




Today's Farm

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COMMENT



Mark Moore
Editor,
Today's Farm

European seminar on education and extension

The 25th ESEE Conference took place in Teagasc Ballyhaise College at the end of June. This is a major conference which included participants from 30 countries around the world, discussing new research in agricultural advice and education. Of course, it was all online.

On the one hand, this meant there were delegates from as far away as Australia, South Sudan, Egypt and Mexico, who might not have been able to make the trip. On the other, hopefully we will soon be able to travel again rather than meeting virtually.

An seimineár Eorpach ar an oideachas agus an fairsingiú talmhaíochta

Bhí an 25ú Comhdháil den Seimineár Eorpach ar an Oideachas agus an Fairsingiú Talmhaíochta ar siúl i gColáiste Teagasc, Béal Átha hÉis ag deireadh mhí an Mheithimh.

Comhdháil mhór ab ea í, ar fhreastail rannpháirtithe ó 30 tír ar fud an domhain uirthi le plé a dhéanamh ar thaighde nua ar chomhairle agus oideachas na talmhaíochta. Ar ndóigh, is ar líne a bhí sí ar siúl.

Ar thaobh amháin, d'fhág sé sin go raibh toscairí ann ó áiteanna i bhfad i gcéin, ar nós na hAstráile, na Súdáine Theas, na hÉigipte agus Mheicsiceo, nach mbeadh in ann an turas a dhéanamh de ghnáth.

Ar an taobh eile, tá súil againn go léir go mbeimid in ann taisteal arís go luath in ionad a bheith ag teacht le chéile go fíorúil i gcónaí.



Flower power of low-input grassland

>> 28-29

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Cover | Laois farmer Bruce Thompson is too modest to relish being dubbed 'Dairy's David Attenborough', but he shares the same infectious enthusiasm and love for the environment as the world famous broadcaster.

Developing food for the elderly

Researchers at Teagasc Moorepark's Food Research Centre recently received funding of €250,000 from an EU project called EAT4AGE. Recently announced by Minister of State at the Department of Agriculture, Food and the Marine, Martin Heydon, the award comes under the EU's 'Joint Programming Initiative – a Healthy Diet for a Healthy Life'.

The project aims to develop targeted nutrition for the prevention of under-nutrition in older adults. This can often arise as a result of a loss of appetite and/or issues related to food composition and texture.

The EAT4AGE project aims to develop palatable, nutritious and digestible foods for the prevention of under-nutrition in active ageing communities.

Other collaborating partner countries include Norway, the UK and France. The project intends to investigate the formulation of innovative and energy-dense foods that increase appetite and improve bioavailability of proteins in age-tailored food products (Teagasc, TRResearch).



THURSDAY, 12 AUGUST 2021

- Kildalton College Open Day.
- **Venue:** Teagasc, Kildalton College, Piltown, Co Kilkenny.
- **Event time:** Tours start at 11am and 2pm.



Gentle robots



The Teagasc Horticulture Development Department recently commenced work on a three-year EU project called 'Soft-Grip'.

This will focus on using a functionalised soft robotic gripper for harvesting delicate produce, in this case mushrooms, powered by imitation learning-based control.

Teagasc's role in the project is to ensure that user needs and functional requirements of a robotic gripper are understood and incorporated into the design, manufacture and performance of the gripper.

The gripper will 'learn' how to harvest mushrooms by 'imitation' of the harvesting process performed by actual harvesters (Teagasc, TRResearch).

New anti-microbial from sheep dung



Teagasc researchers have discovered a novel bacteriocin from sheep faeces with activity against a broad range of food and gut pathogens. They have isolated a strain of *Actinomyces ruminicola* that produces a novel, broad-spectrum bacteriocin called actifensin. Actifensin demonstrated antimicrobial activity against bacteria such as *Lactococcus*, *Lactobacillus*, *Streptococcus*, *Pediococcus*, *Bacillus*, other *Actinomyces spp.*, and *Clostridium spp.*

Notably, actifensin inhibited pathogens such as *Clostridioides difficile*, *vancomycinresistant Enterococcus* and methicillin-resistant *Staphylococcus*, bacteria that represent a significant challenge to the medical field due to their antibiotic resistance. Weak inhibition was also demonstrated against the common food-borne pathogens *Listeria monocytogenes* and *Listeria innocua*. The discovery of compounds such as actifensin generates new possibilities in the field of biocontrol and an opportunity to reduce our reliance on antibiotics (Teagasc, TRResearch).



Nutritional management at grass

Maeve Regan, Head of Ruminant Nutrition, Agritech

As we progress further into the grazing season, we enter a time where the main nutritional focus should be on maintaining high quality grass swards in front of grazing mobs, be it youngstock or milking cows.

Assessing grass availability as often as possible is key to making well informed, timely decisions around taking out surplus grass to maintain quality and pre-grazing yields of 1,200-1,400 kg DM/ha. Where pre-grazing yields are higher, it will be extremely difficult to graze out these paddocks to target residuals (3.5-4cm), resulting in poor grass quality and utilisation in the subsequent rotation.

When grazing heavy covers of grass, it is worthwhile remembering that for every 4% reduction in grass digestibility, milk solids yield will consequently reduce by approximately 5%.

Getting back on track:

As Irish farmers, we must be relentless in the pursuit of maximising the use of our unrivalled global advantage of growing grass. Currently only 7% of the land area on specialist Irish dairy farms is reseeded annually (approx. 2.5% nationally if we look at the country's entire grassland area). Economically, a low proportion of perennial ryegrass in the sward is costing farmers up to €300/ha in lost grass production during the growing season.

Due to inclement weather conditions across many regions during May, reseedling plans in some cases were delayed or postponed. However, when the opportunity arises this autumn, it is imperative to proceed with reseedling plans - the target being to reseed 10% of the grazing platform annually, resulting in a completely renewed platform every 10 years.

Taking stock:

As we reach the halfway point in the year, now is a good time to examine how much grass has been grown to date. For example, if you aim to complete six grazings/paddocks so far this year, at an approximate pre-grazing yield of 1,300 kg DM/ha, you will estimate to have grown approximately 7.8 tonnes of grass to date.

For further information on nutritional management at grass, contact your local Agritech sales advisor or visit



www.agritech.ie

What is my carbon footprint?

Martina Harrington
Beef specialist, Teagasc
Animal and Grassland
Research and Innovation
Programme



There has been much talk about the carbon footprint of beef but what, if anything, can we as suckler farmers do to improve it?

In my experience, greenhouses are not that common on suckler units but farmers are aware that these greenhouse gases (GHG) allow heat from the sun to come into, but not exit, the atmosphere...hence we get warming like in a greenhouse, or a car on a hot day. If it continues, the consequences for the planet are dire.

Carbon footprint is defined as the amount of greenhouse gas (GHG) emissions (carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄) associated with the production of a specific type of agricultural produce, expressed as kg CO₂ equivalent (CO₂eq) per kg produce (e.g. per kg of beef or milk).

For every kilo of beef that sits on a shelf in a supermarket, it has a rating as to how much GHG were emitted to the atmosphere to produce that kg of beef.

Unfortunately, in Ireland, agriculture is responsible for 35.4% of all GHGs produced. This is compared to 20.4% for transport, the next biggest emitter of GHG. See Figure 1, Source EPA Ireland's GHG emissions 2019.

What are the main GHGs produced in agriculture?

- Methane – 68% of total agricultural emissions in Ireland.
- Nitrous oxide – 29.3% of total agricultural emissions in Ireland.

Carbon dioxide is the other GHG. However, it is mainly derived from fossil fuel combustion and conversion of natural vegetation to managed land.

In Ireland carbon dioxide accounts for only 2.7% of GHG emissions from agriculture. This is mainly from liming, spreading urea and ploughing. Therefore, we will concentrate on methane and nitrous oxide.

How are methane and nitrous oxide

Figure 1



produced?

Methane is a byproduct of the digestive process of ruminants, i.e. cattle, sheep and goats. In the rumen, bugs break down forage, a byproduct is biogenic methane gas. The more fibrous the material, the more methane that is produced.

Approximately 95% of this gas passes out in the breath of the animal, only 5% comes out the other end.

Stored animal manure is also a source of methane. When slurry is stored in anaerobic conditions the bacteria in the slurry break down the organic content and release methane.

Nitrous oxide (N₂O) is a gaseous form of nitrogen produced in the soil when microbes break down nitrogen (N). It makes up the other 29.3% of GHG emission from agriculture in Ireland. The main sources are:

- The application of synthetic fertilisers on pastures – 38%.
- Animal excreta deposited during grazing – 23%.
- The spreading and storage of slurry and FYM – 14%.

The rate of N lost from pastures in the form of N₂O are dictated by environmental conditions that favour microbial activity such as:

- Wet soil conditions.
- Rainfall.
- High soil temperatures.

Now that we know what GHGs are and how they are produced, we can

look at what methods are there to reduce them:

•**Methane:** the less time an animal is ruminating, the less methane they can produce. So we need better lifetime performance in all animals. For the suckler cow, we must aim to have only productive cows in the herd – a calf per cow per year and all heifers calving at two years of age.

Once we have a calf on the ground, that calf must have excellent average daily gains, which will lead to a lower age at slaughter. These targets are achieved through better breeding, better grassland management, better health and better nutrition at housing. Ongoing research into feed additives may help in the future to reduce methane emissions

We also need to look at manure management – reducing the amount of slurry produced by extending the grazing season and reducing the age at slaughter. The slurry that is produced should be stored properly and for the least amount of time. Current research on slurry additives may also help in the future.

•**Nitrous oxide:** reduce the amount of synthetic fertiliser you have to apply by improving the soil fertility, in particular the soil pH. Change the form of nitrogen applied from CAN fertiliser to protected urea, incorporate clover and watch the ground conditions when fertiliser is applied.



Peter Lawrence, John Pringle and Martina Harrington.

10 steps: reduce your carbon footprint

1 Reduce the age of slaughter: Currently, we slaughter approximately 1.32m prime cattle in Ireland. On average, they are 26 months old and weigh 345kg at slaughter. If we push animal performance and reduce the age at slaughter by even one month, we could reduce the GHG produced by 250kt. That is the equivalent to not having to cull almost 100,000 cows.

For it to be a win-win, farmers need to look at maintaining the slaughter weight by increasing their average daily gains as cheaply as possible.

2 Improve breeding performance: Increase your calves per cow per year. The national average is 0.85 calves per cow per year. This means if I want to sell 25 weanlings per year, I must keep 29 cows. If I can improve my cow fertility and increase my calves per cow per year to 0.95, I only have to keep 26 cows to sell 25 weanlings. A reduction of one cow per 10 calves can cut the beef carbon footprint by 6%.

The win-win is I only have to feed and maintain 26 cows rather than 29 to sell 25 weanlings. Teagasc figures show that by increasing your calf per cow per year from 0.85 to 0.95 you can increase your net margin per cow by €87.

To achieve this performance you

need to breed a good fertile cow, which requires a well thought out breeding plan. You must also cull unproductive cows and calve your heifers at two years of age.

3 Improve animal health: If you have animals with a fluke, worm or virus burden they will not deliver optimum performance. Talk to your vet and put in place a dosing programme that control the fluke and worms on your farm while also addressing any viruses.

4 Proper winter housing and nutrition: When we look at performance on farm, it is often the first winter where animals really underperform, increasing the age at slaughter, but also reducing the chance of heifers reaching target-breeding weights to calve at two years old. This can be due to many issues – health, housing environment or nutrition.

• **Housing environment:** When housing animals ensure they have enough lying space, feed space, water and that the ventilation is adequate. Your Teagasc advisor can call and go through this with you.

• **Health:** Talk to your vet and ensure you have a good dosing regime in place for worms, fluke and lice. Check whether your animals need to be vaccinated

• **Nutrition:** Test your silage and then balance your diet accordingly for protein and energy.

5 Longer grazing season: The longer cattle are grazing, the less fibrous forage they are eating, the less slurry they are producing, the less methane they are generating. Also, if cattle are turned out earlier in the spring to graze paddocks, it gives an opportunity, if soil conditions permit, to apply slurry. This reduces the time slurry has to be stored and methane produced.

