Oak Park, Carlow
Tel: (059) 917 0200 Fax: (059) 9183498
e-mail: mark.moore@teagasc.ie | web: www.teagasc.ie

All advertising enquiries to: Shane O'Grady, IRN Publishing,
First Floor 121-123, Ranelagh, Dublin 6
Tel: (01) 412 7828 E-mail shane.ogrady@irn.ie

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Cover | Louise, Kevin (two) and Brendan Elliott are starting out in dairy farming in Co Westmeath. We explore the factors which influence sustainability for farm families, whether young or more established. See article on p11.

COMMENT

Mark Moore
Editor,
Today's Farm

Calm is always best

It was a summer evening and I stood with Teagasc advisor Billy McCarthy and farmer Tom Moroney in a field in west Waterford. As we chatted the dairy cows came and surrounded us in an almost perfect circle, like petals on a daisy. Almost eerily calm, their heads to the fore as if hanging on Tom's every word.

Naturally, dairy cows are used to human interaction but I couldn't help thinking it was also related to the easy-going disposition of the farmer. The vast majority of farmers, dairy or drystock, are skilled herdspeople who treat their stock as colleagues, so Peter Mullan's article is a gentle reminder of best practise that most already follow.

Is fearr suaimhneas i gcónaí

Tráthnónta samhraidh a bhí ann agus mé i mo sheasamh i ngort in iarthar Phort Láirge in éineacht le Billy McCarthy, comhairleoir de chuid Teagasc, agus Tom Moroney, feirmeoir. Mar a bhíomar ag cur is ag cúiteamh, tháinig na ba bainne anall chugainn agus rinne fáinne thart orainn, ar nós peitil ar nóinín. Bhí siad socair suaimhneach, a gcloigne chun cinn inár dtreo, amhail is dá mbeidís ag éisteacht le gach uile fhocal beo a tháinig amach as béal Tom.

Ar ndóigh, bíonn cleachtadh ag ba bainne ar dhaoine daonna, ach ní fhéadfainn gan smaoineamh arbh é an bealach deas réidh atá ag an bhfeirmeoir ba chúis leis sin. Tréadaithe sároilte is ea formhór mór na bhfeirmeoirí déiríochta agus stoic thirim, a chaitheann lena gcuid beithíoch amhail is dá mba comhghleacaithe iad. Mar sin, is meabhrú séimh é alt Peter Mullan faoin deachleachtas a leanann an chuid is mó dúinn cheana féin.

events

TEAGASC EQUINE CONFERENCE

- 14 November 2019
- Event time: 2pm
- Registration from 1.15pm
- Venue: Castletroy Park Hotel, Co Limerick

A health check for your horses, breeding programmes, and future decision making, this event is a must attend for all equine professionals, breeders, young horse producers and all those with an interest in the future development of the Irish sport horse industry.

Online booking is available on the Teagasc website.

Admission (including refreshments) €40. Student rate €20. Places are limited.

For further details, contact equine specialist Wendy Conlon: wendy.conlon@teagasc.ie

TEAGASC OUTLOOK 2020 CONFERENCE

- 26 November 2019
- Event time: 10am
- Venue: Ashtown Conference Centre, Teagasc Ashtown, Dublin 15. Eircode: D15 DY05

Following the challenges of 2018, the agri-food industry has experienced another challenging year in 2019. While weather conditions through spring and summer were quite good, autumn set in very early in some parts, with grazing curtailed, harvest completion delayed and planting of the 2020 crop deferred.

With the notable exception of pigs, output price developments in 2019 have been negative. On the inputs side, lower levels of feed use in grassland systems have been offset by higher feed and fertiliser prices.

In 2019, dairy has had a positive income rebound and the pig sector has benefitted from lower global production. However, in other sectors, there have been more mixed incomes developments in 2019.

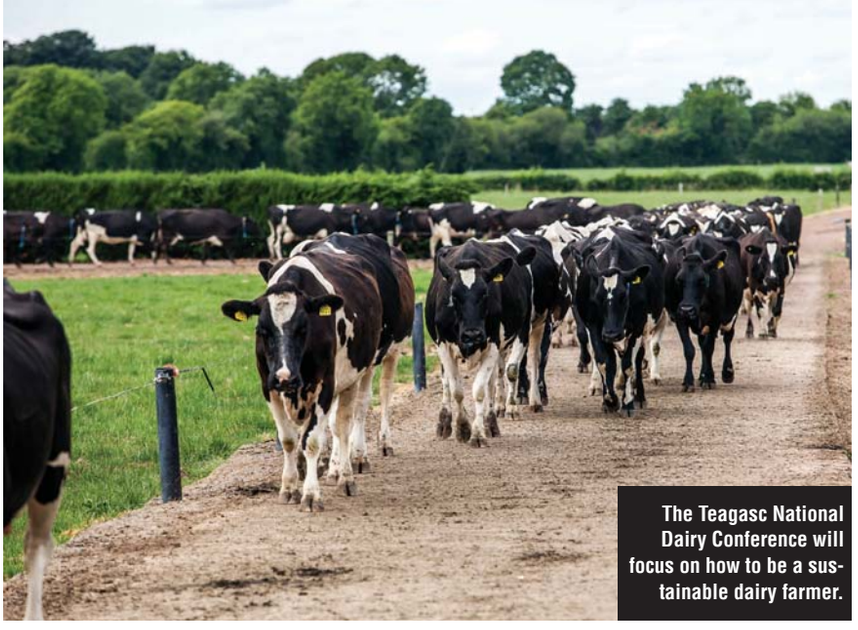
Turning to 2020, Brexit is a key consideration. This year's conference will include the short-term outlook for the major farm sectors, and will consider the implications of an orderly or disorderly Brexit.

Who should attend?

This event will be of interest to farm representative organisations, food businesses and representative bodies, financial institutions, academics, policymakers and farmers.

How to register?

You can go directly to the Eventbrite registration page https://outlook-2020teagasc.eventbrite.ie



The Teagasc National Dairy Conference will focus on how to be a sustainable dairy farmer.

BRIDGING SCIENCE AND THE CONSUMER

- Key market trends and implications for the Irish food industry
- 19 November 2019
- Event time: 10am to 4pm. Registration from 9.30am to 10am
- Venue: Teagasc Food Research Centre, Ashtown, Dublin 15, D15 DY05

TEAGASC NATIONAL DAIRY CONFERENCE, KILLARNEY

- 3 December 2019
- Event time: 9am
- Venue: Killarney Convention Centre, INEC, Killarney, Co Kerry

See page 5 for further details on the conference and admission.

Agenda

9am: Registration

9.45: Opening address: Majella Moloney, regional manager, Teagasc

Session one

Sustainability from an environmental perspective chaired by Professor Gerry Boyle, Teagasc director.

10am: Building on the Best: Dr Padraig French, Teagasc Moorepark.

10.45: Increasing N use of efficiency and reducing emissions: Dr David Wall, Teagasc Johnstown Castle.

Increasing N use of efficiency: protected urea and LESS: Dr William Burchill, Teagasc Moorepark.

Increasing N use of efficiency: white clover: Dr Brian McCarthy and Dr Deirdre Hennessy, Teagasc Moorepark.

Session two

Sustainability from a labour perspective chaired by Dr Sean McCarthy, Kerry Agribusiness.

11.45: Making our farm work for us: Frank Coffey, Currans, Co Kerry; Ed and Catriona McHugh, Killucan, Co Westmeath.

Lead dairy farming: making it happen: Abigail Ryan and Dr Marion Beecher, Teagasc Moorepark.

12.45: Lunch.

Session three

Opportunities in dairy farming: succession and progression chaired by: Mairead Lavery, *Irish Farmers Journal*.

2.15: Evaluating opportunities in dairying: Dr Laurence Shalloo, Teagasc Moorepark.

2.30: Partnership options for dairying: Gordon Peppard, Collaborative Farming Specialist, Teagasc.

2.45: Panel discussion with farmers who have followed different pathways into dairying: Peter Irwin, Kilmeedy, Co Limerick; Karol Kissane, Asdee, Co Kerry; Sinead Walsh, Bandon, Co Cork.

4.30: Close of conference.

All are welcome to attend

TEAGASC NATIONAL DAIRY CONFERENCE - MULLINGAR

- 5 December 2019
- Event time: 9am
- Venue: Mullingar Park Hotel, Mullingar, Co Westmeath

See page 5 for further details on admission.

Agenda

9am: Registration

9. 45: Opening address: Con Feighery, regional manager, Teagasc.

Session one

Sustainability from an environmental perspective chaired by: Liam Herlihy, chair, Teagasc.

10am: Building on the Best: Dr Padraig French, Teagasc Moorepark.

10.45: Increasing N use of efficiency and reducing emissions: Dr David Wall, Teagasc Johnstown Castle.

Increasing N use of efficiency: protected urea and LESS: Dr William Burchill, Teagasc Moorepark.

Increasing N use of efficiency – white clover: Dr Brian McCarthy and Dr Deirdre Hennessy, Teagasc Moorepark.

Session two

Sustainability from a labour perspective chaired by Michael Hanley, Lakeland Dairies.

11.45am: Making our farm work for us: Frank Coffey, Currans, Co Kerry; Ed and Catriona McHugh, Killucan, Co Westmeath.

Lead dairy farming: making it happen: Abigail Ryan and Dr Marion Beecher, Teagasc Moorepark.

12.45: Lunch.

Session three

Opportunities in dairy farming: succession and progression chaired by Amii McKeever, *Irish Farmers Journal*.

2.15pm: Evaluating opportunities in dairying: Dr Laurence Shalloo, Teagasc Moorepark.

2.30pm: Partnership options for dairying: Gordon Peppard, collaborative farming specialist, Teagasc.

2.45pm: Panel discussion with farmers who have followed different pathways into dairying: Brendan Elliott, Killucan, Co Westmeath; Shane Dolan, Athlone, Co Westmeath; Ciaran and Kathy Kavanagh, Tullamore, Co Offaly.

4.30pm: Close of conference.

All are welcome to attend.

TEAGASC BEEF CONFERENCE

The Teagasc beef conference will take place on Tuesday 10 December at the McWilliam Park Hotel in Claremorris, Co Mayo.

More details will be available closer to the time but both technical and economic aspects will be discussed and this will be free to attend.

National Dairy Conference 2019

'Being a Sustainable Dairy Farmer'

Tuesday, 3rd December | 9.00am
INEC, Killarney, Co. Kerry

Thursday, 5th December | 9.00am
Mullingar Park Hotel, Co. Westmeath

The theme of this year's **Teagasc National Dairy Conference** focuses on dairy sustainability and addressing the conference will be a number of leading dairy farmers, Teagasc advisers and researchers.

Over the past number of years, sustainability from a number of perspectives has come increasingly to the forefront of Irish dairying. Farmers who recognise the challenges this presents and adapt accordingly will continue to operate profitable and viable farm businesses.

The **Teagasc National Dairy Conference** will focus on three components of dairy sustainability: environmental, work life balance and succession/progression sustainability.

All are welcome to attend

Admission:
EARLYBIRD: *Book before 17 November using code* **DAIRYCON19**
Teagasc Clients/ConnectEd Members: €60 / €50 early bird
Students: €30 / €25 early bird
Non Client/Industry: €120 / €100 early bird

Register today at **www.teagasc.ie/dairycon19**

For further information please contact:
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Herd health key to unlocking potential in the Kingdom

A health plan, and adequately ventilated housing are key to disease prevention

John Greaney

James and John Flaherty fly the flag for Co Kerry in the BETTER Farm Challenge. Having joined the programme in January 2017, they farm 41ha, of predominantly heavy ground. Stocked highly at 2.12LU/ha, they operate an under-16-month bull and 22-month heifer beef system.

James, ably assisted by his father John, and mother Noreen have together experienced many highs and lows over the past three years. One of the lows was undoubtedly losing over a dozen calves in spring 2018.

Transition

James returned home from New Zealand to take over the mantle and had a clear vision of what direction he wanted the farm to take. Originally a dairy farm, the Flahertys milked over 60 cows but due to its fragmentation, and losing leased ground, the dairy operation was no longer viable.

A commercial herd of 50 continental suckler cows now graze the fields in Cordal, just outside Castleisland. "With beef prices and the crisis we are in at the moment, the biggest factor that is going to either keep a person in business or make them go broke is producing as many kilos of beef as you possibly can off grass and milk, and that's why we've looked for a milkier cow type," James says.

This year, 100% AI was used on the farm, with calving slightly later in spring to get cows outdoors soon after calving. Grassland management has improved and a lot of reseeding has been done. The farm has consistently grown over 13t/DM/ha over the past two years, on the basis of good soil fertility and good infrastructure. Most importantly, herd health issues have been rectified.

Poor weather in the back end of 2017 when stock had to be housed very early, coupled with a bad spring in 2018, resulted in James' "worst farming experience ever". As well as having to buy in extra meal and fodder in the spring of 2018, the Flahertys had to contend with a calf pneumonia outbreak. "We lost a lot of calves from it," says James. "It was very disheartening.

"A combination of poor ventilation in the house and the terrible spring was the problem. I had a lot of my good cows left with no calf at foot and with the year that was in it, I had no other option but to cull them."

Eventually, they got to the bottom of the problem, working closely with their local vet Stephen Murphy.

"No matter how bad it gets, we still have to move on," says James. "If we got caught up on everything that goes wrong in farming, we would get nothing done. There were many farmers with the same problems up and down the country.

"Cattle were inside for far too long in 2017/18. I thought the sheds were fairly well ventilated but there were improvements needed, such as replacing vented sheeting with Yorkshire boarding. We also knocked out a lot of existing walls, or cut them several feet, to improve air flow. Keeping animals warm back then was not a problem, keeping the animals cool was the biggest problem. Not enough fresh air was getting in."

James recommends that a smoke test be carried out if in doubt over the ventilation in a house. The availability of fresh clean air relies on the effectiveness of the ventilation in the shed. Good ventilation supplies enough clean air to remove gases, odours, dust, bacteria and removes heat and moisture generated by the animals housed.

Fresh air and sunlight is actually a disinfectant, if a virus is coughed up in a building, it will last for 20 hours. However, if the same virus is coughed up outside, it will last for just 20 minutes.

The Flahertys have one of the finest yards in the programme but with hindsight James is sorry he tried to keep the sheds so compact. "Stephen, our vet, was quick to point it out. The last shed we built is situated directly across from our main slatted house and at the time seemed perfectly placed. Unfortunately, it has restricted the air flow coming into the slatted house."

Prior to the spring of 2018, the Fla-

VENTILATION CHECKLIST

- Cobwebs
- Condensation or rust damage to roof.
- Blackened timber.
- Stuffy/heavy smell of ammonia.
- All the above are key indicators that there is not enough air circulating through the shed.

