TEAGASC

March-April 2023 | Volume 34 | Number 2

Today's Farm

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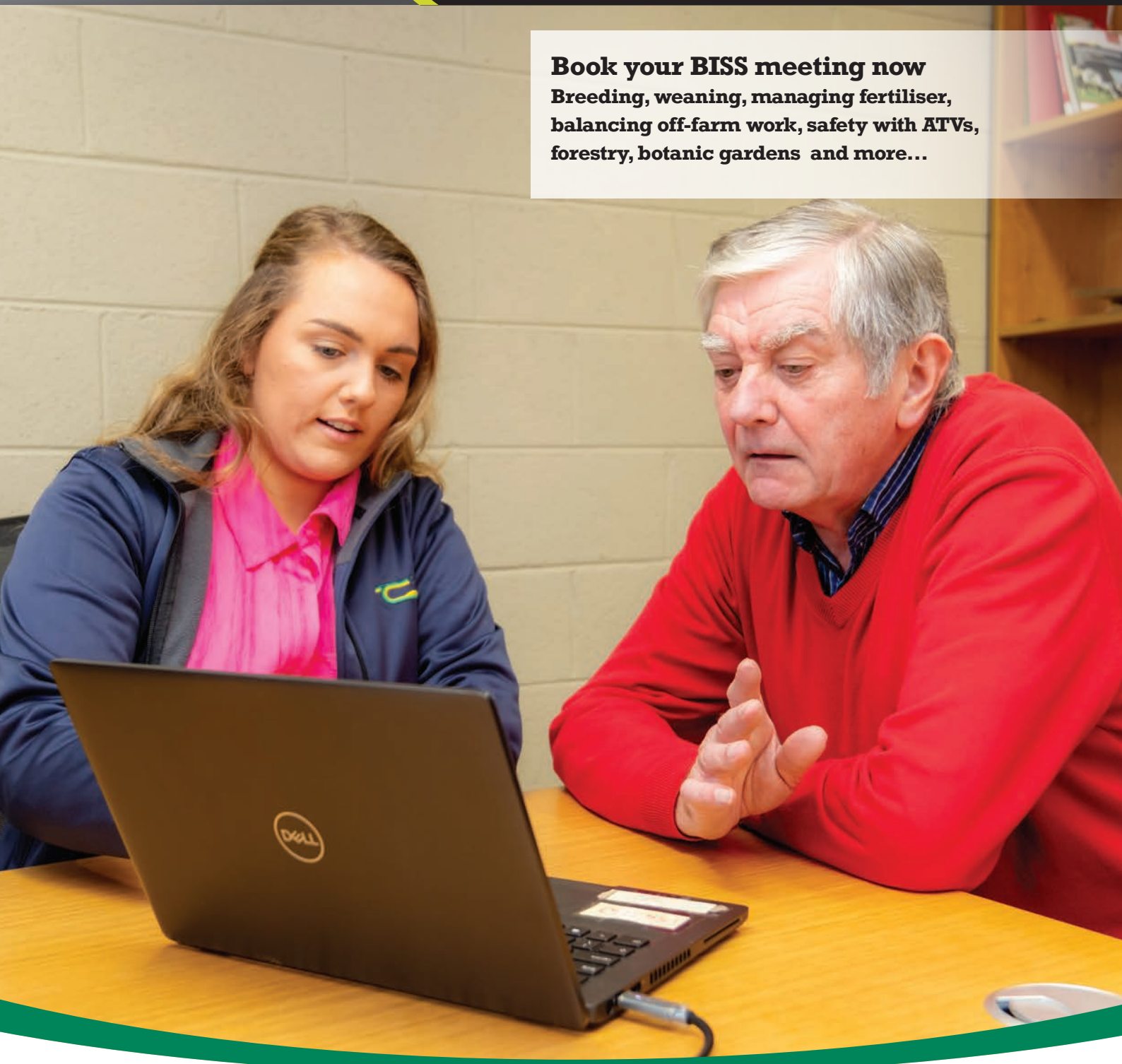

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contents

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Cover: Advisor Aoife Forde and weanling-to store farmer Pat Fitzpatrick from Knockerra, Kilrush, Co Clare. \ Pat Carey

COMMENT

Mark Moore
Editor,
Today's Farm

Get the task sorted

One of the cornerstones of time management is to get started on a task. Once you have you at least begun, you can make progress. Postponing will likely make the task even more daunting. It's a bit like that with your annual application to the Basic Income Support for Sustainability (BISS) scheme, which is the successor to the Basic Payment Scheme.

Make a start by contacting your local Teagasc office to make an appointment as soon as the scheme is open – this step alone will get you going on what is admittedly a chore, but a very important one.

Cuir tús leis an tasc

Ceann de bhunchlocha na bainistíochta ama is ea tús a chur le tascanna. Nuair a bheidh tús curtha agat leis ar a laghad, beidh tú in ann dul chun cinn a dhéanamh ina dhiaidh sin. Dá mhéad a chuireann tú ar an méar fhada é is ea is dúshlánaí a éireoidh an tasc. Is mar sin atá sé le d'iarratas bliantúil ar an Scéim Tacaíochta Ioncaim Bhunúsaigh i dtaobh na hInbhuanaitheachta (TBII), atá tagtha in ionad na Scéime Íocaíochta Bunúsaí.

Déan teagmháil leis an oifig áitiúil de chuid Teagasc chun coinne a dhéanamh chomh luath is a bheidh an scéim ar oscailt. Ar an gcaoi sin, beidh tús curtha agat le hobair mhaslach, ach fíorthábhachtach mar sin féin.

GURTEEN COLLEGE OPEN DAY

8 March 2023
- Hear about the courses offered at Gurteen College.
- Venue: Gurteen College, Ballingarry, Roscrea, Co Tipperary, E53 TP93.
- Event time: 10:30am – 12:30pm.

TEAGASC COLLEGE OF AMENITY HORTICULTURE OPEN DAY

9 March 2023
- Hear about the courses offered at the Teagasc College of Amenity Horticulture.
- Venue: Teagasc College of Amenity Horticulture, National Botanic Gardens, Glasnevin, Dublin 9, D09 VY63.
- Event time: 12 noon – 3pm.

BALLYHAISE COLLEGE OPEN DAY

10 March 2023
- Hear about the courses offered at Ballyhaise College.
- Venue: Teagasc, Ballyhaise Agricultural College, Ballyhaise, Co Cavan, H12 E393.
- Event time: 10am – 1pm.

CLONAKILTY AGRICULTURAL COLLEGE OPEN DAY

10 March 2023
- Hear about the courses offered at Clonakilty Agricultural College.
- Venue: Teagasc, Clonakilty Agricultural College, Darrara, Clonakilty, Co. Cork, P85 AX52.
- Event time: 11am – 1pm.

LET'S TALK ORGANICS - FEEDING THE EWE PRE- AND POST-LAMBING IN AN ORGANIC SITUATION

8 March 2023
- Event time: 7:30pm.
- Venue: Online.

A series of organic webinars with Teagasc organic specialists covering various technical aspects of organic farming.

This episode of *Let's Talk Organics* will focus on feeding the ewe pre- and post-lambing in an organic situation.

FARMING FOR SOIL HEALTH

16 March 2023
- Event time: 10.30am – 3pm.
- Venue: Johnstown Castle, Co Wexford, Y35 Y521.

Productive and resilient agricultural systems start from a foundation of good soil health. This field day, held in association with the third Global Soil Biodiversity Conference, will demonstrate the practices and technologies that can be adopted on farms to assess and enhance soil health. These will include:
- Demonstrations of visual assessment techniques.
- Soil functional assessment.
- Practices that improve health in soils (including diversification of grassland swards, cover crops, straw incorporation and manure amendment of soils).
- Avoiding physical damage of soil.
- Enhancing soil nutrient supply.
- Increasing soil carbon.

Those in attendance will also have the opportunity to take a close look at some of the biology in soil and partake in our 'Ask a Soil Scientist' Q&A.

Attendees will include farmers, agricultural advisors and policymakers, and the scientific community, including Global Soil Biology Initiative scientists.

This event is free to attend, but registration is essential.


Botanic Gardens.

LET'S TALK ORGANICS - GROWING RED CLOVER SILAGE TO FINISH BEEF CATTLE

5 April 2023
A series of organic webinars with Teagasc organic specialists covering various technical aspects of organic farming.
- Venue: Online.
- Event time: 7:30pm.

AGRI AWARE FARM WALK AND TALK

The Agri Aware Farm Walk and Talk series demonstrates the practical elements of modern agriculture to second-level students preparing for their Leaving Certificate Agricultural Science exam.
- **Tuesday, March 7** – Gurteen Agricultural College, Co Tipperary.
- **Thursday, March 9** – Teagasc, Kildalton Agricultural College, Co Kilkenny.
- **Friday, March 10** – Teagasc, Kildalton Agricultural College, Co Kilkenny.
- **Wednesday, March 15** – UCD Lyons Farm, Co Kildare – Double Day.
- **Thursday March 16** – Salesian Agricultural College, Pallaskenry, Co Limerick.
- **Tuesday, March 21** – Teagasc, Ballyhaise Agricultural College, Co Cavan.
- **Thursday, March 23** – *Irish Farmers Journal* Farm – Tullamore, Co Offaly.

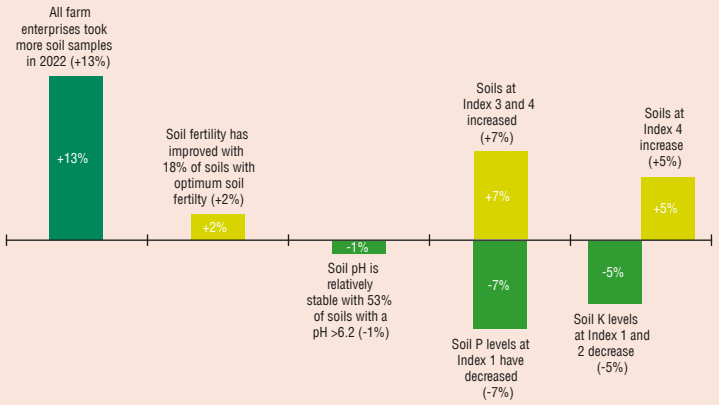
Tickets are €10 per student, with teachers going free. Places are on a first come-first served basis and must be paid in advance or you may lose your spot. You can register on the Teagasc or Agri Aware websites. Farm Walk and Talk is a longstanding collaboration between Agri Aware, Teagasc, UCD, the Irish Farmers Journal and I.A.S.T.A.

etc pages

Don't neglect phosphorus (P) and potassium (K)

With a 25% reduction in the use of both P and K fertilisers in 2022, a word of caution is advised around soil fertility levels.

National highlights (all soil samples).



With the continued high fertiliser prices, there is a real concern around national soil fertility levels declining in the years ahead. A lot of progress with soil fertility has been achieved in the last five to 10 years and building on that progress is essential to driving nitrogen (N) use efficiency and reaching national emissions targets.

Fertiliser planning will be critical to managing all applied nutrients if we are to continue to maintain and build soil fertility levels.

In 2022, Teagasc analysed a total 38,134 soil samples comprising of dairy, drystock and tillage enterprises. Soil sample numbers increased by 13% in 2022, which is the same as the increase in 2021. There were 30,082 grassland soil samples (+12%). For dairy farms, 23,322 soil samples (+11%), and on drystock farms, 10,062 soil samples (+19%). On tillage farms, there were 4,325 soil samples, which represents a 14% increase in soil samples in 2022.

Overall, soil sample numbers have increased on all farming enterprises. This increase is primarily driven by the significant increase in the cost of N, P and K fertilisers, in addition to changes to soil sample requirements as per the nitrates directive. The following is a summary of the main changes for soil pH, phosphorus (P) and potassium (K) in 2022.

