



Today's Farm

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Mark Moore
Editor,
Today's Farm

Some risks are greater than others

The COVID-19 pandemic has sharpened our awareness of risk. We are aware that our risk of getting the virus is determined by our location and behaviour. Our age, gender and underlying conditions decide our risk of getting ill or dying of COVID-19. In addition, we know that some vaccines (a scientific miracle) come with a tiny risk of an adverse side effect.

There's a risk that we may suffer 'risk fatigue' and ignore some big fat risks we face every day. Take sunshine for example. In an article in this edition, Francis Bligh draws our attention to the risk of skin cancer. This risk will still remain when COVID-19 is but a distant memory.

Is mó rioscaí áirithe ná rioscaí eile

Táimid níos feasaí anois ar rioscaí de bharr phaindéim COVID-19. Is eol dúinn go mbraitheann an riosca go dtolgfaimis an víreas ar an áit a bhfuilimid agus ar an gcaoi a n-iompraímid muid féin. Is iad ár n-aois, ár n-inscne agus na fadhbanna sláinte atá orainn cheana féin na fachtóirí a shocraíonn an riosca go n-éireois tinn nó go bhfaighimis bás fiú de bharr COVID-19. Ina theannta sin, tá a fhios againn go bhfuil riosca fíorbheag fo-iarmhairtí ag baint le cuid de na vacsaíní (éacht eolaíochta gan amhras ar bith).

Tá an riosca ann go dtiocfadh 'an tuirse riosca' orainn agus go dtabharfaimis neamhaird ar roinnt rioscaí ollmhóra a bhíonn ann gach lá. Solas na gréine, cuir i gcás. In alt san eagrán seo, tarraingíonn Francis Bligh ár n-aird ar riosca na hailse craicinn. Riosca é sin a bheidh fós ann fiú tar éis dúinn an lámh in uachtar a fháil ar COVID-19.

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Lamb producer Peter McGuinness and Teagasc advisor Edward Egan.

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Cover | "Having plenty of slurry storage capacity gives you peace of mind," says Waterford farmer John Cheasty (right) pictured with Teagasc Farm Buildings and Infrastructure Specialist Tom Fallon.

ESEE 2021

25th European Seminar on Extension & Education

21–23 June 2021,

Teagasc Ballyhaise Agricultural College, Cavan, Ireland

The European Seminar on Extension and Education conference is a major biennial event which presents new research on agricultural extension and education. From June 21-23, ESEE21 will be hosted by Teagasc Ballyhaise College, in collaboration with University College Dublin and CAFRE in Northern Ireland.

Due to COVID-19 restrictions, the conference will be delivered online.

The title of the 2021 conference is *Learning for Life. Continuous innovation support through extension*

and education for sustainable farm communities.

- Digital delivery of advice and education: What have we learned from the disrupted norm?
- The evolving roles of advisers and educators in supporting learning.
- Lifelong learning – encouraging and facilitating continuous learning and development by rural individuals, households, and communities.
- Evaluation and impact assessment of Ag Education and Innovation support models.

Teagasc Research Insights webinar

Role of grass breeding and evaluation to increase the sustainability of pasture-based systems.

- Date: 12 May 2021.
- Event Time: 9:30am.
- Venue: Online.

Wednesday, 19 May 2021

- Social Media Takeover with Pat Collins.

Social media takeover on the farm of Pat Collins, Cattle (Non-Suckling) Grassland Farmer Of The Year 2020.

- Venue: Twitter and Instagram.



Podcasts

Teagasc now has a range of podcasts covering farming enterprises, research and current issues facing rural dwellers.

Podcasts available are: the Tillage Edge podcast, the Dairy Edge podcast, the Beef Edge podcast, the Pig Edge podcast, the Ovicast Sheep podcast, the Signpost Series podcast and the Research Field podcast.

Visit <https://www.teagasc.ie/news-events/daily/podcasts/> to listen to the podcasts by clicking on the player.

Alternatively:

- Subscribe on Apple Podcasts.
- Subscribe on Spotify.

Environment Edge

One of the most recently launched podcasts is the Environment Edge, which is Teagasc's environment podcast focusing on challenges and opportunities in agriculture.

Presented by Cathal Somers and Deirdre Glynn, this podcast will bring you the latest information, science and opinions on farm sustainability.



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Palmerstown, Kilkenny

Four years in: A review of the Grass10 campaign

John Maher, John Douglas and Joseph Dunphy
Grass10 Campaign,
Teagasc Animal and
Grassland Research and
Innovation Programme

Grass-based systems of milk and meat production have a sustainable, green and high-quality image world. They are also cost-effective. Ireland's comparative advantage in milk and meat production can be explained by the relative cost of grass, silage and concentrate feeds, which are estimated at 7c, 15c and 30c per kg.

Teagasc analysis has indicated that net profit per hectare is increased by €173/ha for each additional tonne of grass DM utilised on Irish dairy farms, with the corresponding figure for drystock farms being in the region of €105/ha.

Teagasc launched a four-year Grass10 campaign (2017-2020) to promote sustainable grassland excellence on Irish dairy, beef and sheep farms.

The Grass10 partners are Grassland Agro, AIB, FBD, the Department of Agriculture, Food and the Marine and the *Irish Farmers Journal*. The Grass10 programme also works closely with Teagasc's Grassland Science Department.

The primary objective of the Grass10 Campaign is to increase the

number of Irish farmers utilising 10t of grass DM/ha/year using 10 grazings per paddock.

A detailed review of the first four years of the programme is available at <https://www.teagasc.ie/publications/2021/Grass10-Report-2017---2020php>.

Practice changes

The programme identified five key priorities:

- **Grazing infrastructure** — improve paddock layout, water systems and farm roadways.
- **Soil fertility** — improve soil pH, P and K.
- **Reseeding** — reseed poorly performing paddocks.
- **PastureBase Ireland (PBI)** — increase both the number of farmers using the programme and the number of measurements taken per farm.
- **Grassland management skills** — improve the grassland management skills of farmers.

PastureBase Ireland measurements

The number of farmers regularly measuring pasture must increase if grassland management is to improve. Regular Grass10 meetings on farms have helped to train farmers to measure grass and use PBI.

The number of farmers now recording 20 or more grass measurements and using PBI to manage grass on their farms has increased by over



100% since the Grass10 campaign began (see Table 1).

The Teagasc National Farm Survey data indicates that grass utilisation per ha increased by 0.3t (7.7t-8.0t of DM/ha) on dairy farms, while it remained static at 5.9t on drystock farms over the last few years. This corresponds to the annual grass production of 10.7t and 7.9t of DM/ha on dairy and drystock farms, respectively, in 2019.

On dairy farms where PBI is used, an average of 13.6t of DM/ha grass was grown in 2019. This suggests that there is still significant potential to grow more grass on the average dairy farm. There was a significant improvement in soil fertility over the period as well. About 20% of soil samples currently tested are at optimal soil fertility, compared to 10% at the start of the Grass10 campaign.

Grass10 courses

About 45 training courses have been delivered to farmers over the last two years. The courses were held on farms using the concept of the 'Grazing Coach'. Grass course members met at the same farm each month and monitored grazing decisions and performance throughout the year.

The Grazing Coach selected is a farmer who wants to learn, but has the potential to improve grass produc-

Table 1: Number of dairy and drystock farms who have completed 20 or more grass measurements on PBI over the 2016-2020 period

Year	Dairy farms	Drystock farms	Total
2020	1623	116	1739
2019	1014	106	1120
2018	731	93	824
2017	739	70	809
2016	659	49	708



Grassland Farmer of the Year competition

In 2017, the Grassland Farmer of the Year competition was launched as part of the Grass10 campaign. This coincided with the Year of Sustainable Grassland, supported by the Department of Agriculture, Food and the Marine, and was held in collaboration with the other Grass10 stakeholders.



Caroline Walsh from Ballinascorthy, Co Cork, is the current Grassland Farmer of the Year. Previous winners include Eddie and Denis O'Donnell, Golden, Tipperary, John MacNamara, Hospital, Limerick and Bryan Daniels, Kilmoganny, Kilkenny.

tion and grazing efficiency on their own farm. John Fox, a dairy farmer in Glenroe, Co Limerick, who milks 80 cows, talks about his experience:

"I always like to have cows out grazing and get a lot of satisfaction from it. However, I felt I could do it better. The first thing I noticed from being part of the Grass10 course was that I didn't have to top paddocks anymore after grazing.

"I gained confidence in using PastureBase Ireland figures and the grass wedge, and this enabled me take out paddocks that are too strong for grazing, but at same time, to graze the right covers of grass.

"This improved milk solids, because I was entering the paddock at the right time. Walking the farm and doing the measurements has allowed me to have better grass for my cows, but I

also grew more grass on the farm."

Weekly Grass10 newsletter

The Grass10 newsletter is delivered to over 1,500 industry stakeholders and 4,000 PastureBase Ireland users weekly. It is produced every Tuesday and takes into account the grass measurements taken by grassland farmers and fed into PastureBase Ireland.

The newsletter includes predicted grass growth for the upcoming week. Farmers' daily grass management decisions are of huge importance to ensure good-quality feed availability for the animals during the grazing season. Being able to predict grass growth for the following week at farm level would help farmers to better anticipate variations in grass growth.

The Moorepark St Gilles Grass Growth model is a dynamic computer

model working at farm and paddock level. It takes into account soil type, weather and the grazing management practices when predicting farm grass growth.

Social Media

Grass10 has been present on Twitter since the campaign started, under the Twitter handle @TeagascGrass10. This platform is used as a communication tool for all Grass10 messages, events, publications, videos and the Grass10 newsletter. The page works closely with the PastureBase Ireland account.

• **Grass10 wishes to acknowledge the support of our industry stakeholders in the Grass10 campaign.**

Grass10 in 2021

The Teagasc Grass10 team, along with their colleagues in the local advisory offices, have commenced the 2021 series of Grass10 grazing courses. Currently held online, on-farm practical experience with advisors/specialists and farmer coaches will resume when COVID-19 restrictions are lifted.