The win-win is that Teagasc figures show that for every extra day at grass in spring there is a saving of €2 per LU/day.

6 Incorporate clover: N₂O is produced when chemical nitrogen is broken down in the soil by bacteria. If this source of nitrogen is replaced by biological nitrogen produced by white clover, we can significantly reduce N₂O emissions. Research in Teagasc Solohead showed a reduction of between 11 and 26% in the carbon footprint of dairy systems.



Continued on next page



From page 7

7 Improve soil fertility:
If you have optimum soil fertility, you will require less nitrogen to grow the same amount of grass. Optimum soil fertility is when you have a pH of at least 6.3, and a phosphorous and potassium index of two or three depending on your stocking rate.

Research shows that liming acidic soils increases grass production by 1.0t DM/ha. On a drystock farm, this is valued at €105/tonne DM. An application of 5t/ha of ground limestone to correct soil pH represents a cost of €25/ha/year over five years. The return on investment from lime gives €4 to €7 worth extra grass for every €1 invested in lime.

8 Apply fertiliser in the right conditions:
The rate of N₂O production increases when fertiliser is applied in conditions that favour microbial activity. So avoid wet soil conditions, applying in heavy rain or when soil temperatures are very high.

9 Change from CAN to protected urea:
Protected urea is urea which is treated with an active ingredient called a urease inhibitor. The urease inhibitor can be either a) coated onto the outside of the fertiliser granule or b) incorporated into the urea granule during manufacture.
It has been shown in Teagasc trials to have the same efficiency and yield but to cost less per kg of nitrogen than CAN. However, the big payoff is that published Teagasc trials have shown that protected urea results in 71% lower nitrous oxide emissions than CAN fertiliser.

10 Carbon sequestration:
Carbon sequestration occurs when carbon dioxide (CO₂) is absorbed from the atmosphere by plants during photosynthesis. Carbon is then assimilated into its organic form and can either be respired (by plants or microbes) back into the atmosphere or stored more permanently in soil or in woody biomass.

If more carbon is stored than respired, an ecosystem will act as a CO₂ sink. Globally, soils and forests store vast amounts of carbon with agricultural ecosystems such as grasslands, peatlands and woodlands acting as important sinks. If we can increase the amount of carbon we are sequestering we can reduce our carbon footprint.

The Teagasc Signpost Programme

On 18 May, Teagasc launched The Signpost Programme. The primary objective of the programme is to reduce greenhouse gas emissions by up to 15% by 2025 on the Signpost farms and by 2030 for all farms.

This represents an important first step in reducing GHG emissions from Irish agriculture.

While the primary focus of the programme will be on reducing emissions from agriculture, the programme will also highlight practices that can reduce nutrient losses improve water quality, manage and enhance biodiversity, improve profitability and improve social sustainability (both work-life balance and animal welfare).

A network of 100 Signpost farms spread right across the country from all sectors, which will act as demonstration farms for the programme.

These Signpost farmers will be supported to change how they farm, to reduce emissions while at the same time maintaining, or improving profitability.

Track progress

Farmers will have the opportunity to track the progress of their own local Signpost farm and hopefully be inspired to make a change to how they farm to reduce gaseous emissions.

Two of the 20 farmers in the beef programme are Ruairi Cummins and John Pringle.

Ruairi Cummins

Ruairi Cummins farms in Rossenarra Demense in Kilmoganny, Co Kilkenny. Ruairi farms alongside his wife Helen and three children Ciara, Eoin and Laura. Ruairi runs a spring-calving suckler system with bull calves brought through to slaughter at under 16 months and heifers sold as stores at 16 to 18 months. Some of the lighter bull calves are castrated at sold as stores at 16 to 18 months also.

"We have really focused on improving breeding efficiency over the last number of years in particular targeting a younger age at first calving," says Ruairi.

Higher age at first calving increases the lifetime emissions burden of the cow. In 2021, all of Ruairi's heifers calved on target at two years of age.

Ruairi is also very focused on increasing animal growth rates and animal performance is closely tracked and monitored through regular weighting of stock on the farm. Achieving higher growth rates leads to a higher final weight at finishing and/or lower finishing age.



This means more beef relative to the length of time the animal is on the farm producing emissions.

"I have focused on production over the last number of years. However, with the challenges facing the beef sector into the future I believe I can build on breeding and grass management improvements further in the next few years to enhance the sustainability of my farm from both a profitability and environmental perspective," concludes Ruairi.

John Pringle

My farm is a typical Co. Wicklow drystock family farm. My wife Linda and I have three children, Lucy and twin boys William and Scott who all have a great interest in the farm and nature. As a newly selected participant for the Teagasc Suckler Signpost Beef Demonstration Farm Programme, I am very conscious of passing on the farm to the next generation in good environmental health.

I operate a traditional mixed farming system which consists of a suckler beef herd and a mid-season ewe lambing flock.

All the farm is in grass and it comprises 58ha all located in the one block. The suckler herd is made up of 44 spring-calving cows calving from mid-February to late April. I operate a closed herd policy and all my replacement heifers are calved at around 24 months.

All males are kept entire and are finished under 16 months at 380kg to 400kg carcasse. Heifers which are not kept for breeding are either sold as bulling heifers or finished on the farm at 22 months of age. The mean lambing date for our 255 ewes is around 15 March and all lambs are finished off the farm.

I am determined to showcase that suckler beef and sheep farming can both be profitable but most importantly are environmentally sustainable and work in harmony with nature. I am very keen on looking after the health and biology of my soils, enhancing bio-diversity and looking after the wildlife and habitats on my farm.



John Pringle and his daughter Lucy.

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sheep

A successful breeding season means getting your dates right

Obviously, the ewe needs to meet the ram...but the calendar date is key too

Michael Gottstein
Head of Sheep
Knowledge Transfer



The breeding season sows the seeds for the next year's lamb crop. Poor conception or ovulation rates will result in fewer lambs and poorer profits in the subsequent year.

While most people consider the breeding season on sheep farms to be the five- or six-week period that the rams are out with the ewes, it is in reality much longer. The breeding season for next year's lamb crop actually starts once the current year's lamb crop is weaned.

The following are some dates/steps that can help you maximise the success of your breeding season.

• **Late June/early July:** weaning time. Ewes need a long period to regain body weight lost during late pregnancy and early lactation. Productive ewes will require about 10 weeks of good grass to regain condition. After weaning ewes should be on restricted grazing for a week to allow them to dry up.

Following that, ewes should be grouped according to body condition. Thin ewes should get access to good grass. Fat ewes can be used to clean out paddocks. Reassess body condition every three weeks to prevent thin ewes getting over fat or fat ewe losing body condition.

Contrary to what many farmers think it is NOT a good idea to allow ewes to lose weight post weaning. Thin ewes that do not regain body condition after six weeks of good grass should be culled.

• **Early July:** ram health check. Gather your rams and give them a complete health check. Semen production

Key messages

Time spent preparing for the upcoming mating season will pay dividends in terms of:

- Having ewes in good body condition at mating – this will carry through to lambing.
- Having a compact lambing season with greater than 95% of the ewes in-lamb.
- Achieving your target litter size.
- Having planned health treatments carried out, to avoid nasty surprises later in the year.

is a slow process (approximately six weeks). It is essential that you have control of the ram in the two months prior to mating to ensure fertility.

Check rams for lameness, body condition, signs of disease and injuries. Just like the ewes, the rams also need significant time and feeding to regain body condition if they are below target. Identify how many (if any) replacements are required and purchase them early so that they have the best chance of acclimatising to their new environment and feeding regime.

• **Late July/early August:** ram sales kick off. This is the best time to purchase replacements as you will have the greatest selection of the best quality rams available. Waiting until later in the season means that most ram breeders will have the best of their rams already sold.

Select rams based on physical appearance/functionality and, where available, also use the genetic evaluation to identify the individuals that



best match your requirements. High starred sheep have been consistently shown to outperform low-starred sheep.

Performance

When assessing performance data, study the following information:

- **Data quality index:** select rams from a flock where the breeder has a data quality index (DQI) greater than 70%.
- **Linkage:** select rams from a flock that is linked – unlinked evaluations are basically just an evaluation within the breeders flock and are of little value.
- **Genotyped:** select rams that have been genotyped and parentage verified. That gives you a higher level of accuracy and you can be more confi-



While most people consider the breeding season on sheep farms to be the five- or six-week period that the rams are out with the ewes, it is in reality much longer

dent in the evaluations.

• **Index and sub-index:** select rams that are high in the traits that are important to you. For example, a ram that will be used to produce only factory lambs should be five-star on the terminal index and also good on the sub-indexes for lamb survival and days to slaughter. A ram that will be used to produce flock replacements should be high in the replacement index and sub-indexes such as daughter's milk or number of lambs born.

Key times of year

• **August:** vaccination time. This is the time of year that we need to start thinking of vaccinating flock replacements for contagious abortion (toxoplasmosis and enzootic abortion). Some of these vaccines are live

and can only be given to non-pregnant sheep.

• **September:** final health check for both ewes and rams. Identify sheep that have failed to recover body condition. At this stage, anything that hasn't improved is unlikely to improve and should be culled. Check ewes' udders for the second time as some of the ewes may have got summer mastitis during the summer.

Regular footbathing at fortnightly intervals will ensure feet are in good condition for the breeding season. All sheep should be on a rising plane of nutrition in the four to six weeks prior to the breeding season.

• **October:** final health checks. Aim to have all health treatments, e.g. fluke drench, etc, carried out prior to ram turnout. Any sheep that are lame

at ram turnout should be separated from the flock, treated and allowed sufficient time to recover before being reintroduced to the flock.

• **Mating:** the timing of your mating period should co-inside with spring grass growth on your farm. For most farms that means early to mid-March. Where ewes are in ideal body condition at mating the majority of the ewes will be cycling and will be mated in the first 17 days of the mating period. This will facilitate having greater than 95% of the ewes in lamb in a five-week mating period.

Use a team of rams. Using three or more rams per mating group will ensure against infertility and a "blocker" ram. Ensure rams are accustomed to each other prior to mating to reduce the risk of fighting.

Bruce and the beetles

This Laois farmer and his dairy discussion group show that production and environmental initiatives are compatible

Patrick Gowing
Dairy specialist, Teagasc Animal and Grassland Research and Innovation Programme.



Bruce Thompson is an environmentalist with 300 cows. Walking through a paddock with him is an eye-opener and proof that production and promoting the environment are not incompatible.

Seeking out dung beetles, he points to the almost perfectly circular holes they have eaten out of cow pats three to four days' old. Bruce is soon pulling apart the cowdung and dropping spade-fulls into a bucket of water where a wide range of insects float to the surface.

He points out that black beetles are similar to dung beetles, but with a noticeable metallic copper colour on their wings. Eventually, he finds a jet-black dung beetle and explains how they chew up the dung, drying it out sufficiently for earthworms to begin the next stage of converting manure into soil organic matter.

Bruce's infectious enthusiasm and ability to communicate the complexity and importance of insect populations helps explain his high media profile.

The Thompsons, Bruce and his father Ian, farm in Ballyfin, Co Laois. Bruce qualified in Automobile Engineering at Cork IT and when asked what brought him back to farming, he replied: "I came home to help my father get the farm back up on its feet after a TB outbreak and haven't looked back since."

Bruce took over fully in 2012 and completed his Green Cert through Gurteen College, completing the 180 hour course. In 2012, the farm had 63 cows, 80 cows in 2015 and today stands at 300 cows on a 100ha milking platform plus support blocks for silage and heifers.

The Thompsons undertook a large capital project in 2017, where they installed a 40 point Waikato rotary parlour when the herd was at 200 cows. Bruce says: "When we looked at it, we knew we were not finished growing the herd and that the rotary would allow for further expansion. Also, the savings in labour helped justify the additional investment cost."

Last year, the herd delivered 460kg MS/cow on 800kg of ration.

Anthelmintics and dung beetles

Bruce is widely known on social media for his interest in dung beetles.

"I was dosing the calves with my father one year and he commented that we were dosing more often now than he used to in the past, as resistance to the wormer built up over time.

"This got me thinking and I started exploring online what the causes and possible solutions may be. We started by reducing our use of wormers on our own farm by using diagnostic testing and faecal egg counts for our calves.