National highlights (all soil samples)

- All farm enterprises took more soil samples in 2022 (+13%).
- Soil fertility has improved, with 18% of soils with optimum soil fertilty (+2%).
- Soil pH is relatively stable, with 53% of soils with a pH >6.2 (-1%).
- Soil P levels at index 1 have decreased (-7%), soils at index 3 and 4 increased (+7%).
- Soil K levels at index 1 and 2 decreased (-5%), soils at index 4 increased (+5%).

Enterprise highlights

• Dairy

- 20% of soils have optimum pH, P and K (4% increase).
- 53% of soils have a soil pH >6.2 (no change).
- 21% of soils are at P index 1 (8% decrease).
- 28% of soils are at P index 4 (6% increase).
- 39% of soils are at K index 1 and 2 (9% decrease).

• Drystock

- 13% of soils have optimum pH, P and K (no change).
- 43% of soils have a soil pH >6.2 (4% decrease).
- 31%of soils are at P index 1 (5% decrease).
- 43% of soils are at P index 3 and 4 (4% increase).
- 53% of soils are at K index 3 and 4 (no change).

• Tillage

- 19% of soils have optimum pH, P and K (1% increase).
- 61% of soils have a soil pH >6.5 (No change)
- 52% of soils are at P index 1 and 2 (5% decrease).
- 23% of soils are at P index 4 (4% Increase).
- 29% of soils are at K index 2 (7% Increase).
- 30% of soils are at K index 4 (8% decrease).

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Future-proofing through breeding

Tweaks to the Economic Breeding Index will benefit dairy and beef farmers.

Robert Prendeville
Teagasc Kerry Joint Programme

Alan Twomey
Teagasc Moorepark

Adrian Curtin
Teagasc Dairy Advisor Kanturk

William Daly. \ Valerie O'Sullivan

The Economic Breeding Index (EBI) has revolutionised dairy breeding in Ireland. It has become the go-to tool when selecting dairy sires. The EBI of dairy females continues to increase by €10 each year, which equates to €2,000 extra profit on farms with 100 cows.

To remain relevant, the EBI must adapt to new information, regulations and economic changes.

Last November, the EBI got its latest revamp, which saw the addition of a carbon sub-index, an updated beef sub-index, and the inclusion of a TB resistance trait in the health sub-index (Figure 1).

Carbon sub-index

This is the first breeding tool in the world to include the cost of carbon. Although farmers are currently not taxed on carbon, it is envisaged that it could become a cost for farms in the coming years.

It will be three years before progeny of sires selected today will be in the milking herd. So including carbon in the breeding index today helps future-proof the industry.

In addition, agriculture must reduce carbon emissions by 25% by 2030 and all farmers will be obliged to assist the sector to reach this goal. The inclusion of the carbon sub-index will speed up genetic progress in reducing the absolute emissions from the dairy herd.

Fertility and maintenance traits have a favourable impact on carbon emissions. For example, a cow with improved fertility will mean fewer replacements are needed and a higher portion of her feed will come from grazed grass, which results in lower carbon emissions.

Cows with a lower liveweight will also have lower carbon footprint, as these cows have a lower intake. Nevertheless, cows with higher milk production will have higher total emissions on average, due to the higher feed intake required for the increase in production.

Beef sub-index

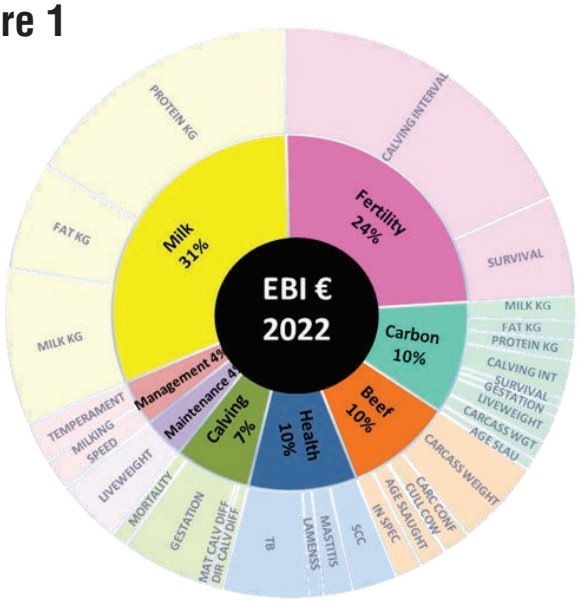
Despite strong markets at the moment, beef coming from the dairy herd is a growing concern due to increasing challenges with exports and long-term profitability on beef farms.

Growth in the use of sexed semen is expected, reducing the number of dairy males coming from the dairy herd. However it is still important to improve, or at least maintain, genetics for beef traits in dairy cows as they will continue to contribute 50% of their offspring's genes.

The beef sub-index within the EBI was revised, which comprised the inclusion of an age at slaughter trait and an in-spec carcass trait, as well as an update of the economic values for carcass weight and conformation. These updates within the beef sub-index will better reflect the economic cost for beef farmers.

This will now cause greater divergence for dairy sires for the beef sub-

Figure 1



index, which will now penalise the extremely poor beef merit sires more than before.

Breeding advice for this spring

Selecting high-EBI sires is the advice given to dairy farmers in order to continue improving the profitability of their herd. Where possible, sexed-semen should be considered, especially for high fertile females, to ensure the number of dairy males is reduced. Dairy farmers will benefit by building relationships with beef farmers and increasing their usage of beef AI.

Beef sires can be selected on the Dairy Beef Index (DBI), which is an index to identify beef bulls that are easy calving and short gestation but also have good beef merit. This will provide a more valuable beef calf for beef farmers and increase the demand for calves in future years.

Case Study

Margaret and William Daly are farming in Lismire, Kanturk, Co Cork. William is also a demonstration farmer on the Kerry and Teagasc Joint Programme.

"We bought the farm in 2013, it was formerly a tillage farm and we converted the land to a grazing platform for the dairy enterprise," says William. "Cows graze on the home block only. The stocking rate on the farm is 2.48 LU/ha. Replacement calves and heifers are contract reared during the grazing months. In 2022, the farm supplied 554kg of milk solids per cow to Kerry.

"We are focused on increasing the milk solids on this farm by utilising grazed grass and increasing herd EBI," says William. "Grass covers are recorded on PastureBase Ireland. We put a significant effort into maintaining a high six-week calving rate."

William purchased sensor technology for the cows in 2021 to further improve herd health and heat detection. In 2022, the six-week calving rate was 82%.

The herd EBI has increased from €87 in 2017 to €150 in 2022, an increase of €11 per year. For 2023, the expected EBI of the herd will be €192.

Continued on page 10

William Daly. \ Valerie O'Sullivan

William Daly.
\ Valerie O'Sullivan

Continued from page 8

The carbon sub-index figure for the herd is €5. Replacement heifers born in 2022 have an EBI of €229. There has always been a strong focus on selecting for protein percentage in particular. Last year, the average protein for the herd was 3.73%.

Coming up to last year's breeding season, William put a lot of effort into his breeding plan.

"Firstly, I wanted to make sure I only generated enough replacement heifers for the herd. I identified cows that I wanted to generate replacements from and the remainder were bred to beef sires."

For the dairy sires, he was looking for bulls that had a high fertility sub-index (over €100), high fat (over 0.24%) and protein (0.18%) percentages and a good health sub-index (+€3).

He used a team of 10 bulls with an average EBI of €292. He also purchased 45 sexed dairy straws for both cows and heifers in an effort to reduce the number of male dairy calves.

William used dairy AI on the intended cows for the first four weeks of breeding and beef AI thereafter. Only high-DBI beef sires were used. A panel of nine beef bulls were selected. Those sires had an average DBI of €85 and ranged from €40 to €119.

The gestation length of those beef sires was -1.9 days, with a carcass weight of +7.4kg. Angus and Hereford bulls were used to mop up at the end of the breeding season. After a 13-week breeding season, 8% of the cows were empty in 2022.

"I will have slightly more replacement heifer calves born in 2023 than planned," says William.

"Approximately 28 replacement heifer calves will be born from the 45 sexed semen straws that were used and a further 15 replacement heifer calves from conventional straws."

These figures would indicate a replacement rate of approximately 30%. The expected commercial beef value of the beef-sired calves is €122, so they will be good-quality stock for a beef farmer.

"I'm planning on using sexed semen again this year and probably less dairy straws," says William.

He genotyped replacement heifers born in 2021 and 2022 to ensure the best heifers are selected for breeding. The aim is to have a 25% replacement rate for the farm. The focus on the targets will be similar to last year.

The milk sub-index for the team of dairy sires will be over €90, fertility sub-index over €100, maintenance €15, carbon sub-index over €7 and a health sub-index of above €6.

However, William will push harder on the fat and protein percentages. He will aim for a team of bulls having fat and protein percentages of 0.3% and 0.2% respectively.

"We will aim to have a DBI team of bulls of €100," concludes William. "That means everything will be a bit more in balance."

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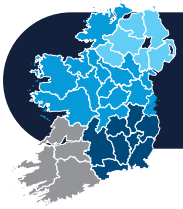

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IE-SHB-221100002 Nov 2022

Weaning: starting them early

Moving from milk to solid feed is stressful for any mammal. Offer your calves concentrates from just a few days old to ease their transition

Tommy Cox
Teagasc DairyBeef 500
Programme Advisor

Offer a high-quality, palatable starter concentrate to bought-in calves as soon as they arrive. Refresh the feeder each day. The feed should contain 17-18% crude protein and have an energy value of at least 12 MJ/kg (greater than 0.95 UFV/kg). Avoid finely ground, dusty feeds which will reduce intake.

Calves fed coarse starter mix initially eat more and have higher weight gain and generally make the transition better. Calves should only be weaned once they are eating a high volume of meal.

The amount of concentrates a calf will eat depends on the availability of concentrates and the volume of milk it's being fed. Ideally, calves will have been consuming at least 1.5kg of starter concentrates or more per day for at least three consecutive days prior to weaning. This level of intake is usually reached by eight weeks of age.

CASE STUDY: Gareth Peoples

DairyBeef 500 farmer Gareth Peoples farms full-time in Tullyannon Carrigans Co Donegal. Gareth operates a calf-to-steer beef system and is coming close to weaning his group of spring-born calves.

Eighty calves were reared this year on the farm, a mix of autumn- and spring-born Holstein Friesian male calves, all of which will be slaughtered as steers at approximately 24 months of age. The plan is to increase to over 100.

"All calves on the farm are sourced locally," says Gareth. "This means less stress for young animals; minimising any potential disease outbreak. My preference is for a calf that is at least three weeks of age as at that stage immunity has increased and they are less vulnerable."

Two days after arriving on farm calves get a vaccine for pneumonia and a drench to prevent coccidiosis. Calves are fed a 750g of a 23% crude protein milk replacer twice daily from arrival until they are about five weeks.

They are then cut back to once-a-day feed and from then on the quantity of milk replacer fed will be reduced until weaning.

Teagasc advisor Gary Fisher and Gareth Peoples. \ Clive Wasson

"From five weeks, calves are fed 400g of milk replacer in three litres of water and are kept on that regime until they reach their targeted weaning weight of 90kg at generally 55 to 60 days," says Gareth.

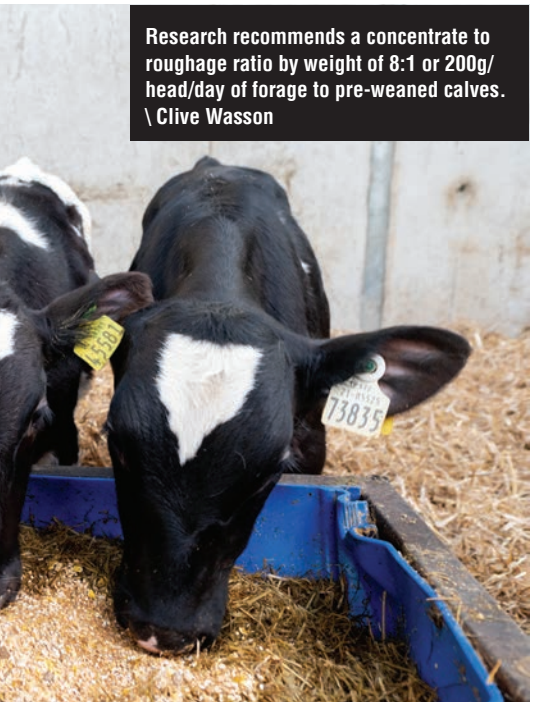
From arrival, calves are introduced to a highly palatable coarse ration. The ration contains 19% crude protein and is made up if high quality ingredients soya bean, barley, flaked maize, soya hulls, distillers and molasses. It also contains an acid buffer and yeast to prevent digestive upsets.