James Flaherty.

hertys never had any major issues with herd health. "It was probably a ticking timebomb and we hadn't previously experienced a winter of that length," says James.

"Farmers across the country were dealt a severe blow that winter but those with a strict herd health plan in place were in a better place to manage the storm."

Vaccines don't come for free but they have a role to play on all farms no matter how big or small. Farms countrywide experience different challenges. Some farmers are continually looking for a blueprint when it comes to herd health but there isn't one because all farmers do things differently and operate different systems.

Some herds are closed, others are at a risk of buying in diseases. The land in north Kerry is heavy and the prolonged winter opened James' eyes.

Today, James acknowledges that if he had been vaccinating, it would have saved some, if not all, of his well-bred stock. With an estimated cost loss of €13,200 on stock and an additional €4,000 on veterinary fees, the Flahertys implemented a vaccination plan, created extra housing capacity and improved ventilation. A life lesson for sure.

Month	Action
September	Calves - Booster pneumonia vaccine (pre-weaning).
October	Calves - Pre-housing worm treatment. IBR vaccine.
November	Breeding stock - Initial leptospirosis vaccine early in the month. - Don't forget lepto shot for heifers at end of month.
	Calves - Clip backs and tails. - Lice treatment.
December	Breeding stock - Fluke treatment (after eight weeks housed). - Lice treatment. - Scour vaccine in early calving cows.
	Calves - Fluke and worm treatment. - Monitor Lice and treat, if necessary.
January	Breeding stock - IBR vaccine to all cows.
February	Breeding stock - Monitor lice and treat, if necessary. - Scour vaccine in late-calving cows.
March	Calves - IBR vaccine - Cryptospiridium control, if necessary. - Coccidiosis control.
April	Breeding stock - Initial BVD vaccine early in the month. - Pre-breeding scan for cows and maiden heifers. - Don't forget the booster BVD vaccine for heifers at the end of the month.
	Calves - IBR vaccine. - Cryptospiridium control in late calves. - Coccidiosis control. - First clostridial vaccine.
May	Breeding stock - Heat and service recording.
	Calves - Don't forget the booster clostridial vaccine.
June	Breeding stock - Heat and service recording.
	Calves - Begin monitoring worm burdens and treat, if necessary.
July	Breeding stock - Monitor worm burden particularly in first-calving cows and treat, if necessary.
	Calves - Monitor worm burdens and treat, if necessary.
August	Breeding stock - Pregnancy scan.
	Calves - Monitor worm burdens and treat, if necessary. - Initial pneumonia vaccine.

Five things to consider

Peter Mullan, Teagasc,
Manorhamilton, Co Leitrim

Cattle are regularly taken from comfortable surroundings, in their paddock or pen, into an unfamiliar environment where they may be prodded with a needle or have a dosing gun shoved into their mouth. Remind you of anything? A dental visit perhaps?

When it is put like that, from the animal's point of view, it is not hard to see why they might find any handling operation a stressful experience. If the animals find it stressful they may not co-operate, making the experience stressful for the handler too.

Stressful animals are much more prone to picking up infections, which can lead to reduced performance. Animal handling need not need be overly stressful. Small changes can yield significant benefits for all involved.

The Flight Zone

Cattle are prey animals, and they view humans as predators. We've all hear of the 'fight or flight' response and cattle will usually choose flight, though newly calved cows are likely to stand and fight.

The animal's flight zone is its personal space. The size of the animal's flight zone is an indicator of just how tolerant it is of human interaction. In other words, it is an indication of how wild or tame the animal is.

Dairy cows, for example, have a very small flight zone, indeed many may have virtually none at all. This results from close daily human contact since birth. Young calves reared artificially are totally dependent on humans for feed. This creates a positive association with humans. As adults, daily milking reinforces this close animal/human bond. As a result, dairy animals are generally tame and relatively easy to handle.

At the other end of the scale you have suckler-bred beef animals that may well have had minimal human contact from birth and are almost completely unaccustomed to people entering their personal space. These animals will frequently have a very large flight zone and will not let a person get close to them.

Extreme care needs to be taken when handling these types of fractious animals, especially in the confines of a handling yard, as serious accidents can and frequently do occur in these scenarios.

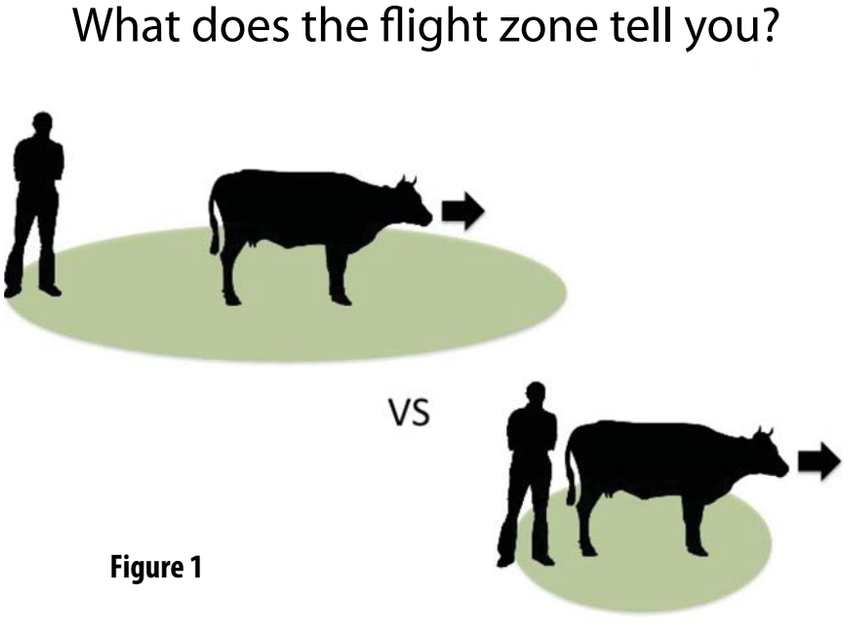


Figure 1

An experienced handler can quickly identify an animal's flight zone and can use this awareness when carrying out handling tasks. If you step in and out of an animals flight zone at the correct times, you can get them to move in the direction you want.

An experienced handler will easily identify a particularly difficult animal and be aware of them at all times, in order to prevent a fight or flight scenario developing. In a field, the animal will opt for the flight option, in a confined space, such as a handling yard where flight is not an option, it may choose to fight or attack.

Animal's point of balance

The animal's point of balance is at its shoulder. Allowing for the animals flight zone, if the handler stands at its shoulder, the animal, if settled, will not move (Figure 2). Move in front of the shoulder, the animal will move backwards (Figure 3), move behind the shoulder it will move forwards (Figure 1).

A good knowledge and experience with these movements can make tasks such as sorting cattle and moving cattle through a crush much simpler. It can also greatly reduce the need to resort to the use of stick and prods.

> The size of the animal's flight zone is an indicator of just how tolerant it is of human interaction

When using its point of balance to get an animal to move in the required direction, you are working the animal from its front and side rather than from behind. This has the benefit of the animal being able to see you at all times, as you are not dipping in and out of its blind spot which is to its rear. Animals will be calmer and less likely to get agitated.

Handler's attitude and skill level

Starting any task with the right at-

when handling cattle

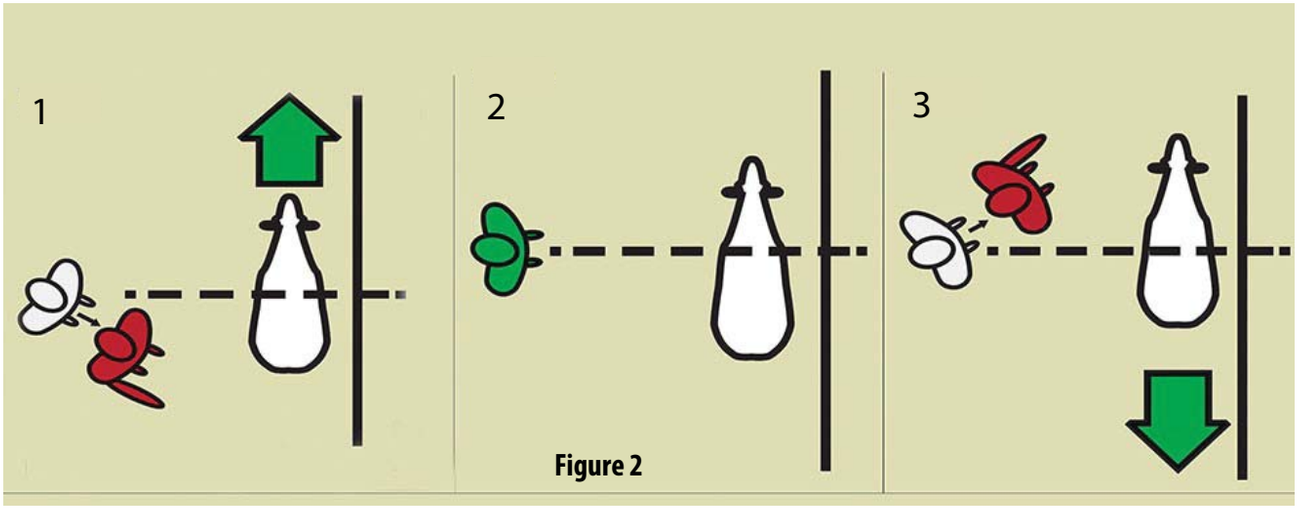


Figure 2

titude is crucial. If we expect the process to be stressful, it will be.

Patience is essential when working with cattle. A calm handler has a much better chance of achieving their objectives. When handling cattle, it is often said that 'slower is faster'. This is particularly relevant where fractious cattle are involved. Excitable animals that have become agitated are often best left alone for at least 30 minutes to allow them time to calm down.

The most expensive, best laid out facilities will not work well where the handler has the wrong attitude. The opposite is also true, in that a basic, well maintained unit can work satisfactorily when being used by a handler with the right attitude.

Not everyone has the natural instincts to be a good handler. Skills and good handling habits can, however, be learned at any stage, but bad habits can also be easily handed down.

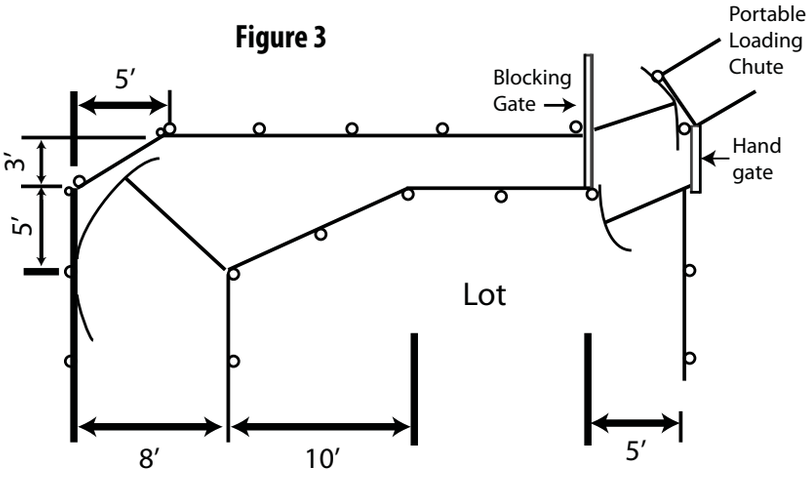
Layout of Facilities

In Ireland we tend to focus more on our facilities being of solid construction rather than how we have them laid out. Sturdy construction is obviously of huge importance, but does not necessarily mean that the workings of these units will be good.

The basic elements of a good cattle handling unit should include:

- Good secure access to the unit from sheds and fields.
- Sufficiently high internal and external gates and barriers to prevent escape.
- A good sized collecting area in which yarded cattle will not be packed too tightly.
- At least one smaller sorting pen adjoining the collecting area. This can lead directly to the crush, or on to another small pen feeding the crush. Ideally, this pen would be no more than 3m wide, as this is the maximum width a handler can control to prevent cattle passing.
- A crush made up of heavy duty gates that can be opened individually to release an animal which has gone down.
- A good quality head gate to catch an animal for tagging, injecting etc (an anti-backing bar or sliding gate set up approximately 2.5m back from head gate is useful also).
- A solid, level, preferably non-slip floor.

Figure 3



Basic improvements

Good handling facilities will effectively draw the cattle through. In poorly designed facilities, bottlenecks will appear, which cattle do not want to pass, examples include:

- **Blind 90° corners** – cattle can't see where they are supposed to go. Curved or angled corners work better and prevent cattle baulking.
- **Square pens where cattle bunch head-first into the corners** – putting some form of barrier into these corners can prevent this bunching and improve cattle flow.
- **Cattle getting stuck at the crush entrance** – install a properly funnelled entrance, ensure one side is in line with the crush, with the other coming out at a 30° angle (allowing for the standard crush gate to open).
- **Excessive cattle movement/ baulking in the crush** – put some form of sheeting on the side of the crush panels to cut down on external distractions.

Research into human-animal relationships (HAR)

An investigation of the HAR using housed pregnant dairy and beef origin heifers

Niamh Woods[1,2], Mark McGee[1], Marijke Beltman[2], David Meredith[3], John McNamara[4] and Bernadette Earley[1]

[1]AGRIC, Teagasc, Grange, Dunsany, Co Meath
[2]School of Veterinary Medicine, University College Dublin, Belfield, Dublin 4
[3]Teagasc, Rural Economy Development Programme, Ashtown, Dublin
[4]Teagasc, Kildalton, Piltown, Co Kilkenny

A detailed understanding of how livestock perceive and communicate with stockpersons is crucial to improving animal welfare and farmer safety. However, research into how animals, and people, experience these interactions is still limited.

To lead and handle animals, a farmer must first understand the way in which the animal perceives its environment. This is essential to understanding and anticipating its reactions.

Thus, it is important to assess the situation (low stress or high stress), attitudes and handler behaviour; the human-animal interactions and the handling facility characteristics.

The outcome of any livestock handling event depends on a combination of factors that are associated with the event.

The human-animal relationship (HAR) can be defined as the perception between the animal and the human, which develops and expresses itself in their mutual behaviour. The level of fearfulness of animals is determined by the experiences the animal has gained, in association with their individual genetic disposition.

This study assessed fear responses and HAR, over time in housed pregnant dairy (20) and beef (43) origin heifers using three behavioural tests; crush agitation (CA), exit speed from the crush (ES) and avoidance distance at the feed face (AD). The CA and ES were recorded consecutively on days 43 and 86 post-housing;

Avoidance distance (AD)

Avoidance distance was measured on day 51 and 99 post-housing by a familiar and an unfamiliar human.

The human was positioned 2m from the feed face and approached the animal slowly with their left arm raised at a 45-degree angle from the hip.