"As I investigated further, I realized there is far more going on in the dung pads on-farm and the effect the anthelmintics were having on the biology within the dung pads.

"I contacted entomologist Dr Sally Anne Spence from the University of Oxford, who explained to me the role the dung beetle has in breaking down the cow pad quicker and breaking the cycle of the disease-causing worm in pasture and how the overuse of anthelmintics have a negative effect on biodiversity in pasture."

Bruce was accepted as a Nuffield scholar in 2019, where he planned on doing a study on anthelmintic resistance and its effects on biodiversity. His travels so far have brought him to South Australia and Tasmania. There he looked at the accelerated effects of wormer resistance on farms.

"I visited farms where there was



resistance to all five major wormer active ingredients and in some farms, the sheep had to be removed as they could no longer control the worms in the flock."

As part of his studies, Bruce explored different grazing options to reduce worm loads on stock. He also visited a research station which is importing African and European beetles to control the worm load on farms.

"The native beetle didn't have any interest in cattle dung when cattle were first introduced," says Bruce.

"It took a long time for the cow pats to break down. The pats are ideal for flies to nest in and there was a large build-up of flies in the area. Beetles introduced from Europe were 99% effective in reducing the fly issue as they broke down the cow pats."

Bruce hopes to travel further when Covid regulations allow, to finish his Nuffield studies.

Actions taken on his own farm

Bruce has introduced a new grazing



regime for his young stock on-farm to help lower the worm burden on the calves and reduce the need for wormers.

He has developed a Paddock Parasite map, which details the parasite loading on each paddock. Using this, Bruce operates a traffic light system of grazing for his young stock.

A green paddock has a low worm burden and is available for calves to graze. An orange paddock is a paddock the calves have recently grazed. They will return to a green paddock depending on the rest period they have had, to break the worm cycle. Red paddocks are those with a history of a high worm load based on egg counts and the calves don't graze there.

The traffic light grazing strategy is run in conjunction with diagnostic faecal sampling every two to three weeks from a pooled sample. Bruce will only dose his calves if the egg count is about 250 eggs per gram. Bruce uses a microscope to do his

own diagnostics on the faecal samples, but says there are plenty of labs around the country that can do it for farmers.

"We dose calves strategically," adds Bruce. "The calves are weighed. Any calf that is below target or not achieving their average daily weight gain will be dosed, while the balance of the calves will not be dosed that time. This continues through the grazing season.

"The yearling heifers are also monitored, but no dosing has been used on them since 2018 and no dose has been administered to the cows since 2017. This has significantly reduced our overall use of worm doses, which has improved the number of dung beetles on this farm, increasing biodiversity and further reducing the worm load."

Discussion group and European Innovation Partnership (EIP)

Bruce now wants to move this on and try it at a larger scale with the help of his local dairy discussion group.

The O'Moore Discussion Group has recently received sanction for EIP grant aid money from Europe to roll out the implementation of new grazing strategies across the discussion group.

"The group, and Teagasc facilitator Lorcan Dooley, have really embraced these ideas," says Bruce. "With the EIP money, we plan to purchase weighing scales to monitor calves and complete more diagnostic testing to help reduce anthelmintic use."

Bruce is one of the founders of a new website www.dungbeetlesforfarmers.co.uk. This website was set up with vets, ecologists, entomologists and conversationalists to give free and impartial advice for farmers who may be struggling with wormer resistance and are looking for alternatives.

Large dairy farmers sometimes bemoan the lack of positive PR for the industry. Bruce Thompson and the O'Moore dairy discussion group are certainly doing something about it.

When should you end the breeding season?

The bottom line on extended milking of late-spring calving cows

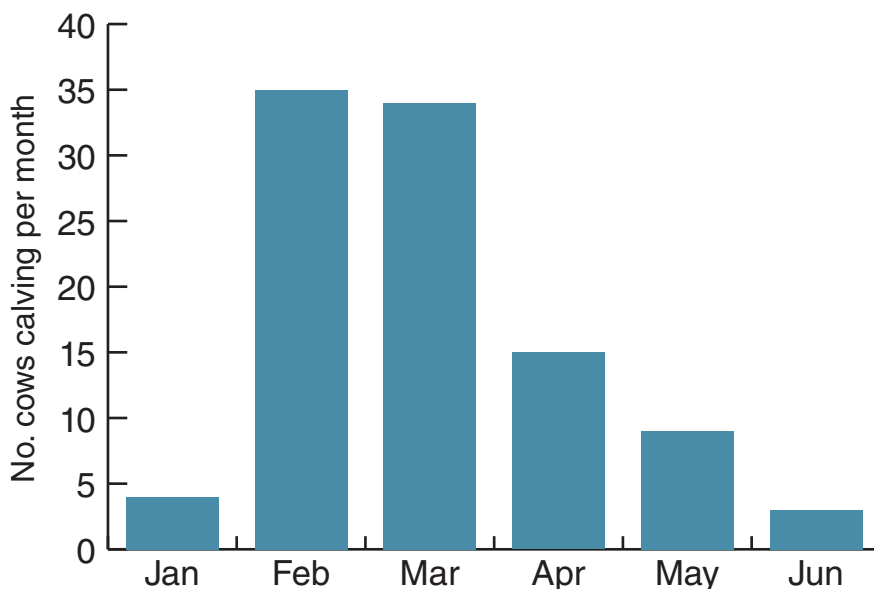
George Ramsbottom
Teagasc Animal and Grassland Research and Innovation Programme.

Herds with a very spread out calving pattern generally can't afford to take a break from milking over the winter. Such patterns result in high cost systems of milk production with lower profit, so the additional margin is needed by the farming family. It is possible however to take steps to correct the calving pattern. This involves taking the following steps:

- Establish a date on which to end the breeding season this year. Ending the breeding season on July 20 will confine calving to April next year. If you continue to breed until later in the year, you will have later calving cows and the cycle will start all over again.
- Where calving pattern is spread out, it may be difficult to stop milking altogether for this winter so accept that this winter you will continue to milk the late calvers through the winter;
- Bring in extra home reared, or buy in, suitable early spring calving replacement heifers for next year. They will produce as much milk in the coming year as a late calver and are certainly more likely to remain in the herd calving in early spring in future years;
- Next spring either cull this year's late calvers from the parlour or, if accommodation and forage is available, finish them.

Nationally, an average of 389,000 cows or just over one quarter of 'spring calving' dairy cows calved between April and June in 2019 and 2020. Teagasc's target is that only 10% of spring calving cows should calve

Figure 1: Average monthly calving pattern for a 100 cow dairy farm using national average calving data.



in the period – and those should calve in the month of April not in May and June.

This is to maximise the proportion of grazed grass in the cow's diet. To achieve this, February calving is best (see Table 1). Using months of calving data, Figure 1 presents the monthly calving profile for a 'national average' 100-cow herd.

The data in Figure 1 shows that, on average, 73% of the spring calving component of the national herd calve before the end of March. There is, however, a marked reluctance to call an end to the breeding season, with almost as many of the remaining cows calving in May and June combined as in April.

This presents a dilemma for farm-

ers. Should they wish to dry off the whole herd in mid-December, they reduce total milk sales from the herd because, based on the calving pattern detailed, the average cow has spent 274 days in milk production – far short of the targeted 305 days in milk.

Milking on over the winter however, as highlighted in Table 1, increases feed and forage costs and means that the farmer doesn't get a break from 365 days a year milking. Figure 2 shows the expected end of calving based on when the breeding season ends the following year.

The data in Figure 2 shows that where the decision is made to finish calving by 1 May or 1 June, the last inseminations should take place on or before the 20 July or 20 August respectively.

Estimating margin per cow from milk produced by extending lactation

Taking a planned 'end of milking' date of 15 December, the expected milk yields for cows with the potential to deliver 6,500l in a 305-day lacta-

Table 1: Feed and forage costs (€/cow) by month of calving.

Month calved	Grass	Silage	Concentrate	Total cost
Jan	3,836	1,141	697	€662
Feb	3,990	1,029	525	€608
Mar	3,598	1,358	588	€647
Apr	3,248	1,666	616	€674
May	2,702	1,960	833	€734
Jun	2,555	2,093	868	€753



tion and the residual milk remaining to be produced over the winter and through the following spring are presented in Table 2 for cows calving between January and June.

Using the calving profile presented for the 100 cow dairy herd in Figure 1, the cows calving from March onwards have the potential to remain in milk for between 30 and 120 more days before they are dried off.

Compared to the January and February calving cows that have had the opportunity to complete an average of 305 days in milk, the cows calving from March onwards outlined in Table 2 have only spent an average of 254 days in milk and so reduce the whole herd average to 274 days.

This means that should the farmer decide to stop milking on December 15, total milk production is reduced by over 46,000l.

Figure 2: Expected last calving date based on when the last cow is bred.

Breeding date	Expected calving date*
10 July	21 April
20 July	1 May
30 July	11 May
10 Aug	22 May
20 Aug	1 June
30 Aug	11 June
10 Sept	22 June

Our estimates for the balance between the value of this 'lost' milk

compared to the increase in production costs that invariably follow

Table 2: Feed and forage costs (€/cow) by month of calving.

Month of calving	Milk produced by December 15 (litres/cow)	Milk yield from December 15 and the end of a 305-day lactation (litres/cow)
January	6,500	-
February	6,500	-
March	6,012	488
April	5,622	878
May	5,232	1,268
June	4,712	1,788

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From p14

overwinter production are presented in Table 3 and applied to the typical national average calving pattern for a 100-cow farm.

Other considerations

A number of factors need to be considered when deciding on whether to milk over the winter:

- Labour availability – is there labour available throughout the winter – typically we're talking about a 30-40 day break between 15 December and the start of the next milking. Not

too many spouses will be in favour of non-stop milking on one person farms.

- The number of cows available for overwinter milking – this will vary with herd size and calving pattern. If there are proportionately more May and June calving cows, the projected margin will be greater (however overall profitability will be lower). What is the minimum number of cows that justify milking-on across the winter on your farm?

Using a similar calving pattern for a 50-cow herd, the margin is €3,649 for milking a similar proportion of the herd through the winter.

Where calving pattern is excellent (70% calving in February, 20% in March, 10% of the herd calving in

April), the margin generated by milking overwinter is €1,490 per 100 cows averaging 6,500l per head in 305 days.

- What is the SCC status of the cows you're considering over-winter milking with? If it's already high, then it's not likely to decline during the winter.

- The milk price assumed was 32c/litre, every 1c/l change in milk price affects marginal profitability for the national average herd by almost €500 for the 100-cow farm.

- Forage quality needs to be high – a 5% reduction in forage DMD will reduce farm margin by approximately €370.

- Are there sufficient suitable facilities on farm to milk the cows over-winter?

Table 3: Estimated cost and projected margin per cow and per farm for a 100-cow farm using the 'national average' calving pattern from milking late-calving cows overwinter from December 15 until completion of a 305-day lactation.

Month calved	No. cows	Litres/cow	Extra days in milk	Milk value	Feed, forage and o/head costs	Margin for milking on (per cow)	Margin from milking
Mar	34	488	30	€156	€74	€82	€2,788
Apr	15	878	60	€281	€147	€134	€2,010
May	9	1,268	90	€406	€221	€185	€1,665
Jun	3	1,788	120	€572	€294	€278	€834
Total farm margin							€7,297

Assumptions included in the analysis are a milk price (base plus bonuses of 32c/l); additional feed and forage costs while in milk over a 'dry cow diet' of €1.95/day for 5kg of additional concentrate feed and 3kg DM of additional forage, 50c/cow/day for additional overhead costs.

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Palmerstown, Kilkenny

Winning the second half – how do cows experience your farm?

Tom Fallon
Farm Buildings and Infrastructure specialist.



A lot happens in the first 150 days of a cow's lactation, but to a large extent, the game is decided in the second half. How can we win the second half?

As cows are putting on weight, they often have further to walk and like many players, they are getting tired after doing a lot of work. The autumn is the best time of the year for farmers to influence cow body condition. A herd lameness problem can arise very quickly in the autumn. Cows have a hunger for work in early lactation, but it can be a different story later in the year.