"In my experience, calves can be slow enough to consume any significant levels of concentrates," says Gareth. "But once they start, intake increases rapidly especially when they are reduced to once a day milk feeding.

"Keeping the troughs clean and feed fresh, from the start, is vital to get calves to start consuming reasonable levels. Generally at weaning calves would be consuming over 2kg of concentrates per day and they are kept on this level until turnout."

Straw is the fibre source and calves have access to clean fresh water at all times. When calves are first let out to grass they are put out to stronger and stemmy covers. Gareth says this ensures extra fibre and that the grass isn't too lush, reducing the risk of summer scour.

"We continue the concentrate supplementation for the first few weeks post turnout and once calves get accustomed to the diet concentrates are reduced and the quality of grass that they are grazing is improved," concludes Gareth Peoples.



Research recommends a concentrate to roughage ratio by weight of 8:1 or 200g/head/day of forage to pre-weaned calves. \ Clive Wasson

Forage

Calves need small amounts of roughage in order for the rumen to develop. Forage supplementation aids rumen development, but is not nearly as fundamental as concentrates.

Straw is an easy roughage for calves to digest and is preferable to hay. High consumption of hay will decrease intake of concentrates, and the young calves will often develop 'pot bellies'.

Don't allow excessive consumption of straw either as it will reduce the overall energy density of the diet and performance will be reduced.

Research recommends a concentrate to roughage ratio by weight of 8:1 or 200g/head/day of forage to pre-weaned calves.

Ensuring successful weaning

At weaning, calves should be healthy and not stressed. If there are any 'issues' with them, continue milk feeding.

Stressful events such as castration, disbudding or vaccination will cause upsets and potentially cause a growth check after weaning.

Step weaning

Calves can be either 'abruptly' or 'step' weaned. Stepped weaning is when the amount of milk being fed and the number of feeds/day are steadily reduced.

Generally, stepped or gradual weaning is achieved by reducing the volume of milk fed over seven to 10 days. If calves are being fed milk twice a day, weaning can be achieved by cutting down to once a day feeding.

Both stepped weaning and abrupt weaning can work well provided the calf's rumen is adequately developed and that they are eating at least 1kg of calf ration per day.

However, stepped weaning reduces the stress at weaning and helps avoid temporary setbacks in growth rate

Preventing post-weaning growth check

The post-weaning growth check found in many calves is due to three factors:

- Low intake of dry feed up until weaning, resulting in limited rumen development. This results in a growth check for about two weeks while the rumen becomes accustomed to digesting significant quantities of dry feed.
- High intake of bulky roughage such as grass and hay. Calves are physically unable to eat enough roughage to sustain rapid growth weights with their small, developing rumen.
- Calf stress when feeds are changed. Feeding concentrates before, during and after weaning should limit the level of any growth check. If a growth check does occur, the lost growing time will never be made up and it will take longer to attain target weights.

Challenge into opportunity

A setback generated new perspectives for this large scale beef farmer.

Aisling Molloy
Future Beef Programme.

In November 2020, in the depths of the COVID-19 pandemic, John Barry's farm near Nenagh in Co Tipperary had a TB outbreak. Clear for many years, the farm was immediately prevented from selling live animals. With cattle not due to finish until June, John's cashflow situation looked challenging.

"I discussed the situation with Michael Daly (his Teagasc advisor of over 14 years)," says John. "He suggested I consider off-farm work."

John contacted Farm Relief Services (FRS) in Roscrea, explaining that he couldn't take work too far away as he was farming himself. They were extremely accommodating and a few weeks later, he began working on a dairy farm just five minutes away in Ardcroney.

"I found working on another farm very interesting and enjoyed the milking and feeding duties," says John. With modern technology, he was able to keep an eye on his own animals using a calving camera linked to his mobile phone. He also had the flexibility to drop home if necessary.

"The TB restriction was lifted in July 2021, however I enjoyed the work and decided to continue with it," says John. "My main concern is that any farmer I work for is sound, i.e flexible and understanding of my circumstances. Also, the facilities and equipment should be fit for purpose. I'm paid by the hour, but I want to do the work as efficiently as possible and get home."

Work-life balance is hugely important to John, so he works with FRS Monday to Friday. Saturday is his day for getting on top of his own farm jobs and Sunday is his family time with partner Sarah and son Jack.

He says family support is hugely important, particularly since Sarah went back to work after maternity leave, and both families help to look after Jack.

Valuing your time

"When I was farming full-time, I had a lot of time on my hands and enough money to keep going. However, with recent life changes like building a new house and Jack's arrival, I'm glad to have an additional source of income."

John says working off-farm has made him seek efficiencies in his own business. He installed extra calving pens close to the spring herd shed. There is a new cattle crush in the shed where the autumn cows are housed, making it easier for them to be inspected and inseminated.

John says he now gets cows and calves out to grass earlier in spring, saving time feeding and bedding and helping prevent health issues. The autumn herd are calved outdoors to help prevent disease in the calves.

"Having set dates for breeding means I am not calving or breeding all year round, which can easily happen with a split calving system," says John. "Compact calving is more efficient and I aim to limit each breeding and calving season to less than 12 weeks."

A new internal roadway is a huge help when moving cattle. Good fencing and a strong electric current also saves time, as cattle tend to be in the paddock where he left them.

"Having reliable machinery is also important," says John. "The tractor always starts, which means I can comfortably feed and bed over 200 head of cattle in 1.5 hours per day."

One of John's land blocks is on the other side of the village. He set stocks this with dry cows during the year and has selected appropriate ACRES actions to maximise his income there.

"I work long days during the silage and calving seasons," says John. "But I don't work in the dark, as much from a health and safety perspective as from having a work-life balance. Since Jack arrived, he's more important to me than farming, but you do have to generate your income."

Michael Daly, John Barry and Aisling Molloy.

Future plans

Finishing bulls under 16 months of age will always be an option on the farm. But while stores are making over €3/kg live, John says he is happy to continue with his suckler-to-store system.

"My main target over the next few years is to have all stock meeting their target weight for age, by improving grass management to have more leafy grass in the diet, making better quality silage and increasing weight gain over the winter."

Farm profile

John Barry took over the farm when his father Jim retired in 2016. He farms just under 72ha of land in three main blocks in Newtown, Nenagh, Co Tipperary. He operates an 85-cow suckler-to-store system. This is comprised of 50 spring-calving cows and 35 autumn calvers. Most of the males are sold as 18 month store beef, with the best conformation ones being sold as weanlings.

Heifers that aren't kept for breeding are also sold as stores. John is a big believer in artificial insemination (AI) and approximately 70% of his calves are sired by Limousin, Belgian Blue, Simmental or Charolais AI bulls. He also has a five-star terminal Charolais stock bull on the farm, which he uses for mopping up at the end of the breeding season.

The farm is all in grass, aside from 2.4ha of spring barley. John builds this into a reseeding programme by sowing forage rape first, followed by spring barley and then reseeding with perennial ryegrass and clover seed. Some of the barley is kept for winter feeding and all of the straw produced is kept on the farm.

He joined the Future Beef programme in 2021 to help improve the financial and environmental sustainability of his farm.

In the Jan-Feb edition of Today's Farm, we featured Michael and Niall Biggins. Their calves/cow/year is 0.99 and the replacement index for their first calvers is €133.

BovINE- European beef farmers learning from each other

Richard Lynch
BovINE Project Manager, Teagasc.

Maeve Henchion
Teagasc, BovINE coordinator.

Alessandro and Paolo Vigna finish cattle intensively in Piedemont, northern Italy; by contrast, Airi Külvet in eastern Estonia fattens her mix of Simmental, Red Angus and Wagyu exclusively on grass. Miguel Carvalho at the Herdade da Lobeira farm in southern Portugal manages his pastures to conserve soil and water and for west of Ireland suckler farmer Trevor Boland, water is not a problem.

From all points of the compass, these beef farmers have discovered that they share the same challenges – environmental, social and economic sustainability.

In order to assist beef farmers to learn from each other to address these challenges, the EU funded a three-year multinational project called BovINE.

"Teagasc originally submitted a proposal to the European Commission to establish this network to address challenges facing the sector, as identified by farmers themselves," says Maeve Henchion of Teagasc Ashtown, who together with Richard Lynch coordinated the project at a European level.

The Irish national network was managed by Kevin Kinsella of the IFA. Nine countries were involved in the network: Belgium, Estonia, France, Germany, Ireland, Italy, Poland, Portugal and Spain, with the UK also involved to support communications. Work started in January 2020.

How does it work?

"Farmers were consulted each year, in each of the nine countries, to identify the challenges they faced in becoming more sustainable," says Richard.

"Based on this input, researchers across Europe and beef farmers in other countries identified and shared practical solutions to these needs. Throughout the project, solutions were gathered from a wide range of European beef production systems, with many of these good practices transferrable to other countries. Pasture-based beef production systems were common in several of the participating countries and many of the solutions shared related to management techniques for these systems. Due to the different climatic and topographical conditions, there were some differences in the types of solutions found."

Miguel Carvalho (centre) hosting a BovINE project on-farm demo about regenerative agriculture and holistic pasture management.

PORTUGAL

The Portuguese beef industry, which consists of almost 1.3m beef animals spread across 30,000 farms, has recently seen a resurgence in popularity as its producers try to improve their country's self-sufficiency in beef. Many of the farms operate extensive systems which are exposed to extreme drought in the summer months. Improving forage capacity on farms and promoting feed efficiency through genetics, health and compound feed formulations are high on the agenda for most Portuguese beef farmers.

Miguel Carvalho, the farm manager at the Herdade da Lobeira farm in the south of Portugal, took part in a BovINE knowledge exchange event held in the Navarra region of Northern Spain to find innovations that he could use to make his farm more sustainable.

"During the meeting, we discussed the challenges of soil degradation, which was due to continuous grazing practices and removal of natural vegetation such as cork oak trees, to sow new leys," says Miguel

"Through regenerative farming techniques that promote a short grazing and long rest period, we have seen great improvements in soil health and subsequent forage production.

"By becoming involved with BovINE, we got access to the knowledge of other farmers across Europe who had experience of this type of pasture management."

ESTONIA

Airi Külvet

Estonia has long been a leader in organic farming methods, with over 22% of agricultural land under organic certification, compared with about 2% in Ireland.

Airi Külvet, who manages a 300ha organic cattle farm in eastern Estonia, inherited 45ha from her grandfather in 1995 and since then has focused on acquiring more land and converting it to organic status.

"Our cattle are a mix of Simmental, Red Angus and the Japanese breed Wagyu, renowned for their high levels of intramuscular fat; all are fattened on pasture. I joined the BovINE project as I am keen to share my experience of regenerating poorly producing pastures and learning new ways to make the farm even more sustainable. One of the useful innovations we implemented was the French carbon calculating tool CAP2ER, which we have applied to the farm to monitor our climate footprint. For me, the BovINE Knowledge Hub is a valuable resource that can educate beef cattle farmers for years to come."

ITALY

The Italian beef herd book has close to 2.5m animals, including 600,000 suckler cows.

Due to its relatively small breeding population, it relies heavily on imported animals, mostly as weanlings, from other European countries such as France, Spain and Ireland.

Italian brothers Alessandro and Paolo Vigna shared their story of purchasing Irish-bred cattle at the Irish national BovINE meeting in 2022.

The Vigna family are one of the largest beef finishers in Italy, rearing and finishing over 20,000 cattle annually.