If you want to:

- Grow and utilise more grass and

extend the grazing season through practical on-farm training.

- Build your capacity and confidence to implement better grazing techniques, measure grass, and use PastureBase reports to make grazing decisions.
- Take part in a challenging discussion group with like-minded farmers.
- Gain encouragement and support from advisors and farmers to help you to stay focused and make progress.

- Improve the nutrient use efficiency on your farm.
 - Increase your ability to meet your derogation requirements through grass measuring.
- Then a Grass10 course is for you!

To join a Grass10 course, apply online at <https://www.teagasc.ie/crops/grassland/grass10/grazing-courses/> or contact your local Teagasc advisor.

Contract rearing male calves

Establishing a relationship based on trust and a good contract will benefit both owner and calf rearer

Gordon Peppard
Teagasc Collaborative
Farming Specialist



Farming near Enniscrone, Co Sligo, Peter Gilmartin traditionally sold steers and heifers from his suckler herd as yearlings. “In spring 2020, we decided to start contract rearing male calves from dairy herds,” says Peter.

“We reduced the suckler herd and sourced 50 male calves from dairy farms in Munster.

The three-week-old calves were split evenly between Continental, Friesian and Jersey cross animals and weighed on average 50kg on arrival at Peter’s farm. Having received their initial electrolytes and allowed a settling in period, all calves were reared on milk replacer, concentrates and roughage until weaning at about nine to 10 weeks. By then, they weighed 85kg and were eating a minimum of 1kg of concentrate per day.

“During their first season at grass, the calves received 2kg of concentrates for the first three weeks,” says Peter. “Having had a suckler system, the one area where we noticed a big change was the need to dose the dairy-bred animals more often, as they grazed hard, picking up parasites due to not having a cow to suckle.”

The male calves were castrated during the summer months, following the correct veterinary procedures.

Following the winter housing period, where the steers received high-quality silage and an average 1kg of concentrate, they returned to grass as early as possible this spring to maximise growth from high-quality early grass.

“As part of the contract agreement, I am paid a set rate for the calf rearing period and then a flat rate for the remaining time on the farm,” says Peter.

The initial plan was that the male animals were to remain on-farm until 15 April 2021, when the owner had to either organise sale to a third party,

to Peter or agree a further rearing period. As an incentive to maximise performance, an additional bonus payment was agreed on any weight achieved above a set target.

“In contrast to selling yearlings on one sale date per year, I now have a regular income and cash flow, so forward planning is much simpler,” says Peter.

“There is no exposure to a volatile beef market or price and as a self-employed worker, the male animals work very well from an ease of management point of view, there is no heat detection, AI, etc, as would be involved with rearing of females.”

Peter concludes by saying he was delighted with his first year in his new enterprise and a new batch of 2021 male calves have arrived.

Teagasc has developed two new template agreements to cover contract rearing.

Contract calf rearing agreement

In general, contract calf rearing involves the movement of male calves and any heifer calves that are not required to be kept as dairy replacements from the owner’s farm to another farm for rearing under a contract agreement. The animals remain in the ownership of the dairy farmer and an agreed fee per head per day is paid to the contract rearer.

These calves are reared from any age greater than ten days, the point at which they are permitted to move farm, until weaning. The weaning age/weight is agreed by both parties and could be based on age, weight or when an adequate proportion of the diet is coming from concentrates and forage rather than a milk based diet.

Once the calves have reached the end of calf rearing stage and are weaned, there are then four main options available.

- Return to the dairy farm.
- Contract rearer can agree to continue with a weanling rearing agreement.
- Contract rearer can purchase them for future rearing themselves.
- Dairy farmer can sell them to a third party.



Contract calf and weanling rearing agreement

This agreement outlines that the calves, once weaned, will remain on the contract rearer’s holding for further rearing. The length of this additional period is agreed between the animal owner and the contract rearer in advance.

During the rearing period the animal owner pays an agreed fee per head, per day, and the animal owner retains ownership of the animals.

There are four key areas to be addressed during the formation of these agreements.

- Outline – animal owner and contract rearer’s details.
- Duration – establish the start and end date of the agreement.
- Payment – agree payment rate per head per day and decide on method of payment.
- Terms and conditions – establish a management protocol of the animals for the duration of the agreement.

Benefits for the dairy farmer

Additional land, labour and facilities provided

As the contract rearer is completing all works associated with the management and rearing of these calves from 11 days of age, they are in effect providing:

- Additional labour – which can be difficult to source. It also avoids employment law issues.
- Extra facilities – calf housing facilities, feeding systems and milk replacer; feed and straw storage areas are provided for, reducing the need for capital expenditure.
- Land – (if animals staying on rearer’s farm beyond rearing phase) – removes the problem of land availability and the exposure to substantial rental/purchase costs.

Ease of management

With the male calves now contract reared on another farm, there are fewer groups of animals on the dairy farm. This allows for increased efficiency and improved management of the remaining animal groups. It also significantly reduces the disease pres-



Peter Gilmartin farms near Enniscrone, Co Sligo.

sure on the remaining heifer calves in the calf housing area.

•Increased milk production and profitability.

Where these calves were previously reared on the dairy farm, additional land can now be freed up for either grazing or fodder production. This provides an opportunity to increase milk output or reduce the need to purchase additional forage.

What are the advantages for the contract rearer?

•Cash flow and income

Having an agreed fee per head per day gives the contract rearer a guaranteed monthly income independent of volatile beef prices. Monies are paid into the contract rearer's account on

an agreed regular basis and they can make plans and commitments based on having a stable monthly cash flow.

•No investment in stock

There is now no/less of a requirement to avail of stock loans to purchase animals and the risk of paying excessive high prices to purchase livestock is reduced. In many cases, contract rearing agreements run in parallel with the rearer keeping stock of his or her own.

•Potential to be more profitable

In an efficiently run contract rearing enterprise, a high level of performance can be achieved. Coupled with the removal of the risk of purchasing expensive animals and the beef price uncertainty, there is the potential to make the farm more profitable.

What are the costs involved?

Each rearing agreement will be different, depending on the arrangement between the parties. Therefore the fee per head per day will vary.

The contract rearer will generally supply the housing facilities, land, straw, labour and management. Items to get clarity on in advance are in relation to milk replacer, calf starter concentrate, vaccinations, veterinary treatments, dehorning, castration etc.

All of these areas, plus many others, need to be discussed and agreed on before any final fee can be arrived at.

Summary

For contract rearing to be a success it must be a win-win situation for both parties involved. A level of trust, honesty and flexibility must exist between both parties. Events may change, and things will go wrong, so good communication and a 'give and take' attitude are required. It is important to have a written agreement so that all parties are in no doubt as to their responsibilities.

Contract calf and weanling rearing agreements provide an excellent opportunity for non-dairy farming enterprises to devise a different system of production. The contract ensures that in return for a good performance of the reared stock that they will be rewarded for their land, labour, facilities and management through a pre-agreed monetary rate per head per day.

This allows them to better plan their cash flow, and they are not dependent on the sale of stock on two, or three, main selling days in the year.

Dairy farmers have the reassurance that they have a destination to which they can move a number of animals from their holding at an early age, reducing the need for additional facilities, labour, etc. This allows them to allocate more time and resources to the main cow herd.

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What's the future for Irish beef farming?

Pearse Kelly

Head of Beef and Sheep Knowledge Transfer, Teagasc Animal and Grassland Research and Innovation Programme



In December 2005, Pearse Kelly wrote an article entitled: "What Future for Irish Beef Farming?" Ireland had nearly completed the first year under the new, decoupled system of direct payments, with the many different headage payments replaced by a Single Farm Payment on each hectare.

In this article, Pearse reviews what actually happened and whether it can help us predict the future for the sector.

Freedom to farm

The expectation in 2005 was that the Single Farm Payment would give beef farmers the freedom to farm, rather than be tied into suckler cow quotas, premia applications, regulations and retention dates.

The 'Celtic Tiger' was alive and well, providing many opportunities for off-farm income for farmers and their partners. The term "armchair farmers" began popping up, as the Single Farm Payment offered farmers the freedom 'not to farm' but still claim their direct payments.

There has been some reduction in the number of 'active' beef farmers, but for the most part we have not seen any real growth of an 'armchair' category of beef farmers. What we have seen is a rise in the average age of our beef farmers – it's now around 60 years of age.

So what level of production will there be on beef farms over the next 15 years? There will be three big influences on this. The first is the growth in the wider economy.

Since the start of COVID-19, economists have been telling us that we can expect a post-COVID jump in econom-



ic activity.

The majority of beef farmers need to have off-farm employment to supplement their incomes. They will be among the first to take advantage of a rising economy, leaving less time for farming.

This will put a downward pressure on beef farm outputs. Demand for dairy calves by beef farmers outstripped supply over the last two springs, during the height of the pandemic restrictions.

Will the same demand be there if many beef farmers are back in work full-time?

The second major influence will be demands to reduce our emissions of carbon from agriculture. I didn't men-

tion any potential influences regarding the environment on likely future beef outputs in my 2005 article. While water quality had been under the spotlight since the 1980s, it has tended to be more of an issue for dairy farms than drystock farms.

During the four phases of REPS, there was a huge amount of slurry storage built on drystock farms. Now, of course, it is all different. Greenhouse gas (GHG) emissions have come to the top of the agenda for all agencies, organisations and government bodies.

The very ambitious target of having a climate neutral agriculture by 2050 has been set in the Ag Climatise – National Climate and Air Roadmap for the Agriculture Sector.

What does this mean for the Irish cattle sector?

In short, we don't know yet, but this target will, without a doubt, have an impact on our levels of beef production for the foreseeable future.