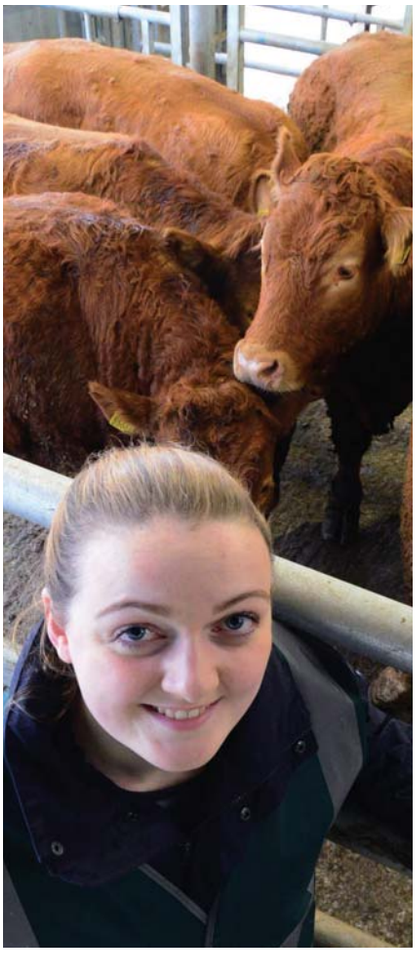
The withdrawal distance of each animal was recorded using a laser distance measure. If the animal did not withdraw, it was recorded whether or not the animal could be touched by the human.

The beef-origin heifers habituated to both the familiar and unfamiliar humans, whereas the dairy-origin heifers only habituated to the familiar human, over time. From the three investigated tests, AD proved to be a more sensitive measure of the human animal relationship and how cattle perceive humans, whether they are familiar or unfamiliar.

SAFETY

The three main themes with an impact on risk and safety during livestock handling are:
- The handler.
- The handling facilities.
- The cattle.

The AD test being carried out by an unfamiliar human.



Niamh Woods.

Implications

Development of a positive human animal relationship (low levels of fear in animals and high levels of confidence in humans) can be beneficial, e.g. the presence of a familiar human, providing gentle handling may calm animals in potentially aversive situations (e.g. isolation, calving) thereby reducing distress and risk of injury to the animal and the human.

Further work assessing the human-animal relationship is ongoing, with a primary focus on safety implications when working with cattle.

Acknowledgements: Department of Agriculture, Food and the Marine - Research Stimulus Fund Programme. Niamh Woods is funded under a Teagasc Walsh post-graduate Fellowship with UCD.

Defining dairy sustainability

The word 'sustainability' is everywhere but what does it actually mean?

Tom O'Dwyer
Teagasc Animal and Grassland Research and Innovation Programme

The Teagasc National Dairy Conference 2019 takes place on Tuesday 3 December in the Killarney Convention Centre, Killarney and on Thursday 5 December in the Mullingar Park Hotel, Mullingar. The theme is "Being a sustainable dairy farmer." But what does being a sustainable dairy farmer involve? There are many different possible answers but for me you are a sustainable dairy farmer if your farming is profitable, environmentally sound and socially acceptable.

- **Profitable** – your business cannot sustain itself unless it is profitable and provides adequate compensation for you, your family and your capital investment, management skills and labour.
- **Environmentally sound** – we all have to do more to preserve and renew the resource base that sustains us, to increase the positive impacts of agriculture on the environment while reducing any negative impacts. The key challenges here are water quality; emissions (both greenhouse gases and ammonia); and biodiversity.
- **Socially acceptable** – there must be a good quality of life for farmers and their families, including both their farming and non-farming activities. If dairy farming is not socially sustainable, individuals may exit the sector, or there may be a shortage of young people willing to take over farms when older farmers retire from farming, or a lack of people willing to work in the sector.

Your business cannot sustain itself unless it is profitable and provides adequate compensation for you and your family.

Continued on p12

TOP TIPS FOR SUSTAINABLE DAIRY FARMING

Profitable
e.g. gross output per ha; gross margin per ha; total costs; market orientation.

Environmentally sound
e.g. GHG emissions, N surplus, P surplus, water quality, % biodiversity and quality.

Socially acceptable
e.g. hours worked, succession, age profile, isolation.

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From p11

Teagasc advisor Denis Brassil, Frank and Gearoid Coffey.

Being a sustainable dairy farmer involves adopting new technologies, but also renewing the best practices of the past. Irish dairy farmers have never been slow about adopting research-proven technologies; in fact, they have been enthusiastic innovators during the last decade, which has contributed greatly to improvements in the productivity of the Irish dairy herd.

As an example, look at the changes in the genetics (EBI) of the Irish dairy herd in the past twenty years – a real example of the rapid adoption of a new technology by farmers.

Teagasc has identified the technologies and practices which will allow dairy farmers and the overall sector to improve its sustainability; and further technologies will be developed in the years to come through our research programmes. However, in order for these technologies to have an impact – to improve the sector's sustainability credentials in reality – dairy farmers need to embrace them.

So, for example, Teagasc research has identified a range of measures to enable dairy farmers (and other farmers) to reduce their environmental footprint, thereby improving the sector's overall environmental sustainability. Three of these technologies will be highlighted at the conference: using protected urea, applying slurry using low emission slurry spreading (LESS) and incorporating white clover into grass swards.

The conference will feature a number of farmer speakers. Two of these will present papers relating to the socially acceptable aspect of sustainability. Frank Coffey will outline how he makes his farm work for him, focusing on achieving a good work-life balance and managing the number of hours worked while also engaging in a range of off-farm interests.

Brendan Elliott will describe how he has progressed from having no background in dairy farming, to becoming a farm manager and to now having a leased farm, and milking his own herd of 70 cows. Brendan is married to Louise and they have a two-year-old son, Kevin.

Frank Coffey milks 100 cows at Currow, Co Kerry. Married to Siobhan, they have four children ranging in age from six to 17 years. The herd has expanded from 40 cows to the current 100 cows over the years, with milk supplied to Kerry Agribusiness.

Frank's typical working day is a "7am start and 6pm finish; that's a long enough day for anybody".

Frank says: " I can trace my focus on time management back to when my eldest son, Gearoid, started to play football with Currow GAA club. From initially just taking him to and from training, my involvement progressed to taking on a training role, and then the position of club chairman.

"If I have to be in Currow for 6.30pm, then I have to finish on the farm 30 minutes before that. Otherwise I am letting a lot of people down." He explains how he meets his off-farm commitments: "Once I know that I have a commitment [outside the farm] at say, 6.30pm, I work back from that allowing time for the wash-up, milking, getting the cows and so on. That off-farm commitment dictates the time I start the evening milking."

The start time for the evening milking is important on Frank's farm. "There is nothing stopping me from starting the evening milking at 3pm… only myself. Once cows are milked in the evening, you don't see jobs to be done; so I make a point of starting the evening milking early enough to finish by 6pm."

Efficient

Frank has adopted a number of practices on his farm to make things "as simple and efficient as possible":

- Heifers are contract-reared.
- A contractor spreads 90% of the slurry, the first round of fertiliser and makes first-cut silage.

"The best decision I ever made in terms of simplifying my system was to crossbreed my herd with Jersey, starting in 2009. It has really simplified the system. I am now breeding my cows back to high-EBI, high-fertility Friesian sires, while continuing to use Jersey on the heifers."

Brendan Elliott milks 70 cows at Killucan, Co Westmeath. Married to Louise, they have one child Kevin, who is almost two. Brendan started milking in spring 2019 and has milked 70 cows this year, supplying milk to Lakeland Dairies.

Brendan is from a non-farming background and trained as a farm apprentice, with the Farm Apprenticeship Board (FAB). He worked on a number of farms, culminating in six years as farm manager on the Hickey farm in Westmeath initially, and then Roscommon.

"I learned a lot over the years, but especially from my last employers, the Hickeys – the importance of having the right cow, making the most use of grass, how it was possible to lease a farm and meet the repayments."

Brendan purchased 70 heifers this spring, mostly from his previous employers, and started milking in February on a leased farm of 70 acres. "The farm was developed – fully reseeded, new roadways and water system – during 2018," says Brendan, who was still working as a farm manager.

"I left my job in January 2019 [he notes the generosity of the Hickeys in encouraging him to go out on his own] and committed fully to milking my own cows," says Brendan. "So, during the first year of the project, we were paying rent but had no income from the land. But on the plus side

we have a fully reseeded farm which yields 13t to 14t DM/ha."

While there was a good farmyard on the leased farm, the buildings were suited for beef cattle and had to be converted for dairy cow use; a milking parlour had to be built also. All of the development work was taken on by Brendan and his father and father-in-law to keep costs down; a second-hand milking parlour was installed.

The hours Brendan has had to work to get his enterprise up and running would not bear scrutiny under the EU working time directive. "I don't mind working the hours as we're in the startup phase, but in the longer term, when we have more cows and more scale, we can look at employing help."

When asked why he had taken the decision to set up on his own, Brendan said: "I love farming, and always wanted to milk my own cows. I think that there is a good living to be had from milking 70 to 80 cows, even on a leased farm. I also have an asset – over 100 head of stock."

According to Brendan the owner of the land must also get a fair deal. "We have been very fortunate with our choice of landlord and I know that the family who own the land are very happy to see the output of the land increase. Getting on well with your landlord is also key to sustainability."

As regards the future, Brendan has a 10-year lease on his farm and will look to really optimise the performance of both his herd and the farm. He will consider other opportunities if they arise, including further leasing or land purchase, although that will be in the future.

The calm and relaxed temperament of the cows in Brendan's herd is noticeable and several "pet" animals come over to say hello. "I actually reared many of these heifers myself when working as a farm manager," says Brendan.

Brendan Elliott.

HOW TO BOOK YOUR CONFERENCE PLACE

Visit www.teagasc.ie/events to find out more about the Teagasc National Dairy Conference 2019 and to book your tickets. Early booking is recommended. The cost of attendance is the same as previous years: €30 for students, €60 for Teagasc farmer clients and ConnectEd members and €120 for all other attendees. Registration includes entrance to the conference, including choice of three workshops; morning/ afternoon teas, lunch; and a copy of the conference proceedings. There is an early booking discount until the middle of November.

Finally, if there is one thing you do before the end of 2018, make it that you attend the Teagasc National Dairy Conference. It will be worth it.

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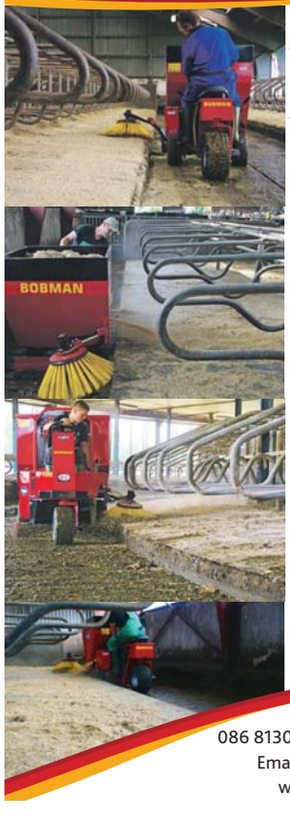

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Long-term land leasing makes lots of sense

Landowners are moving away from conacre and entering more permanent arrangements like long-term land leasing

Gordon Peppard
Teagasc Rural Economy Development Programme

Why are landowners favouring long-term land leasing?

• Profitability of existing enterprise
Depending on their farming system and scale, some traditional farming enterprises are struggling to deliver an adequate family farm income. Many beef, sheep and tillage farmers work part-time away from the farm to provide an adequate income to support their families. Many of these farmers are seeking new ways to optimise income from their assets.

•Successor's situation
On some farms, there is no identified successor, or possibly the successor is not yet ready to take over the running of the farm. The person currently farming may want to cut back on their workload to enjoy a better work life balance or retire altogether.

•Enhanced tax relief
Income tax incentives introduced by Revenue and the Department of Agriculture in 2014 made leasing more attractive to landowners who did not wish to farm the land themselves.

These tax incentives are still in place, as per Table 1.

Table 1: Income Tax Incentives for Long-term Land Leasing

Term of Lease (yrs)	Max tax-free income/year
5 - 7	€18,000
7 - 10	€22,500
10 - 15	€30,000
>15	€40,000

Land can now be leased for up to 25 years without impacting on the landowner's ability to qualify for Retirement Relief from Capital Gains Tax provided all other requirements are met.

Payments received under the Basic Payment Scheme can be leased with the land to the lessee, (ensure to seek advice from your agricultural advisor in relation to the correct transferring of these entitlements for draw down). These entitlements should be detailed in the lease agreement.

The value of the Basic Payment Scheme Entitlements leased with the land can be added together with the agreed fee per acre/hectare and qualify as a tax-free income under the relevant threshold.

If the income from long-term leasing of lands that is qualifying for income tax relief is the only income on the farm, then this is regarded as non-reckonable income for the purposes of PRSI contributions and the individual may be best advised to make voluntary contributions to Revenue in order that their requirements for social insurance benefits, including the state pension (contributory) are met.

It is therefore essential that the landowner should discuss with their accountant/Department of Employment Affairs and Social Protection, and Revenue, PRSI contributions and Universal Social Charge payable on this income.

The amount of income involved often determines the length of the lease agreement. If land is co-owned between a husband and wife, the relevant thresholds shown in Table 1 can be doubled. Legal proof of co-ownership such as land registry folios naming both parties as co-owners will be required.

To qualify for the income tax incentives, land must be leased to non-relatives. The only exception to this is where an uncle/aunt leases to a nephew/niece. If leasing to a niece/nephew, it is very important to seek taxation advice, as transferring the land to this person down the line could have significant tax implications.

Where the lessee is farming through a limited company, the company can now qualify the landowner for the income tax incentives. A person connected with the company cannot lease to their connected company and avail of the income tax exemptions.

•Opportunity for improvements/ investment in the land.
The landowner is providing the opportunity to the active farmer to invest in the land during the term of the lease. Due to security of tenure, there is now an incentive for the lessee to develop the lands and make them more productive by the end of the lease. There is generally a willingness to apply lime, improve soil fertility, reseed the land, and maintain fences etc. where a long-term commitment is in place.

•Qualify for retirement relief from Capital Gains Tax on transfer or sale of the farm*
Where land is let on conacre for more than 10 years, the landowner may not qualify for Retirement Relief on Capital Gains Tax if the farm is sold or transferred to a family member. Leasing the land long-term provides the structure to avoid this happening.*

•What are the advantages from the lessee's (active farmer) perspective of a long-term land lease?

1 Security of tenure
A lessee who is using long-term leased land as part of their farming operations can plan their business better in terms of lands farmed, stock carried and crops grown. It gives more certainty to the business, the scale of farming operations and may provide expansion opportunities. This is the key advantage for the active farmer.