"Our largest unit is located in the Piedmont region of north central Italy, where we finish upwards of 7,000 head of cattle annually, 400 of which are Irish-born Aberdeen Angus weanlings," says Alessandro.

"We aim to improve the quality of our product, so we were keen to learn how rearing cattle in pasture-based systems, such as those in place in Ireland, could improve the overall sustainability of our business.

"The BovINE project represents an interesting opportunity for young – and not so young – farmers to make contact with international colleagues to learn how to improve their own farming practices," he says.

Alessandro Vigna.

IRELAND

Trevor Boland is one of hundreds of Irish farmers who participated in BovINE meetings and events. Trevor farms part-time in Bunnafedia, Drumard, Co Sligo.

He is farming in parnership with his father Joseph and works off-farm as an accountant with IFAC.

He farms 48ha and his main enterprise is a 45-cow autumn-calving suckler herd, with most cows calving in August and September: "I hope that my participation in the BovINE network will help to secure the future of family farming in Ireland and across Europe in terms of improving financial, viability and environmental sustainability."

Trevor Boland.

More information

For more information on the BovINE Knowledge Hub, please visit the project's website (www.bovine-eu.net).

Pictures courtesy of our BovINE colleagues.

Why you must use less bagged nitrogen

Improving soil fertility, using LESS and incorporating clover enables you to cut bagged nitrogen without losing yield. But if, in reality, you don't cut your bought-in fertiliser, there's little reduction in greenhouse emissions and no cash divided for you.

Siobhan Kavanagh
Signpost Programme

Seamus Nolan
Teagasc Dairy Advisor

How do steps taken on your farm affect the total greenhouse gas (GHG) emissions calculated for agriculture as a sector? To answer this question, we need to consider what counts towards agricultural GHG emissions and the proven GHG reduction technologies available to farmers.

How are greenhouse gas (GHG) emissions from agriculture calculated?

The 'national inventory', overseen by the Environmental Protection Agency (EPA), accounts for the total GHG emissions released within the borders of Ireland during any given year.

The EPA reports national GHG emissions for all sectors, one of which is agriculture.

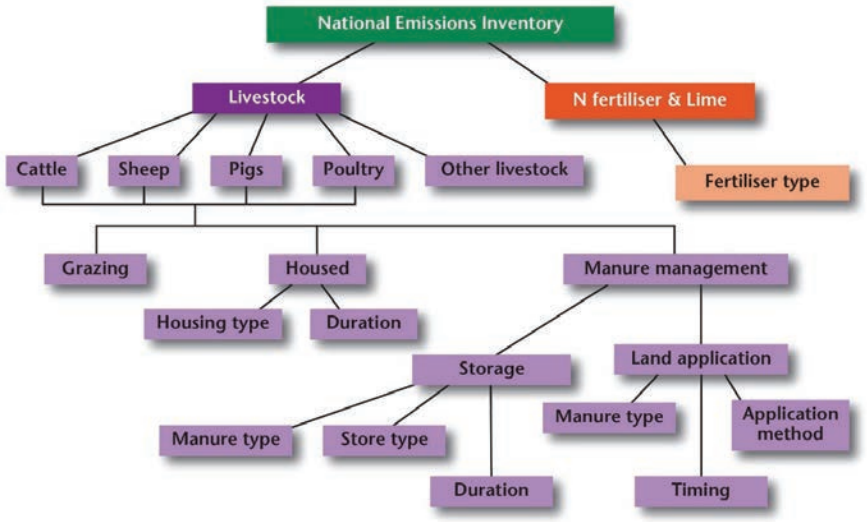
It's complicated by the fact that different industries produce different greenhouse gases. So, in contrast to other sectors which are focused on the GHG carbon dioxide, the agricultural sector concentrates on methane and nitrous oxide (N_2O). These two gases together contribute over 90% of total agricultural greenhouse gas emissions.

Figure 1 shows that livestock and chemical N fertiliser are the main sources of GHG emissions.

There is a major focus on reducing our reliance on chemical N fertiliser because we have a very robust suite of tools (LESS, protected urea, clover swards, etc) to replace it without compromising yield.

What are the main strategies to reduce emissions from nitrogen fertiliser?

Figure 1: Greenhouse gas emission sources from the agricultural sector (EPA, 2022).



1 Get soil fertility right. Moving from soil pH 5.5 to 6.3 can make up to 70kg N per ha per year available to the crop as well as reducing N_2O emissions per kg of N applied. Target Index 3 for P and K.

2 Apply slurry using LESS between February and May. Slurry nitrogen fertiliser replacement value can be increased (and ammonia emissions reduced) by between 25% and 50% through using dribble bar or trailing shoe technology.

3 Use clover or multispecies swards. Clover can fix 80kg to 120kg N per ha per year depending on underlying soil fertility and sward management. Multispecies swards also offer extra benefits in terms of drought resistance and animal health.

4 Include legumes such as beans in a tillage rotation; grow over-winter cover crops to reduce N leaching; and incorporate organic manures.

5 Replace CAN and urea with protected urea. For the chemical N used on the farm, replace CAN and urea with protected urea. Protected urea is 30% cheaper than CAN/urea, delivers the same grass yield, and can be used throughout the growing season within the regulated spreading period. Most importantly, it reduces GHG emissions by 71%.

What is meant by enabling actions?

Enabling actions are actions that a farmer can take which allow him/her to reduce the quantity of chemical N used on the farm, while maintaining yield. Enabling actions include liming, making better use of slurry and incorporating clover into grassland swards.

Continued on page 20

Patrick O'Neill was able to save over €17,000 by reducing his use of bagged fertiliser in 2022. \ Mark Moore

Continued from page 18

How are the enabling actions accounted for in the National Inventory of greenhouse gas emissions?

For the enabling actions (liming, LESS, clover, etc) to reduce GHG emissions, chemical N fertiliser application must be decreased by the amount of N that each measure saves; otherwise there is little or no GHG saving.

And you, the farmer are losing out as there is no cost saving from applying lime, using LESS or incorporating clover, etc. The National Inventory does not measure clover incorporation levels (remember that the National Inventory picks up the benefit of clover in reduce fertiliser usage).

It does measure lime application, which actually counts as a small increase in GHG emissions, but the savings from the reduced N fertiliser application due to liming are much greater.

In short, if chemical N doesn't decrease, agriculture won't get the credit for it in the inventory and you don't get the benefit in your pocket.

Harvesting the benefits of clover swards

Patrick O'Neill farms in partnership with his father Tom, 5km north of Edgeworthstown in Co Longford. They milk approximately 115 cows, supply Lakeland Dairies, and rear their own replacements. Patrick is a participant under the Ballyhaise Monitor Farm project. "The project was set up by Donal Patton to replicate some of the work being done at Ballyhaise College at commercial farm level," says Patrick. "This work revolved around establishing clover and reducing nitrogen inputs."

The O'Neills hosted a very successful event in April 2022 as part of a wider series farm walks promoting the use of clover at farm level.

Clover has been gradually built up on the farm over recent years. "Initially, our aim was to over-sow around three suitable paddocks per year, while also incorporating clover through any reseeding," says Patrick. "Reseeding was more successful than over-sowing and this seems to have been the experience of other farmers in the area too."

According to Patrick, "establishment of clover is one thing but management is equally important".

"We have followed the advice as best we can in relation to the management of these swards and have managed to reduce our chemical N use significantly while continuing to grow between 13t and 13.5t DM/ha across the farm."

Instead of the normal application of 20 units per acre of N only seven to eight units are applied on these swards from May onwards. A point emphasised by Patrick is that it is important to realise that you need sufficient clover in a paddock to apply the reduced N strategy.

Patrick and his Teagasc advisor Seamus Nolan. \Mark Moore

"There is little point reducing or eliminating N application in paddocks where there is only 5% clover present," confirms Patrick.

While no issues have arisen with bloat to date, Patrick is conscious that as the clover content increases on the farm this will be an area he may have to focus on more.The O'Neills have also invested in LESS technology.

"We have seen huge advantages in applying LESS technology on this farm," states Patrick. "Not alone does it allow more efficient use of the N in the slurry, it fits in well with clover sward management. "It's important to remember that clover swards have a low N demand but do still have a P and K requirement and the use of LESS allows me to apply a lot of these nutrients as slurry.

Importantly, Patrick has reduced chemical N use as a consequence of incorporating clover, making best use of slurry and improving soil fertility.

Patrick has seen a saving of €17,435 and a reduction in total GHG emissions of 2%, due to a reduction in chemical N use from 214kg N per ha in 2021 to 115kg N per ha in 2022. A reduction in yield was observed in 2022 due to drought. This is consistent with Pasturebase data.

Table 1: Impact of a reduction in chemical N use on key performance figures for Patrick O'Neill.

THE SIGNPOST PROGRAMME

	2021	2022
Chemical N use kg/ha	214	115
Chemical N saving kg/ha		99
Value per kg N		€2.38
Total farm saving		€17,435
Emissions reduction	Reducing by 99 kg N / ha	2%
Grass grown t DM / ha	14.4	13.3*
Clover levels on the farm	11% clover with 24% of the area under clover	18% clover with 35% of the area under clover

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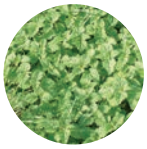
Docks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Thistles


Buttercups


Dandelions


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Mike's clover road

Thanks to white clover this Cork farm is on track to dramatically reduce its use of bagged nitrogen.

John Maher
Grass10

Padraig McCormack
Dairy KT, Cork East Unit

John Maher, Mike Bermingham and Padraig McCormack. \ Fergal O'Gorman

Mike Bermingham farms with his wife Tina and their two teenage children near Fermoy, Co Cork. This spring, about 100 cows will calve down, over 80% of them within six weeks. Most will have calved by the time you read this article.

The Bermingham land is around 500ft above sea level and Mike describes it is a reasonably dry farm. The paddocks have grown 13t of grass DM/ha on average over the last few years (12.5t/ha in 2022). The 100-cow herd (EBI €198) delivered about 541kg MS/cow to Dairygold Co-op in 2022.

"Over the last few years, we could see that there are ever greater challenges coming down the tracks in terms of nitrogen," says Mike.

"So we began taking a closer look at the role white clover can play in replacing nitrogen fertiliser."

Mike says that the reseeds he has completed for many years have all included clover, but making use of the nitrogen generated by the clover plant wasn't a priority. This journey really began in the spring of 2021, when he joined the Clover 150 programme. The programme targets a total usage of just 150kg N/ha.

"In the first year, I was really nervous about making greater use of white clover, as I was asking myself 'will the grass grow?'" says Mike. "By year two, I was less nervous about it as doing – and seeing – is believing! This year I am much more comfortable about it.

"Even though the soil fertility on the farm is good, I will continue to focus on P and K, as clover needs these to be right.

"The benefits of white clover really tend to occur from May onwards as the sward's white clover content increases. The main benefits I see of white clover in grass swards on my farm are:

•A reduced need for nitrogen fertiliser application in summer.

•Increased grass quality, especially during the summer months.

•Higher cow performance – extra milk solids."

Re-seed or oversow?

"Incorporating white clover in a full reseed is the easiest method of establishing white clover and is the gold standard approach," says Mike. "Over-sowing is a simple and low cost method of introducing white clover into swards, but success is very dependent on weather conditions at sowing, soil moisture and competition from the existing sward."

In 2021, Mike reseeded 12% of the farm and oversowed 20%. In 2022, no reseeding was carried out, but 15% of the farm was oversown. The plan in 2023 is to reseed 11% of the farm and oversow 7%.

By the end of 2022, about 80% of the farm had white clover established with an average level of 18%. This ranges from 8% to a high of 31%. An average annual sward white clover content of approximately 20 –25% is desirable for animal and sward production benefits.

Mike says his approach to reseeding with clover is as follows: "I aim to reseed as early in the year as possible

(April/May) when soil temperatures are high. The sward is sprayed off with glyphosate and a minimum of seven to 10 days after spraying is allowed before cultivating with a min-till machine. We prepare a fine, firm seedbed, and about 2kg/ac of clover seed is sown with the grazing mix.