Table 1: Cattle numbers from the CSO Livestock Surveys (December 2005 and December 2020)

	Total Cattle	Suckler Cows	Dairy Cows	Male Cattle
Dec. 2005	6,390,200	1,113,700	995,800	2,175,500
Dec. 2020	6,529,400	922,700	1,456,000	1,885,100



There has been some reduction in the number of 'active' beef farmers, but for the most part we have not seen any real growth of an 'armchair' category of beef farmers.

Young advisors, and farmers, will be addressing this topic for the rest of their careers.

The third influence that will affect beef production levels is the introduction of environmental schemes under the new, soon to be agreed, Rural Development Programme. We know a reasonably substantial environmental scheme is planned and the payments for involvement will be dependent on farmers carrying out tasks and achieving certain goals.

Some of these requirements will likely reduce output. All beef farmers will have to consider the financial

benefits of joining any such scheme.

Suckler cow numbers

The next topic I looked at back in 2005 was the number of suckler cows we expected to be in the country over the coming years. That autumn, the value of bull weanlings had fallen significantly, with even good-quality weanlings back by up to €200 per head.

This was because they no longer carried with them a plethora of premia payments. With the cost of keeping the suckler cow put at €600, only efficient farms would achieve a profit. We expected less efficient

farms to start dropping suckler cow numbers. We also expected some buyers to start breeding their own weanlings.

Milk quotas meant options to expand were limited, so 9,000 dairy farms had suckler cows. In 2005, we had just over 1.1m suckler cows in the country. Last December, there was a little over 900,000 suckler cows.

The Suckler Cow Welfare payment, which began in 2008 and ran for five years (worth €80 per cow up to a maximum of 100 cows), slowed the

»Continued on page 12

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» From page 11

rate of decline. This was followed in 2015 by the BDGP scheme, which again steadied the ship and today we have the BEEP-S scheme.

In the last three years, Teagasc has seen a significant number of its full-time suckler farmer clients switch to dairying. This trend is likely to continue.

Again, if we see a return to full employment in a more buoyant economy, the less labour-intensive 'non-suckler' beef systems become more attractive. Having said all of that, there are factors preventing a significant drop in suckler cow numbers.

The average suckler cow herd size is under 20 and many of these cows are kept on 'marginal land' that is only suitable for them, or perhaps a flock of ewes.

There is also no incentive for a part-time farmer with a small suckler herd to switch to an alternative beef enterprise, where profitability per hectare may be no better.

Larger herds on better quality land will also remain in suckling, but they do need to be at the top of their game when it comes to efficiency levels. In short, in 2005 it was difficult to predict future suckler cow numbers – and it still is.

Beef from the dairy herd

Fifteen years ago, dairy farmers were starting to drop their beef enterprises to reduce their stocking rates so that they could join the REPS scheme. At the time I wrote: "At the moment, there are very few calf-to-beef systems using bought-in dairy bred

calves on pure drystock farms. This is likely to change and we may see this type of system returning to some farms." How times have changed.

No one was predicting the end of milk quotas and the expectation was that dairy farmers who were exiting milk would be the most likely customers for the small number of surplus calves that were coming from dairy farms.

Today, we are looking at over 1.0m dairy-bred calves under six weeks of age available for beef production. Interestingly, there are still approximately 350,000 of these finished on dairy farms, but that still leaves a huge number of calves for finishing on beef farms, even with a strong live export trade.

These numbers suggest that calf-to-beef enterprises are going to be a common feature on many Irish beef farms over the coming years. But will they be profitable? That's a big question, but if they are to leave a margin for the beef farmer, we will have to see a significant improvement in the beef merit of many of the calves coming from the dairy herd. Recent statistics have shown carcass weights and conformation have been trending downwards in dairy-bred beef calves over the last 10 years.

Beef contracts

We believed 15 years ago that we were starting to see the introduction by meat processors of forward contract pricing arrangements for beef cattle. We hoped these contracts would become the norm and would provide a degree of certainty, especially for finishers. Are we any further on in

2021? Probably not. Yes, some innovative processor-farmer contracts have emerged and there are some currently in operation that are showing a degree of promise.

Unfortunately, the majority of beef farmers still do not know, one month out from slaughter, what price they are going to be paid per kg. For the sector to prosper, this nut will eventually have to be cracked.

Other predictions

In 2005, I surmised what would happen to slaughter age, investments in farm buildings and specialisation on farms. We definitely have seen a huge amount of investment in farm buildings on beef farms in the intervening years and we expect that to continue, as it allows part-time farmers the ability to continue farming more efficiently.

The biggest influence on slaughter age was a long period of young bull beef production. For the moment though, that is consigned once again to the history books on many farms.

The future

My final comments on the beef sector back in 2005 were that it was hard to predict what was going to happen six months ahead, let alone in 15 years, but that the industry was very resilient and capable of adapting to meet the many new and changing requirements. This still very much applies.

In the years ahead, there will be many new challenges facing Irish beef farmers and the innovation and flexibility we have seen in the sector will, without doubt, help them to overcome these challenges.

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BovINE– a project seeking solutions for all European beef farmers



Richard Lynch Maeve Henchion
Teagasc Rural Economy
Development Programme



A European project known as BovINE (Beef Innovation Network Europe) aims to identify the grassroot needs of the 255,000 farmers that make up the EU bovine meat sector. The idea is to then collectively develop practical solutions for these needs that can be implemented on European beef farms.

Belgium, Estonia, France, Germany, Ireland, Italy, Poland, Portugal and Spain are partners in the project and will each develop their own national knowledge exchange networks by enlisting beef farmers, farming organisations, advisors, researchers and other stakeholders. These will be connected across Europe by the overall project coordinator, Teagasc.

All nine countries have appointed a network manager to coordinate the multiple stakeholders from the beef supply chain within that country, to identify both the challenges their beef farmers are facing and any potential solutions they might have to address the needs of the other eight countries in the project.

BovINE has created a number of working groups which will focus on improving one of four pillars of sustainability; socio-economic resilience, animal health and welfare, production efficiency and meat quality and environmental sustainability.

Each working group will bring together various experts within the European research community to unearth innovations not yet tested on commercial beef farms.

Central Space for sharing solutions

At the core of the BovINE project is a specially developed online digital knowledge repository, known as the BovINE Knowledge Hub (www.hub.bovine_eu.net), where all the innovations, technologies and useful



good practices are stored and shared amongst the European beef farming community.

The knowledge hub is free to all with an interest in beef farming and is open not only to those who wish to search for useful solutions, but also for anyone who wishes to share tips and practices with others.

Challenges and solutions to date

In 2020, the BovINE project identified several challenges surrounding the economic, social and environmental sustainability of beef farms across Europe.

Needs identified included tools to aid beef farmers in risk management and economic planning, innovations and technologies that can reduce mor-

talidity at calving time and solutions that reduce the leaching of nutrients into waterbodies. Improving the carbon footprint of the farm as a whole was also key.

This year will also see the roll out of over 50 demonstrations of research innovations not yet tested on European beef farms.

Within Ireland, demonstrations will be undertaken on a novel technique for reviving newborn weak/unresponsive calves, the implementation of forward purchasing and selling contracts, the use of nitrogen fixing crops and the use of automated weighing systems and methods to predict future calving difficulty by measuring pelvic width in beef heifers.



In 2021 the project will be searching for research solutions and good practices utilised by other European beef farmers to address the following topics:

- Initiatives to improve the image of beef and to break the current trend of consumption decline.
- Economically efficient housing systems for beef cattle.
- Simple tools to measure and communicate animal welfare standards on beef farms.
- Management, housing and environmental factors which affect animal welfare in rearing and finishing units.
- Managing animal nutrition and stress to improve meat quality.
- Methods to optimise the number of calves per cow per year in suckler beef herds.
- Environmental sustainability reward schemes for beef farmers.
- Methods to improve carbon sequestration on beef farms.

Research innovations and good practices addressing these topics will be reported back to Irish farmers in a workshop co-organised by Teagasc and the IFA in November/December 2021.

How to get involved

If you are a beef farmer, advisor, veterinarian or any other stakeholder in the Irish beef supply chain, you can get involved by becoming a member of the Irish BovINE network. To join the network, please contact kevin@agspace.ie or richard.lynch@teagasc.ie.

You can also find out more information on BovINE by visiting the projects website at www.bovine_eu.net or by connecting with us on our social media channels. Also keep an eye on our YouTube channel (<https://bit.ly/3sD58vs>) to see the latest videos and presentations on innovative solutions for beef farmers.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 862590.

The end of one journey is the beginning of the next

Edward Egan
Teagasc Drystock advisor,
Navan, Co Meath.

Trim farmer Peter McGuinness, who won the 2020 Sheep Grassland Farmer of the Year, and Edward Egan, Teagasc advisor, review the lambing season and look forward to summer management.

On the 15 October last, almost 800 ewes were put to the ram. The flock is run over 205ac, including about 22ac of redstart. The mature ewes had a scan rate of 1.85%, while the flock weaning rate for 2020 was 1.45.

Grass

The aim on this farm is simple – breed as many lambs as possible and finish the lambs as quickly as possible from grass. Peter joined the Teagasc drystock Grass10 course in Meath two years ago: “I found the course an invaluable experience,” he says. “I measure grass weekly from early February to closing up in late December. This allows me to see what grass I have ahead and to take action early if necessary.”

Outdoor lambing

Peter lambs the single and twin-bearing ewes outdoors. Triplet-bearing ewes and ewes that are having lambs adopted onto them are housed. No ewes are turned out to grass with triplets. “My main reasons for lambing outdoors are less labour, lower cost and fewer health problems,” says Peter. “I see the weather as the greatest risk to outdoor lambing for both man and sheep.”

A careful eye is kept on the weather forecast in the weeks leading up to and during lambing.

Key to outdoor lambing

Peter says there are four things that you must plan carefully when lambing outdoors.