2 Better financial justification for the required investment
With a long-term lease, the active farmer (lessee) can justify financial investment in any improvement works that are necessary to the land in order to farm it productively. Such investments may include: reclamation, soil fertility, reseeding, roadways, fencing and the provision of adequate water supply.

3 Farm buildings may come with the land, potentially reducing the need for capital investment
Where the active farmer is expanding their farm business, making use of existing facilities can greatly reduce any capital investment required in buildings. Such investment may

include: the provision of animal housing, slurry storage and silage facilities.

What does a long-term land lease involve?

A land lease is a written legal agreement between a landowner (lessor) and an active farmer (lessee) utilising the land. The lease is signed by both parties, witnessed by an independent person, and stamped by Revenue.

The basic details that are included in a lease are:

- Term length of the lease.
- Annual payment and payment procedure.
- Details of the land use and the upkeep of the land.
- Insurance.
- Treatment of Basic Payment Entitlements.
- A clause preventing subletting.
- The lease must be stamped by Revenue and registered with the Property Services Regulatory Authority (PSRA).

Stamping of the lease

The lease must be stamped by Revenue and registered with the Property Services Regulatory Authority. Where the lease is six years or greater the lease is stamped at a zero value and no stamp duty is payable. Where the lease is five years the stamp duty is charged at 1% of the annual lease fee. This should be paid within 30 days of the commencement of the lease.

Legal advice

The people involved in the lease must sign up to the conditions contained in the written lease agreement. While there are template lease agreements available, it is important to tailor the lease agreement to the needs of both the lessor and the lessee. An example of this would be the upkeep of fences or hedges on the farm. The responsibility for this should be clearly stated in the lease. Therefore, seeking the advice of a solicitor to review the terms of the lease before signing is important.

Farm buildings should generally be dealt with in a separate agreement to avoid any issues with the Landlord Tenant Act.

Alternatively, a separate renunciation clause may be signed by both parties where the tenant waives any rights under the Landlord Tenant Act at the outset of the lease. As all lease agreements are different, each agreement should be tailored to suit both the lessor and lessee.

Summary

Long-term leasing can be very beneficial for both the landowner and the active farmer in terms of land use and maintaining the land in a good productive state. It also makes sense financially for both parties as it allows the active farmer to better justify any required investments and the landowner benefits from the income tax incentives.

For further information, a booklet on long-term land leasing is available on the Teagasc website.

*Ensure to seek legal and financial advice to ensure that all requirements will be met to avail of Capital Gains Tax relief in the future. Like with any major decision involving land and/or buildings, independent legal advice from a solicitor and taxation advice from an accountant should be sought before entering into any long-term land leasing agreement.

Continued on p16

James Croke.

Case study: Alfred Sweetnam and James Croke

Farming outside of Mullinahone, Co Tipperary, Alfred Sweetnam traditionally calved 100 suckler cows each autumn. All heifers and steers from the herd were sold the following September/October as yearlings. In 2017, with the profitability of the beef enterprise coming under pressure and with the uncertainty of beef production into the future, Alfred started to look at ways to generate income from the farm while also reducing workload.

Largely farming on his own, Alfred looked into the benefits of long-term leasing. "The tax-free income on long-term lease is very attractive," says Alfred, who decided in 2018 to lease out 40 acres to his neighbour James Croke, a young dairy farmer. Suckler cow numbers were reduced to 65 and Alfred still had plenty of lands left to farm himself and sustain this stocking rate.

On asking Alfred what were the main decisions arrived at when deciding whether to lease to James or not, he answered that "Knowing the farmer in question and the way he operates his own farm left me in no doubt that James would treat and work the land the same way I would do so myself.

Asking about the benefits of taking on 40 acres, James replied that: "Having the security of a 10-year lease allowed me to develop a business knowing that I had the land in the long term."

As all the lands leased in were adjoining James' own land, it was all additional milking platform, enabling him to increase his dairy cow numbers from 140 to over 200.

"I was delighted to increase to this stocking level as it allowed me to employ one full time labour unit and another person part-time," says James. "I was busier with 140 cows than I am now with over 200. The added advantage is that my work-life balance has dramatically improved with more time available to spend with family; time to do other tasks on the farm that may have been left on the long finger in the past."

Having the security of tenure allowed James to develop the infrastructure of the leased ground with the development of new farm roadways etc. Similar to Alfred, James also re iterated the point of knowing the lessor, as James knew the quality of the lands, the good fertility status and the well maintained nature of the parcels.

Both agreed that having a proper written agreement from the start was an excellent way to ensure that every party knew where there stood and what was required. "This arrangement is having multiple benefits for everyone involved," concluded James with Alfred nodding in agreement.

Teagasc education courses – frequently asked questions

Tony Pettit
Head of Education,
Teagasc

Q What agricultural education programmes are provided by Teagasc?

Teagasc offers full time programmes and adult Green Cert programmes in agriculture through a network of six colleges:

- Teagasc Ballyhaise College, Co. Cavan: www.teagasc.ie/education/teagasc-colleges/ballyhaise/.
- Teagasc Clonakilty College, Co Cork: www.teagasc.ie/education/teagasc-colleges/clonakilty-agricultural-college/.
- Teagasc Kildalton College, Co Kilkenny: www.teagasc.ie/education/teagasc-colleges/kildalton/.
- Gurteen College, Co. Tipperary: www.gurteencollege.ie.
- Mountbellew Agricultural College Co. Galway: www.mountbellewagri.com.
- Salesian Agricultural College, Co. Limerick: www.salesianag.com.

Applications for Teagasc Level 5 full-time courses will open in mid-November and can be made online at www.teagasc.ie/education/going-to-college/apply-online/. Adult Green Cert courses commence on a rolling basis - contact colleges directly for information.

Teagasc also provides adult Green Cert courses across its 12 advisory regions. Contact details for information on local Green Cert courses are available at www.teagasc.ie/education/local-education-centres/.

Q Is there a Teagasc course prospectus available?

Teagasc publishes an annual course prospectus. The 2020 Prospectus is available at: www.teagasc.ie/publications/2019/teagasc-college-prospectus-2020.php.

Q What is the difference between full-time programmes and adult Green Cert programmes?

Full-time courses are open to all applicants, be they school leavers or those returning to agricultural education at a later stage. Full-time applicants must be 17 years of age by 1 January, following their enrolment.

Full-time learners participate on a daily basis, typically from September through to May/early June (depending on individual course schedules) over a two year cycle. The learner contribution charge per course is €990 per year, or €1,980 over the two years.

Learners enrolled on Teagasc full-time courses may be eligible for a Teagasc maintenance grant, depending on their income.

(See www.teagasc.ie/education/going-to-college/student-maintenance-grants/ for further information).

Adult Green Cert programmes are designed for older learners, not those who have recently left school. There are two programmes provided:

- **Teagasc Part-time Green Cert Programme:** Applicants must be 23 years of age or older to enrol in this programme. Learners attend on a part-time basis. The full programme takes in the region of 30 months to complete. The learner contribution charge is €1,700.
- **Teagasc Distance Education Green Cert programme:** Applicants must have already attained a non-agricultural major award qualification at, or equivalent to, Level 6 on the Irish National Framework of Qualifications. This programme requires the participants to take on a greater level of self-directed learning The full programme takes in region of 18 months to complete. The learner contribution charge is €2,990.

All of the above programmes are validated by Quality and Qualifications Ireland (QQI) and lead to QQI awards at Level 5 and 6 on the Irish National Framework of Qualifications.

Q Can I specialise in a particular area on an agricultural college course?

Teagasc full-time agricultural courses allow for significant specialisation. The first year (Level 5) at agricultural college provides foundation knowledge of the overall farming sector, but allows for some choice on production modules, where feasible. In the second year, (Level 6) learners opt for a specialised advanced programme option. These options are:

- Advanced dairy management - offered at all colleges.
- Advanced drystock (beef/sheep) - offered at all colleges.
- Advanced crops and machinery - offered at Kildalton.
- Advanced agricultural mechanisation – offered at Salesian Pallaskenry, Teagasc Ballyhaise.

Q What are the benefits of a formal Teagasc education to me or my child?

Each decade accelerates the breadth and depth of knowledge, skills and capabilities required to run a farm, be it big or small, full-time or part-time.

Tomorrow's farmer will wear many hats as a manager, controller and operator for technical production, farm business and finance administration, work and labour planning, farm software and decision supports, sustainability and environmental compliance, quality control and farm assurance, safety and risk, husbandry and welfare, among many others. The pace of change in farming is becoming more rapid and transformative.

Education is a fundamental investment for modern farming. A research study conducted across 1,100 farms (Economic returns to formal Agricultural Education, Teagasc 2014) highlighted the strong rates of return from Teagasc education at an individual farm level. These returns have a strong multiplier through the agri-food chain and the national economy.

Teagasc courses combine theory, practical instruction and on-farm placement with an emphasis on 'learning by doing'.

» Continued on p18

From p17

Learners get the initial grounding needed to wear the many hats modern farming requires. Learning is now a lifetime requirement in any career. A formal Teagasc education provides an initial, but key step, for those entering working in farming.

Q Are there opportunities for education and career progression?

Teagasc educates people for careers both within and outside of their own farm gate. Graduates of Teagasc agricultural programmes may seek employment as farm or herd managers, jobs that are in high demand thanks to the rapid expansion of the dairy sector. Others seek opportunities in the wider agri-service sector and sometimes combine this with part-time farming.

In some cases, a Teagasc education sparks an interest in progressing to higher education, which in turn becomes a stepping stone to wider career opportunities. Teagasc itself is a good example and has advisors and teachers on its staff whose first step in agricultural education was a Level 5 Certificate at an agricultural college. The current principal of Mountbellew Agricultural College, for instance, commenced her agricultural education with a Level 5 Certificate in Agriculture and progressed to a Level 10 PhD.

Agricultural colleges partner with many Institutes of Technology for CAO listed Level 7 and 8 land sector degrees programmes. Substantial elements of these programmes are delivered in situ at agricultural colleges. Teagasc also partner with University College Dublin and University College Cork for selected programmes

Q What education opportunities are there for those interested in the wider land sector?

Teagasc offers both full-time and short duration accredited Level 5 and 6 courses in Horticulture. Specialised options are offered at Level 6 for Food Production Crops, Nursery Plants, Landscaping and Sports Turf. Teagasc also partners with Waterford Institute of Technology for Level 7 and 8 horticultural degree programmes. Teagasc horticultural programmes are provided at the following two colleges:

- Teagasc College of Amenity Horticulture, National Botanic Gardens, Dublin: www.teagasc.ie/education/teagasc-colleges/botanic-gardens/.
- Teagasc Kildalton College, Co Kilkenny: www.teagasc.ie/education/teagasc-colleges/kildalton/.

Teagasc Kildalton College also offers full-time Level 5 and Level 6 programmes in Horsemanship and Stud Management, while Teagasc Ballyhaise College provides full-time Level 5 and 6 programmes in Forestry.

It is important to note that learners who have successfully completed the Level 5 and 6 horticultural, equine and forestry options meet the education qualifications required for schemes and incentives for young farmers.

Q Are there courses for those interested in careers for the pigs and poultry sectors?

Teagasc offers part-time options in Pig Production leading to a Level 5 Certificate in Agriculture and in Pig Management leading to a Level 6 Advanced Certificate in Agriculture. These courses are delivered, subject to demand, by the Teagasc Pig Development Department in conjunction with Teagasc Ballyhaise College and Teagasc Clonakilty College. Learners participating in full-time courses can

undertake pig production electives subject to sufficient demand.

Teagasc likewise provides poultry options at Level 5 leading onto Level 6. Poultry courses are provided subject to sufficient demand on a full time basis and also on a part time basis by Teagasc Ballyhaise College and Teagasc Advisory Services.

Teagasc pig and poultry courses meet the education requirements for young farmer measures when a learner completes all the subjects of the Level 5 Certificate in Agriculture and Level 6 Advanced Certificate in Agriculture in addition to the pigs and poultry modules. These modules are delivered over two years on a part-time or full-time basis.

Q What about education requirements for farm schemes and incentives?

National and EU policy prioritises 'young trained farmers' for certain schemes and incentives.' Depending on the terms and conditions of individual scheme or measures, the upper age to be recognised as a young trained farmer is either 35 years of age or 40 years of age.

Graduates of the two year full-time cycle at agricultural colleges and graduates of Teagasc adult Green Cert programmes meet the education requirements for young trained farmer schemes and incentives. Measures and schemes where a recognised young trained farmer qualification is either mandatory, or advantageous to have, include:

- Young Farmers Scheme.
- National Reserve Scheme – Young Farmer Category.
- Young Farmer Capital Investment Scheme under the Targeted Agricultural Modernisation Schemes. (TAMS)
- Registered Farm Partnerships/Collaborative Farming Grant Scheme.
- Stamp Duty Exemption on Transfer of Land to Young Trained Farmers.
- Capital Acquisition Tax Relief.
- Stock Relief on Income Tax for Certain Young Trained Farmers.

Q Where can I get more information on Teagasc courses?

Additional information on Teagasc courses can be obtained by:

- Attending college course and career events: www.teagasc.ie/education/going-to-college/college-open-days/.
- Contacting colleges or Teagasc advisory education centres.
- Accessing education webpages: www.teagasc.ie/education/

Don't forget the bigger picture

Education is much more than gaining current grass, livestock, crops and machinery knowledge. There is a bigger picture that adds value and reap awards over a lifetime including:

- Getting a grasp of fundamental principles around the science of farming and the land sector
- Learning to learn through communication, thinking and problem solving and planning skills during course activities; including learning by doing, group work, learning from tutors and each other, course discussion groups, farm visits and host placement.
- Understanding how 'big ticket' issues such as sustainability and climate change will impact the land sector.
- Reaching out, making friends and broadening personal /social media networks (if you wish) that can support you long after you graduate.
- Having fun and memorable experiences as you learn.

In summary, education is much more about creating lasting personal development than gaining short-term knowledge.

Why choose a Teagasc course?

Teagasc is unrivalled in the depth of knowledge and expertise it can draw on to support your education. We are at the cutting edge of research and knowledge transfer for the land and agri-food sector. Teagasc engages with all land sector areas including farming, agricultural mechanisation, horticulture, forestry and equine as well as with financial institutions, agri-service providers, the food processing sector and state agencies as well as institutes of technology and universities.