"I have used many varieties of clover, all from the recommended lists. These include Chieftain, Buddy, Coolfin, and Aberherald."

Mike applies about 2t of lime/ac at sowing. P and K fertiliser are applied using three bags of 10:10:20/ac. The ground is rolled well to ensure good contact between the seed and the soil.

A clover-safe spray is used to control docks. The new reseed is grazed at a cover of about 700kg DM/ha to help encourage the clover plants by allowing light get into the sward. Soiled water is applied after grazing to help clover development.

"My approach to oversowing has changed a bit," says Mike. "In the past, I targeted the month of May, but from now I will aim to carry out sowing earlier, at the end of April.

"The paddocks I choose for oversowing will generally have good soil fertility (index 3 or greater for P and K and soil pH 6.5), good ryegrass content and are a bit more open. They will also be fairly free of weeds like docks.

"Before I go oversowing, I will graze the paddock very tight and try and target damp conditions. I use an Einbock harrow to sow the seed and sow the clover seed at a rate of 2.5kg/ac. I roll it and apply soiled water. I will graze the sward at a cover of 700kg DM/ha and do this for two more grazings.

"I will continue to graze the paddock well for the rest of year and not allow it reach a high cover. I reduce the amount of nitrogen fertiliser by half during the summer or use dirty water instead of fertiliser.

"The following grazing season, I will graze it early, but I am careful not to damage the paddock at any time. It is important to avoid carrying a high cover over the winter on oversown paddocks, as this does not help the clover.

"I have no problem oversowing a paddock again the following spring if things don't work out as well as they should. I used less than 200kg (160 units/acre) of N fertiliser/ha in 2022 and my aim this year is reduce nitrogen fertiliser further and get closer to the 150kg/ha target," Mike says.

Establishing white clover

A targeted multi-year approach should be used in establishing a white clover system with a combination of reseeding and over-sowing.

- Reseed approximately 10% per year.
- Oversow approximately 10-20% per year.

Suitable paddocks for over-sowing are those with good soil fertility, high perennial ryegrass content and low weed content.

Paddocks for a full reseed should be identified as early as possible in the process to avoid over-sowing clover on these. Poor performing paddocks, paddocks that have old swards, swards with weed content etc should be prioritised for reseeding.

Sward white clover content increases through the spring, into summer and generally peaks in August/September. Good grazing management is key to maintaining sward white clover content.

Tackling infectious lameness

With the majority of flocks experiencing cases each year, it's unsurprising that infectious lameness is among the top health and welfare concerns for sheep farmers

Frank Campion
Teagasc Animal and Grassland Research and Innovation Programme, Athenry

Jake Delaney
PhD student, Teagasc Animal and Grassland Research and Innovation Programme

Infectious lameness negatively impacts pregnancy rate, ewe BCS and lamb growth rate. Setbacks in any of these can result in significant financial losses. However, we should be careful not to brand infectious lameness as exclusively a production problem.

The stress and discomfort of affected animals, for potentially prolonged periods of time, means infectious lameness should be considered a welfare reducing disease and closely monitored and treated accordingly.

There are three types of infectious lameness: interdigital dermatitis (scald); footrot; and contagious ovine digital dermatitis (CODD). Interdigital dermatitis and footrot are the most prevalent types of infectious lameness in Ireland.

CODD is already present in approximately half of all UK sheep flocks and anecdotal evidence suggests that CODD is an emerging issue in Irish flocks. It is an issue that may come to the fore when controlling, treating and preventing infectious lameness outbreaks.

Lambing is under way, or has just been completed, on many farms with sheep being turned out to pasture. Milder weather, coupled with increased grass growth rates, creates the perfect storm for the emergence of scald within the flock, particularly in lambs. The condition can spread rapidly throughout the flock.

If left untreated, scald can lead to a more severe condition. Research from the UK has concluded that scald and footrot are part of the same disease spectrum and that scald should be considered as early-onset footrot, which if left untreated will progress in time to full footrot.

Footrot can potentially lead to cases of CODD also, where CODD or its causative agents are already present on farm. Therefore, prompt and effective treatment of scald is essential to limiting and preventing cases of infectious lameness.

If a high proportion of your flock is getting lame at any one time, or you are struggling to control lameness, then consider consulting with your advisor and veterinarian to develop and implement a lameness

Research project

A research project being undertaken Teagasc and University College Dublin (UCD) is seeking to quantify the production and economic losses associated with infectious lameness in Irish sheep flocks.

It aims to develop tailored, evidence-based control, treatments and prevention protocols which farmers can readily employ. One key element of this research project is a nationwide survey on lameness.

This survey is available to complete online (scan the QR code on your smartphone) and aims to investigate the following factors:

- The methods farmers are employing to treat lame sheep.
- What bio-security protocols farmers implement on farms.
- Where farmers source their information on lameness control and treatment.
- The on-farm prevalence of the different types of lameness and the times of year during which they are most prevalent.

By completing the survey, farmers will help us to determine the on-farm factors that are associated with increased/decreased levels of lameness. Establishing the levels at which infectious lameness is prevalent on farms and during which periods throughout the year is key. In particular, we are interested in how different areas/soil types are affected.

In order to assess the production and economic impacts caused by infectious lameness another element of this study will be conducted on the Teagasc BETTER sheep farms.

Lame sheep will be compared to their non-lame counterparts in achieving production goals such as seven-, 14 and 21-week weights and time taken to reach slaughter weight along with the BCS and weight of ewes versus non-lame ewes at various stages of the year.

This data will allow us to place a monetary figure on production losses and therefore enable us to estimate the cost to each individual farm of an outbreak of infectious lameness.

If you would prefer to complete a paper based copy of the survey detailed above, please contact 091-845 827 so that one can be sent to you.

Sheep being scanned with an EID 'wand' for identification and recording of data.

control plan for your farm. Observing sheep at pasture is generally the best method for identifying the number of lame animals. It is important to remember that one in three sheep with foot lesions may not present as lame on visual inspection.

For this reason, particular attention should be paid to sheep once they have left the footbath. Any exposed lesions present on the hoof may have become irritated by the foot bathing solution. As a result, the sheep may display an uneven gait and should be separated for closer inspection and further treatment, if necessary.

Footbathing, coupled with an aerosol antibiotic spray post-footbathing, has been shown to be an effective treatment method for scald. More severe conditions such as footrot and CODD may require an antibiotic injection which should be given in conjunction with veterinary advice. This is particularly the case for CODD-based infections where foot bathing has been shown to have a low efficacy.

Prompt treatment is essential to minimise the impact on the animal's welfare and prevent the spread of the disease to other sheep.

Ideally, once lame sheep are identified (not always easy where ewes have lambs at foot) they should be isolated in a separate field to the main flock but close to the handling yard. There they can be easily re-examined and re-treated if the condition fails to improve.

Footbathing is most effective when sheep remain in the footbath for 15 to 20 minutes when using a zinc or copper sulphate-based solution followed by at least 30 to 60 minutes where the sheep are standing on a dry, hard stand to allow the solution to dry.

A batch footbath allows for the treatment of many animals without stalling/slowing the handling process or increasing labour hours.

Persistently lame ewes or rams that are not responding to treatment can act as a 'disease well' for the remainder of the flock. These repeat offenders should be culled to avoid the spread of disease within the flock.

The use of EID technology or a simple recording book or app can help when monitoring sheep for lameness. It will help track repeat offenders and any antibiotic treatments administered.

Sheep leaving a batch footbath.

Want to shave one-third off your nitrogen costs?

Urea will cost you 33% less than CAN with no reduction in grain yield.

Ciaran Collins
Tillage specialist, Teagasc Crops Environment and Land Use Programme.

CAN has always been somewhat more expensive than urea. The differential has grown over the last 12 months because CAN is largely produced in Europe where gas prices have been volatile. Urea, by contrast, is produced all over the world, including areas where gas prices have not been as high.

Financial

In the 2023 Teagasc 'costs and returns' listings, fertiliser represents 45% of the cost of growing winter wheat and 42% for spring barley. Any savings that farmers can make on fertiliser will therefore make a significant difference to profitability in 2023.

The fertiliser nitrogen costings are based on CAN at €800/t (€2.96/kg N) and urea at €900/t (€1.96/kg N), which is a 33% differential per kg of nitrogen in favour of urea.

Based on these figures, a 40ha winter wheat grower switching from CAN to urea for nitrogen (N) top dressing (190kg/ha) would save €191/ha or €7,640. The equivalent saving for a 40ha spring feed barley grower is €84/ha or €3,360.

Research

To evaluate the relative performance of protected urea, a field experiment was conducted (reported by Roche et al, 2016) on a free draining loam, long-term spring barley site in Marshalstown, Co Wexford between 2013 and 2015.

CAN, urea and protected urea (NBPT urease inhibitor) were compared. Grain yield, N uptake, gaseous emissions and nitrate leaching were measured. An unfertilised control area was included. The N, totalling 150kg/ha, was applied in line with normal farmer practice - 30kg/ha at sowing and 120kg/ha at mid-tillering.

The results showed that grain yields (Figure 1) between CAN, protected urea and urea were similar, but N uptake was, on average, 13kg/ha higher with protected urea when compared with CAN. Average protein percentage was slightly higher from protected urea (0.3%) when compared to CAN.

We must bear in mind that other studies have found reduced yields when using urea, due to ammonia volatilisation. Applying urea to moist soil followed by drying will increase the risk of ammonia loss. Protected urea should be used in these circumstances.

Environment

The experiments also found that using protected urea reduced N (ammonia NH_3) losses compared to urea. N_2O emissions from spring barley are low, but can be reduced further by using inhibitors. Yields are not impacted. There was no significant effect of fertiliser formulation on nitrate leaching. Overall, when using urea protected with NBPT, you can be confident of producing at least the same spring barley yields as can be achieved using CAN, while gaining cost and environmental benefits.

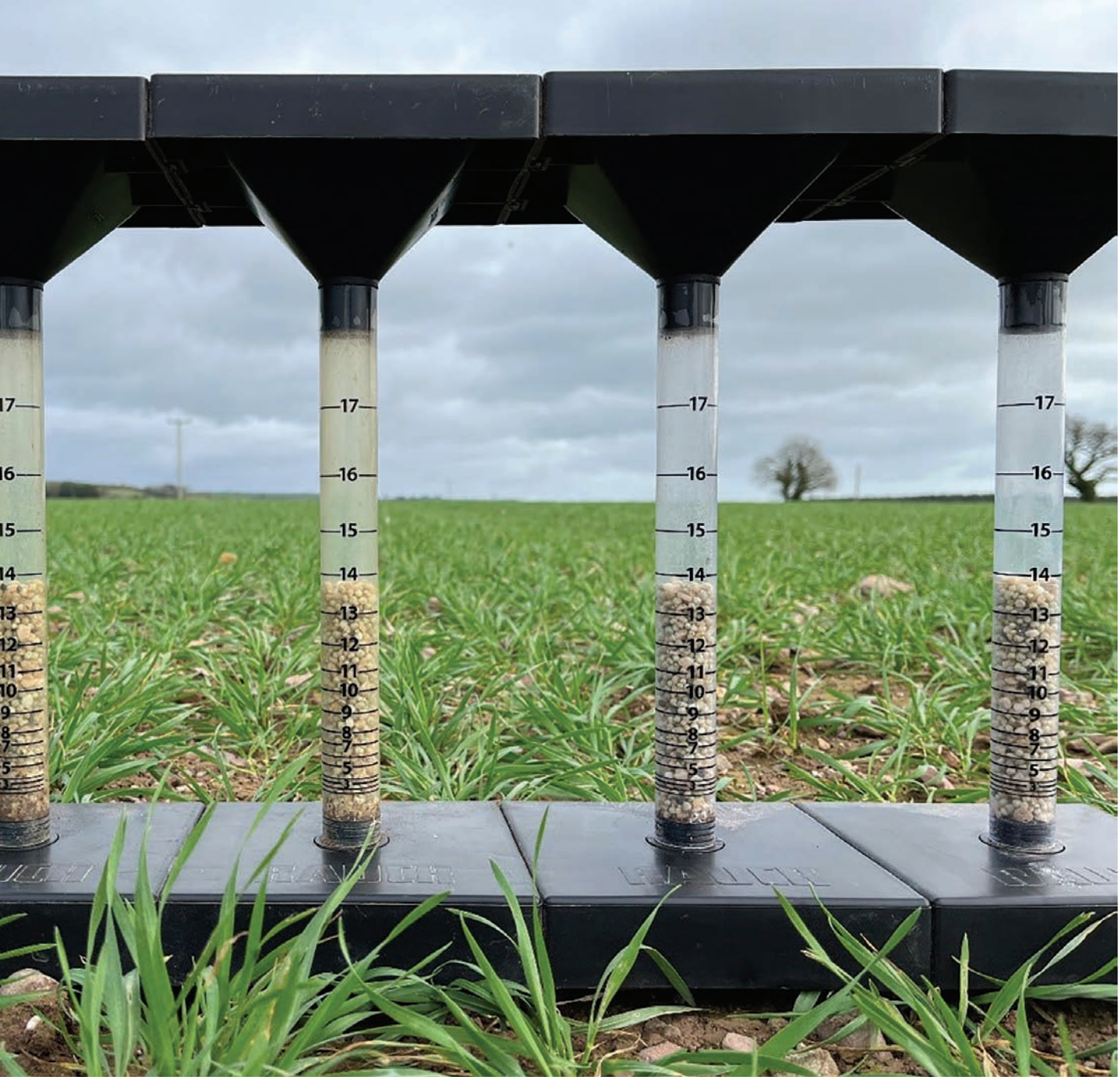
Tray testing is vital to check spread pattern.