It is recommended that all farmers write out a plan for the remainder of the year. For most farmers, going on a holiday takes a lot of planning and preparation. In the same way, some planning will help to have a good end of season and it will also set yourself up for next year.

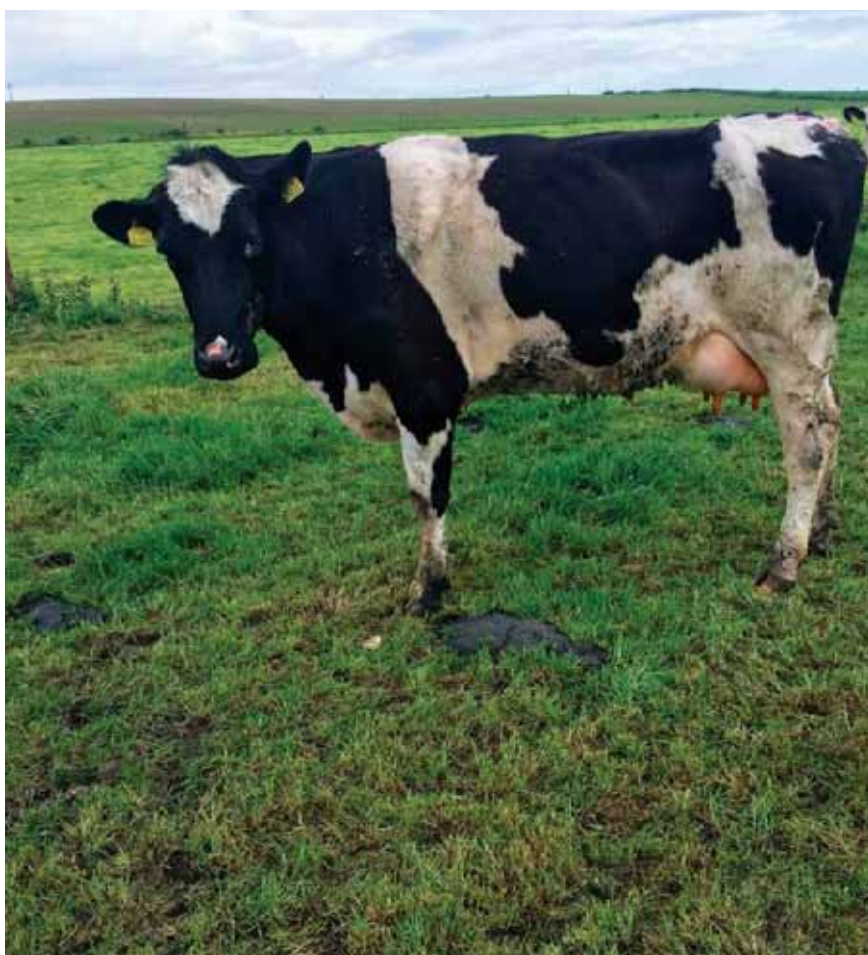
Cow care in mid-summer

- Systematically check cows for lameness or impending lameness (a stone recently trapped between the claws, etc) and treat accordingly. This can be done by giving each cow a locomotion score or by checking how each cow is standing and walking, especially the cows at the rear of the herd.

White line disease is very common, especially following periods of heavy rainfall and it can affect both back and front feet. Breakdown of the white line allows the entry of grit and dirt. This condition can readily be treated by hoof pairing. Foot bathing is only recommended for treating mortellaro (digital dermatitis) and footrot.

Foot bathing twice a week is recommended to bring mortellaro under control. Please see: <https://ahdb.org.uk/knowledge-library/mobility-scoring-for-dairy-cows>.

- Scan and condition score cows. Cows use feed very efficiently in the second



This first lactation animal calved on the 5 April (photographed on 22 May). Her size is good but her body condition will need to be monitored. She must be looked after next winter by having at least a three month dry period.

half of the lactation, so it makes sense to supplement cows that are destined for culling in the autumn or after one week post-calving. This will allow you to manage the peak milk supply next year.

- Supplement magnesium in the cow's diet throughout the year. It reduces stress on the cows by helping muscles to relax including the heart muscle. Ensure 30g per cow per day is included in the diet to prevent grass tetany, but 15-20g is normally adequate in dry warm weather when the risk is low.

Many first lactation animals fail to reach their potential because of com-

petition for feed space in their first winter with the full herd.

Are there problems arising on your farm?

- Are cows following a trail on the farm roadway? The surface may be poor with stones becoming exposed, so cows won't use the full width of the roadway.

- Are cows slowing down or even stopping at a section of the roadway? This can happen where there is a depression in the roadway or where there is a mucky section with a lot of shade from overhanging trees.



- Cows may be slow to leave paddocks because the exit has become degraded over time.
- Cows crowding each other at a gathering point before they cross a public road can be a problem. An underpass is the solution of choice. Some farmers have their own pressure release mechanism, such as holding the cows with a wire a few metres before the roadside gate. This wire can be released to reduce the pressure prior to crossing the road.
- The section of roadway nearest the farmyard and especially where cows step onto concrete needs careful attention. There is no 'give' in concrete, so loose stone on concrete is not satisfactory. Topping up the dust on the stretch of roadway before the concrete surface will help to trap stones.
- We need to recognise that these issues can become a big problem when there is a change in personnel and cows are rushed around milking time.

Cow flow through the milking parlour

As cows are heavier in the autumn, the size of the collecting yard can become an issue. We recommend a minimum of 1.5m² per cow, preferably 1.8m² for cows 580kg in weight.

A dedicated collecting yard and a carefully operated backing gate can reduce milking time. The milker should not have to leave the parlour pit to bring cows in.

If cows are approached 'head on' they will tend to back away. Level non-slip concrete surfaces and having adequate light in the parlour will facilitate good cow movement.

Cows have a rigid backbone from the shoulder to the tail head, so it is important to minimize turning. Cows are also sensitive to the emotional state of the farmer or milker, so leave anything that is annoying you outside the parlour.



A fresh looking fourth lactation 'silent' (she gives no trouble) cow. She did 582kg milk solids in 2020 and has a maintenance sub index of €25.

Five in a row (for all our cows!)

The national average of completed lactations per cow is low, at under four. We would like to increase this to five.

This is a significant cost in terms of the extra replacements needed, the loss in production in having a less mature herd profile and a higher carbon footprint for the output achieved.

Increasing this by one lactation per cow would increase herd profitability

by approximately €100 per cow.

I have no doubt that where cows' needs are met in winter accommodation, they will in turn deliver for the farmer. There will be fewer downer cows, less lameness and cows will calve down in better condition.

Having adequate feed space simplifies winter herd management and it can often mean feeding costly ration is not necessary for cows that are somewhat below the desired condition score. All of this will lead to less stress on the cows and farmer, as well as better performance.

Cows are herd animals, they like to be together while eating and lying down. In the past, we foolishly thought otherwise. The Sustainable Dairy Assurance Scheme (SDAS) obliges farmers to provide at least one cubicle per cow.

The Department of Agriculture, Food and the Marine (DAFM) Building Specifications have been an enormous help in raising building standards in recent years.

Many farmers are delighted with how cows are responding to new cubicle accommodation, where they have more space and do not have to compete to get to the feed barrier.

Farmers have said to me that it was only then that they realised just how bad the old accommodation was.

Teagasc researchers carried out a study in 2019 to investigate welfare and lameness on 103 Irish dairy farms. As part of this study, dairy cows were mobility scored to determine the prevalence of and factors associated with lameness.

organic

Organics – the road less travelled

Once seen as exotic, organic dairy farming is now regarded as an economically viable option

Joe Kelleher

Organic Farming Specialist,
Teagasc Rural Economy
Development Programme

May this year marked my 20th anniversary as a Teagasc advisor. I spent the first five years in west Clare working as a Rural Environment Protection Scheme (REPS) advisor and the last 15 years working in Limerick primarily as a dairy advisor. I have worked with great farmers and witnessed how dairy farming has evolved.

Until 2015, most farmers had 60 to 80 cows within numbers static due to quota restrictions. Then in 2015, with the removal of milk quotas, numbers began to creep up; in many instances without major planning.

The farmers with 60 cows found themselves with 70 cows in 2016, 80 cows in 2017 and so on until one spring, a few years later, they found they had calved down 100 cows. Many were scratching their heads wondering: “How did that happen?”

During the noughties, many dairy farmers held on to a good few beef

calves as “a way of gathering a lump of money at the back end of the year” to pay the taxman. After 2015, many of these calves found their stay was cut short and left the farm as calves; their place having been taken by the extra dairy cows.

When the 60-cow farmer hit 70 cows, there was no noticeable difference in stocking rate as the 10 extra cows were eating the grass that the 40 calves had been eating.

By the time the same farmer hit 80 cows they realised they were struggling to grow enough grass to keep ahead of the cows. Previously a round or two of nitrogen could be skipped, they now had to follow the cows religiously with the bag to the acre.

Then, less paddocks were skipped for bales and silage became slightly tight, but they always managed to find 20 acres down the road to rent for silage the following year.

This pattern continued until that spring morning when the farmer realised he, or she, had calved down 100 cows. The upside, of course, was that the milk cheque had grown in line with the cow numbers. The downside



was that costs had grown at an even greater pace, especially the feed and fertiliser bills.

The other major downside was the hours worked had risen dramatically and, with it, stress levels increased on many farms.

I recall a farming client of mine in his early sixties calling into my office (post 2015) telling me he was thinking of milking another 20 cows the following year.

He was a single man making a decent living. This man, or woman, was already milking 80 cows but would have been relatively lightly stocked and felt he could easily have carried the extra 20 cows.

His yard was well set up for 80 cows with 80 cubicle spaces, a 10-unit parlour and adequate slurry storage.

The extra investment to carry the extra cows would have been considerable and it would have taken a good few years to get that investment back.

After teasing the issue out with him, I asked him one question: Why? And he could not answer me. Sometimes, when everyone else is going in one direction, the logical thing to do is to follow them. To me, observing my cli-



Joe Kelleher discussing organic farming at a recent meeting of the K18 discussion group in Middleton, Co Cork.

Seamus Ahern, (Organic Farmer) Ballysimon, Middleton, with Joe Kelleher.



ents from the outside, cow numbers, milk cheques, bank loans, feed bills and fertiliser bills were going up, but the quality of life was coming down.

I really admired the farmers who went against the grain and took different paths: the 50- to 60-cow farmers who stayed at this level despite opportunities coming their way, those who went once-a-day milking and those who employed more labour than many thought they needed. They all did it primarily for one reason, because they valued their own time and wanted a good quality of life.

Many of these farmers who added on extra cows are now at a different stage of life. They may have children put through college and, in many cases, may not have an identified successor.

They have taken on the challenge of milking the extra cows and many have enjoyed the challenge of doing so but now are ready for the next challenge. I believe organic farming could be the challenge many farmers are looking for.

Growing 13t of grass DM/ha is being achieved by many dairy farmers across the country, albeit with a

heavy reliance on chemical fertiliser, but growing 10t with no chemical nitrogen is a challenge that really excites me.

We have numerous examples in research stations where yields of 10t DM/ha are being achieved using tools such as white clover, red clover and multispecies swards.

“ When the 60-cow farmer hit 70 cows, there was no noticeable difference in stocking rate as the 10 extra cows were eating the grass that the 40 calves had been eating

A dairy farmer with monocultures of ryegrass may have to reduce their stocking rates to 1.0LU/ha under organics because ryegrass is heavily reliant on chemical nitrogen to grow the large volumes it does grow.

More diverse swards rely on the symbiotic relationship between the plants in the sward, especially the

clover, the drive the good growth rates being achieved. With diverse swards with good levels of clover content, a stocking rate of 1.5LU/ha should be possible.

For the national average farmer with 80 cows, this would mean cutting back to 57 cows.

The national farm survey indicates that this 80-cow farmer is spending €20,000 on fertiliser per annum. If this bill is eliminated/or reduced and we get a bonus of 5c to 10c extra for our milk, coupled with the organic scheme payment (€220/ha in conversion and €170/ha when converted) then maybe this same farmer's bottom line mightn't look much different to what it does now.