Notable features of Teagasc education include:

- **National education network:** Seven colleges (four Teagasc, three private) and 12 advisory regions.
- **Commercial college farms:** The combined college farms total :
- 1,000ha of commercially farm land
- 1,200 dairy cows
- 270 suckler cows
- 1,000 ewes
- **Specialised resources:** Extensive range of workshops/labs, farm facilities, machinery and equipment for teaching purposes. Teachers and tutors have access to update land sector research.
- **'Hands on' environment:** In full-time courses, teaching and learning is split about 50:50 between classroom and practical instruction.
- **Student support.** Each college has an Access Officer who can assess learning support requirements.
- **On-farm experience:** Teagasc has a network of 1,500 host farms/ land sector hosts that provide additional 'real life' experience to our learners. In addition we link with close to 60 commercial farms, 'Education Benchmark Farms' , that provide benchmarking and learning opportunities as part of course activities.
- **Research linkages:** Teagasc Research programmes have been established at a number of colleges that feed into the teaching and learning experience.
- **After graduation**: You can engage with Teagasc advisory and research services and discussion/ knowledge groups, alumni events, and avail of continuous professional development opportunities. Teagasc ConnectedED is available to those with careers in the wider agri-service sector.

Hedges fit for birds and bees

Catherine Keena
Teagasc Crops, Environment and Land Use Programme

What is in a hedge? Let's start at the top. Three large native Irish trees are frequently found in hedges – oak, ash and willow provide a habitat for numerous invertebrates as well as birds such the two Irish owls – barn owl and long-eared owl.

Whether you like it or not, ivy is a plant of immense biodiversity value which provides nest sites for bats and birds. Its flowers in September October are the only source of pollen and nectar to bees and hoverflies at this late time of year.

Subsequently the late ripening berries, still available in January and February, may be the only source of food when all else is gone.

While ivy is not a saprophytic plant that sucks nutrients from host trees, it does add weight to leafless trees in winter trees, making them more susceptible to wind blow, although usually only those already diseased or weakened.

Moving down to the body of the hedge, the most predominant shrub in our native Irish hedges is whitethorn (hawthorn) with white flowers amid green leaves in late May producing haws in autumn.

Such "sceach" or thorn hedges also include blackthorn which has contrasting white flowers on black leafless branches in late March, followed by sloes in autumn.

Deep within these thorny bushes, there is a safe nesting place for songbirds such as blackbirds and thrushes.

Flowering climbers such as bramble or blackberry are a valuable food source for bees and fruit for birds and mammals. The symbiotic relationship between flora and fauna is demonstrated by the evocative scent of honeysuckle or woodbine being emitted only at dusk when moths are on the wing.

The dense base of the hedge is home to small birds such as robins and small mammals including hedgehogs and shrews. In hard weather, this may be the only unfrozen foraging ground, insulated by the leaf litter. Woodland plants such as primrose, fern and foxglove adorn the hedge base. Hedges are networks for nature through the farm and the countryside as birds, bats and bees follow these linear habitats rather than crossing open fields.

Bat

Bee

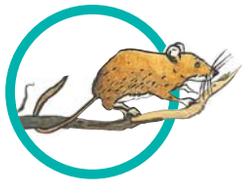
Whitethorn haws and flowers

Thrush's nest

Holly

Moth

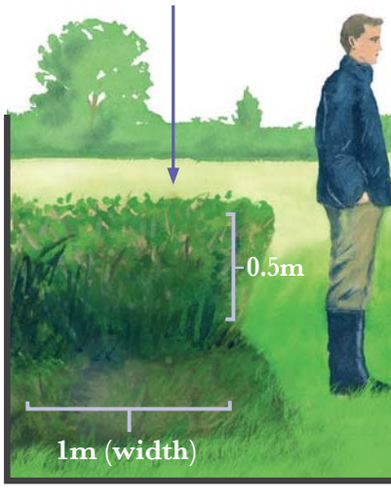
Primrose



Mouse

Foxglove

Flat top, short back and sides hedge (undesirable)



Key criteria for routinely trimmed hedges

- At least 1.5m above ground level or top of any hedge bank – for birds to nest and have cover over and under the nest.
- Contain occasional thorn trees for flowers for bees and fruit for birds and small mammals.

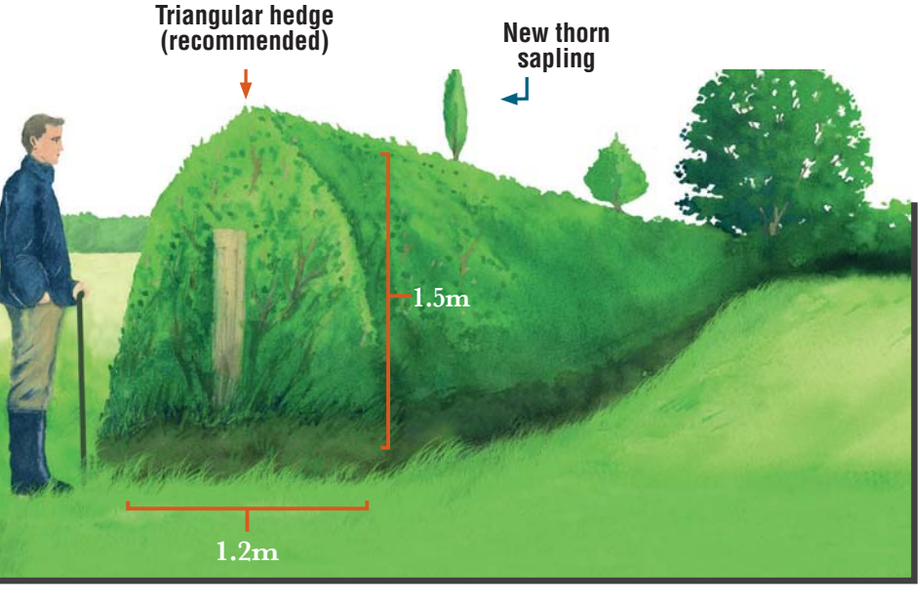
Blackbird

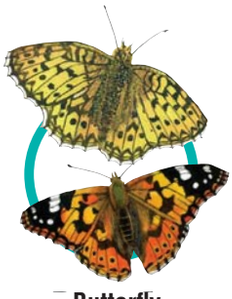
Blackthorn sloes

Robin

Long-eared owl

Ivy





Butterfly

Shrew

Ash

Woodbine/ honeysuckle

Hedgehog

Are your hedges fit for birds and bees?

Hedges are so beneficial the bigger they are, the better. However, it must be remembered that hedges are a man-made habitat. Trees including whitethorn are, by their nature, intended to grow up and mature into a single-stemmed tree with a full canopy.

If the intention is to maintain a hedge, the growing point of each tree must be cut. The ideal is to shape the hedge to a triangular profile from a wide base to a peak. This triangular profile allows light in at the base which encourages dense growth at ground level.

For birds to nest, the hedge must have a dense base and a height of at least 1.5 metres of hedge growth above ground level or the top of the bank. The taller the better, but the height will be limited to the reach of the hedge cutter.

Bees need flowers. There are approximately 100 Irish bees species and one-third are under threat of extinction. A simple way to provide flowers in routinely cut hedges is to allow an occasional thorn tree to grow up and mature as an individual tree with a full canopy. Such individual thorn trees will provide flowers for bees in summer, and fruit for birds and small mammals in autumn.

'Escaped' hedges

Where old hedges have grown into lines of trees with full canopies, these escaped or relict hedges should only be side-trimmed and never topped. Acting as a strip of woodland, they are another extremely valuable habitat especially where outgrowths of shrubs fill in around the individual tree stems. Where the base of escaped hedges has become very thin, laying or coppicing at ground level can rejuvenate.

COMPETITION: Look out for our hedgerow competition. An entry form is included with your latest Teagasc newsletters.

Conservation tillage

Jimmy Staples
Teagasc Crops, Environment, and Land Use Programme

Ivan Whitten
Teagasc, Naas

This is a general term used to describe tillage systems that have the potential to conserve soil and water by reducing their loss relative to some forms of conventional tillage. The benefits for farmer and environment are considerable.

Globally, there has been a trend towards more sustainable cropping techniques dominated by non-inversion tillage systems. One such technique is conservation tillage (CT). A widely accepted definition of CT is a cultivation or cultivation and planting combination which retains a minimum of 30% of the previous crops residue on the soil surface.

This should not be confused with conservation agriculture (CA) which is based on:

- Continuous minimal soil disturbance.
- Permanent soil cover (plants or residues).
- Diverse crop rotations.

While there are challenges in adopting CT/CA systems there are also multiple benefits; financial, environmental and social.

The benefits that CT/CA can provide for agricultural systems include soil conservation, economic advantages associated with reductions in crop establishment time and energy use; reduction in soil erosion and non-point pollution, and enhanced storage or retention of soil organic matter and improvement of soil quality at the soil surface.

Improved soil structure is one of the most valuable benefits of conservation tillage.

Michael Grace and Ivan Whitten

Farmer profile

Shay and Michael Grace are a father-and-son tillage business farming 120 hectares in Clane, Co Kildare. Up until 2012 the Graces operated a traditional plough and one-pass based establishment system.

The Graces decided to look for an alternative to the traditional plough-based establishment system and, after much deliberation and research, they bought a Claydon drill (seed only).

"We believe the new drill will help us move to a rotation which will give us better crop returns and improve the timeliness of our operations," says Michael.

Why switch?

The move away from the plough was also driven by a fragmented land base around a busy town coupled with labour issues during the Celtic Tiger years.

"We moved from the plough as wanted to try something different," says Michael.

"The primary aim was to have healthier soil and therefore better crops with increased profitability. The system has helped us to:

Spread workload with increased yields after the initial settling down period.

Reduce establishment costs.

Achieve healthier soils with less run off.

Soil type: The Graces' soil types are mostly medium which it is easy enough to work once conditions are reasonable.

"It took us three to four years to level up the fields after years of the plough," says Michael.

"Each year, crops are drilled at a

The Graces decided to look for an alternative to the traditional plough-based establishment system and, after much deliberation and research, they bought a Claydon drill.

slight angle to the previous year's as the legs on the Claydon drill help improve drainage of surface water."

Soil fertility and structure: To enhance soil structure, all wheaten and oaten straw on the farm is chopped. All the fields are soil-sampled every three years to try balance off-takes.

"The latest sets of samples taken were one hectare grid samples rather than the standard five hectare," says Shay.

"The grid soil-sampling has given us a better picture of the farm's fertility as more samples are taken. In the longer term, it will open the door for variable-rate fertiliser spreading."

The samples showed up small "acid patches" in fields. Soil fertility has been improving slowly over the last five to six years with most fields Index 2 and 3 for phosphorus (P) and potassium (K).

"On the high pH soils and high P fields, there has been some lock up of nutrients in particular P and Manganese," says Michael.

Last year, the Graces were able to use TAMS support to purchase a combined seed and fertiliser drill to help improve establishment of spring beans and oats.

Use of organic manures: The Graces have been using Dynamo poultry pellets for three to four years, covering 50% of their land each year. No noticeable effect on crops has been noted as the 625kg/ha is not a huge amount.

"The aim is to put on as much fertiliser as a crop will remove and add a little extra organic material to help soil health and fertility," says Shay.

"Returning chopped straw in the system helps feed soil organisms and slowly improves soil structure and organic matter levels. This year, only the barley straw was baled. Everything else was chopped (wheaten straw, oaten straw and rape and bean haulms)."

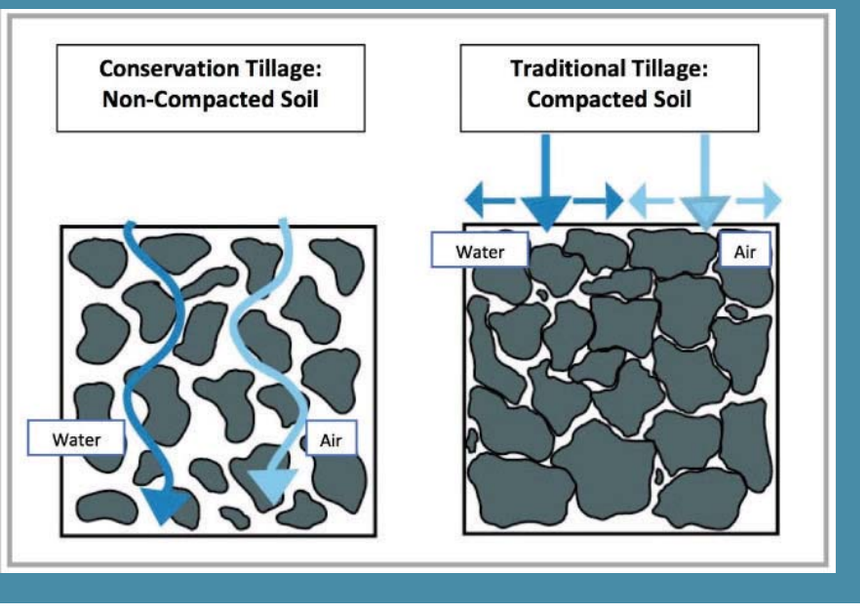
Grace five-year rotation: A well-structured and thought-out crop rotation is the key to CT/CA systems as both cultural and chemical control methods can be used to stay on top of grass weeds. The rotation starts with winter barley as the early harvest allows winter oilseed rape (WOSR) to be set in late August. It also helps to spread the workload. WOSR and spring oats are used as break crops in the system, allowing two first wheats to be grown over a five-year rotation. The Graces' simple five-year rotation is as follows;

1 Winter barley.
2 Winter oilseed rape/spring beans.
3 Winter wheat.
4 Winter oats.
5 Winter wheat.

GLAS options: Minimum tillage, wild bird cover and environmental management of fallow were the options that the Graces implemented on their tillage farm. One major flaw with GLAS is the limited number of actions allowed per parcel/field plus the need to fence off parcels even though there are no livestock on the farm.

Continued on p24

Non-compacted soil is porous, allowing both water and air to penetrate the surface (Figure 1). This improves water absorption and reduces the likelihood of soil erosion and surface runoff. This keeps the soil and nutrients on the field where they can work for you, rather than in local waterways.



Issues with the system

•**Slug control.** It is only really a problem in WOSR and a crop following WOSR. You're better off applying slug pellets as soon as field is rolled.

•**Grass weeds.** Rotation is key. Having a non-cereal crop in the rotation is the best way best of controlling grass weeds. WOSR is better than beans because if the beans are thin, grass weeds can come late in the season. Spring cropping also helps as grass volunteers can be sprayed off in the autumn and the spring.

The Graces utilise a number of cultural control methods and in combination with their rotation they're vital in controlling grass weeds on the farm. These include;

•Stale seedbeds: it is important when establishing stale seedbeds to ensure you do not till deeper than is necessary in order to get weed seeds to germinate. Rolling is another important step in establishing effective stale seedbeds as it improves weed seed/soil contact and helps to preserve moisture.

•Cover crops with volunteers sprayed off; allows for volunteer cereals and grass weeds to germinate while providing soil cover and a source of organic manure.