Sulphur

When using urea or protected urea, sulphur (S) application needs to be considered. Responses to sulphur are most likely on sandy, free draining soils where sulphur release from the soil can be low. In addition, sulphur can be leached from these soils. On land where you anticipate sulphur deficiency, apply 15kg/ha S. Responses are less likely on heavy soils.

A number of protected urea blends contain sulphur, typically 38% N and 7% S, however care needs to be taken at wide bout widths. Many compound fertilisers contain sulphur and a 470kg/ha (3.75 bags/ac) application of a compound containing 4%

S can meet crop requirements. Sulphate of ammonia (21% N, 24% S) or



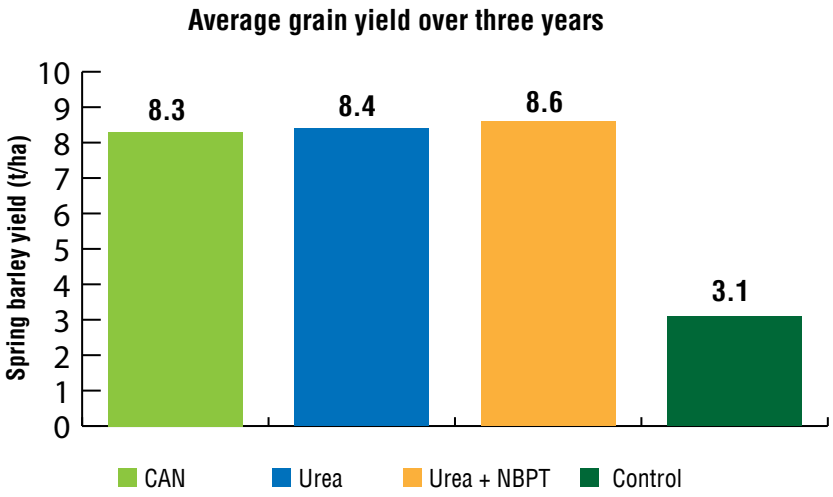
ASN (26% N, 14% S) can also be used in your programme to fulfil S requirements.

Spreading urea

Urea is less dense than CAN, typically 75 – 80% that of standard fertiliser. This makes it more difficult to spread evenly at wide bout widths. Think of applying the same force to a table tennis ball and a golf ball. Urea will also be impacted by wind to a greater extent.

Using good-quality urea is essential when spreading at wide bout widths and it is crucial that the fertiliser spreader is set up correctly. The settings for spreading urea will obviously be different than those for spreading CAN. Consult the spreader manufacturer's recommendations for the specific product you plan to spread. Once you have calibrated your spreader, the next step is to use trays or mats to check the spread pattern in the field. The correct spread pattern will ensure the best return on your very large investment in fertiliser.

Figure 1: Spring barley grain yield across three years (2013, 2014, 2015). Roche et al., 2016.



Better together

Teagasc researchers have found that growing peas and beans in combination can reduce risk and increase yields.

Sheila Alves
Teagasc Crops Environment and Land Use Programme
Oak Park.

Ewen Mullins
Teagasc Crops Environment and Land Use Programme
Oak Park.

Faba beans and peas are renowned as excellent sources of in-demand plant protein. They are effective break crops in cereal rotations, interrupting the cycle of diseases such as take-all and fixing atmospheric nitrogen (N), reducing N requirements in the following cereal. So, where's the catch?

Like all crops, Faba beans and peas each have their own weaknesses. Peas are prone to lodging and spring-sown faba beans can struggle in dry summers. However, growing them together in mixed stands means the crops can complement each other, decreasing risk in unfavourable seasons.

Potential of intercropping

The potential of mixed stands to assist a crop prone to lodging has long been recognised, specifically in barley-pea and oat-pea mixes. The legumes latch on to the stiff culms of the cereal with their tendrils. The legume benefits, but the weight of the legume can interfere with the growth of the cereal.

We are investigating the potential to mix two legumes – for example, peas with faba beans – with each supporting the other to deliver more consistent yields. Importantly, such diversification also increases in-crop biodiversity and enhances soil structure and health.

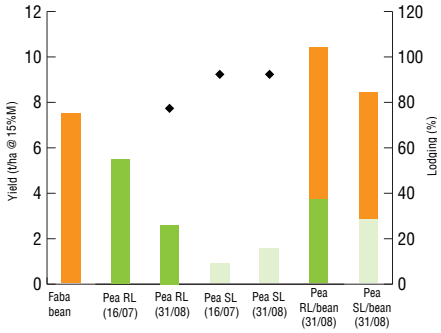
Based on four field trials over two years, Teagasc research shows that the mechanical support provided by faba beans to the field pea in mixed plots effectively prevented the peas from lodging in all experiments, compared to plots where peas were the sole crop (Figure 1).

The presence of both crops increased productivity per m², regardless of the presence of lodging (Figure 1 and 2). Further trials are needed and are underway to tailor intercropping agronomy to the available pea and bean varieties. Also, the market for a mixed crop needs to be established so that post-harvest separation and processing can deliver added value for the grower.

If used as a mixture, the proportion of each crop will have to be determined and adjusted to requirements.

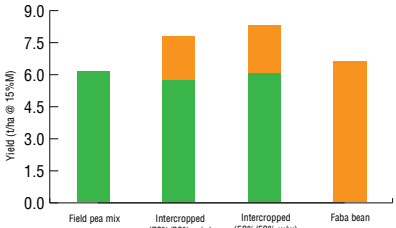
The research is being continued as part of VALPRO Path, an EU-funded research project tasked with increasing the added value potential of plant protein crops.

Figure 1



Mean yield (t/ha) of winter field peas (green columns) and faba bean (orange column) and lodging ( ) in intercropping trials. The total seed rate of mix stands and sole pea plots was 80 seeds/m2. In the mix plots, tl seed rate of faba beans and peas was 24 and 56 seeds/m2, respectively. The seed rate in sole bean plots was 30 seeds/m2. Two varieties of field peas were used, one susceptible (SL, light green column) and another mo resistant (RL, dark green column) to lodging. Sole field pea plots were harvested in two different dates: 16/07/2020 and 31/08/2020. Sole faba bean and mix stand plots were harvested on the 31/08/2020.

Figure 2



Mean yield (t/ha) of spring field pea mixture (green column) and faba bean (orange column) in intercropping trials. The total sowing rate of mix stands and sole plots of faba beans and field peas

EU production

In the European Union (EU27), an average area of 2.1m ha/year are planted with dry pulses and protein crops for the production of grain (around 2% of the total arable land). Output averages about 4.5m tonnes/year.

Field peas and broad and field beans, accounted for 60% of the total cultivated area and made up 72% of the grain production. The highest average yields of field peas and faba beans in the EU27 for the period of 2011-2022, were reported in Ireland (4.1t/ha and 5.0t/ha, respectively), Belgium (3.6t/ha and 4.1t/ha, respectively) and Denmark (3.8t/ha and 3.7t/ha, respectively). However, the area of crops cultivated was very low in these countries.

The production of field peas and faba beans has fared differently over time in the EU27. Field pea production decreased from around 4.3m tonnes/year, in the early 90s to around 2m tonnes/year from 2015. Broad and field beans production have increased slowly over time, from a production value of 0.5m tonnes/year in the early 90s to a value of 1.2m tonnes/year from 2015 on. The same trend was observed in Ireland.

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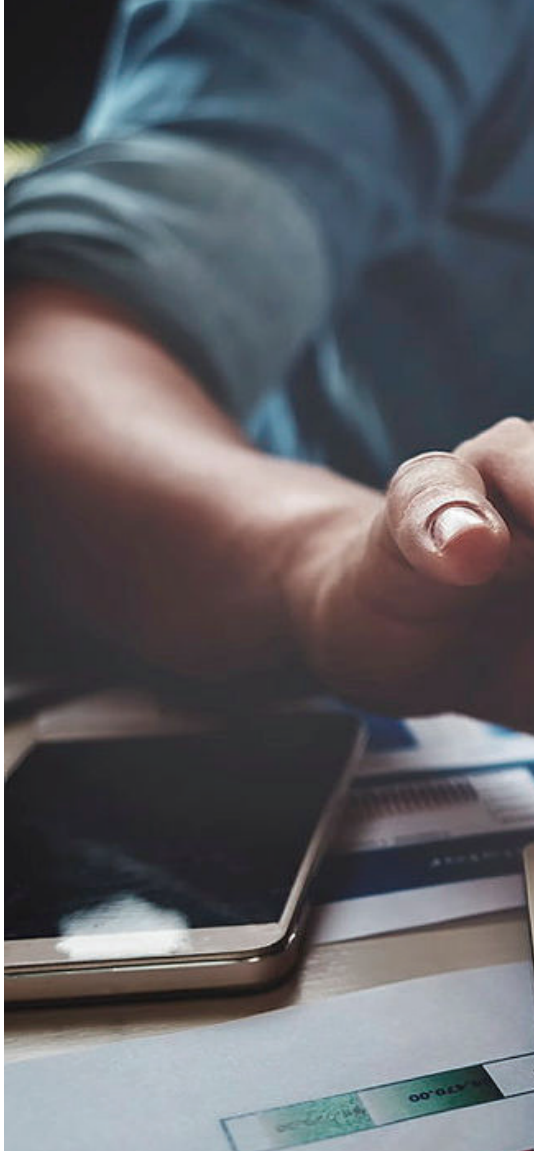

Changes to scheme terms and conditions make this year's one-to-one office meeting with your Teagasc advisor more important than ever. Stay 'on-the-ball', do any preparation needed and make an early appointment with your advisor to minimise stress.

Kevin Connolly
Teagasc financial management specialist.

This year's direct payment focused office consultation will have many similarities with previous years, but there are new schemes, new terminology, terms, conditions and requirements to comply with.

It is important that you contact your advisor as soon as you are aware that the DAFM system is open for applications. Allow at least an hour for your appointment – there is a lot to discuss!