The upside to all this is that the farmer is now milking 23 cows less, spending less time in the parlour, has much reduced hours, has adequate cubicle and slurry space and the carrot on top is that they have reduced their carbon footprint by almost 50%.

If you have dreamt of getting back to the cow numbers you had pre-quota then perhaps it is time to stop following the herd and choose a path suits you and your farm.

Land drainage: Design and implementation

Pat Tuohy

Drainage researcher,
Teagasc Animal and
Grassland Research and
Innovation Programme



Owen Fenton

Researcher, Hydrology,
Water & Soil Quality,
Teagasc Crops Environment
and Land Use Programme



Almost half (49.5% – 3.4 m ha) of the total land area of Ireland is classified as “marginal land” because it is affected by natural limitations related to its soil, topography, relief and climate. The most common limitation on marginal land is poor drainage status and much of it is in need of artificial drainage if its productivity is to be improved.

In wet years, poorly drained soils may never dry out at all, as persistent rainfall maintains high soil moisture content. Grass yields are limited due to the adverse effect of excess water and a lack of air at rooting depth, which limits plant respiration and growth.

In situations of prolonged waterlogging, plants will eventually die due to a lack of oxygen in the root zone. Furthermore, waterlogged soils are impassable to machinery and livestock for long periods, due to the high soil moisture content and reduced soil strength. This reduces the number of grazing days and hinders silage harvest, thus introducing higher costs related to imported feedstuffs.

Environmental considerations

The implementation of land drainage works is known to affect the dynamics of water movement from drained sites and the potential impacts on water quality need to be recognised.

Examination of the potential environmental impact of these systems showed that both phosphorus and nitrogen attenuation capacity is dependent on surface and subsurface soil chemistry and drainage design specification.

The potential for nutrient loss is related to soil type, chemistry and the level of interaction that drained water has with nutrient attenuating layers or elements of the soil body. Shallow drainage systems, for



Excavating a test pit.



Installing mole drains.

example, are more likely to promote high intensity flows that have little interaction with the soil body relative to groundwater systems, which promotes water movement through the soil.

Furthermore, soils with high levels of organic matter are known to have poor nutrient retention capacity, which makes them vulnerable to

nutrient loss. Land drainage system design needs to account for such variability and works should mitigate against negative impacts on water quality.

Artificial drainage of poorly-drained mineral soils has positive effects on greenhouse gas (GHG) emissions by reducing losses of nitrous oxide (N₂O) and allowing for

extended grazing, though drainage is linked to carbon loss on carbon-rich soils such as peats.

The cessation of drainage works and the re-wetting of some organic soils has been proposed. The amount of carbon stored by soils provides an important sink to counterbalance and negate against the effects of increasing levels of carbon dioxide (CO₂) in the atmosphere.

Management of these soils will dictate the amount of carbon that is stored in the long-term and land management strategies will need to be informed by the relative amounts of carbon stored in different soil types and their capacity to build carbon. Precision management will be required for each soil type and for each farm system, to ensure improved water quality and carbon storage can be prioritized within profitable production systems.

Planning for land drainage

The purpose of land drainage is to remove excess water from the soil as quickly as possible. How best to achieve this will vary with soil type. We need a better understanding of the underlying causes of drainage problems and of the design and implementation of appropriate drainage



Installing field drains.

systems to resolve these issues.

We must move away from the short-sighted approach that a broadly similar drainage system can be installed in every wet field regardless of soil and site conditions.

When planning any drainage programme, the potential of the land to be drained needs to be first assessed to determine if the costs incurred will result in an economic return through additional yield and/or utilisation.

Careful thought is needed before deciding on the most appropriate part of the farm to drain. From a

management point of view, it is better to drain the land which is nearer to the farmyard and work outwards, however it may be more beneficial to target the areas with high potential for improvement to ensure a better return on the investment.

Drainage investigations

What exactly is the problem? Collect all the information at hand, over an



Continued on next page

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A soil test pit



Continued from page 23

extended period to establish where and what the root causes are. Where does the water gather? Where does overland flow occur? Where are the worst underfoot conditions? Where are the poorest areas of grass growth? How good is the existing drainage network? Is the whole profile made up of poor soils or is the problem caused by specific layers? Is there water movement at any depth? This information will help in deciding where best to invest in drainage works.

Knowledge of previous drainage schemes in the area, and their effectiveness will often provide key insights. A number (approx. one per ha) of test pits (at least 2.5 m deep) should be excavated within the area to be drained to investigate.

These should be dug in areas that are representative of the area as a whole; consider digging in wet and dry areas for comparison. Remember soil test pits are very dangerous and prone to collapse. You should not enter soil test pits but instead observe from a safe distance.

Inspect different soil layers as they come up in the excavator bucket. As the test pits are dug, the faces of the pits are observed, soil type should be established and the rate and depth of

water seepage into the test pit (if any) recorded.

Visible cracking, areas of looser soil and rooting depth should be noted as these can convey important information regarding the drainage status of the different layers.

The depth and type of drain to be installed will depend on the interpretation of the characteristics revealed by the test pits.

There are two principle types of drainage system:

- **Groundwater drainage system:** A network of piped drains exploiting permeable layers.
- **Shallow drainage system:** Where movement of water is impeded at all depths.

Groundwater drainage system

Strong inflow of groundwater or seepage from the faces of test pit walls, indicate that layers of high permeability are present. Under these circumstances piped drainage systems (at the depth of inflow) are advised to capture and remove this water, thereby controlling the watertable.

Deep piped drains are usually installed at a depth of 1.5-2.5 m and at spacings of 15-50 m, depending on the slope of the land and the permeability and thickness of the drainage layer. Piped drains should always be installed across the slope to intercept as much groundwater as possible,

with open drains and main piped drains running in the direction of maximum slope.

Clean aggregate, in the 10 – 40mm grading band (with further benefits evident for smaller (10-20mm) material) should be used to surround the drain pipe. The gravel should be filled to a minimum depth of 300mm from the bottom of the drain to cover the pipe.

The stone should provide connectivity to a layer of high permeability and should not be filled to the ground surface. The purpose of a drain pipe is to facilitate a path of least resistance for water flow.

In long drain lengths (greater than 30m) a drain pipe is vital to allow a high a flow-rate as possible from the drain, stone backfill alone is unlikely to have sufficient flow capacity to cater for the water volume collected.

Shallow drainage systems

Where a test pit shows no inflow of groundwater at any depth, a shallow drainage system is required. Soils with very low permeability throughout are more difficult to drain. Shallow drainage systems improve the capacity of the soil to transmit water by fracturing and cracking the soil. They rely on soil disruption techniques: mole and gravel mole drainage and sub-soiling.

Mole drainage is suited to stone-free



Adding stone aggregate to a field drain.

soils with a high clay content which form stable channels. Mole drains are formed with a mole plough comprised of a torpedo-like cylindrical foot attached to a narrow leg, followed by a slightly larger diameter cylindrical expander.

The mole plough creates both a zone of increased permeability adjacent to the mole leg (shallower depths) and a channel for water flow at moling depth. The effectiveness of mole drainage will depend on the extent soil cracking during installation.

The ideal time for carrying out mole drainage is during dry summer conditions, to allow for maximum cracking in the upper soil layers and adequate traction to prevent wheel-spin on the surface.

Gravel filled moles employ the same principles as ordinary mole drains but are required in soils which will not sustain an unlined channel. The gravel mole channel is filled with gravel from an attached hopper which supports the channel walls.

Washed aggregate within a 10-20mm size range should be used. Sub-soiling is used effectively where an iron pan or cemented layer impedes drainage. The effect is to break the layer and crack the soil. A stable channel will not be formed.

Collector drains, which are installed across the slope at 0.8 – 1.0m deep, are required for all shallow drainage systems. Depending on the topography and slope, the collector drains will be at a spacing of 10–40m. A larger spacing reduces costs, but results in a much higher chance of failure.

The disruption channels themselves are drawn at right angles to the collectors (up-slope) at spacings of

1.0-1.5m and a depth of approximately 0.4-0.5m. Stone backfill for collectors should be filled to within 250mm of the surface to ensure interconnection with the disruption channels when installed afterwards.

Outfalls/maintenance

Every drainage scheme is only as good as its outfall. Maintenance vastly improves the capacity and the lifespan of the drainage system, but also helps with water storage, sediment trapping and remediation of nutrient losses.

Drainage systems are poorly maintained in most cases. A maintenance plan should be adopted for both in-field and open drains, focusing on areas susceptible to blockages. This provides a cheap and effective means of improving drainage by maximising the effectiveness of existing drainage infrastructure.

Fine soil particles are many times smaller than the aggregate (e.g stone) around a pipe or the slits in the actual drainage pipe. This means they can get washed from the soil and ultimately settle in field drains and impede flow.

Iron (ochre) can also block drains where it accumulates after being washed out of the soil. Plants and their roots can thrive in open channels, at the pipe outlet and deep within the pipe system causing blockages.

Collapse/sedimentation of open drains, due to flow conditions, undercutting of banks or livestock damage can also cause impediments.

•Drainage systems will deteriorate at a fairly steady rate until blockages become established and “self-clean-

ing” is inhibited.

•If flow is slowed or stopped entirely then large volumes of sediment will be deposited in the system. Relatively minor blockages can quickly undermine the whole system.

•Regular inspection, cleaning and maintenance is required.

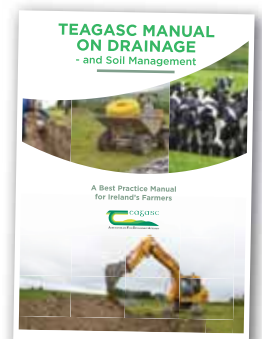
Open drains, culverts and outfalls must be cleaned regularly to remove any obstructions while they should be established to as great a depth as possible to aid flows. Prevent livestock access to open drains.

Field drain pipes and outlets should be jetted/flushed or rodded regularly to maintain flow, and their outlets should be well marked and protected during the cleaning of open drains.

If cleaning an open drain, it is vital that weeds/debris should be removed from the drain bed and one bank only. The other bank should be left undisturbed throughout that season. Sediment traps should be installed to prevent sediment losses and excessive erosion.

To protect fish eggs and small salmonids, drainage works and the maintenance of drainage systems in areas likely to contain these species should be carried out between mid-May and mid-September.

Further detailed guidance is available in the Teagasc Manual on Drainage – and soil management, which has been recently updated.



The fight against blight

Shay Phelan

Tillage specialist, Teagasc Crops Environment and Land Use Programme



Growing potatoes is not for the faint hearted. They are a high input crop with costs for commercial growers coming to over €2,500 per acre in many cases. One of the biggest expenses is disease control, potato blight (*Phytophthora Infestans*) in particular.

The annual battle is already under way, whether you are a commercial, organic or just “growing few drills for the house” type of grower.

We are all familiar with the regular blight warnings issued by Met Eireann, which indicate that a period of weather favourable to the spread of the disease is on the way.

Most commercial growers are using weekly fungicide programmes to keep ahead of the fungus, as it can be very difficult to “cure” once you get a bad infection. Casual growers probably don't need to apply fungicides every week, but they still need to control blight.

If casual or hobby growers ignore blight warnings, not only do they put their own few drills at risk, they can put neighbouring crops at risk too.

Blight can spread from single plants grown in gardens or patios, volunteers in other crops, dumped potatoes or even discarded skins, etc.

If any of these potato plants become infected with blight, it can spread very quickly into commercial crops, potentially destroying them. We hear many advisors talking about Integrated Pest Management (IPM) in regards to controlling weeds, disease and pests. Put simply, this means using both chemical and non-chemical measures to control the particular pest in question.

One simple IPM measure when it comes to controlling blight is to pull or destroy potato plants growing where they are not supposed to be.



This removes sources of infection and reduces the risk to the national crop.

Unless they are organic growers using “resistant” varieties or copper sulphate solution “Bordeaux Mixture”, most growers will apply conventional fungicides to control the problem. Mancozeb is by far the most famous fungicide used in controlling blight over the years and most people who grew up on farms would be familiar with the can of Dithane 945 in the shed for potatoes – in many cases it was used throughout the season.