•Grass margins; the use of competitive grass margins (perennial ryegrass or a timothy and cocksfoot mix) allows for the control of sterile brome at the bases of ditches/hedges and field margins, by preventing brome from setting and shedding seed thereby preventing this problematic grass weed encroaching into the field.

•Cleaning down machinery between fields; one of the biggest culprits of spreading grass weeds into fields which have been previously unaffected is contaminated machinery. By implementing a machine hygiene policy the Grace's reduce the risk posed by contaminated machines. Cleaning down combines and balers coming from neighbouring farms or infected fields will drastically reduce the possibility of contamination.

•Hand rogueing; preventing seed return is by far the most effective way of reducing and preventing grass weeds from getting a foothold in a field.

• No big square balers are allowed; there is always the possibility of weed seeds being introduced by balers and it has to be considered as a source of contamination. Shay and Michael are acutely aware of the possibility of compaction occurring on over-trafficked soils.

Conservation tillage learning curve: "Like anything in life that you are not used to; learning comes mainly from making mistakes and from not being afraid to ask questions," says Shay Grace.

"Sowing early was considered critical but in terms of good establishment you need to have patience if conditions are not suitable. The autumn of 2019 was definitely the exact opposite to autumn 2018!"

"When switching from a plough-based establishment system, the most important thing is not your new drill or cultivator, it is mindset," says Michael.

"Flexibility, patience and a heightened attention to detail are vitally important." Shay concludes: "Every day is a learning day with this system and an open mind is important if you want to succeed in life."

Weed control in winter cereals

Shay Phelan
Teagasc Crops, Environment and Land Use Programme

Phelim McDonald
Teagasc Carlow

The wet autumn delayed planting of winter cereal crops and created a backlog of work for many farmers.

As a result on most farms, the weed control strategies will have to be adjusted since the pre-emergence options were not used due to workload and field conditions not allowing tractors and sprayers into fields.

For most growers, post-emergence treatment will be used this season, but slight adjustments may have to be made especially where troublesome grass weeds are present.

With a limited number of active ingredients to choose from, knowing your problem weeds and targeting them will be an important part of any weed control plan.

Target the most competitive weeds for control early but also bear in mind that for grass weeds, such as annual meadow grass, the products available work best on small plants.

Early application, especially for control in winter barley, is essential.

Weed control strategies

- Refer to field history and the weeds in each field.
- Identify the weeds and their economic importance.
- Know the strengths and weaknesses of available herbicides.
- Apply herbicides to suit the weed stage and weather conditions.

Post-emergence applications need to be applied early, at the two- to three-leaf stage for best effect. You should then assess weeds when spring growth commences. Table 1 lists the available herbicides for winter cereals.

Annual meadow grass

Annual meadow grass is considered a moderately competitive weed and is not as competitive as wild oats or cleavers.

Table 1: Main winter cereal herbicide autumn post-emergence options

Name	Rate/ha	Latest timing	Comments
Alister Flex **Wheat only**	0.8-1.0 L	GS 29	Cleaver control up to four whorls, good on fumitory, poppy and volunteer oilseed rape. Good contact effect on grass weeds. Limited residual effect. Use early post-emergence.
Firebird Navigate Griffen Reliance Naceto **Wheat & barley**	0.3 L WB 0.3 L WW 0.3 L WB 0.6 L WW 0.6 L WB 0.6 L WW	GS 24 GS 23 31 Dec GS 21 GS 13	Good residual control of BLW and grass weeds esp. AMG. Use pre-emerge for best effect. Second application where label allows for improved sterile brome control. Max single dose 0.3L/ha (Firebird, Navigate and Griffen WB). 0.6L/ha Naceto, Reliance & Griffen WW.
Monolith Wheat only	0.33kg/ha	GS 33	Mainly for sterile brome and Black grass but also control wild oats, AMG RSMG.
Broadway star **Wheat only**	0.265 kg	GS 32	Strong brome and grass weed product with main BLW. Needs PDM for AMG control & residual activity. For spring post emergence use. Needs an adjuvant
Defy Roxy 800EC Quidam **Wheat & barley**	 2.0 L	 GS 21	Very good option for high AMG situation. Add DFF 0.1l/ha for additional BLW control. Use pre or early post emergence. Avoid use at peri emergence on Winter Barley.
Diflanil 500 Hurricane Stride Sempra Farmco Dazzle Solo **Wheat, barley & oats**	0.25	GS 29	BLW only. No grass-weed control. Poor on fumitory and poppy.
Anthem Sharpen Stomp Aqua Fastnet Most Micro **Wheat & barley**	3.3 L 3.3 L 2.9 L 3.6 L 3.6 L	GS 30	Broad spectrum, better on fumitory than DFF but weak on groundsel. Good AMG pre em. Good residual activity for pre-emergence situations.
Flight **Wheat & barley**	4.0 L	GS 30	Broad spectrum. Good on cleavers, poppy & fumitory, weak on groundsel. Use pre emerge for best AGM control.
Adept **Wheat & barley**	4.2L/ha	GS 30	For AMG suggested pre emerge use 4.0 plus 0.15L/ha DFF. For post emerge use 3.25L/ha plus Defy 2.0L/ha.
Tower **Wheat & barley**	2.0 L	GS 30	Amg control plus BLW incl. Fumitory, cleavers, poppy, speedwell. Can be applied pre or post emergence. Buffer zone 9m.
Fence **Wheat & barley**	0.5L	GS 13	Good grass weed control when used early. Tank mix partner for DFF and PDM mixes.
Thor **Wheat & barley**	30g 10g before end of Feb	GS 39	Good mixer for BLW control. Will control vol. osr and beans at 10g/ha
Tribe **Wheat, barley & oats**	10g+	GS 33	Good mixer for BLW control. Will control vol. osr and beans at 10g/ha
Cameo Max **Wheat & barley**	Max dose 60g/ha	GS 39	BLW control. Useful for tidy up. Needs growth for best results.
Zypar **Wheat, barley & oats**	0.75L	GS 45	Useful tidy for difficult weeds including cleavers, fumitory, poppy, vol. osr, vol beans and wild carrot.

Continued on p26

Table 2: Brome control in winter wheat in spring

Product	Rate/ Ha	Weeds controlled
Alister flex	0.8 -1.0L	Charlock, cleavers, chickweed, pansy, deadnettle, fumitory, poppy, volunteer OSR, speedwell, AMG, brome. Not very persistent in autumn, often used in Feb.
Broadway star	0.265 kg	Cleavers, chickweed, charlock, marigold, pansy, groundsel, speedwell, wild oats, volunteer OSR, brome. Add adjuvant e.g. Torpedo for best results
Pacifica Plus Mix restrictions	400g	Brome, wild oats, AMG, volunteer OSR, chickweed, charlock, deadnettle, groundsel.
Monolith	330g	Wild oats, blackgrass, bromes, AMG, chickweed, mayweeds

From p25

But it can multiply quickly, often producing two generations in one season. It can become a problem quite quickly in thin crops and can cause trouble at harvest time. The control of annual meadow grass requires a strategic approach in winter wheat and barley.

There are many effective products for the control of annual meadow grass on the market such as Flufenacet, e.g. Firebird; Prosulfocarb e.g. Defy; Pendimethalin-based – Stomp etc; or Chlorotoluron – Tower. In the spring, products such as Allister flex/ Pacifica can be used in wheat.

Generally, the autumn-applied products are most effective when they are used pre-emergence or early post-emergence.

Broad leaved weeds

For some late-planted crops there may be no opportunity to apply a herbicide until the spring. This should still be OK for most weeds but using spring type herbicides such as a sulfonylurea or a hormone-type product need good growing conditions for best effect.

You also need to be aware of label restrictions concerning latest timings and mixing. They can complicate other treatments, e.g. plant growth regulation, trace elements or disease control, so plan carefully.

Brome

Brome is an increasing problem in winter cereals and needs careful management to prevent a buildup of a weed seed bank. An effective control strategy comes from the integration of cultural and chemical control strategies.

In winter barley, where brome is a problem, chemical control is based on products containing flufenacet but these products need to be used pre-emergence and repeated early post-emergence and will still only achieve 50% to 60% control.

In winter wheat, there are a number of chemical options which can be used in spring but growers must avoid using the same products each year as this will eventually lead to a build-up of resistance.

One farming family who take a planned approach to weed control is that of George and Muireann Byrne, who took over their farm from well-known Larry and Kathleen Byrne, just outside Carlow town.

George grows all winter cereals and plants beans, beet and maize in the spring, giving him good opportunities to break problem weed lifecycles. It takes a lot of skill and effort to juggle and manage a rotation with seven or eight crop types but George is well up to the job, returning some of the best yields and margins every year.

"We plough using minimum till equipment where feasible," says George. Some barley went in after beans this October using a Lemken disc and Vaderstad drill and the results will be good he believes. His target sowing date has shifted in the last few years with no sowing until after 10 October this autumn.

"Our maize was harvested in the third week of October. Some was pitted for our cattle and some was sold, and it left behind surprisingly good conditions underfoot but he has some beet still to pull and will wait patiently so as not to damage the soil. "I had to stop because the headlands just weren't to my liking and it's not gone late yet in my opinion."

He has been in no rush to sow crops on that land or elsewhere. "I prefer to wait till the weather gives me suitable soil conditions. That means the seed will have the best chance of establishing and weeds will be less likely to compete along with the obvious advantage of lower BYDV risk," says George. His seeding rates are adjusted upwards with an eye on slugs, crows and the colder, wetter and darker days ahead.

His soils are typical Carlow land, loamy with some lighter pockets and not too much heavy land. This may explain his calm approach to late harvested crops and later plantings this year and his determination to get weeds under control after planting.

"Fields that won't come right for me, and some headlands, might be left to be sown in spring. I'm not going to fight against them. Winter crops are expensive enough to grow without getting poor yields. Everyone will have a time in their head when they know further delay won't result in better conditions." Farmers on heavy land will agree with him, but will have different dates in their mind depending on their individual circumstances.

George would consider winter sown beans this year but like many others he is fearful of crow damage. "I would have to plough for them so they are not lying in a water filled trench

Carlow tillage farmer George Byrne.

but if the crows are hungry they would find them however deep I sow them. I'll see how much cereal I get sown and decide then."

He reckons there will be no rolling done this autumn as conditions have been start-stop and soils are too tacky. "It would cause much more problems than it would solve" says George. However, his strategy for chemical weed control remains the same.

"Your first opportunity is your best opportunity to hit weeds," George maintains. "I try to apply pre-emerge herbicides if at all possible. With annual meadow grass you have to control as early as possible." Later-sown crops are likely to be a little thinner and weaker, and AMG, more than other weeds, can get well established quite quickly and control options run out then, especially for barley.

George will apply DFF and Pendimethalin up to one week after sowing this year. If conditions do not allow for spraying at that stage, then early post-emergence application of the same products will be his second line of attack. "I won't wait for the third leaf. Post-emergence this year will be into November or even early December for the November-sown wheat and hybrid barley."

George is aware of possibility of spray damage on crops that are just coming up (peri-emergence) but once the first leaf is fully out he will be getting geared up for spraying opportunities. He will treat barley first and then on to the wheat and oats. The ability to correctly time any input to any crop is critical for good production results.

Significant differences

Of any 10 neighbouring farmers on similar soils, there are often significant differences in timing of sprays. Usually only one of the 10 will have got it just right. The post-emergence options are many but whether it's Defy and DFF, Firebird or Tower or Flight, your skill and judgment will determine if the application can be made to the soil you manage.

Sterile brome is kept in check using integrated pest management. "Graminicides on spring break crops, stale seed beds with the later planting has minimised the problem for me," says George. The message has been taken on board: "Don't look for the solution to brome in a spray can."

Winter wheat will often have a follow up treatment of Broadway Star in February and the oats may or may not get anything more. Indeed, if post-emergence application is missed they still may not require any herbicide due to their natural ability to compete with and tolerate weeds.

Of course the only option for the barley next spring will be: "A cheap run with a sulfonylurea to control some BLW like groundsel, fumitory and charlock. I'll fight a battle against weeds whenever I can with rotations, cultivations, and timings and products. And when Teagasc clients read this, I'll still be out looking to spray the emerging crops. Once I win more battles than I loose, I'll be happy enough," George concludes.

Holding you to account

Kevin Connolly
Finance Specialist,
Teagasc Rural Economy
Development Programme

Compiling your farm tax accounts is an annual chore, an unavoidable step in arriving at your final tax liability. But there is a lot more information to be gleaned from these figures than just the size of yet another bill. For some, the tax bill is small, as the farm's performance may have been poor (or markets weak) and by drilling into the accounts you should be able to find where the problems lie.

The accounts contain two main statements: profit and loss and the balance sheet. These statements deal with different financial measures of your business but they are closely related.

Profit and loss statement

The profit and loss statement summarises whether the farm has made a profit or loss. The reference period is usually 12 months and often, but not always, runs in line with the calendar year: from the start of January to the end of December. Some farm businesses have "accounts years" that end on dates other than 31 December and this is usually done on the advice of the accountant because it best matches the timing of sales or purchases of stock on the farm.

The point is that the profit and loss statement represents the financial story that happened during a period of time – the title at the top of the profit and loss statement is usually worded as – trading, profit and loss statement for John Smith (for example) for the year ended 31 December 2018. The profit and loss statement tells the story of trading events such as those outlined in Table 1 below.

Net profit is often referred to as the bottom line as it is what is left over after the cost of running the business for the year is deducted from the value of what the business produced.

The balance sheet

The other financial statement included in the tax accounts is the balance sheet. This statement is often overlooked as people tend to focus on whether the business made a profit, and whether this was higher or lower than expected, or different from previous years.

The balance sheet differs from the profit and loss statement in that, instead of focusing on the financial "movements" due to farming activity, the balance sheet gives a snapshot of the farm business at a specific point in time showing the value of assets (things owned), liabilities (things owed) and the difference between these two, which is the net worth or,

Table 1: Trading events represented in the profit and loss statement.

Sales	The value of the product sold by the farm business for the period
Purchases	The total value of all livestock that was purchased during the year
Adjusted for any change in value of livestock held	The value of stock held on the farm may change from the start of the accounts period to the end due to additional animals being born but not sold, delaying selling animals (or on the flip side selling animals sooner than planned) or buying or selling additional stock
Less cash expenses	The cost of the inputs required to run the farm business and produce the product either sold or held as additional inventory for the year
Less Depreciation	The deduction for the use of machinery and buildings which will continue to be used in the business for a number of years
= Net profit	What is left to reward the business for both its management and the owner's invested stake in the business

There is a lot more information to be gleaned from your accounts than just the size of yet another tax bill.

to put it another way, the owner's stake in the business.