“Firstly, you must have good grass covers. Secondly, you must have good labour. Thirdly, you must have the right equipment. And, finally – and most importantly – you must be flexible.”

Compact breeding and lambing

Lambing is compacted by only having a five-week breeding season. “The downside to this is a barren rate of 5.5%,” says Peter.



“The benefit is that the lambing season is short and intensive. When it’s over, it’s over.”

Peter reckons that about 90% of the mature ewes will lamb in the first three weeks. Labour is organised to focus on this busy period. Compact lambing results in a more even batch of lambs for the summer.

Lambing date

The date lambing starts is seen as one of the most important decisions on this farm. The date, 10 March, was chosen as the date to start lambing on this farm for three main reasons. Firstly, in the hope that the worst of wintery weather would have passed. Secondly, the start of lambing coincides with the annual increase in spring grass growth. Lambing earlier would increase the chances of running out of grass if you got a cold March or early April.

Thirdly, 10 March lambing allows a high percentage of lambs to be killed off grass before the end of September.

Grass cover at lambing

The target grass cover for 10 March was 900kg DM/ha. The actual cover on 10 March was 1,045kg DM/ha. This is higher than the Teagasc target for a mid-March lambing flock of 650kg DM per ha, when stocked at 10 ewes per ha. Peter’s view is that it is better to have a good surplus of grass ahead, in case of a cold March and April. Mature ewes do not get any meal post-lambing.



Temporary fencing reduces paddock size for better grass management.



Peter McGuinness and Edward Egan.

“For me, having surplus grass up to mid-April is better than having too little,” says Peter.

“Having surplus grass in late March to mid-April gives me great peace of mind. Getting lambs off to a good start is critical to finishing a high percentage of them by September.”

It’s important to note that while the grass covers may appear high, the grass grown here is top quality right to the base.

Peter is measuring grass weekly, so he can react quickly to the surge in grass growth you’d expect in April. If grass gets ahead of him in April, he can drop paddocks out of the rotation, even for a light cut of silage.

Early nitrogen

This year, Peter spread 30 units of protected urea per acre in the first week of March over the entire grassland area. Because he had good grass covers at the time of spreading, he is confident of a response to this early Nitrogen. The leaf of grass is like a solar panel charging a battery. To give grass the best chance to make use of early nitrogen, it is better if the grass is 5.5 or 6cm plus, rather than 3cm or 4cm.

Group sizes

Once lambs are about five weeks old, they will be put into three groups: Two groups each with 300 ewes and their lambs and then a third group containing the rest.

“Moving into these large groups

means more grazing power,” says Peter. “This allows paddocks to be split, rotated and grazed out more quickly.

“This helps to maintain a proper rotation, as grass growth rates pickup in April and May.

“Small groups lack grazing power. They require small paddocks, which means more fences, more water troughs and moving more groups.”

First cut silage

Last year, the first cut of silage was taken in the third week of May. When tested, it was 73 DMD, 16% CP and 27% DM.

“Cutting silage early not only produces better quality silage, but last year it allowed lambs to be weaned on 20 June onto top-quality aftergrass,” adds Peter.

“About two weeks after weaning, breeding ewes will be divided into groups based on body condition.”

Thin ewes are in one group and fatter ewes in other groups. Lambs get first grazing in each paddock, followed by thin ewes, with fatter ewes been used to clean out paddocks.

Temporary fences

Temporary fencing plays an important role on this farm: “They are more work than permanent fences, but they are cheaper and offer greater flexibility,” says Peter.

“They are used in the grass fields during the summer and autumn. During the winter, they are used in the redstart.”

Lamb drafting pattern

The aim is to have as few lambs as possible on this farm from August onwards, so that lambs are not competing with ewes for autumn grass.

“Our focus from early August is to get the ewes back into good condition and to start building grass reserves to get you through to December,” says Peter.

“Having enough grass in the spring so ewes do not have to be fed meals post-lambing requires closing paddocks in rotation from 20 October. However, closing paddocks in this way requires that you start building covers from August.

“Building covers in August is much easier to do when you have fewer finished lambs around. Last year, the lambs were fed a total of 8t of meal.

“Last year, 94% of the factory lambs were finished by the end of October. The remaining 6% were sold as stores in October.”

Closing paddocks

Paddocks closest to the yard are closed first so that they are available for lambing.

The start date for closing paddocks was 20 October. Paddocks are grazed down to 3.5cm-4cm to ensure clean regrowths. Thus, the cycle continues.



Good grass covers on 31 March as a result of late October closing.

Counting the cost of controlling blackgrass

Jimmy Staples

ECT Project Advisor,
Teagasc, Oakpark, Carlow,
Ireland, Teagasc Crops
Environment and Land Use
Programme



As part of the Enable Conservation Tillage (ECT) project, we completed a 10 year macro-economic analysis on the cost of blackgrass control in winter wheat and winter barley in Ireland.

This analysis estimated that even with good levels of control achieved in nine of the 10 years, blackgrass would still cost Irish tillage farmers €30m in lost winter wheat output. In addition, €13.5m worth of winter barley production would be lost.

Trying to establish what the control of blackgrass costs an individual farmer's bottom line can be difficult. Herbicides are the easiest of the control measures to put a figure on, as you pay for each litre or kilogram of product you apply and most farmers will know their costs per acre for spraying.

Table 2 highlights the potential cost of a number of measures that can be used to control blackgrass on-farm.

These are costed using the Teagasc Crops and Returns 2021 booklet and will vary from farm to farm.

Other costs are harder to quantify. For instance, if a field has to be taken out of crop production and sown down with grass for a five year period, there may or may not be a market for fodder or grazing, and this would have to be considered when calculating the cost versus growing a combinable crop.

The potential cost of pushing back sowing dates also needs to be carefully considered. Later sowing dates may result in a small yield reduction, or could potentially lead to missing the opportunity to sow an autumn crop altogether.

The cost of cleaning machinery between fields and farms is another cost that has to be calculated at farm level, based on down time, labour and investment in equipment to carry out the job.

Farmer case study:

A north Dublin farmer took a lease on a block of land in 2018. A crop of winter wheat was established, it received an autumn herbicide and wintered well. The following spring, blackgrass



was identified in 40% of the field.

The crop was brought through to harvest. About 60% of the field yielded 4.2t/ac, while the area affected by blackgrass only yielded 1.5t/ac. With grain prices at €165/t, this resulted in a loss of €446/ac over the affected area.

A seed sample was sent to Teagasc Oak Park and an IPM strategy was put in place. The decision was taken to leave the field fallow for the

Table 1: Variation in yield loss in winter wheat at different blackgrass densities.

Plants/m ²	% yield loss	€ Loss per hectare
12	5	75
25	10	150
50	15	225
100	20	300
250	35	525
300	40	600
500	50	750

Based on a 10t/ha crop at €150/t



Table 2: Cost of blackgrass control in winter wheat

Action	Cost €/ha	Notes
Crop destruction	1,330*	Spraying off patches in late May/early June (*costs of growing crop up to mid May)
Yield loss	300	Two tonne yield loss caused by 100 blackgrass plants/m ²
Chopping of straw	262	Straw on the flat at €100/ac includes cost of chopping
Growing an alternative crop	230	11t winter wheat crop vs 8t spring barley crop
Herbicides	144	Flufenacet, Diflufenican, Tri-alleate and ALS chemistry stack to aid resistance management
Stale seedbed establishment	70	Will be higher where multiple stale seedbeds are used
Increased sowing rates	16	Increase sowing rate of winter wheat by 20%

Based on costs from Teagasc Crop Costs and Returns 2021.

classes of chemistry and the decision was taken to sow winter oilseed rape in the autumn of 2020.

While the costs of trying to control the blackgrass have been significant, the steps have been effective.

By following an IPM strategy, the levels of blackgrass in this field have been reduced considerably. The crop of winter oilseed rape is yet to be harvested, but the signs are positive at the moment.



Action	Cost per hectare
Yield loss	€1,100
Fallow period	€300
Stale seedbed	€316
Alternative crop	€216
Total	€1,932

2019/2020 season, to try and reduce the amount of seed in the seedbank.

Stale seedbeds were established on four occasions over the course of the season. While this helped the problem at hand, it resulted in a negative financial impact.

As opposed to making an expected profit of approximately €125/ac from an average crop in an average year, establishing a stale seedbed came at a cost of €32/ac each time.

Results from Teagasc Oak Park revealed that the blackgrass population was susceptible to a number of

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Novel nozzles reduce drift

The Sustainable Use Directive (SUD) aims to reduce the risks to the environment, particularly waterbodies, associated with pesticide use. Compliance with buffer zones associated with pesticides is a fundamental part of protecting our water.

Ciaran Collins & Dermot Forristal
Teagasc Crops Environment
and Land Use Programme

Michael McCarthy Teagasc Mallow

Francis Quigley Teagasc Machinery
Specialist

STRIFE – Surface water Tool for Reducing the Impact of Pesticides in the Environment – allows farmers to reduce the mandatory buffer zones associated with pesticides, providing they use spray drift reducing technology. The farmer further benefits by keeping the spray on-target.

Buffer zones are applicable to all surface waterbodies. Waterbodies are defined as “a feature which is capable of holding water permanently, or at any stage, during the year” and are measured from the top of the bank of the waterbody. Buffer zones can vary in size (1m – 70m) but a one-metre minimum applies in all cases regardless of application rate. There are three instances where the mandatory pesticide buffer zone can be reduced:

- When using DAFM-approved drift reducing nozzles.
- When using reduced application rates.
- When using DAFM-approved drift reducing nozzles and reduced application rates.

It is important to refer to the PCRD website to establish the required buffer zone when using STRIFE. In the example in Table 1 and Table 2, the mandatory buffer zone is 10m,

but can be reduced depending on the rate and nozzle type used. If there are multiple products in the tank, the largest buffer zone must be adhered to.