However, this is the last season that Mancozeb can be used on potatoes, as its registration for use expired earlier this year. In the last few years, products containing the active ingredient Fluazinam, e.g Shirlan or Volley, became popular among growers, mainly for use late in the season as it had good activity on tuber blight.

Similar to Mancozeb, many small growers used this product throughout the season as it was available in small quantities. However, like many other organisms, blight is continually evolving and mutating, which results

in different strains of blight developing that have different characteristics, including in their resistance to fungicides.

A strain of blight called 37 A2 has developed across Europe which is largely resistant to fluazinam. This strain has spread to most countries across the continent and Dr Steven Kildea in Oak Park confirmed its presence in Ireland in 2020.

We know that we have mixtures of strains in the blight population, however if your crop contains the 37 A2 strain, then we can safely predict that control from Fluazinam products will be poor.

Therefore, the advice is this: If you are going to use Fluazinam, only use it once during the season and mix a partner product with it, e.g cymoxanil, to spread the risk.

Steven Kildea is constantly monitoring blight and looking at the performance of different active ingredients against the fungus. To this end, we are always looking for blight samples from across the country, to analyse which strains are prevalent in Ireland.

Table 1: Approved potato fungicides 2021.

Product Name	Active substance	Mode of Action	Rate/ha	PHI (days)	Max no. of applications
Ranman Top	Cyazofamid 160 g/l	Contact	0.5l	7	6
Shirlan/Tizca/Volley/Fluazinova	Fluazinam 500 g/l	Contact	0.4l	7	10
Kunshi	Fluazinam 375g/kg + Cymoxanil 250 g/kg	Translaminar + Contact	0.5kg	7	8
Grecale	Fluazinam 300g/kg + Cymoxanil 150 g/kg	Translaminar + Contact	0.6l	7	6
Vendetta	Fluazinam 375g/kg + Azoxystrobin 150 g/kg	Contact and protectant	0.5l	7	-
Option	Cymoxanil 600 g/kg	Translaminar (Tank Mix partner only)	0.15kg	14	8
C50 WG	Cymoxanil 500 g/kg	Translaminar (Tank Mix partner only)	0.24kg	7	4
Cymbal	Cymoxanil 450g/kg	Translaminar (Tank Mix partner only)	0.25kg	14	6
Revus	Mandipropamid 250 g/l	Translaminar + Contact	0.6l	3	4
Proxanil	Propamocarb 400g/l + Cymoxanil 50g/l	Translaminar + Contact	2.5l	14	4
Infinito	Propamocarb 625 g/l + Fluopicolide 62.5 g/l	Translaminar+ systemic	1.6l	7	4
Zorvec Endavia	Oxathiapiprolin 30 g/l + Benthiavalicarb 70 g/l	Systemic and Protectant	0.4l	7	4**
Zorvec Enicade + Gachincho	Oxathiapiprolin 100 g/l + Amisulbrom 200 g/l	Systemic and Protectant	0.15l + 0.3l	7	4**
Curenox 50 WP*(Off label approval)	Copper Oxychloride 87.8 % WP	Contact	1.0kg	8	6.0 kg

* Curenox 50WP is approved by the Irish Organic Association for use on organic potato crops

** Max of 3 consecutive applications

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Flower power of low-input grassland

Here's how your REAP payment is calculated

Catherine Keena
Teagasc Environment Specialist, Teagasc Crops Environment and Land Use Programme



If you are one of the 5,000 farmers who have been accepted into Results-based Environment Agri Pilot (REAP), you must choose an area of between 2ha and 10ha of grass fields on your farm. Tillage fields or peatland with heather are not eligible.

Your advisor will walk suitable grass fields with you this summer and score each field using one of two scorecards: one for Low Input Grassland (LIG), or one for Multi Species Ley (MSL). The score determines the level of payment. The advisor will also discuss with you the option of planting trees or hedges.

Here, Catherine Keena describes how low-input grassland is scored with payments ranging from €0 to €400 per hectare based on nine questions. The field's score is based on: the number and abundance of non-grass species; the extent of field boundaries including hedges, stone walls, earth banks and watercourses; and the length and width of grassy margins – either 1m, 2m or 3m.

Q1: How many positive indicators are present?

<2	2-4	5-8	9-12	>12	Score:
0	5	10	15	20	

Tick if present:

- | | | |
|--|---|---|
| <input type="checkbox"/> Marsh cinquefoil | <input type="checkbox"/> Large Umbels - Angelica, Valerian, Hogweed | <input type="checkbox"/> Common knapweed |
| <input type="checkbox"/> Sorrel (Common & Sheep's) | <input type="checkbox"/> Small Umbels - Pignut, Yarrow, Wild carrot | <input type="checkbox"/> Scabious (Devil's-bit & Field) |
| <input type="checkbox"/> Bird's foot trefoils | <input type="checkbox"/> Bedstraws and Stitchworts | <input type="checkbox"/> Selfheal and Bugle |
| <input type="checkbox"/> Vetches and vetchlings | <input type="checkbox"/> Marsh pennywort | <input type="checkbox"/> Orchids |
| <input type="checkbox"/> Marsh marigold | <input type="checkbox"/> Lady's mantle | <input type="checkbox"/> Mints |
| <input type="checkbox"/> Cowslip & Primrose | <input type="checkbox"/> Sedges | <input type="checkbox"/> Violets |
| <input type="checkbox"/> Ox-eye daisy | <input type="checkbox"/> Woodrushes, Spike rushes | <input type="checkbox"/> Forget-me-nots |
| <input type="checkbox"/> Tormentils (Common & English) | <input type="checkbox"/> Lady's smock (or Cuckooflower) | High quality Positive Indicators: |
| <input type="checkbox"/> Yellow Composites | <input type="checkbox"/> Wild thyme | <input type="checkbox"/> Kidney vetch |
| <input type="checkbox"/> Yellow rattle | <input type="checkbox"/> Louseworts | <input type="checkbox"/> Carline thistle |
| <input type="checkbox"/> Meadowsweet | <input type="checkbox"/> Ragged robin | <input type="checkbox"/> Harebell |
| <input type="checkbox"/> Eyebrights | <input type="checkbox"/> Meadow thistle and Marsh thistle | <input type="checkbox"/> Greater knapweed |

Q2: What is the combined cover of positive indicators throughout the field?

- **Negligible (<5%):** a few, scattered or very small patches. The entire sward appears grassy.
- **Low (6-10%):** occurring in small patches or very scattered over the field, not highly visible when looking down on the sward (you must search to find them) and missing from most of the field. Most of the sward looks 'grassy'.
- **Medium (11-20%):** occurring scattered, or in patches over the entire field, occasional occurrence when looking down or across the sward. Much of the sward looks 'grassy'. You encounter a positive indicator every couple of steps.
- **High (2-40%):** visible over the entire field. Much of the sward may look 'grassy'. But with frequent yellow and pink flowers present. You encounter a positive indicator with every step.
- **Very high (>40%):** very visible throughout the sward and providing a high amount of ground cover. Good diversity of leaf shapes and flowers (look for different shapes and colours) apparent in the sward when looking down onto it. Only small patches of the field may appear 'grassy'. You encounter multiple positive indicators with every step (and in between steps).

negligible <5%	low 6-10%	medium 11-20%	high 21-40%	very high >40%
0	10	15	20	25

Q3: What is the vegetation structure or litter levels?

A meadow closed off or recently mown for hay or silage is scored as 'good' structure.
 • **Poor:** can be over-grazed or under-grazed. Most of the field (>75%) has either very tall or very short, even, vegetation or litter levels are greater than 50%



- **Moderate:** between 25% and 50% of the field has tall and/or short sward with occasional intermediate sward height spread patchily through the field or litter levels are 25% to 50%.
- **Good:** tall/medium and short vegetation throughout and litter levels are less than or equal to 25%.

poor -10	moderate 5	good 10
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Q4: What is the combined cover of negative indicators throughout the field?

Negative indicators include ryegrass, docks, ragwort, nettles, bracken and thistles (creeping and spear).
 • **Very high (>40%):** occurring in dense patches or abundant throughout the field. Very visible in the sward.
 • **High (30-40%):** occurring in medium to large patches in the field and not limited to previous feeding sites, trackways, field boundaries, water troughs and gateways. Readily visible in the sward.
 • **Medium (11-30%):** occurring in several small- to medium-sized patches throughout the field and also around trackways, field boundaries, water

very high >40%	high 31-40%	medium 11-30%	negligible to low <10%
-15	-10	-5	0



Forget-me-not flowers.

troughs and gateways.

• **Negligible to low (<10%):** if present, scattered or small clumps of weeds only. Where present at gateways, water troughs, field boundaries and along well-used trackways, this cover should be less than 10% and the weeds should not extend into the main body of the field.

Q5: What is the score for field margins?

The score for field margins varies based on their density and the width fenced as outlined below. An additional five points will be awarded for any field margin along a watercourse or drain (subject to a maximum of 30 points for this question. For a very high-quality species rich field with a combined score of 35 for Q1 and Q2, the margins do not need to be fenced.

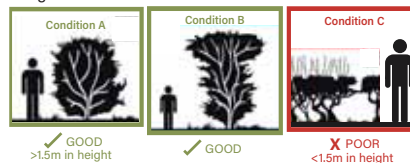
Margin width:	Densities per hectare:		
	50-200m/ha	201-300m/ha	>300m/ha
3m	20	25	30
2m	15	20	25
1m	10	15	20

Q6: What is the score for field boundaries?

The score for field margins varies based on their density and their condition as outlined at the top of the next column..

Condition / management:	Densities per hectare:		
	40-100m/ha	101-160m/ha	>160m/ha
A or B	5	10	15
C	0	0	0

Hedgerows/treelines:



Q7: What is the combined cover of negative indicators/invasive alien species throughout the field boundaries and margins?

Negative indicators include ryegrass, docks, ragwort, nettles, bracken and thistles (creeping and spear). Invasive alien species include Himalyan balsam, Japanese knotweed, giant hogweed and giant rhubarb.

very high >40%	high 31-40%	medium 21-30%	negligible to low <20%
-15	-10	-5	0

Q8: To what extent is the field poached?

• **Very high (>50%):** extensive damage from poaching across most of the field. Often extensive rutting and compaction from machinery
 • **Med high (26-50%):** soil disturbance around water sources extends for 3m. Extensive areas of bare ground noticeable and not confined to regularly used routes. Can be me-

dium extent of rutting and compaction from machinery.

• **Med low (11-25%):** unvegetated bare areas noticeable in wetter soils during summer. Patches of bare ground not limited trackways/gates or thin soil. Soil disturbance around water features extending 1-3m.

• **Negligible to low (0-10%):** low impacts on the field. Small patches of bare ground possibly along well-used trackway/gates. Very small areas of poaching away from routes and gates. Grassland as a whole is well vegetated in summer. No poaching or dunging at wet features

very high >50%	med-high 26-50%	med-low 11-25%	negligible to low 0-10%
-30	-20	-10	0

Q9: Is there evidence of damaging activities to soil/vegetation/water?

Damaging activities include: bare soil and erosion; damage to watercourses; inappropriate use of herbicide; burning; dumping/littering; fertiliser (organic or inorganic) application at boundaries; evidence of field boundaries having been removed or damaged by machinery; and extensive areas of bare or disturbed ground along field boundaries.

high >50%	medium 6-50%	low 1-5%	none none
-30	-20	-10	0

When a plan comes together

There are many different kinds of plans and every farm family should have one

James McDonnell
Financial specialist, Teagasc Rural Economy Development Programme.



Farming is a risky business and the best way to manage risks is to plan for them. Some are within our control, and by managing what is within our control, we make the business stronger to meet the challenges from beyond the farm gate.

For example, by using good genetics, we can ensure that when we sell animals, milk or crops that we get an above average price, even if the general price available is poor due to market forces outside our control.

What should a plan look like?

Most farm plans that I have seen are a document that could run to 20 or 30 pages, but plans do not need to be any longer than a few pages. For some, the farm plan is about keeping the farm business going more or less along the same lines, while making regular tweaks to improve profit.

Plans do not have to be ambitious. Many farmers are part-time now. If you fit into this category, your biggest challenge might be achieving a good work/life balance by running the operation with fewer hours. For others, the goal could be a succession plan.