The balance sheet is often laid out side by side with the previous year's figures for ease of comparison. It helps to answer the following, revealing, questions:

Did the farm's assets increase or decrease in value? Was this due to acquiring assets or did existing assets increase in value? Perhaps the opposite happened and there was a decline in the total value of farm assets due to a sale or annual depreciation in value.

Did the farm's liabilities or debt levels change? If the liabilities increased during the year, was this due to more long-term borrowing to fund asset investments? Or was the increase in liabilities related to increases in short-term debt such as merchant credit, bank overdrafts or stocking loans?

This distinction is important as a significant rise in short-term debt should be investigated and compared with the normal trend in farm spending for the year. Did you have to dip into your overdraft earlier than usual this year, and if so, why was that?

If liabilities declined, was this due to clearing either short-term or long-term debt? This is likely where some of the profit earned by the farm during the year was used. You should also be able to trace other links between the profit and loss statement and the balance sheet.

By examining these statements and linking them back to what your memory and insight of what happened on the farm that year, you should be able to develop an even greater understanding of what affects the farm finances.

To get into more detail on the figures, the Teagasc Profit Monitor is also available to analyse your farm enterprise data and allow you to better compare farm performance, year on year, or farm to farm.

Budget 2020 – the headlines

Around the same time that you were in contact with your accountant regarding your tax affairs, the government of the day also released their budget for the following year which usually involves a number of tax changes. These will not have any impact on your upcoming tax bill – remember you are now taxable only on the last fully completed financial year, which is 2018.

The changes proposed in the October 2019 budget and which are summarised here will impact your tax bill next year.

Income tax

There were no changes to the two income tax rates of 20% and 40% or the tax bands which set out how much of your income is taxable at the 20% and 40% rates.

The earned income tax credit has been increased by €150 to €1,500/year – this will reduce the final tax bill for the self-employed, including farmers.

There were no changes to either the rates of Universal Social Charge (USC) or Pay Related Social Insurance (PRSI) which are also direct taxes on income.

For those in receipt of dividends from holding shares in companies, the rate of Dividend Withholding Tax has increased from 20% to 25% but since these dividends were already taxable as part of the annual tax return, this is more a timing issue of when the tax is applied rather than a tax increase.

Corporation tax

For those farmers in companies the corporation tax rate remains at 12.5%

Capital taxes – taxes on movement of assets such as land

Stamp duty

Stamp duty, which is levied on the purchase or lifetime transfer of commercial property (including land), was increased. It went up from 6% to 7.5%. This will add to the potential expense for those farmers who buy land.

As before, for those receiving land via an inheritance, there is no stamp duty levied on this transfer. Also, reliefs such as young trained farmer relief and consanguinity relief will either eliminate or greatly reduce the stamp duty bill for those that qualify.

Capital acquisitions tax (CAT)

This tax is levied on the receiver of gifts or inheritances of assets such as land. There was no change in the rate of CAT applied, which stays at 33%. What did change was the tax-free threshold which deals with gifts or inheritances received by children from their parents – this increased by €15,000 to a lifetime threshold of €335,000.

Capital gains tax (CGT)

There was no change in the rate of capital gains tax, which remains at 33%. This tax applies on disposals such as a sale or a transfer to a family member of assets such as land. Like its near neighbour CAT, mentioned above, there are also some very useful reliefs including retirement relief and site to child relief.

One CGT relief which is specifically directed at farmers is farm restructuring relief. This relief was due to expire at the end of 2019 but was extended in this budget until 31 December 2022. This relief allows any potential CGT arising on a sale or transfer of land to be relieved if the money from this land disposal is reinvested into new lands which result in a more consolidated farm holding with a shorter distance between the parcels of land that make up the farm holding.

This extension in the availability of the relief should be taken as a positive statement indicating that Revenue is keen to assist farmers to restructure their holdings.

There were other significant measures announced in the October 2019 budget relating to measures around carbon in fuels and vehicles and also funding for Brexit-related issues. More detail on all these issues will be available in the Finance Bill.

Just prior to Christmas, this will be signed into law by the President as the Finance Act.

For a golden pond

…you need to do a little maintenance

Paddy Smith
Teagasc College at the
National Botanic Gardens

Observing the change of seasons playing out around a managed pond is one of the nicest experiences in gardening. Water in the garden can be calming but it can also be lively and refreshing. Its reflective properties, especially in the autumn and winter, are often visually stunning.

Unfortunately, these vibrant images are soon impaired by falling leaves which settle on the water surface before sinking to the pond floor, potentially impacting water quality. High nutrient entry in the form of organic matter allows algae to thrive resulting in high levels of sediment and the need for extra maintenance.

For a functioning, sustainable water feature, whether it's a pond, rill, fountain, water wall/blade or even a pondless water feature, a little TLC is required at this time of year.

There are many kinds of gadgets on the market, such as pond vacuums, which can target every nook and cranny of a pond but a little planning and elbow grease goes a long way towards smooth water flow.

Preventing entry

Removing plant debris before it enters, or upon entering, a water feature is essential. Decomposing leaves and other organic matter infuse the feature's water with nutrients, depleting oxygen levels. They can also restrict water flow to, and from, a pond pump and filters, causing problems such as inadequate pressure, reduced flow rates, higher running costs and even burnout due to the pump running dry.

Installing pond netting at, or just above, the water surface can go a long way to preventing pump and filter malfunctions, while maintaining water quality. A pond pliers is a useful garden tool to have in your garden shed as twigs/sticks and other larger debris may be too awkward for netting.

Floating, mechanical surface skimmers or edge skimmers, which remove plant remnants before they sink to the bottom of the reservoir, can also be installed with little fuss and without impairing the aesthetic value of the water feature.

Autumn and early winter is a dangerous time for water pumps, plant material falling into your water feature or organic matter growing in the water can clog up the moving parts. A little maintenance now will ensure your pump keeps functioning to its optimum.

Pumps

A good pump can be the heartbeat of a healthy pond and they are usually designed for a specific purpose. It's very important to keep moving parts of a pump clean, as lack of cleaning can lead to blocked inlets.

Always make sure the pump is unplugged when handling, while checking to see that the rotor is able to move freely. Pump shields (porous netting) can be installed around nearly all kinds of submersible pumps. These mesh materials prevent flora, newts and other wildlife getting caught in the pump.

When re-submersing the pump, ensure it's located away from the deepest part of the reservoir where sediments will naturally accumulate. Regular maintenance is key to maintaining water quality. A little maintenance undertaken at this time of year will be rewarded with a well-functioning water feature during the coming year.

calf housing

Simple steps for good calf housing

Tom Fallon
Farm Buildings & Infrastructure Specialist, Teagasc

1 **Natural ventilation:** natural ventilation is used in the majority of calf houses. This works in two ways:

- 'Stack effect': this occurs where warm air rises and leaves the building through an opening in the ridge and it is replaced by cooler, fresher air. The recommended roof slope of 15 to 22 degrees is a major help to the stack effect.
- 'Wind effect': in this case wind drives fresh air through the building.

Natural ventilation works best when the calf house is positioned at right angles to the prevailing wind and the building is not excessively wide (ideally <12m) or excessively high (3.35m to 4m at the eaves is recommended).

Air inlets can be provided by Yorkshire boarding or vented sheeting. Yorkshire boarding has two staggered lines of vertical timber so it reduces air speed, water entry and the likelihood of draughts. Specification S101 from the Department of Agriculture, Food and the Marine (DAFM) stipulates that the minimum length of the boarding is 1.5m, that the laths are 25mm thick, a maximum width of 75mm with gaps of at least 25mm. The two lines of laths are 40mm to 50mm apart.

Space boarding can be satisfactory on the sheltered side of a calf house in a suitable site. If in doubt, use Yorkshire boarding because wind direction can change and calves are sensitive to draughts. A draught is essentially excessive air movement (air speed >0.5m/s) at calf level. A capped ridge outlet is recommended with flashing, as required to prevent wind driven rain getting in. Two alternative designs are shown in Figures 2 and 3. An adequate roof slope will ensure that the outlet is at least 1.5m above the inlet.

The recommended pen area per calf is 2.3m² (at least 2m²).

Figure 1: Space boarding on left and Yorkshire boarding on the right

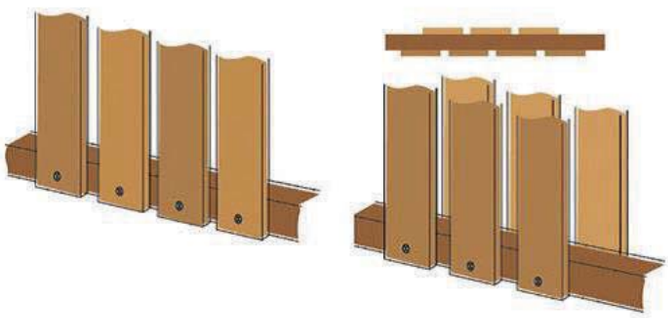


Figure 2: Covered open ridge

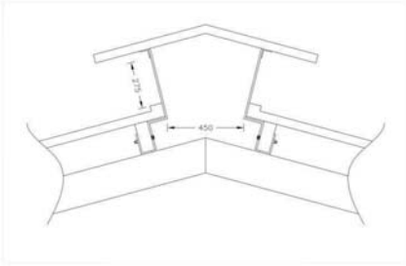
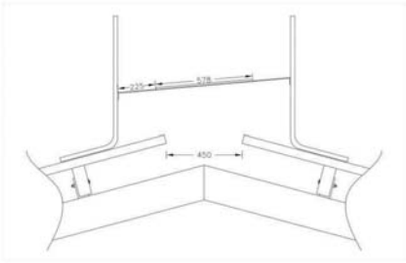


Figure 3: Protected ridge with upstands



Individual pens

These are generally not recommended since they add to the workload (although some farmers find them useful for training calves to drink). Individual calf pens are 1m wide and 1.5m to 1.7m long. Calves must be able to see neighbouring animals and can't

be kept in isolation unless there is a veterinary imperative. A useful alternative to individual pens is to train young calves in small groups of two or more calves in small pens.

2 Dry with good drainage: calves spend 80% of their time lying down so they need a dry bed. A dry environment will also reduce the spread and growth of bugs. All calf houses should be built with a damp proof course to provide rising dampness.

A slope of 1:20 in the calf pen area is recommended (Specification S124 DAFM). A split drain (drainage channel) as shown in Figure 4 (page 34) has the advantage that has the advantage that it will get urine and associated smells out of reach of calves quickly. This drain should be positioned approximately 0.8m inside the feed barrier. In large pens, typically where automatic calf feeders are used, there is merit in having this drain approximately 3m within the pen. The front of the pen can fall into the channel so it will make it easier to achieve the 1:20 fall and it will provide ample room for calves to socialise while reducing the use of bedding. This area will, however, have to be cleaned at least daily, preferably with a "hand yard scraper" since any use of water within the building should be kept to a minimum to keep down humidity.

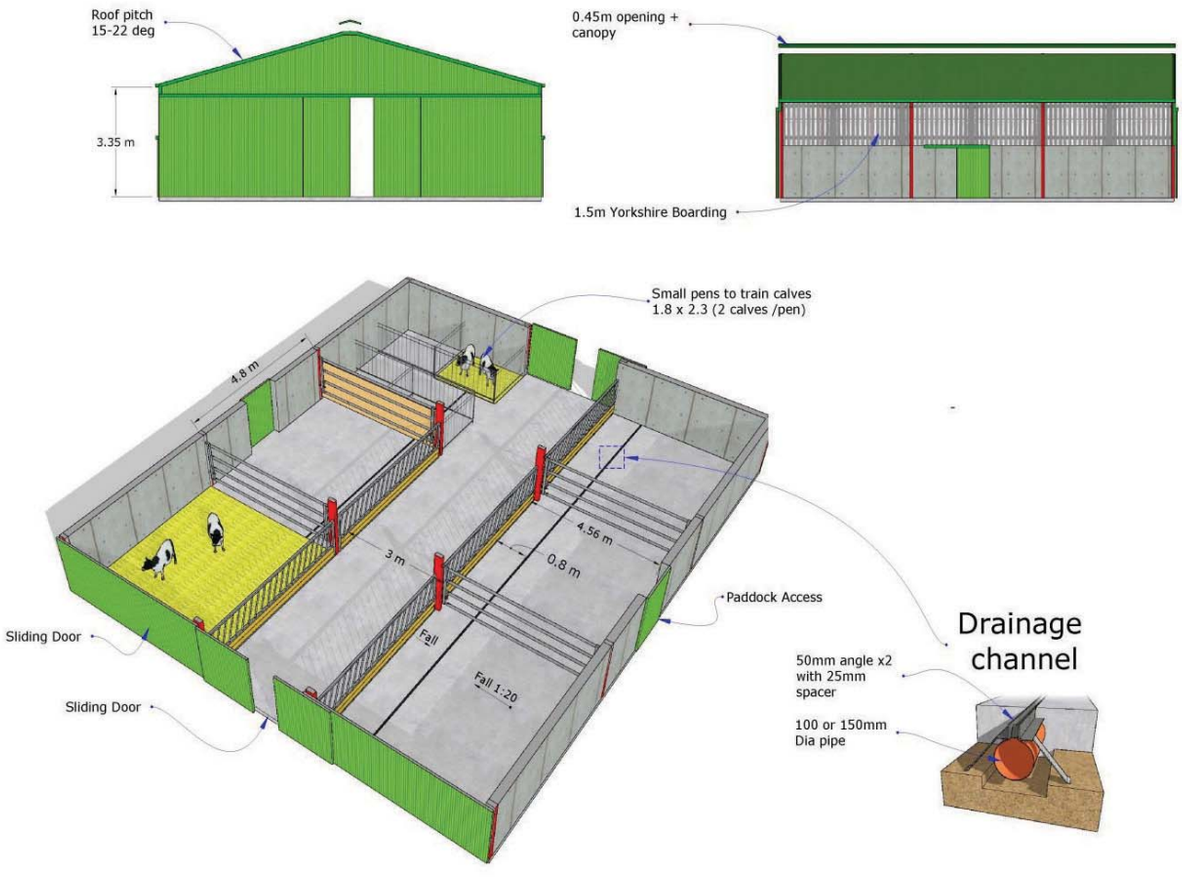
3 Clean and cleanable: floors and walls should be easily cleaned. Floors can be laid in bays of not more than 4.5m by 6m to avoid the need to make contraction joints. Floors of concrete that is well compacted need to be well cured to avoid plastic shrinkage, cracks, etc (spray the freshly poured concrete with a fine mist of water until it is ready to take a new sheet of polythene and leave covered with this sheet for 10 days.). When calves are in the shed, the use of water should be kept to a minimum. When the shed is emptied, clean out as soon as possible and clean with a power washer or steam cleaner and appropriate disinfectant. A long rest period will help to eliminate bugs.