Note that statutory ‘no-use’ zones (called safeguard zones) apply around all drinking water abstraction points (public and private boreholes and rivers/lakes), ranging from five metres to 200 metres, depending on the size and extent of the supply. These safeguard zones cannot be reduced using STRIFE.

Sprayer nozzles

Selection of the most appropriate nozzles is essential. The nozzle used, in combination with spraying pressure and forward speed, determines:

- Application rate (litres/ha).
- Risk of drift (and STRIFE category).
- Deposition pattern on the target crop, weed, soil or insect.

Drift risk and deposition on the target are largely determined by the spectrum of droplet sizes produced by the nozzle. With multi-nozzle holders, it is best to fit nozzle options that include standard fan jets and low-drift air-induction nozzles.

There is a trade-off between drift reduction and droplet size. Droplet size can be measured in many ways, with BCPC ‘spray quality’ frequently quoted (very fine, fine, medium,

coarse, very coarse, extra coarse and ultra coarse).

Most drift reduction strategies work by producing larger, fewer droplets, which are less prone to drift and can give good canopy penetration, but will give less coverage on the target.

So, how does this affect the product performance in the field? Plant protection product manufacturers are cautious and often recommend the evaluation settings of 200 litres/ha application rate and a ‘fine’ or ‘medium’ spray quality.

Does this mean that working outside of these recommendations will give poorer performance, as most low-drift nozzles will produce coarser spray quality?



Table 1:

	Nozzle type			
Elatus Plus ¾ rate	Non drift reducing nozzle	50% drift reducing nozzle	75% drift reducing nozzle	90% drift reducing nozzle
Buffer zone (metre)	8m	4m	2m	1m

Table 2:

Fungicides				Buffer zones				
Product name	PCS	Active substance	Concentration	Mandatory (non drift reducing nozzles)	When using 90% drift reducing nozzles	When using 75% drift reducing nozzles at various application rates		
Elatus Plus	05380	Benzovindiflupyr	100g/l	Non STRIFE	STRIFE 90%	STRIFE 75%		
				Full rate	Full rate	Full rate	¾ rate	½ rate
				10m buffer	1m buffer	3m buffer	2m buffer	1m buffer

Farmer profile: John Kelleher



John Kelleher is a tillage farmer from Killavullen just outside Mallow in Co Cork, farming just over 300ha, predominantly a mixture of winter and spring cereals. Add in his contract farming land, and John sprays over 4,500ha each year.

John has always been a fan of low drift technology and prior to 2018, he ran a 24 metre 4000lt Hardi Navigator with Hardi's own air bag system.

"With the air bag, I was always very confident in achieving good coverage with a standard flat fan nozzle as opposed to using the older type low drift nozzles, which simply increased the droplet size," John says.

"Good coverage is key especially when applying herbicides and targeting tricky weeds such as wild oats and canary grass."

In 2018, John upgraded his sprayer to a 6,000lt Amazone with a 36 metre boom and GPS section control: "While I was slow to move away from the air-bag, I felt my Hardi had enough done and with the TAMS grant available, this was an opportune time for me to change. I wanted to increase both my tank capacity and boom width and the best deal I could get was on an Amazone."

With the change of sprayer, John also changed his nozzle technology. He now uses both 75% and 90% low drift red 04 air induction nozzles.

"I find I am mostly spraying with the 75% drift reduction nozzles, as I am still a little sceptical of the large droplet size with the 90% DR nozzle. I tend to use these when conditions are very poor or the product I'm spraying requires me to do so, for buffer zones and STRIPE etc."

John also has automatic height control on the boom, which he says is a brilliant addition. The boom is automatically maintained at a height of 50cm above the crop at all times.

"When I was controlling the boom height myself, I tended to keep it high to protect it, but with the auto height feature, the boom is closer to the crop and drift is noticeably reduced, which is what we're all after," he concludes.

Michael McCarthy



Less drift means less loss of product and less variability across the field in windy conditions. It allows better timeliness with more spraying days. This helps offset the disadvantage of the coarser droplets.

Many trials have shown that efficacy with air-induction nozzles can be as good as conventional nozzles, but not in all situations. Where target plants are small (eg. grass weeds), the fine or medium spray quality from a stand-

ard nozzle may be better.

In practice, a three option approach on sprayers may be best, reserving the coarsest low drift nozzles for extreme conditions or where the maximum STRIPE benefits must be gained. But for more typical use, a 50% or 75% STRIPE nozzle giving 'very coarse' and 'extremely coarse' spray quality may be a better choice to balance drift reduction with good target deposition (Table 3).

Table 3: Standard and air-induction nozzle options to give 140 l/ha at 10kmh from one manufacturer

Nozzle name	Nozzle type	Size	Pressure	Spray quality	STRIPE category
XR 110 03	Flat fan	03 (blue)	2.8	Fine	Std
AI XR 110 03	Air Induction	03 (blue)	2.8	Very Coarse	50%
AI 110 03	Air Induction	03 (blue)	2.8	Extremely Coarse	75%
TTI 110 03	Air induction	03 (blue)	2.8	Ultra coarse	90%

When using 50% drift reducing nozzles at various application rates

STRIPE 50%

Full rate	3/4 rate	1/2 rate
5m buffer	4m buffer	3m buffer

When using non drift reducing nozzles at various application rates

Non STRIPE nozzles

Full rate	3/4 rate	1/2 rate
10m buffer	8m buffer	5m buffer

Slurry storage – have you enough?

The impact of dairy farming systems on the environment is of critical importance in gaining access to new markets, increasing market share in existing markets, while also maintaining access to premium dairy markets that will return a good milk price to the farmer.

Tom Curran
Teagasc
Regional Manager,
Cork West



Tim Hyde
Teagasc
Environment Specialist

To be sustainable, our dairy farming systems must operate in harmony with the surrounding environment and we are obligated to contribute to reducing our carbon footprint. At the same time, we must improve water quality and biodiversity on our farms.

The storage and use of slurry is a key factor in this sustainability. We have to change our view on what slurry is. Slurry is a valuable resource rather than a waste product. Put simply, just as grass is the cheapest feed for cows, slurry is the cheapest source of nutrients available to farmers to grow grass.

Every kilogramme of grass you can produce from slurry reduces the chemical fertiliser that you have to buy to grow the grass. For example, 3,000gals/ac of good-quality slurry (6% DM) applied to first-cut silage fields will supply approximately 30% of the crops N requirements and all P and K requirements.

The Ag Climatise roadmap mentions that chemical fertiliser usage needs to drop by 20% over the coming years. It also sets a target to have 75% of slurry spread by Low Emissions Slurry Spreading (LESS) equipment



by 2025. The efficient use of slurry will increase your profit margin on every litre of milk.

In an environment where chemical fertilisers are expensive and where their use is going to be subject to increased regulation, farmers must use slurry as the number one source of nutrients on the farm. Only then should you top up with chemical fertiliser to meet your crop requirements.

This article will focus on the first part of the equation – do you have enough storage to allow you to use this slurry at the correct times of the year? The correct time of the year is when grass is actually growing. For most soils, this is when soil temperature is greater than 5-6°C. So for dry soils, this could be late January in a warm dry spring. But for heavy or peat soils, this could be the early to

mid-March.

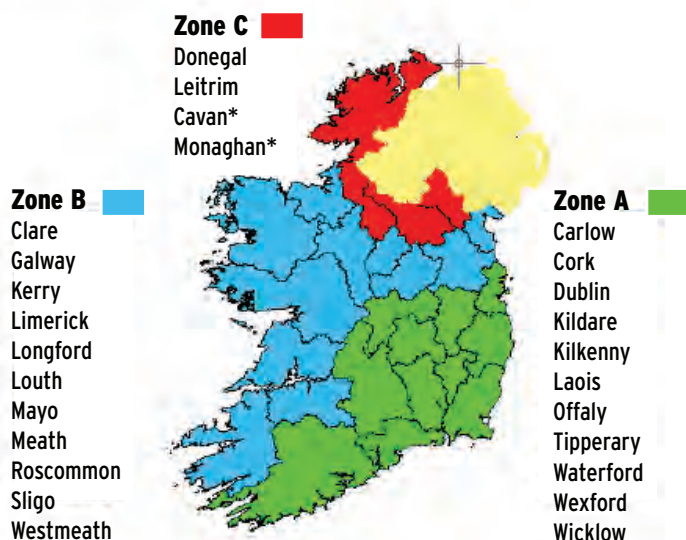
Over the winter period, when grass growth is low, at up to 5kg DM/ha/day, the uptake of nutrients is also very low. Surplus nutrients are easily lost by runoff (P) or through leaching (N). This is confirmed by research, which shows that the biggest loss of nutrients from farmland to watercourses occurs in late autumn, through the winter and early spring.

There has been, and continues to be, a lot of criticism of 'farming by the calendar' but this misses the point in relation to the impact of out of season spreading on the quality of water in our nearby streams and lakes and estuaries.

Out of season spreading brings the amount of slurry storage available on the farm and the management of that storage very much into the limelight.