Taxes on transferring assets to the next generation can be very high without good planning, and by delaying making a plan, you could run out of options. So what do you think your plan should look like?

What will this cost me?

Most of us when we hear the words 'farm-planning', think there is a lot involved and that it will be costly. Often, plans are completed as part of

a bank loan application, contain lots of figures and are difficult to follow by the untrained eye.

But most plans should not cost anything more than some time, if you have the right tools at your disposal. The main purpose of the plan is to achieve something, so the cost will be more than covered by the return, as the saying goes: "You must throw a sprat to catch a salmon."

Where do I start?

Teagasc has planning tools that you can use to help. You may need guidance on which tools to use or how to use them, depending on the purpose of the plan. This is when you need some help from your advisor, mentor, or family. The plan could be a financial, succession, time management or other.

Financial plan

Prior to completing any plan, the first step is to analyse the farm business as it stands now. The requirement here is to look at yourself as a farm manager and ask: "Have I being doing



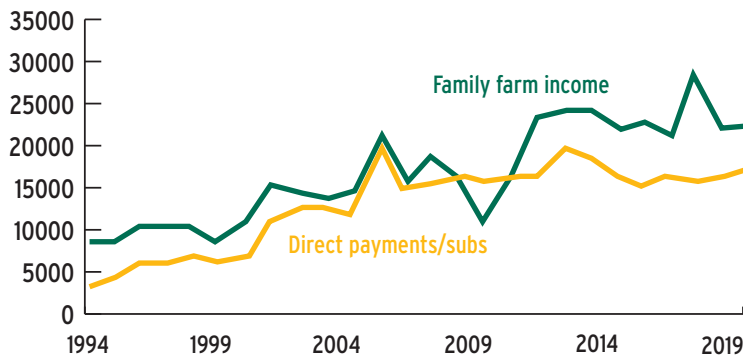
a good job managing the farm?" To answer this question honestly, a set of management accounts is needed.

The Teagasc Profit Monitor can help with this. By getting your business analysed in this way, you can benchmark your farm business against other farms with the same mix of enterprises. This benchmark is your "efficiency level".

Many farm business are not as ef-

Figure 1: Contribution of Direct Payments to Family Farm Income 1994 – 2018 (source NFS).

*From 2012 onwards farmers with sales of less than €8000 were excluded from the data





efficient as they could be – if your farm is in this category, your business plan should focus on addressing this.

If the plan is to grow the farm business, then a detailed financial plan is required. The workbook “My Farm My Plan, Planning my Future” is a tool you can use to gather the information to help you and your advisor complete a financial plan.

The advisor can then project forward using a computer programme to figure out what is achievable.

Succession plans

The average Irish farmer is almost 60 years of age, and many have never thought of retirement. Teagasc hosts a number of “Transferring the Family Farm” events each autumn, with the sole purpose of providing information to farmers wishing to put a succession plan in place.

Farm succession is a very complex area. Capital taxes are complex and so too are the dynamics of families. “The Farm Succession and Transfer Guide” is a workbook available from Teagasc offices to help you write a succession plan. Your local Teagasc

advisor can also help you with this.

The starting point is to write a will, as this decides what happens your possessions if you pass prior to completing your succession plan. Putting a succession plan together is time consuming, so it needs to be started as soon as you can.

Sometimes people put themselves in a situation, by delaying, where the plan becomes a salvage operation because there is leakage to tax or other costs that were unforeseen. Remember, the farm can be put at risk by doing nothing.

How does a plan reduce risk?

Sometimes, it seems like farming is suffering a death by 1,000 cuts, with weather, price fluctuations, compliance costs with rules and the reducing value of entitlements. Having a plan helps you to cope with these challenges.

If you are finding that farming is becoming an increasingly difficult way to earn income, other options worth considering could be land leasing, farm partnerships, forestry or share farming to name a few.

Most people consider farm income the biggest risk, and for the majority of Irish farmers, the EU support payment (BPS) makes a significant contribution to farm income (see Figure 1).

By the time you read this article, I hope that a new CAP agreement will have been agreed, allowing us advisors to help you plan until 31/12/27, knowing what the direct payments will be.

For most risks, there are things you can do help, for example, you could take out insurance to provide labour if you get sick. If you are nervous of bulls, don't keep any.

The challenge is to identify the risks. Sometimes we don't even see the risk, despite walking past it every day, so from a health and safety perspective it is often better to get the help of another farmer to check how safe your farmyard really is.

Finally, it is worth putting in the effort to plan, but it can be difficult, so use whatever help you can get.

I will finish on a quote from the 1980s TV show *The A-Team*: “I love it when a plan comes together”

Farm workplace deaths down but challenges lie ahead



John McNamara & Francis Bligh
Health and Safety Specialists, Teagasc

There were two farm workplace deaths recorded during the first five months of 2021. With an average of 21 farm deaths per annum over the last decade, the 2021 level is, so far, well below average. While any avoidable death is a tragedy for the family involved, this is welcome news. It means we are (possibly) making progress towards the only acceptable goal: zero fatalities in the farm workplace.

The reason for the decline in fatal injuries may be that there are more people on farms due to the COVID-19 lockdown. Many family members who are students or off-farm workers are living and working from home on farms and available to “lend a hand” with farm work.

In addition, there have been virtually no off-farm events or activities for farmers to attend during the lockdown, so work can be done at a steadier pace.

Injury causation

The current trend tallies with research conducted by Teagasc health

and safety specialists among 1,151 farmers. These farmers gave their rankings on the causes of farm accidents and the results have been published in the scientific journal, *Agronomy Research*.

Highest ranked as the most frequent cause of injury (31.6%) was farm vehicle and machinery impact including knockdowns and crushes. The second highest ranked was “organisational” causes (21.3%) with “not taking care” and “rushing” accounting for 65.5% of causes within this category.

Further causes of injury ranked in order were livestock (18.4%); slurry (13%), trips and falls or buildings-related (7.2%); electrical (4.8%) and other (2.2%).

Overall, this study indicates that farmers rank both physical causes and work organisation issues as major causes of injury. The data tallies with injury prevention models which indicate that a combination of safety behaviours and a safe physical workplace are required to achieve injury prevention.

Children and older farmers

A concerning finding of the study was the very low rankings give to childhood injuries (1.3%) while “older farmer age” received no ranking.

On average, one in 10 accidental farm deaths is that of a child, each is a tragedy. Farmers aged 65 and older are the victims of 45% of farm deaths. Much greater attention needs to be given to both the young and old on farms, especially over the summer months.

“Inadequate machinery capacity and poor maintenance also lead to “rushing” which is a major contributor to farm injuries

Safety in summer

The high-risk period for farm safety is from now into July and August when there is high risk of farm injuries. In addition, as COVID-19 restrictions lift, it means that the additional help on farms is likely to return to working away from the farm.

However, farm injuries can be cut substantially if farmers adopt injury prevention measures and focus work organisation to prevent doing work when rushed.

Key controls and behaviours to prevent farm injuries are described in the HSA Risk Assessment Document available to all farmers.

Work organisation essential for safety

A major Teagasc study indicates that a higher level of farm workplace injuries occur on farms which are poorly capitalised. Poorly capitalised farms require longer working hours often involving older farmers.

Long hours lead to tiredness and little time for family or friends. Inadequate machinery capacity and poor maintenance also lead to “rushing” which is a major contributor to farm injuries.

Long hours also eat into time for

Farm safety code of practice training

Trained staff in both Teagasc and agricultural consultancies provide a half-day training on completion of the RAD.

The requirement to submit a farm safety COP training attendance letter as part of the TAMS II payment claim process has been reinstated by the DAFM.

It was temporarily suspended in 2020 as it was not possible to safely hold in-person training courses due to COVID-19 restrictions.

Course

The DAFM recently announced that all farm safety training courses completed after 28 February 2021 must be completed online to be acceptable for TAMS II payment claims.

This will be reviewed over the coming weeks in light of reduced COVID-19 restrictions.

Contact your local Teagasc office if you would like to attend a farm safety course.



leisure and exercise off the farm, which in turn affects quality of life and health in the long term.

Labour declining

The labour resources available to farming are gradually declining and becoming more expensive. The way to identify if you are labour-efficient is to figure out the work hours used by each person on the farm.

Ways of solving a work organisation problem are to: examine your enterprise mix; examine your buildings and farm layout, look at the machinery systems in place and the extent to which you use contractors. Farm profitability should be examined in association with work organisation to ensure that your time is well spent.

TAMS deadline

The DAFM, TAMS II scheme provides grant aid for a wide range of farm developments, which aid farm health and safety. In addition, there is a list of specific health and safety items, which are grant-aided under this scheme.

This scheme closes for applications

in November 2021. Due to the prolonged CAP negotiations, there may not be another scheme for some time.

The best advice is to consider what farm developments you currently require and consult with your advisor about making an application.

Farm Safety Week

This year's Farm Safety Week (19 to 23 July). One of the objectives of the week is to dispel the myths surround risk assessment and encourage farmers to take measures to ensure safety of all on the farm.

The week will offer five days of themed practical advice and guidance. This will be the ninth year of the initiative.

It takes place in the UK and Ireland and is led in Ireland by the IFA. Teagasc will be supporting this initiative again this year.

The week will bring attention to the importance of working safely in farming and it will promote good safety practices and share positive stories to help improve safety on farms.

To find out more, visit the Teagasc website.

Risk assessment document

It is a legal requirement to have an up-to-date farm safety code of practice risk assessment document for your farm.

The original code was produced by the Health and Safety Authority (HSA) in 2006 following the passing into law of the Safety, Health and Welfare at Work Act (SHWW), 2005.

The current version has a green cover to distinguish it from the previous version and is available from the HSA and Teagasc.

Practical

The farm safety code of practice risk assessment document is designed to help farmers meet their duties under the SHWW Act 2005 in a straightforward and practical way.

It focuses in on the most common hazards and provides workable solutions that can be put in place with minimal to zero cost.

Pride and passion for drystock on display at Gurteen

Gurteen College is a private college, one of seven colleges in the Teagasc network

Gurteen College



Molly Parry
Promotions and
Social Media Officer
at Gurteen College



We were looking for an adventure,” says Jon Parry about his family’s move from the UK to his current position as college principal at Gurteen College in Tipperary. As a former dairy specialist, he could be said to be going ‘against the trend’ in joining a college and farm with a strong emphasis on beef and sheep.

“What attracted me to Gurteen was the proud track record of providing education and training to those interested in agriculture and a passion to help them succeed.

“Students, and their future employers, tell us that hands-on learning with quality time spent in the yard at Gurteen, working with our superb livestock makes the real difference.

“All students get a chance to develop skills and work on a wide range of farm enterprises, including dairying, before specialising in their chosen sector. This is why having a top-performing drystock enterprise is crucial in facilitating our student successes.”

The Gurteen drystock enterprise consists of a suckler herd, a breeding

ewe flock, a dairy calf-to-beef system and contract rearing of dairy replacements heifers. Gurteen’s suckler herd is made up of 70 predominantly first-cross Limousin cows from the dairy herd, with calving split between spring and autumn.

Progeny are finished on-site in under 20 months for heifers and below 16 months for bulls. Spring calving begins during the first week of February and lasts 10 weeks, while autumn calving begins the first week of September and lasts nine weeks. Breeding is with a five-star stock bull or via AI.

The dairy calf-to-beef system consists of 80 Friesian, Hereford and Angus calves purchased from the dairy herd at two weeks of age and finished for beef between 18-24 months.

Beef finishing systems last 120 days, and the animals are put on a finishing diet of 25kg grass silage, 5kg of concentrates, 15kg of fodder beet and 0.5kg of straw. Similarly, 60 dairy replacement heifer calves are contract reared from 12 weeks of age until returning to the dairy enterprise as in-calf replacement heifers at 20 months of age.

The sheep enterprise consists of 450 Borris type ewes. The flock consists of 100 early (January) lambing ewes and 350 mid-season ewes lambing in early March. Breeding rams are Charolais and Texel and the aim is to have all lambs sold from grass by the end of September.

Alongside the impressive drystock enterprise, Gurteen also offers students the opportunity to work with its 240 pedigree Friesian dairy herd, 109ac of tillage, commercial forestry, bog, mixed woodland and short rotation coppice willow, making Gurteen a truly sustainable ‘mixed’ farm.