There are four main elements to the application process:

- Identify the land that you will farm during 2023 and what each land parcel will be used for.
- Identify the schemes that you are applying for.
- Finalise the entitlements that are going to be drawn down as part of the annual BISS payment – this may involve checking existing entitlements and also completing the transfer of entitlements.
- Complete any other scheme application requirement that may be relevant, such as for ANC, ACRES, National Reserve and Young Farmers schemes and submit supporting documentation.

Changes in terminology

There are many new terms to get used to in 2023 and these will likely carry through for the next few years until 2027.

- **Basic Income Support for Sustainability (BISS)** – the new BPS – payment is linked to the number of entitlements, one hectare is required for each entitlement.
- **Eco-scheme** – new environmental scheme applied for through the BISS annual application. Note that this is in no way linked to ACRES, which is a completely separate scheme.
- **Complementary Redistributive Income Support for Sustainability (CRISS)** – a new measure to redistribute payments from larger to smaller and medium-sized farms. Not linked to having entitlements, however at least one entitlement must be applied on for a valid CRISS claim. CRISS is paid per eligible hectare up to a max of 30ha.
- **Area of Natural Constraint (ANC)** – same name and payment rates as before. This payment is not linked to having an entitlement. Some changes in its operation, particularly the minimum stock rate –now at 0.1 LU/ ha, which must be maintained for a minimum of 28 consecutive weeks.
- **Complementary Income Support for Young Farmers (CIS-YF)** – this is the replacement for the Young Farmer Scheme.
- **National Reserve** – two options –

Key messages and dates

- Open the DAFM BISS correspondence as soon as you receive it.
- Familiarise yourself with the contents.
- Review your Statement of Entitlements – be aware of the changes in the values of your entitlements listed.
- Alert your advisor to any changes in the ownership or identified farmers on your farm operation – any changes either to the herd number or required to be made since last year will have a significant impact on the application process and will cause payment issues if not addressed at the time of application.
- Contact your Teagasc advisor as soon as you have received the DAFM direct payment paperwork to make an appointment to submit the application.

Advisors will be extra busy this year as the application process will take longer than normal, so it's important not to leave this appointment too close to the deadline of 15 May.

- 15 May – Application deadline for BISS and Area Based Scheme closes.
- 31 May – latest date for amendment without penalty of BISS and Area Based scheme application already submitted.
- 16 October and 1 December – potential payment dates.

Young Farmer and New Farmer – for applying to the reserve for either an allocation of entitlements or a top up on low value entitlements up to the entitlement national average value.

•**Coupled Income Support (CIS)** – commonly known as Protein Aid.

•**Straw Incorporation Measure (SIM)** – must apply on a minimum of 5ha. Maximum payment will be on 40ha.

•**Conditionality** – a new name for what was previously known as 'cross compliance'. This is not a scheme, but refers to the requirement for every applicant farmer to meet certain requirements and standards in respect of the climate, environment, public health, plant health and animal welfare. You must meet the GAEC 8 requirement of having and maintaining at least 4% of the agriculture area as non-productive areas or landscape features.

The schemes associated with the annual land declaration

The linking of land hectares to entitlements for the annual BISS payment follows the same rules as the previous BPS scheme.

However, there are a total of nine schemes that farmers could potentially avail of that are based on farmers having made an annual application to DAFM, listing the land area that is being farmed.

During the application process, before 15 May, each farmer applicant will be required to identify the schemes they are applying for which will be linked to the land they are now declaring.

So, all the schemes in the previous list that a farm is interested in will need to be highlighted. The ACRES actions that were selected (if you applied for that scheme) will also be displayed for review.

To apply for the eco scheme, either two agricultural practices from a list of eight or a single enhanced agricultural practice on all eligible hectares must be selected.

Many farmers will qualify outright for the eco scheme, based on the presence of enough area under habitats or features that promote biodiversity on their holdings, such as hedgerows, stone walls, watercourses etc.

Some farms may have to select additional measures to meet the requirement of two agriculture practices in order to secure an eco payment on their eligible land hectares.

Get to know your land parcel maps

Just as your farmland is the foundation of your farming business, it is important to keep in mind that these same land parcels and the characteristics such as area, boundaries and associate landscape features will also be the foundation for many of the schemes you will be making an application for.

When your advisor is completing the application, they will be keeping that in mind to ensure that all the parcels that make up the farm holding are correct from the point of view of parcel area and parcel boundary.

As part of the DAFM application process, a set of colour maps are sent to each farmer. These maps identify each land parcel that DAFM has marked on the iNet system as being part of your holding for 2022. This is the starting point, but there may well have been changes to the land for 2023.

Keep in mind that the land area you apply on is the land that you have control of on 31 May for BISS and potentially for the whole year for ANC and other schemes.

It is important that you familiarise

Continued on p32

Continued from p31

yourself with these maps. If you haven't studied them previously, then it is important that you really take a close look at them for this year's application.

Try to identify all the land parcels identified on the maps and relate them back to the individual fields that make up your farm holding.

Don't be concerned about writing or making marks on these maps – if your advisor is completing the application, then they will be bringing up the maps electronically on the DAFM online system to view and make any required amendments.

If you want to write in your own field names for later reference during the consultation, then do that. Try to identify the main features on the maps.

This may mean rotating maps around so you "get your bearings"– look for public roads, where the main field entrance is, whether you can identify the buildings, farm roadways.

What about hedges, large areas of scrub and other on the ground features that are visible on the map? Make a note of any significant changes in the land parcel, such as house sites or new building works – some of these may have happened since the map image was taken.

These areas have to be marked on the maps as part of the application, so you should get out on the ground beforehand and make note of the boundaries, step out the distances and take note of a few identifying markers on the ground or in a boundary hedge that also feature on the map, so that you can give some guidance to your advisor when they are marking features in.

Another element of this year's application will be the identification of landscape features such as hedges, stonewalls and ponds so that they are counted in Space for Nature calculations.

Every individual parcel will have to have its parcel use identified also – so whether it is in grassland, sown with a crop, used for forestry, under a farmyard or for other use. Agricultural Activity associated with the land parcel will also have to be identified for each parcel.

There may also be two areas associated with a land parcel – an area that is eligible for BISS and certain area-based schemes may have a separate reference area for nitrates purposes.

Again, this will need to be checked as correct against what is correct "on the ground."

Getting the land parcels and the areas correct has always been critical, but in the coming year, there will be an increasing level of inspection or DAFM checking using satellite imagery.

This Area Monitoring System (AMS) checking will flag up possible issues with parcel crop type or activity that the farmer applicant will then need to clarify with DAFM.

You can reduce the possibility of having to deal with any later issues following inspection by getting the land parcels correctly marked and submitted.

It will be possible to add, delete, sub-

divide and also merge land parcels as part of the application process.

Understanding your entitlements

The need to have one hectare of eligible area to draw down one entitlement is still in place. The value of all entitlements has changed significantly for 2023.

The entitlement previous known as a BPS entitlement is now called a BISS entitlement. Other elements of the new annual payment associated with environmental measures (ECO) or redistribution of payments via front loading (CRISS) are not linked to using a land hectare to claim an entitlement.

All entitlement owners will have received a statement giving details of what the BISS payment linked to each of their entitlements is likely to be over coming years. This will also show how the process of convergence, or revaluing the entitlement to bring every entitlement closer to the national average, is going to impact the entitlement draw down value each year.

For 2023, it will still be possible to lease entitlements in or out and also permanently transfer entitlement inwards (via a purchase, gift received or inheritance) or transfer them out (via a sale, or gift or inheritance outward).

For 2023 and 2024, there will be no clawback imposed on any sales of entitlements without land. Clawback was imposed on sales previously and will be reinstated from 2025. This would result in 20% of the number of entitlements being siphoned off for the National Reserve and lost to the seller and buyer.

This means that for the next two years, there is an opportunity for those holders of entitlements who do not see themselves wishing to claim their entitlements to cash in by selling them.

The process of transferring entitlements, if required, is also completed as part of the annual application process. Obvious transfers such as sales, purchases, inheritances or gifts are usually at the forefront of people's minds.

Other less obvious events such as changes in the names associated with a herd number or changing to a partnership or company will generally also need a transfer of entitlements application to be completed.

The paperwork associated with an entitlement transfer is of such significance that it must be witnessed by a third party. In addition, where the ownership of entitlements is changing, then since entitlements are an asset and have a value, there may also be legal and tax implications to consider.

If you are considering a significant entitlement transaction for 2023, you will need to talk to your accountant and potentially your solicitor as well as discussing this with your agricultural advisor.

In conclusion

All of this means a very intensive period of work ahead in March, April and May for you and your advisor, so any preparation you can do in advance of your own direct payment appointment will help get your application completed faster. Stay on the ball!

Learning from Ozzy Osbourne

The Black Sabbath lead singer suffered a serious all terrain vehicle (ATV) accident and was lucky to survive. Many don't. New ATV regulations are intended to reduce the risks

John McNamara
Health and Safety Specialist, Teagasc

New quad bike or all terrain vehicle (ATV) regulations (SI No. 619 of 2021) come into force on 20 November 2023. These regulations apply to all work sectors including agriculture.

The regulations require:

- 'That the operator of the all-terrain vehicle has successfully completed an all-terrain vehicle safety training course provided by a registered training provider to a QQI standard or equivalent.'
- 'That a risk assessment is conducted in accordance with section 19 of the Act'. The risk assessment requirement refers to the Safety, Health and Welfare at Work Act, 2005.
- The regulation also states that 'personal protective equipment is provided and worn by the operator of the all-terrain vehicle in accordance with Regulation 62'.
- Regulation 62 refers to the personal protective equipment requirements of Safety, Health and Welfare at Work Regulations 2007.

Compliance with a regulation is mandatory from the date they come into effect, so farmers with a quad should consider measures to comply with the regulations. Note that the regulations apply to all quad use, whether it is new or old.

ATV – utility and dangers

Quads are undoubtedly a super farm 'tool' and there are over 20,000 in use on Irish farms. They move fast, have the traction to climb hills and rough terrain, and can carry or tow limited amounts of farm materials.

These characteristics, can lead to danger and risk: The main dangers include losing control, overturning, striking an object at speed or being thrown from the ATV.

Over the 10 years (2013 to 2022), there have been 12 fatalities in agriculture associated with ATVs.

ATV controls and basic safety

Having all controls in good working order is vital for safe ATV operation.

Brakes are the first consideration. ATVs usually have front and rear brake levers on the right and left handle bars; a rear brake pedal near the foot rest; a rear parking brake lever located on the left handle bar or next to the rear brake pedal.

The throttle control is a thumb-operated lever. Other controls include an ignition switch, an engine cut off switch, a fuel valve, a choke, starter and reverse gear where fitted.

It is vitally important that you read your user manual and familiarise yourself with the operation of all controls before driving your quad.

ATV maintenance and pre-use checks

Maintaining your ATV in good condition and completing pre-use checks is essential for safe use. Consult the operator's manual.

- **Damage:** check the vehicle for any physical damage.
- **Tyres:** visually check the tyre tread is adequate. Quad bike tyres are the large balloon type and operate on very low air pressure 3.5 to 6 PSI to allow the vehicle to travel easily on many types of surfaces. Use a gauge suited for measuring low pressures. A 1 PSI difference in pressure can cause ATV control problems.
- **Suspension:** check the suspension by manually bouncing the quad suspension. Generally it should be quite stiff.
- **Electrical:** check the electrical controls by pressing each button on the dash in sequence. Also check the emergency stop button.
- **Fuel level:** check your fuel level and, in the absence of a gauge, be careful of petrol fumes from the tank.
- **Oil:** check the engine and brake oil levels.
- **Controls:** check the controls and cables to make sure they are functioning properly.
- **Brakes:** check the brakes by applying them carefully at start-off (avoid sudden braking).
- **Water and cooling system:** check the coolant levels. If too low, this may indicate a leak or an overheating problem.

Training is now mandatory for quad drivers.

Active ATV riding

On sit-astride ATVs, in particular, the correct rider position is vital. The position of the rider on the machine needs to be changed depending on the terrain, direction of travel and motion.