Zone	Minimum slurry storage capacity	Winter housing start date	End of minimum storage requirement	These are example dates. Use your own farm as an example and work out when you normally house and when you have to spread slurry. Use the last winter as an example.
A	16	1 November	21 February	
B	18	18 October	21 February	
C	20	15 October	4 March	
C*	22	1 October	4 March	

Zone designation

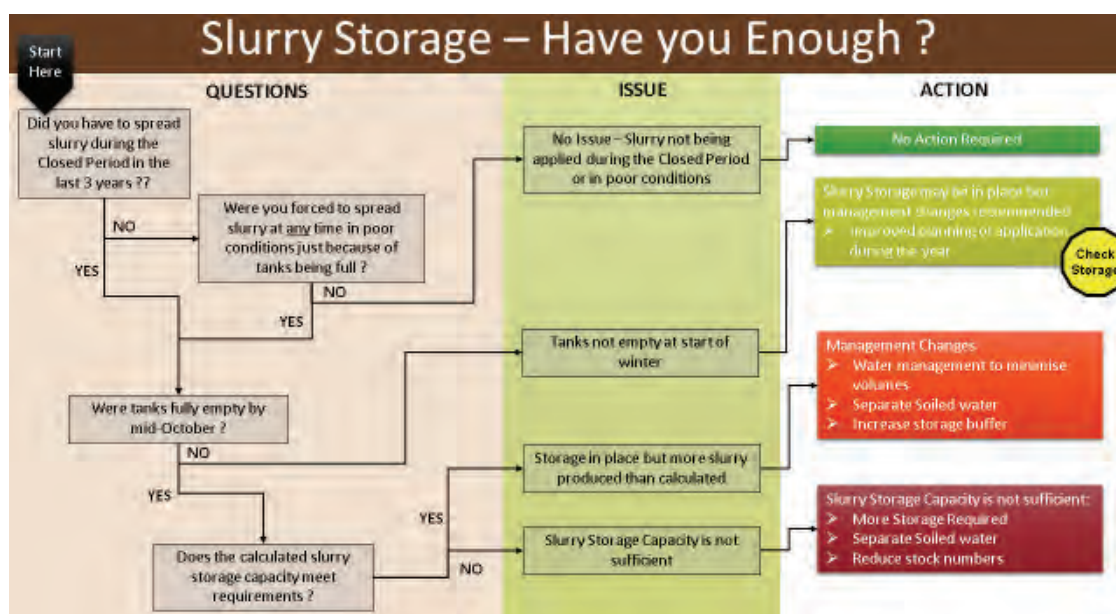


Why have extra storage?

- More flexibility to match slurry application timings with grass growth.
- Better use of nutrients when grass is growing.
- To better manage increased rainfall events at the shoulders of the year.
- Provide cover for miscellaneous issues where water enters tanks and reduces capacity.
- Enough storage to meet the regulations and a buffer of 20% to cover miscellaneous occurrences.
- Use slurry to replace one round of chemical fertiliser/year.
- Apply slurry at the correct time to maximise the fertiliser replacement value (N, P and K) of slurry.
- TAMS grants are available to farmers for additional slurry storage of 40-60%. The cost can also be written off against tax and the VAT is reclaimable.

Table 1: Storage periods for cattle manure and the prohibited periods for spreading fertilisers to land.

Zones	Storage period for cattle manure	Prohibited application periods		
		Chemical fertilisers	Organic fertilisers	Farmyard manure
A	16 weeks	15 Sept – 12 Jan	15 Oct – 12 Jan	1 Nov – 12 Jan
B	18 weeks	15 Sept – 15 Jan	15 Oct – 15 Jan	1 Nov – 15 Jan
C (Donegal and Leitrim)	20 weeks	15 Sept – 31 Jan	15 Oct – 31 Jan	1 Nov – 31 Jan
C* (Cavan and Monaghan)	22 weeks	15 Sept – 31 Jan	15 Oct – 31 Jan	1 Nov – 31 Jan



Some key questions to ask yourself:

- Were all slurry stores empty at the beginning of the last winter?
- Have you had to go out to spread slurry during the closed period?
- Depending on the zone you are in, had you enough storage from the start of the winter housing period?
- Are you concerned that this is an issue on your farm?
- When did you first spread slurry this winter?

- If you spread slurry between the end of the closed period and the 15 February, it is an indicator of storage shortage or issues within the farmyard?
- Where are your dairy/parlour/collecting yard/pit washings stored on the farm?
- Have you excessive straw bedding in your storage calculations that is not actually used in practice?
- Have you considered or planned any

solutions to rectify any storage shortage?

Farmers who have insufficient slurry storage to meet the requirements of 16, 18, 20 or 22 weeks may be in breach of the nitrates regulations.

It is strongly recommended that all farmers plan for a minimum buffer of 20% or an additional two to four weeks storage over and above the minimum nitrates regulation requirements.

Complete storage assessment



The best way to start is to complete a full assessment of your farmyard with your Teagasc advisor for slurry, FYM, soiled water, dairy washings and silage effluent and come up with a plan to ensure you have enough storage to suit your farm.

Your advisor will calculate what storage you already have and what the shortfall is in terms of overall storage capacity required for the number of animals that you currently have or will have in the future.

Remember, if your stock numbers have already increased or are increasing, your slurry storage must also increase. So, build the cost of providing this additional storage into your business plan before you start increasing.

When doing the farmyard assessment, pay particular attention to where your dairy and parlour washings are stored. If they are stored in a slurry tank, they are classified as slurry and will significantly eat into the storage available to you.

Another area of attention is straw

bedding. If animals are actually wintered on straw bedding, it is perfectly fine.

In general, straw bedding is expensive and only a short-term fix. Loose housing, such as calving boxes, calf sheds or short-term calving areas cannot be included as available storage for these calculations.

Make sure that all clean rain water, including roof water, is diverted away from the farmyard. Keep soiled yards to a minimum.

Keep silage pits clean and tidy, so that winter runoff can be diverted away from storage facilities. Farmyards need to be managed in line with local authority requirements.

A key point in all this discussion is that you can have the best facilities in the country, but if they are not managed well during the year, you can still run into trouble.

Moving forward

Tackling this problem is very farm specific. It is rarely as simple as just building new extra storage. Take a step-by-step approach to increasing

capacity along the following lines:

- Install a drainage system to deal with clean surface waters, eaves and downpipes.
- Where appropriate, reduce stock numbers to match available storage capacity.
- Remove stock from outdoor feeding yards.
- Cover open tanks and/or open soiled yards.
- Construct new storage tanks/animal housing where necessary.
- Divert all dirty water to storage tanks and include in any calculations.

Next steps

Get in contact with your local Teagasc advisor to complete the farmyard assessment and discuss options. Prioritise easy fixes, discuss timelines/completion dates. Ideally a farm visit is required if and when COVID-19 restrictions allow.

In the meantime, you can do this over the phone, on Skype or Zoom with your advisor. So get in touch with your local office to arrange a suitable date and time.

Slurry storage capacity and TAMS

Tom Fallon
Teagasc Farm Buildings & Infrastructure Specialist



It is clear that many farms need extra slurry storage capacity to cope with wet spring weather and poor ground conditions as we experienced in late January and February this year.

In building new facilities we need, as far as possible to look beyond meeting the minimum storage requirements. As a rule of thumb, an additional 20% storage for dairy cows and 10% for other stock would give farmers some comfort in the spring time.

Tips

- Minimise the need to move slurry by having adequate storage for each shed or facility.
- Wider tanks to take 4.4m or 5m slats (14.5 feet and 16.5 feet slats respectively) are an economic way of getting extra storage.
- All tanks should be at least 2.4m (8 feet) and preferable 2.7m (9 feet deep).

Costs will vary depending on the size of the job, the local demand to get work done and the level of excavation and rock removal needed.

The cost of steel has increased due to a disruption in supply from the closing of furnaces during COVID-19. Steel just accounts for 20% of the cost of slatted tanks, excluding the slats. A double slatted tank will cost about 11% less than the equivalent single tank because a wall is shared.

Preparing for a TAMS application

Provided farmers meet the minimum slurry storage requirements, additional storage is eligible for a TAMS grant. The grant rate is 40% and 60% for young farmers who are eligible to apply under the Young Farmer Capital Investment Scheme (YFCIS).

All slurry storage facilities need



John Cheasty (right)
with his current Teagasc advisor John Maguire.

John Cheasty milks 105 cows in Fenor, Co Waterford. They produce 500kg milk solids (4.3% fat and 3.67% protein). John has expanded his slurry storage over recent years. The tank on the right (22.3m x 9.2m x 2.4m deep) was built two years ago, costing €35,000, including the fencing of both tanks. The TAMS grant came to €13,000, bringing the net cost to €22,000.

In recent years, John has sent his yearling heifers to a contract rearer for the summer. He believes in attention to detail and is always trying to improve.

"Having plenty of slurry storage capacity gives you peace of mind," says John.

"When he was our advisor, Tom Fallon paid huge attention to detail, designing a practical but also exceptionally safe facility."

planning permission or a Section 5 Exemption from planning from the relevant Planning Authority.

Although we don't know how long TAMS will continue it would be sensible to start planning now for facilities you plan to construct in 2022. The layout and size of the facility that will be submitted for planning will ultimately form part of your TAMS contract so it is vital that you discuss your plans thoroughly with your adviser/consultant.

Indoor agitation points and having adequate space around outside agitation points present challenges for many farmers. Please refer to the Department of Agriculture, Food

and the Marine (DAFM) Specification S123 page 18.

Difficulties with covering outdoor slurry stores

The DAFM Ag Climatise Roadmap envisages that outdoor slurry stores will have to be covered to minimise ammonia losses.

• We share technology with our nearest neighbour, the UK. There is no requirement to cover open slurry stores in the UK. Therefore, there appears to be no imperative to develop the technology to cover these stores especially existing ones.

• How do you cover an existing lined lagoon? Answers to the author, please.

*The Teagasc public website has useful information, such as 'Delivering a Farm Building Project Safely on Time' https://www.teagasc.ie/media/website/rural-economy/farm-management/Farm_Building_Project_Delivery.pdf.

Table 1: Indicative costs of slurry storage

	€/m ³ for net storage
Slatted tank	80-100
Overground steel tank	75
Open concrete tank	70
Lined lagoon	34

Why build a forage reserve?

Carry-over silage gives you peace of mind, and better options, when grass growth is poor.

Joe Patton

Teagasc Animal and Grassland Research and Innovation programme



Siobhán Kavanagh

Teagasc Kilkenny/Waterford



In 2017–2018, most farms experienced severe winter conditions followed by a summer drought that reduced annual grass growth by one quarter. To cope with such shocks, we recommend that farms build a rolling silage reserve of 400kg DM per livestock unit. That's the equivalent of two bales per head, or about one month's feeding for a mature cow.