Natural light

Natural light is conducive to good animal health and provides for a good working environment. Fifteen per cent of the roof area as translucent sheets is recommended (as listed on DAFM S.102).

Continued on p34

Figure 4: Calf house for teat/bucket feeding (10 calves per pen @ 2.2m² per calf)



From p33

Calf shed for teat, bucket or trough feeding

Figure 4 shows a calf shed that is suitable for a range of calf feeding methods. Each pen holds 10 calves, so a 12-teat calf feeder would be very suitable (having more teats than calves facilitates the calves in their rush to get the milk).

Bucket or trough feeding can also be carried out in this shed arrangement. Using 1.5m length of Yorkshire boarding (75mm boards with 25mm gaps and 40mm between the rows) will give 0.18m² of inlet per calf. A ridge opening of 450mm will give an air outlet of 0.11m² per calf. The split drain is positioned 0.8m inside the pen. The calves' feet should not be standing on the drain opening during feeding. It is not desirable to have a drain directly underneath feed troughs/buckets. Farmers have found that there is no need for a plank to keep straw at the back of the pen ('this was just a nuisance at cleaning out'). There is also, no need for a canopy at the back of the pen when a suitable air inlet like yorkshire boarding, that baffles air speed, is used.

Figure 5: Calf shed suitable for an automatic calf feeder

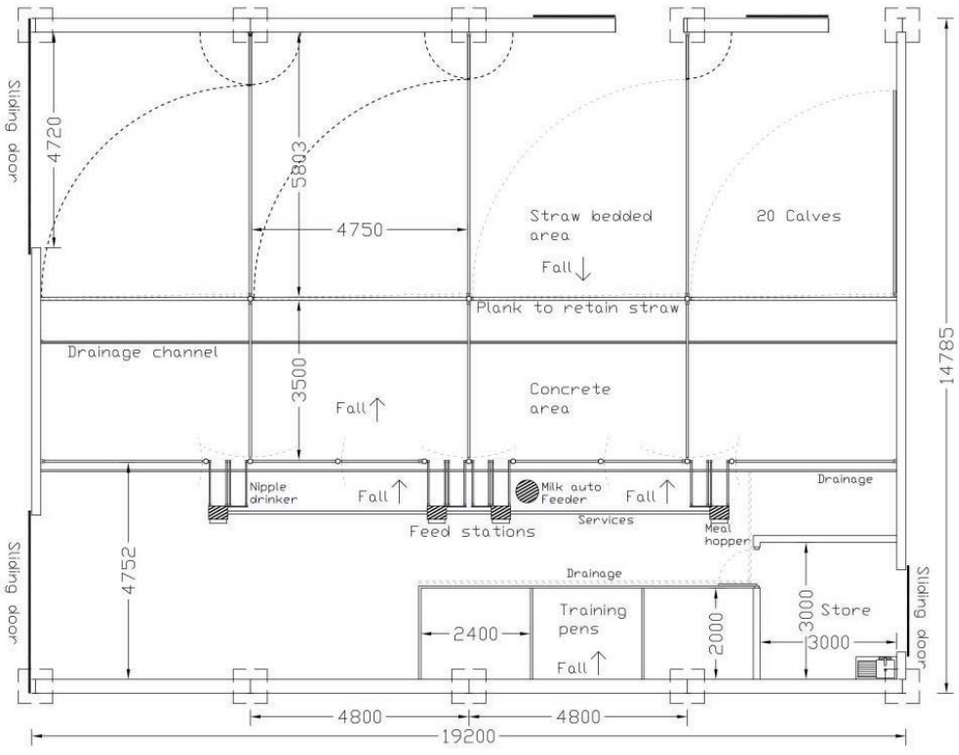


Figure 6: Cross section of calf shed suitable for an automatic calf feeder

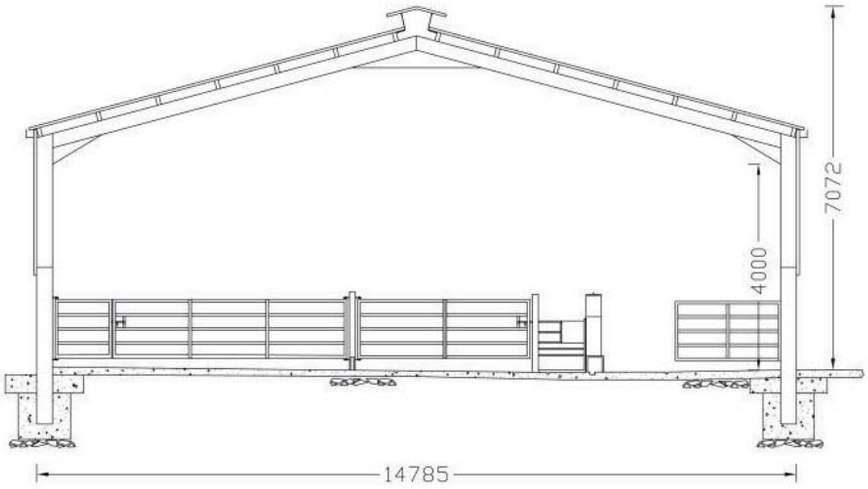


Figure 5 shows a suitable layout when calves are to be reared on an automatic calf feeder. Approximately 3.5m of the pen is not bedded. This facilitates a reduction in straw usage and normal social behaviour among calves. Placing the split drain about 3m from the front of the pen helps to divide the fall across the shed (a 1:20 fall can be hard to achieve in practise). This non-bedded area has to be cleaned at least daily. A hand scraper would be suitable for this purpose. This calf house can accommodate over 80 calves. Three training pens, each capable of holding three small calves are included. A store with its own air space and access to receive a pallet of milk replacer is provided as recommended by DAFM specification S124. Two of the calf pens have small doors to allow calves access to a field, if desirable.

A cross section of this calf house is shown in Figure 7. It does not have to be a portal span. In fact, using internal stanchions will reduce the cost of construction. 6.4m bays could be used allowing more calves per pen so the farmer can get better value from the automatic calf feeder.

Investment in knowledge pays the best interest

Often attributed to Benjamin Franklin, this saying certainly holds true today for Tim McCarthy, a sheep and beef farmer, and forestry enthusiast, from Carriganima, Macroom, Co Cork

John Casey
Teagasc forestry development officer, Mallow

"I was always interested in trees, partly because there was more money in forestry than from sheep on our high ground," says Tim McCarthy. Starting in 1988, Tim went on to plant more ground in 1992, 2000 and 2003. Over the years, Tim has consciously increased his own knowledge of forest management while also building the capacity of the forestry owner group of which he is chairperson. More recently, Tim has been sharing his experiences with the next generation of potential forestry owners.

Fadó fadó (2006), John Casey, Teagasc forestry development officer based in Mallow, initiated a series of meetings and field days with the purpose of setting up forest owner producer groups in west Cork. This, originally LEADER-funded, project was supported from the onset by a cohort of enthusiastic farm forest owners, including Tim.

Their consensus was that the formation of producer groups was crucial to overcoming some of the obstacles that forest owners encounter including lack of market awareness, low forest management skills, small individual forestry plantations, etc.

To address some of these issues, the West Cork Forestry Group was formed in 2009 from two pre-existing groups in Ballyvourney and Dunmanway. The initial focus was on building capacity among the forest owners through a series of courses on timber measurement, marketing, operating chainsaws, etc, and, equally importantly, through the sharing of forest owners' experience of private forestry.

In 2014, the group decided to register as a co-operative and to engage a forester. The Forest Owners Co-Operative Society (FOCS) with members across Munster was born. FOCS offers its members services from planting to harvesting including management plans, road grants, felling licences and supervision of harvesting operations.

From the beginning, Tim has been central to the forest owner group's development and he is currently the chairperson of FOCS. In conversation with Tim, a farm forest owner described FOCS as a "godsend to owners as they ask themselves where they are going with their crop".

In May 2018, 12 members of Forest Owners Co-operative Society, including Tim, were presented with Forest Stewardship Council (FSC) certification for their woodlands by Minister of State for Forestry, Andrew Doyle TD. This followed a Forest Service-funded pilot project in which FOCS and North Eastern Forestry Group based in Dundalk were chosen to participate.

Each member had to complete a pre-audit assessment to identify any non-conformities or issues to be resolved pre-audit. All members agreed that the experience helped to increase their knowledge of their forests, both from each other and from the project specialists.

In September 2018, Minister Doyle launched the forestry Knowledge Transfer Group (KTG) programme, the main aim of which is to broaden the knowledge level of forestry topics amongst farm forest owners.

Teagasc contributes to these KTGs, emphasising how farmers can integrate forestry into their overall farming landscape and to improve whole-

Tim McCarthy at a pruning course.

farm sustainability and to reap the rewards from timely and good-quality forest management. Again, FOCS stepped up to the plate, successfully running four KTGs in west Cork.

In March 2019, Tim generously agreed to share his experience of growing and recently thinning his FSC-certified conifer crop with students as they completed the new Farm Forestry module in the Teagasc Certificate in Agriculture. Much of the conversation was about aspects of individual tree growth through to forest growth and forest timber production.

In terms of practical forest skills, simple methods of tree measurements, forest stocking, calculating yield class, performing log volume calculations and volume estimations for forest plots were also covered.

These crucial skills aid good-quality forest management and can benefit the farm forest by increasing volume with the intention of generating a greater income for the farm forest owner. Tim is very much looking forward to clearfelling his 1988 forest crop within the next three years.

The impact of various forestry operations were also discussed in terms of the best-practice principles to benefit the environment, biodiversity and landscape while also providing a stable farm income from the forest.

Tim's insights provided a perspective of the factors taken into consideration when making the decision to plant a forest, experiences learned along the way and the other potential benefits that can be by-products of having a forestry enterprise on-farm.

Tim feels that the biggest issues for owners and the co-op were how to get info out to our members, especially considering their older age profile; startup costs for groups and, of course, forest certification. Tim maintains that the co-operative approach has vast potential for first-generation forest owners, many starting from a low knowledge base, as their crops grow both in volume and value.

"If farmers are going to invest their land in forestry, they should invest in knowledge for themselves at the same time," is Tim's conclusion.

diversification

An additional link

Constant innovation and focus on customer needs has led to success and national recognition for this family of Galway farmers/butchers

Anne Kinsella
Teagasc Rural Economy Development Programme

Mark Geraghty studied agricultural science in UCD, graduating with an honours degree in 2006. He returned home and spent the next year working between the butchers and the family farm.

"I always had a keen interest in the butchery business, helping out since the age of 13. I received excellent training in all aspects of the business within the environs of the family farm and butchery business," Mark says.

"Being able to select the right animal for slaughter, to breaking the carcass down into all the various cuts is where it all begins. Displaying all the various cuts and products in an eye catching way is key." His parents Pat and Margaret, along with their other long-time resident butcher Padraic McHugh were his mentors.

After spending a year in the business, Mark decided to spread his wings; Australia beckoned and to gain further insight into how butchers and farmers operated down under Mark worked at Weir's butchers in Perth.

"It was a real eye-opener to see all the different products that were created in store. There was a team of four butchers on preparation – boning beef, lamb, chicken and pork. Another four worked full-time on the counter, a team of two were based on added-value products with a further full-time chef on ready meals," Mark says.

"While the raw materials – beef, lamb, chicken and pork, were the same as at home – they were creating many different products that were ready to cook or ready to heat, with a wide range of marinated products also made in store by the chef."

"One major difference was the distance the beef, lamb, pork and chicken had to travel to reach the shop. In Perth there was up to a four hour journey before they got to the butcher's shop. A big contrast to our own shop in Mountbellew where all the beef and lamb comes from our own farm, a few miles out the road."

The next stage of his trip was spent working on a beef farm three hours north of Perth. The farm produced Angus, Hereford and Wagyu cattle. The scale of the operation was huge, over 6,000ha, but it was still regarded as a smaller operation in this part of Australia. A large proportion of the Wagyu and Angus cross cattle were destined for the Japanese market.

"Apart from the size of the farm the next most noticeable difference was to see cattle produced in a feedlot system, in stark contrast to the grass-based system used on our own farm."

Once weaned, all stock was drafted by breed weight and sex into different areas of the feedlot with diets consisting of oaten hay. Every couple of weeks buyers would come to the farm, select the stock they wanted, which would then be transported the five hours journey to the abattoir by road train.

In early 2009, Mark returned home having decided to put all his energy into the family business. It was the height of the recession and he hoped that if he continued to build upon what his parents had built up, coupled with what he had learned while working in the Perth butchers he could get through this difficult time.

"One major advantage we had in our business was that our farm supplied 100% of the beef we sold in our shop and a large proportion of the lamb. The remainder of the lamb we use comes from farms within a 10km radius of the shop," says Mark. "In the years since my travels, we have focused more on Angus and Hereford breeds; they produce a carcass with a nice cover of fat which is vital to produce good-quality high flavour beef.

"All our beef and lamb are slaugh-

Mark proudly showcasing award-winning products.

in the value chain

Butcher Padraic McHugh.

ABOVE: Where the meat comes from.

LEFT: Mark with his parents Pat and Margaret outside their butcher's shop in Mountbellew.

tered in Athenry, beef is aged on the bone for 21 days and our lamb is aged for seven days before sale." Mark comments that this is one area in particular where the difference in production from his family butcher shop differs to the shops in Australia. "The 'Food Miles; we have compared to Australia is minimal."

"Trends and tastes are always changing so to keep up with the times we are always trying new products. Over the course of a year you will find different trends occurring.

Demand

"Early in the year, people are more health-conscious and the slimmers' product range tends to do best, while in the summer, weather permitting of course, barbecue products are most popular," Mark says. With the heat-wave last summer there was a huge demand for barbecue products. Mark and his team tried and tested many different types of burgers, kebabs and sausages which proved very popular.

The success of the business and the quality of the products they produce has been nationally recognised. Geraghty's Family Butchers was recently the recipient of three national awards for what are their best selling products. "We received a gold award for our Ballymaloe relish and red cheddar steak burger, a silver award for our Geraghty's signature steak burger and a bronze award for our lamb burger.

"We received these awards in the Butchery Excellence Ireland, All-Ireland Sausage, Burger and Pudding awards presented in March 2019. It was extremely satisfying to win such awards especially as the beef and lamb had come direct from our own farm," says Mark, proudly.

There have been huge changes to the business over the years, with many people "now more time poor" and hence wanting quicker meal options after a long day at work. "Ready-to-cook products have become more popular over the years since I returned home and these customer needs have to be catered for," he comments.

While sales of the traditional Sunday roast have declined over the years, sales of products ready to cook have kept increasing. Trends and tastes are always changing. "We will have to keep adapting to keep up with these changes," he concludes.

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