As a college, the most rewarding thing for us is to see the pride and

passion Gurteen students develop as they go on to accomplish spectacular achievements, here are some of our drystock students’ stories.

Sean Diver

Sean Diver studied the Level 6 in Drystock Management at Gurteen College in 2013, and is now the farm manager on Tullamore Farm, the *Irish Farmers Journal* beef and sheep demonstration farm.

“I chose to attend Gurteen after doing research on the courses they offered, and I was amazed to find the college had such a large scale fully operational farm with so many different enterprises. I felt that by attending Gurteen, I would be exposed to dairy, sucklers, sheep and tillage, receiving education on the areas I am most passionate about, but also experience in two more sectors while there.

“I have great memories of being involved in the day-to-day farming in Gurteen, everyone was encouraged to get involved, gaining a huge amount of experience in all sectors and farm practices, but especially in sucklers and sheep.

“After Gurteen, I took up a job on a suckler and sheep farm. I found the job through contacts made in Gurteen. In the spring of 2018, I responded to a job advert for the role as farm manager on the Tullamore Farm and this is where I work today. Had I not made the decision to attend Gurteen back in 2013, I feel that I would not be in the position I am now.”

Dr Tomás Russell

Dr Tomás Russell was a student in Gurteen College from 2007 to 2009 on the Certificate in Agriculture and the Advanced Certificate in Drystock Management course. He comes from a beef and sheep farm in Co Offaly, which he currently farms in partner-

This spring, Gurteen sold 24 Friesian steers, with an average carcass weight of 354kg, a KO% of 50.2%, a condition score of O- and a fat score of 3+

Eighty-five of Gurteen early born lambs were sold during April, with an average carcass weight of 19.92kg. All lambs graded U3.



Gurteen College is proud of all our alumni, who can be found all across Ireland! If you'd like to be included on the Gurteen mailing list for our quarterly gazette, contact us today! Email alumni@gurteencollege.ie

Passionate to learn more about all the courses on offer? You can visit the Gurteen website or follow us on Facebook, Twitter and Instagram @gurteencollege.

Teagasc has a network of seven colleges that deliver agriculture and horticulture courses – visit the website <https://www.teagasc.ie/education/> to find out more

Innovation at University College Dublin. My job involves research and teaching. I use the skills, knowledge, and experience that I got in Gurteen every day both at UCD and at home on the farm. I am proud to have studied at Gurteen.”

Catriona Egan

Catriona Egan is a secondary school teacher who also farms alongside her family on their suckler and sheep farm in Co Laois. She's in her second year studying on the Gurteen Distance Education course, the Level 6 Specific Purpose Certificate in Farming.

“Gurteen College has played a huge role in my farming life. I found it great to develop connections with other like-minded people,” says Catriona.

“The structured course has been invaluable to me, as I gained both theoretical and practical ‘hands-on’ skills.

“These transferrable skills such as grassland budgeting, animal husbandry and farm planning have enabled me to plan for the future and help to implement sustainable farming practices on my home farm.”

“Gurteen is proud to have continuing successes with its drystock students and prouder still to utilise our fantastic college farm in teaching these students,” says Jon Parry.

“Offering students hands-on experience in all aspects of farming is incredibly important, allowing them to gain the best knowledge and skills to help them succeed in life, whether that’s on their home farms, or elsewhere within our agricultural industry. Contact us today to find out more about starting your own Gurteen adventure!

ship with his father.

“As a child, I had no interest in anything other than farming,” says Tomas.

“Having been convinced by my mam not to leave school after my Junior Certificate, I completed my Leaving Certificate and elected to go to agricultural college.

“Gurteen was the obvious choice for me as it had a top-quality farm and facilities, and the mix of practical and theory classes really suited me. Although it’s close to home, I decided to live on campus for my two years. The life experience, personal devel-

opment, friends (both students and staff), skills and education that I got from Gurteen was fantastic and really impacted on the direction of my life from there.

“Over two years in Gurteen, I realised that I have a huge love for not only farming but also the agricultural industry and decided to go on to the Waterford IT Agriculture course. After completing this, I moved on to study for a Masters in Agricultural Innovation Support in UCD and then a PhD.

“I now work as an assistant professor of Agricultural Extension and

A pioneer in forestry and broadcasting

Michael Somers
Forestry advisor,
Teagasc, Nenagh

In times past, the words of broadcaster Michael Dillon were gospel in the farming community. Few have reached this kind of legendary standing, yet in the Premier county, one man has achieved similar broadcasting status in his lifetime – Jim Finn from Ballycahill.

For 17 years, Jim has been the voice of farming in Tipperary. Last year, he increased his reach by adding the Farm Focus on Clare FM. But once you scratch the surface, you find the farming king of the microphone has many layers.

His experience with farming goes back over 60 years, from his time helping his father on their mixed farm near Thurles. Jim attended school in the town before going to secondary school at Mungret in Limerick. He smiles as he describes hurling in a rugby school. Many students excelled at both.

When he finished in education, Jim started farming, milking 22 cows, rearing calves, finishing steers and growing barley for Guinness and sugar for the factory in Thurles. Eventually, he concentrated on growing potatoes and cattle. His extensive farming experience has stood to him in his media career.

Rural development

Jim's interests are broad. He has a deep involvement in GAA and drama, two voluntary organisations that are still cornerstones of life in rural Ireland. He has held positions in both areas, as well as at the local co-op.

Jim has a passion for rural development and says his involvement in the local Leader Company in Tipperary is his greatest achievement.

"I was chair, and we were able to bring the Leader program to many communities. Tipperary has many artisan food producers, community development projects and other developments thanks to Leader. Teagasc and the Options program in particular, also played a massive role."

Jim is currently chair of the Irish Local Development Network CLG



(ILDN). This is the representative body for Ireland's local development companies. These 49 not-for-profit groups build inclusive, vibrant communities and better life chances for people in every part of Ireland.

They assist communities and disadvantaged persons/groups with personal development and well-being, social inclusion, employment training and placement, enterprise and social enterprise, community development, environment, and climate action.

Forestry

Jim is a pioneer and advocate for forestry in Tipperary: "My father had a great interest in trees. He believed in planting them for a pension and that's what he did."

In 1995, Jim planted 9ha around his house with Sitka spruce: "There's a reason I planted land outside my front door. It was wet. And very difficult to farm. The forest has been a huge addition to our farm. We got the establishment grant, and we received



Jim Finn and Michael Somers examine his forest with the 16th century Ballinahow castle, which is on Jim's farm, in the background.

the 20 years of premium.”

The site has been thinned twice. “I won't pretend I was happy with the price for first thinning,” says Jim.

“But I see now the value that is added to the crop. We are in the home straight. Timber price is up globally. But even if it falls, we will leave it. It will come around again.

“We follow a very genuine approach to the management of the forest. If we decide to do another thinning, really it must be to increase the percentage of sawlog. That is where the money is. The more sawlog you have, the better the return. It's that simple.”

“We heat our house with the less valuable wood and sell timber for pallets and sawlog. For any farmers coming up to clear-fell, my advice is to get the felling licence early. There's a lot of talk about licensing at the moment. Just be prepared. And don't be afraid to cut when the price is right or indeed to wait if it's not.

“I have grown barley, and a forest is not like a crop of barley. It can be

cut at any time once it's ready. It's a once-in-a-generation crop, and when it comes in, it certainly pays. But you must be prepared to do your homework. There's no use saying the dog ate my homework in the real world.”

Jim regularly walks his forest plantation. Since the second thinning, he has noticed an increase in vegetation in the forest.

“Sitka spruce gets a lot of bad press. But, once thinned, there's no shortage of vegetation and birdlife there. Red squirrels, in particular, are here and that's something positive.”

Radio

Jim took over from Tom O'Dwyer of Teagasc on Tipp FM's Ag Report.

“Tom has moved on to greater things, and I'm delighted I followed him as I love it,” says Jim.

“One of my most memorable interviews was with Lord Plumb in the UK. Lord Plumb was before his time in speaking about food miles. He devised the Fife diet.

“This was a pioneering project that encouraged people to grow and eat local food (produced within 50 miles of Fife) and reduce their carbon emissions footprint. Over 6,000 people signed up and it is one of the most significant food projects in Europe.

“The basics of the job have not changed.

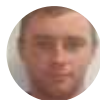
“Of course, the recording and technical aspects of radio are ever-changing. But radio is a passion that I really enjoy.”

Jim sees farming changing. Since he has taken over on Farm Focus on Clare FM, Jim says “The Burren Project” is one of the most impressive developments in farming, devised by farmers for farmers who have a desire to promote one of the wonders of the world.

“Agriculture in the two counties is similar in many ways but different in others. But it's always important that we leave a positive legacy for the next generation,” he concludes.

Spending wisely on garden projects

Darren White
Teagasc College in
the National Botanic
Gardens



Many uncertainties remain due to COVID-19, but as an industry horticulture is growing, as are job opportunities for our graduates. People are spending more time in their gardens and are keen to invest in garden projects. This has provided a great boost to landscapers all around the country with many contractors' diaries filled for the remainder of 2021.

An unfortunate fallout from the pandemic are price increases on a number of landscape materials including plants and paving products. High demand has driven price increases but a number of supply issues have also resulted in a shortage of stock.

According to Matt Lohan of Woodstock Nurseries in Co Kildare, most hedging has risen in price due to a shortfall in supply as a result of climatic factors over the last number of years resulting in lower yields of plants.

Paving products are in a similar position and at the time of writing sandstone paving was sold out. According to Timmy Twomey of the Natural Stone Yard in Co Meath, a shortfall in supply is creating many challenges in sourcing material due to COVID-19 and demand is extremely strong for all natural stone paving.

Spending on a garden project should be viewed as a lifetime investment. That is why it is critical to select the correct type of paving or plant selection to suit your home and what you personally find attractive.

With large country gardens, in



Using a mix of granite as a border and limestone provides excellent contrast.



Avenue trees and specimen trees can really add to a property.

particular, the level of investment can be very high. I would recommend splitting the project over two to three years and concentrate on hedging and specimen trees one year and paved areas the following year and so on.

This gives you the opportunity to research products and decide what will best suit your needs and help ensure the money is well spent.

Porcelain and granite are the current market leaders in terms of paving. Porcelain has become very popular among landscapers and designers in recent times. Many clients like this type of stone due to its clean cut lines and hard wearing surface and slip resistance. It now comes in a range of different colours.

Granite and limestone are timeless and will nearly always be excellent options as hard-wearing, low-maintenance paving.

Planting trees and hedging should be done carefully. It is important to know your site in terms of soil conditions, light and wind direction. Trees and hedging are lifetime commitments so take care in the selection process when purchasing trees.

Avenue trees and specimen trees can really add to a property. Native trees are always advisable but, also, study your neighbours' plants to get an indication of what will grow well and what to avoid.

The use of *Hornbeam Carpinus betulus* as an avenue tree works well as they provide excellent structure. Hornbeam is generally more tolerant

of conditions present in most Irish gardens than some non-natives.

This weeping beech tree *Fagus sylvatica Pendula* provides year-round interest in the garden and creates a beautiful backdrop for the sunken garden below it.

In conclusion, always try to use a reputable nursery, landscaper, garden centre or paving centre as it is in their interest to provide you with good advice.

When it comes to paving and planting, visit a job a landscaper has carried out previously as this will showcase their workmanship. When it comes to spending money on garden projects spend it once and spend it wisely.



The beech tree *Fagus sylvatica Pendula* adds interest to the garden.

Show Jessy your Farm Safety ideas and WIN!

€50
SMYTHS
VOUCHER

Jessy the Sheep Dog, our Teagasc Farm Safety mascot, loves to help keep everyone safe on the farm and to celebrate the end of school term she wants to give 5 lucky winners a €50 Smyths Toys voucher.

Show Jessy your idea of Farm Safety and be in with the chance to win. Submit a picture of you, showing her how you keep safe on your farm or create a drawing of a Farm Safety scene.

With the permission of a grown up,
submit your entry at
www.teagasc.ie/farmsafetycomp

Show me how
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Open the camera on
your phone and scan
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