This level of reserve represents a compromise between feed security and the cost of making and storing the additional feed. Consult your Teagasc advisor to devise the most appropriate means of building reserves for your circumstance.

In practice, developing a reserve will happen through a combination of better silage management and strategic purchase of reserves, where required. Having a forage reserve means that your options are much better in difficult years. Where the daily deficit is <10% on a DM basis, low fibre (NDF) concentrate products, based on native cereal and protein sources, can be readily used.

On the other hand, larger proportional deficits mean you have to buy in high fibre by-product feeds. Much of this product type is imported, with all that entails.

Increasing forage grown per hectare on your land is usually the cheapest means of building forage reserves. Many farms will increase their forage production by getting their fertiliser and liming right. This should be tackled before considering other options.

Management effects on silage yield – soil fertility

Silage yield and quality are often considered as competing objectives. However, a good base of soil fertility and a well-managed reseeding programme will deliver high yields at the quality required across the year.

On farms with poor soil fertility, silage cutting often gets delayed to build adequate yield. However, as shown in Figure 1, if soil fertility is improved, then the crop will reach target yield much earlier, leading to better quality and an improved recovery for second cut.

Management effects on silage yield – should first cuts be delayed for bulk?

On this point, it is vital to consider the yield of forage DM across the year as a whole, not just from a single cut. Figure 2 shows the effect of different first cut dates on total grass silage DM and forage energy (UFL) yield per hectare, in a two-cut system with a



Jack Kearney, Teagasc Glanbia future farmer.

fixed second cut date in late July.

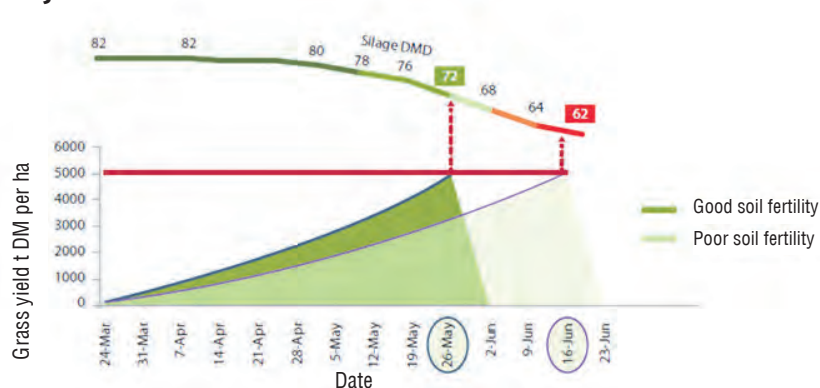
There was no advantage in total DM production to delaying first cut due to poor yield at second harvest. Worse still, first cut silage was lower in DMD and not suitable for growing cattle or calves, milking or suckler cows. Delaying second cut further, for the 'later' first cut swards, would have reduced availability of autumn after-grass and negated any silage yield benefit.

In fact, many farms who delayed first cut in 2017 experienced great difficulty in salvaging second cut crops in late August and September, which contributed to the silage shortage.

Low soil fertility may exacerbate this problem due to slower recovery and increased delay to second cuts. From a cost perspective, delaying first cut would not result in significant dilution of land charge (due to similar total DM yield per hectare), while contractor costs would be similar (particularly on a bale silage system).

Management decisions around first-cut silage yield should be made on the basis of meeting DMD targets and

Figure 1





Jack Kearney, Teagasc Glanbia Future Farmer farms with his parents, Larry and Annette, outside Rathcormac in Co Cork.

"After the fodder shortages of 2013 and 2018, we decided that we needed a plan for winter forage security, ensuring that we had the right quantity and quality of silage for the "normal" year plus a reserve of silage needed for the extreme weather events that have become more prevalent in recent times," says Jack.

There were three parts to the plan:

- Infrastructure – The herd had expanded since the original pits were built on the farm and they were no longer fit for purpose. Jack built two new silage slabs.
- A reserve for difficult years – "A normal winter for Jack's herd is four months, but to have forage security for the difficult years, he needed to conserve the equivalent of an additional two bales of silage per livestock unit in the herd as the reserve," says Teagasc/Glanbia programme advisor Richard O'Brien. "This might only be used every three to four years."

Jack contends that the old saying of "old hay is like money in the bank" is true.

- Appropriate quality – Jack aims to match the silage quality to the animals being fed: "We want to have the flexibility to vary the quality of the silage we are making, with moderate-quality silage for the dry cows but high digestibility silage for the milking cows and the young stock on the farm." Two new silage slabs have given him that flexibility.

Key messages

- Target a reserve of 400kg DM per livestock unit into your silage plans. That's the equivalent of two bales per head or one month's feeding for a mature cow.
- Build soil fertility on the farm in general, and on silage ground in particular.
- First-cut silage yield should be made on the basis of meeting DMD targets

and improving annual grass tonnage per hectare, rather than focusing on the bulk of any individual cut.

- The cost of building a feed reserve highlights the need to closely examine the economics of increasing herd scale based on conserved forage and concentrates.
- Adequate fodder storage space is critical to managing feed reserves.

improving annual grass tonnage per hectare, rather than focusing solely on the bulk of an individual cut.

Cost

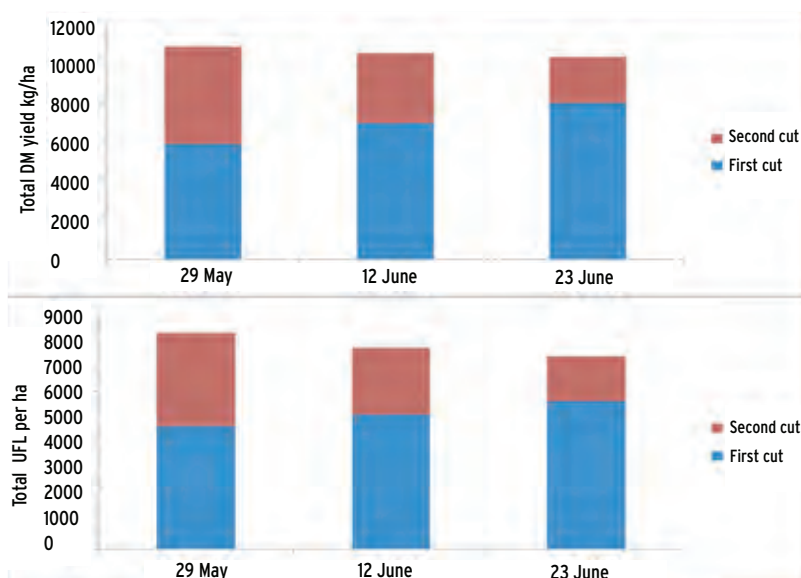
At recommended volumes and a moderate forage unit cost of €160-180/t DM, a standard dairy herd would need to invest €80-€140 per cow for no increase in milk revenue.

However, unlike purchased feed that is used within the year, the reserve is retained as stock inventory and so is largely profit-neutral. The cost of building a feed reserve highlights the need to examine the economics of increasing herd scale based on conserved forage and concentrates.

Fodder feed space

Having adequate fodder storage space is critical. Investment in this aspect of farm facilities has been relatively low in recent years, despite significant increases in dairy herd size in particular. Teagasc recommends that forage storage costs be factored into any farm development plan where annual feed demand is increased.

Figure 2: Effect of first cut date on total silage DM and UFL yield in a two-cut system



slurry storage

Reducing silage waste

Cost savings, better quality, higher intakes and no fear of running short are all benefits of taking action. Everything you take out of the pit could be edible.

Tom Fallon

Farm Buildings and
Infrastructure Specialist,
Teagasc Kildalton


Francis Quigley

Milking Machine and
Machinery Specialist,
Teagasc Kildalton



Minimise the amount of slurry that could come in with the grass by spreading slurry early, at the correct rate and rolling the silage ground.

Ensure the soil is in good health. Avoid soil compaction and lime where needed. It may be convenient to spread lime immediately after the first cut, provided a second cut is not planned for the ground. Maintain good soil fertility.

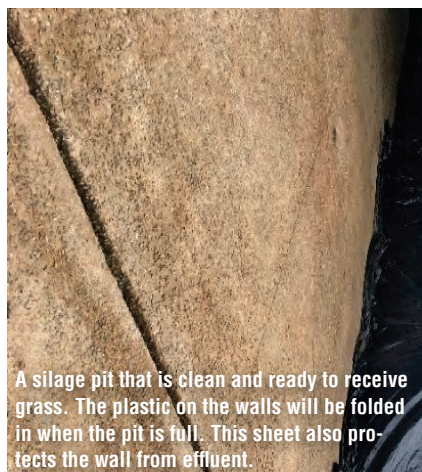
Check silage fields, especially near public roads or laneways, for rubbish that could be detrimental to the silage or animal.

Cleanliness around silage making is critical. This is really about advance preparation. The silage pit and environs, as well as entrances to fields/paddocks and roadways, must be clean.

Keep air out

Line the pit walls with plastic to prevent air from moving between the wall and the grass. Silage is preserved by lactic acid bacteria, which convert the sugar in grass into lactic acid, but only in the absence of oxygen.

It is essential to prevent air pockets



A silage pit that is clean and ready to receive grass. The plastic on the walls will be folded in when the pit is full. This sheet also protects the wall from effluent.



Michael Cody Glenmore, Co Kilkenny, using cable ties to hang gravel bags to the 'Zill' heavy-duty pit cover.

by filling the pit evenly, rolling the grass well (especially at the top and shoulders of the pit) and using at least two sheets of plastic to cover, with a new sheet on the outside.

Good preservation keeps spoilage organisms like clostridia, moulds and yeast at bay.

Any lack of attention to detail in sealing the pit will let in air and delay the preservation process, increasing losses. Silage pits must be airtight.

The amount of air in the pit before sealing depends a lot on the grass dry matter (DM).