Riders must have the physical ability to move and balance the momentum of the quad with their own body weight. Quads/ATVs have a large seat which is designed to allow the operator move body weight to control the vehicle.

Weight transfer is hindered when carrying passengers increasing the risks. Never carry passengers. Teagasc, in association with FBD Insurance and Farm Safety Partnership advisory committee to the HSA has prepared a short DVD on safe operation of an ATV as part of its Managing Safety on Farms series. This can be viewed online, by scanning the QR code using your smartphone camera.

Note that the ATV regulations to be implemented have specific requirements related to training and watching a video, on its own, does not meet these requirements.

Personal protective devices

These are available on the market. Provided they have an EU CE mark, ATV owners can fit one if they consider that they provide additional protection.

Remember, Ozzy Osbourne was lucky. Don't leave your future to chance.

Continuous Cover Forestry delivers numerous pay days

This Limerick farm shows how mixed species forestry can delivers a whole range of valuable benefits.

Jonathan Spazzi
Teagasc Forestry
Development Officer.

The 2023-2027 Department of Agriculture Food and the Marine (DAFM) Forestry Programme, which includes a massive €1,300m to help landowners integrate forests into their farm businesses, encourages diverse types of forest and innovative ways to manage them.

The aim is to produce wood, but also a range of additional benefits to landowners, the environment, and society in general. Limerick farmers Betty and Jonathan Sykes have shown how this can work.

"Twenty years ago, we planted some of our less productive farm land with mixed tree species as a way to diversify income, enhance the local environment and complement our farm's hospitality business," says Betty.

"Today, the woodlands are well established and are an integral part of our farm operation and our daily lives. I could not imagine the farm without our woodlands."

The Sykes' woodlands complement 78ha of well managed grassland at Springfield farm near Drumcolliher.

"We initially planted seven hectares of broadleaves, including beech, sycamore, oak and some cherry on very heavy land in 1993," says Jonathan.

"In 2000, we addeded a further 17ha of mixed species with oak, ash, spruce and beech, with some larch and Scots pine.

Initial management.

The first thinning was carried out within the Woodland Improvement Scheme funded by DAFM. "It included the removal of many of the larch trees that we ultimately used as fence posts," adds Jonathan.

"The main benefit of selective thinning, of course, is that the best trees reach their potential as valuable saw log timber."

He points out that the majority of the small diameter hardwood thinnings removed so far have been sold as firewood to local contractors, with some used to heat the large house on-site.

The house is used as tourist accommodation for groups of up to 25 guests. The wood-burning boiler is saving up to €20,000 per annum, while helping reducing the business's carbon footprint.

The medieval tower restoration

Many mature trees, up to 300 years old, have been retained on the farm and are valued for their landscape and biodiversity role. Some, particularly the wind-blown oak trees, were sawmilled on-site and used in the restoration of a medieval tower, which is located near the house.

Jonathan started the restoration of the medieval tower in the early 2000s. At the time, the roof was missing and some of the stone work needed

Interior of Springfield medieval tower refurbished using local oak. \Mark Moore

Jonathan Sykes and Jonathan Spazzi discussing forest management in the oak section. \Mark Moore

substantial upgrading. Through the years, and with great dedication and skill, Jonathan has been able to fully restore the tower, which is now available to visiting guests and forms a big part of Springfield farm's hospitality offering.

All the timber for the internal work was sourced and milled on the farm and skilfully crafted by local carpenter Barry Hamilton.

Hardwood focus

As the hardwood logs have developed, following from the initial thinning, Jonathan has become involved with a local discussion group, started and facilitated by Teagasc. Its focus is on adding value to small diameter hardwood thinnings and helping the development of intermediate hardwood markets, in addition to firewood.

"Many of the participants had applied Woodland Improvement thinning to their forests, managed trees in their plantations to good size and quality and were looking to explore added value markets," says Jonathan.

Traditional dresser made from one small diameter sweet chestnut tree. \Mark Moore

The group secured support under a DAFM forestry promotional programme for a range of activities, including a study trip to Wales to meet forest owners, businesses and agencies involved in innovative hardwood processing.

"Following the study tour to Wales, we decided to invest in some sawmilling equipment on the farm," says Jonathan.

With this installed, he has been able to convert some of the timber from thinning into posts, beams and planks for the medieval's tower up-keep, as well as producing timber for other farm constructions.

The latest venture is the manufacture of a traditional design dresser in partnership with Barry Hamilton.

"This beautiful piece of furniture was made with only one small size sweet chestnut tree, felled as part of routine thinning. It shows the potential to add value to small/medium diameter hardwood logs," says Jonathan.

Management outlook

Jonathan describes how he now manages the forest under continuous cover forestry (CCF): "The idea is to allow the forest to develop long-term as a diverse and a healthy ecosystem. This will ensure not only productivity, but also biodiversity and resilience. The timber is harvested by selective felling of individual trees or small groups," he says.

"Over time, this approach enables quality production, ensures a permanent forest cover and a high landscape value. The latter is particularly important for our hospitality business.

"As trees mature further and come into seed production, the selective tree felling approach will create the opportunity for new trees to naturally regenerate and grow in the gaps."

CCF management at Springfield is ongoing and a second thinning will be carried out in the coming months, with the help of the Woodland Improvement Scheme funded by DAFM.

Knowledge transfer and innovation

Over the years, Jonathan has partnered with a German organisation called Bildungshaus Heideland HVHS through an Erasmus programme that periodically brings forestry students from Germany to do work experience and learn about Irish forestry. They are qualified in tree felling and plan to work in the forestry industry after their training.

This year, Betty and Jonathan will be further collaborating with a new Masters programme run by the School of Architecture at TU Dublin. This collaboration is facilitated by Teagasc and will explore opportunities for utilising small diameter forest thinning in new building practices based on regional construction methods to reduce embodied carbon in buildings.

The project will involve four Masters students and will aim to dovetail with the continuous cover management model adopted in Springfield.

Other landowners interested in finding out more about the forest development work at Springfield will have the opportunity to attend a National CCF open day planned for 6 July in Co Limerick, organised by Teagasc Forestry Development Department (FDD).

On the day, a new online training facility will also be presented. This new forest management educational resource is targeted towards owners and other groups interested in CCF management. This is the result of an Erasmus- funded project, a collaboration between the FDD and forestry development agencies from Belgium, France and Germany.

Garden tools: think before you buy

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

Sometimes, in a *Desert Island Discs* kind of way, my students ask which two garden tools I couldn't do without. I always choose the secateurs and the spade.

Pruning a tree or a rose bush requires a secateurs, a loppers and perhaps a saw. Without these tools, the job will take a whole lot longer and risks damaging the plant.

Remember that secateurs come in right and left handed versions. Always use a 'by-pass' secateurs rather than an anvil type, as they do less damage to plant tissue.

Possibly the best (and correspondingly expensive) secateurs you can buy are the Swiss-made Felco range. They come in various types, including those with rotating and hydraulic handles.

Other makes are available, in a range of quality levels. You can buy very cheap tools, but you will be buying them (at least) twice. Buy the best you can afford, but only what you need, and maintain them well.

Use a spade to cut through roots or to cut an edge. Never a shovel! However, after you have cut the edge, dig out the soil with the shovel. In other words, always try to use the right tool for the job in question and never use a spade as a lever – use a crow bar.

Suitable garden spades like Spear & Jackson should be narrow bladed with a long handle, which makes it much easier to cut the soil than a wide blade.

Storage

Now, probably the most important consideration – storage. Leaving tools out in the yard or garden to rust away is a waste of money. Clean them off, oil them, keep them sharp and store them properly and they will always be available and ready for use.

Clip-on type garden tools are designed to save on space. Wolf Garten, for example, produces a range of attachment type tools which can all be connected to one universal handle. These include a clip-on hoe, rake and brush etc, designed to make every job in the garden doable. Then all you need is the will to do it!

In our modern era of sustainability, we should do as much work as possible by hand. Where an engine is necessary, I advocate battery power. At home, we use only battery powered hedge trimmers, strimmers and lawnmowers.

As is the case with cars, battery life is getting better each year. The need for machinery is obviously related to the types of garden we choose and the philosophy we employ in their planning. You can decide not to have a lawn. Wildflower or bulb meadows are good alternatives.

Gardening is meant to be enjoyable, not a nagging endurance test. Buy lightweight equipment, especially when choosing power tools. Look at your garden, see what you need to do to maintain it for your enjoyment. Then shop around and choose the very best equipment to suit your needs.

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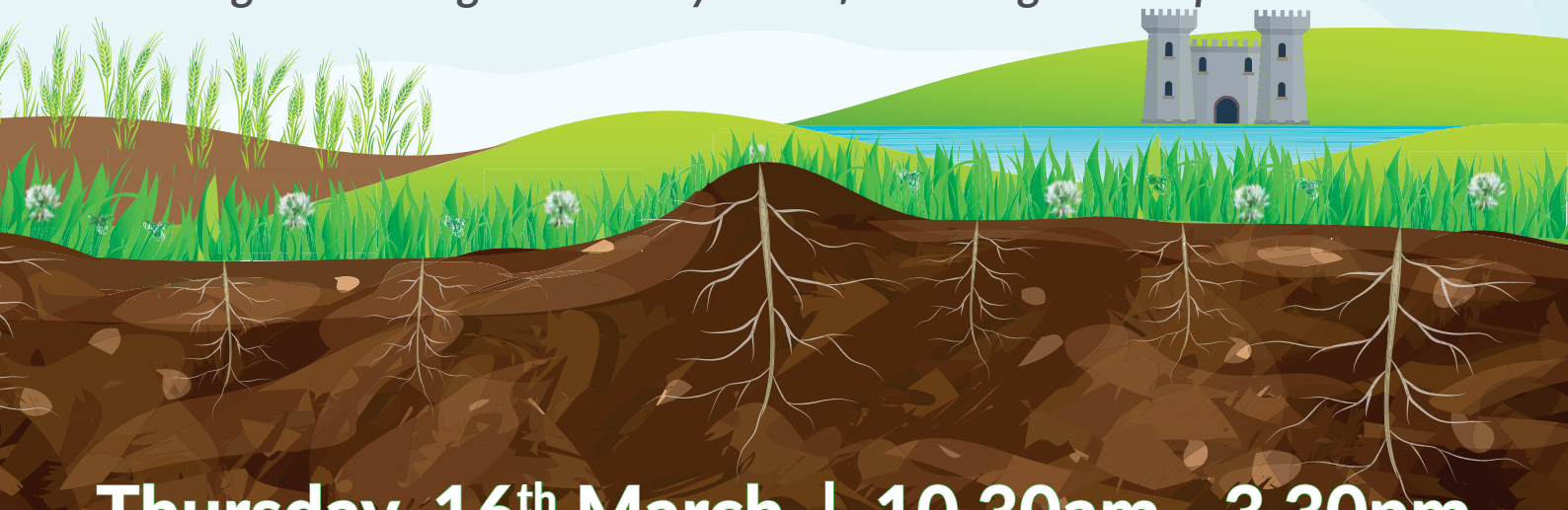
FIELD EVENT

Building resilient agricultural systems from the ground up



Thursday, 16th March | 10.30am - 3.30pm

Productive and resilient agricultural systems start from a foundation of good soil health. This field event, held in association with the 3rd Global Soil Biodiversity Conference, will demonstrate the practices and technologies that can be adopted on farms to assess and enhance soil health.

These will include:

- Demonstrations of visual assessment techniques
- Soil functional assessment
- Practices that improve soil health in soils (including diversification of grassland swards, cover crops, straw incorporation and manure amendment of soils)
- Avoiding physical damage of soil
- Enhancing soil nutrient supply and
- Increasing soil carbon

Those in attendance will also have the opportunity to take a close look at some of the biology in soil and 'Ask a Soil Scientist'. Attendees will include farmers, agricultural advisors and policy makers, and the scientific community including Global Soil Biology Initiative scientists.

This event is free to attend, but registration is essential

For more information or register please visit:
www.teagasc.ie/farmingforsoilhealth

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