In grass under 24% DM, there is very little space for air, as these spaces are filled with effluent. With material over 30% DM, air can find its way deep into the pit unless it is very well rolled and consolidated.

Compacting the grass

Leafy, wet, short, chopped grass will compact a lot better than dry, long chopped, stemmy grass. Nowadays, pits are filled very fast, so there isn't as much time for rolling and consolidating. The loader is heavy, but usually has wide tyres. Compacting the grass is a challenge. Spread loads as evenly and thinly as possible, leaving no lumps and humps or hollows.

The sides of the clamps pose a particular challenge. Often they are relatively steep, which means they can't be rolled for consolidation. It is important that the sides are well built with a uniform slope, without humps or hollows. This will ensure that the silage covers lie right up against the ensiled material, leaving no air pockets once they are weighted down.

Many farmers need to invest in silage storage to match an increase in stock numbers.



Overfilling

Increasingly, pits are being overfilled. Pits are narrower as they rise, increasing the danger of the loader toppling. The effectiveness of consolidation is reduced. At feed out, stripping back the cover and tyres becomes more dangerous and difficult.

The surface of the grass before covering should be smooth, without humps and hollows, eliminating air pockets and ensuring rainwater falling on the covers flows off. Water lodged in depressions causes surface damage and if it leaks through, will leave a column of bad silage. The covers must be weighted down well using a combination of tyres, mats, gravel bags and nets.

Covering the pit

Nets are great for keeping the covers in close contact with the ensiled material. Nets should be non-slip, to make them safe to walk on. Tyres should be placed edge-to-edge, with heavy lorry tyres along the sides. Less tyres are needed when heavy-duty covers are used. An ingested wire can kill an animal, so get rid of any tyres with exposed wires.

Gravel bags exert much more pressure for their size than tyres. They should be used in a line to seal clamps at ground level.

This seal should be right in close to the ensiled material, well inside any channel in order to prevent any air getting back up the pipe in the channel during storage.

Overlaps of the covers should be 1.2m to 1.8m and weighted down with gravel bags as well as tyres to make them air-tight. All too often, polythene on the sides of clamps can be seen flapping in the wind, because the initial covering was never retightened once the clamp settled. This causes massive surface waste and poor preservation in layers below this surface waste.

There are now covers available that cling to the ensiled material, preventing air pockets forming, reducing the amount of air taken in throughout the storage period. These work best where the pit will not be reopened during the summer.

The challenge with heavy duty covers is preventing them being damaged by a shear grab.

Impact of wind

Top and side waste seems to be worse on the windy side of clamps. Wind blowing over silage creates all sorts of pressures that will force or suck air if there are any deficiencies in the covering.

Regularly inspect and repair silage covers. Catching a damaged cover early can help minimise spoilage from oxygen exposure.

Walled pits

Walled pits are better and safer than clamps. They are also generally easier to cover effectively. However, silage waste against the walls is common. Gravel bags are needed

here also, and any water flowing on the cover towards the wall should be channelled away.

To achieve this, the pit would need to be well consolidated beside the wall from the ground up. Overfilling of walled pits is also common and again, makes effective sealing of the edges more difficult.

To prevent burdening the walls with extra weight above their design weight, grass piled above the walls should slope in at 45 degrees. This makes effective rolling at the walls difficult. The extra work and expense dealing with waste silage is considerable.

Wilting – Toss out the grass only on the basis of necessity

As far as possible, mow down dry grass. Pick up swards within 24 hours.

- In dry weather, the dry matter in standing swards can exceed 20%. These swards need minimal wilting and it is difficult to justify spreading out the grass. Cut into standard swards (approximately 2.7m) in the afternoon with a mower conditioner. The contractor may require two or three swards to be raked together to get the harvesting done quickly.
- When a good wilt is needed (grass sugars are low at about 2% etc). Mow around 10am and spread out the grass as soon as possible.

'Swallows of the night':

Bats are fascinating and oft-misunderstood

Picture: Donna Mullen

Catherine Keena
Teagasc Countryside
Management Specialist



Tina Aughney
Bat Conservation Ireland



Seeing bats acrobatically catching insects in flight, it's little wonder they are known as 'swallows of the night'. Their name as *Gaeilge* is just as descriptive – '*Sciathán leathair*' meaning leather wings. Some people are afraid of bats, probably because they are nocturnal and due to the many myths about them.

Bram Stoker hasn't helped the cause with all those wonderful horror films. However, there is no reason to fear bats. They are an individual mammal group more closely related to humans than any rodents.

They give birth to a single pup per year when the females form maternity roosts and, like all mammals, suckle their young. They are the only true flying mammal and are found all across the world, apart from the north and south polar caps.

There are nine species of bat in Ireland. All are small but have long wings – the body of a pipistrelle is typically the size of your thumb, but the wingspan is about 25cm. Our biggest bat is the Leisler's bat, which can still fit into the palm of your hand. It has a 32cm wingspan.

Bats have an important role in the natural ecosystem, keeping insect populations in balance. They are a very good indicator of how good our habitats are.

A healthy population of bats tends to indicate that the area is in good environmental condition.

'As blind as bat' is one of many myths. Bats are nocturnal mammals with good eyesight, but in the hours of darkness they rely on echo location (sonar) to hunt and orientate them-



Common Pipistrelle.

selves. This system of echolocation is so fine-tuned that bats will not fly into your hair – just to break another myth about bats.

Bats rely on linear habitats such as hedges to fly through the landscape. Hedges are like roadways for bats, allowing them to commute through the landscape, from their roosting sites to important foraging habitats such as woodlands and waterways.

Hedges

Hedges can be a very valuable resource, providing insect prey for bats. Bats in Ireland only eat insects and they eat a phenomenal amount of them. The Common Pipistrelle and Soprano Pipistrelle, our smallest bat species, can consume 3,000 insects, midges for example, in one night. So, bats are a very valuable predator of insects. Tall, thick hedges are ideal for bats, as they are more valuable as commuting routes and as a foraging habitat with lots of insects.

If you're out walking in the evening and see something flying by, it will likely be a bat. It's not going to be a bird flying at that hour of the night – not unless it is an owl, which is much bigger and therefore unlikely to be confused with a bat.

So, if you see something flitting up and down making lovely circles about three to four metres above the ground alongside the hedge, it is most likely to be a pipistrelle bat out foraging.

If you have a bat detector, an instrument that picks up the echolocation of bats, tune it to 50kHz and you will hear an array of popping noises. Welcome to the acoustic world of the bat!

Bats will roost in good mature trees in hedges. That's why it is very important to retain some trees in hedges. Trees with holes or split limbs provide a space for bats to roost.

Buildings

Bats are usually seasonal visitors to buildings, but at different times

Leisler's bat.



of year. Between mid-March and September, breeding female bats form maternity roosts to give birth and raise their pups.

Most bats choose buildings as maternity roosts to take advantage of warm locations, including occupied buildings. In winter, bats need quiet, undisturbed roosts of relatively constant temperature for hibernation. Cellars, crevices and roof spaces of abandoned buildings are commonly used.

Bats can also use roosts in buildings as 'transition roosts' between summer breeding and winter hibernation, or 'night roosts', in which to rest between feeding periods.

The Lesser Horseshoe bat flies into open accessible areas to roost, as they can't crawl into crevices and tight spaces like other bat species. They are the only bat species in Ireland which hang upside down, with their wings wrapped around their body.

This leaves them exposed to disturbance and may be why they often use uninhabited buildings.

They prefer large entrances. These allow them sample the light before emerging. They form maternity roosts in the roof spaces of buildings such as old houses, stables and outhouses in summer. In winter, they hibernate in the cellars of old ruins, as well as caves, mines and souterrains.

Ireland has the second largest national population of Lesser Horseshoe bats in Europe. The range in Europe has been contracting.

As a result, it is listed under Annex II of the Habitats Directive, a list of species whose conservation requires the designation of Special Areas of Conservation. It is confined to the west and southwest of Ireland.

The Common and Soprano Pipistrelle bats are the species most likely to use occupied buildings as materni-

Bat Conservation Ireland is a small wildlife charity dedicated to the conservation of bats in Ireland. There are lots of resources for people to learn about bats. Bat Conservation Ireland runs the Irish Bat Monitoring Programme and volunteer participation in this programme is an ideal way to learn more about bats. The Daubenton's bat waterway survey takes place annually in the month of August, where people can learn how to use bat detectors to monitor bats themselves and survey their local waterway.

For further information visit:
www.batconservationireland.org
www.learnaboutbats.com

ty roosts. They tend to occupy crevices, rather than open attic spaces, in a variety of modern and old structures. The brown long eared bat roosts in large attic spaces, outbuildings and churches, as well as holes in trees.

Watercourses

Often called the 'water bat', the Daubenton's bat is easily recognised in flight by its low level flight a few centimetres above the surface of lakes, slow-moving rivers and canals.

It skims like a hovercraft above the water in search of caddisflies, mayflies and midges, and may even scoop prey from the water surface using its big feet.

Many other bats feed over lakes and rivers, but none has such a close association with water as the Daubenton's. They can even swim if they make a mistake and end up in the water. They roost under stone bridges, in ruins, canal tunnels, trees and damp caves.

Picture: Faith Wilson

The brown long eared bat.



Picture: Frank Greenway

Daubenton's bat.



Protecting bathing waters

Farmers and advisors are working together to prevent pathogens from reaching rivers and lakes.

Noel Meehan
Agricultural
Sustainability Support
and Advisory
Programme Teagasc



David Webster
ASSAP Advisor
Westmeath/Offaly



In Ireland, we have a large number of beaches and lakes ideal for swimming and water sports. In total, The Environment Protection Agency (EPA) monitors 147 locations for their 'suitability for public bathing'.

The majority are on the coast, but lakes are also monitored for contamination with bacteria and other pathogens. The bathing season runs from the 1 June to 15 September each year and 95% meet the required standards.

While these results are positive, there is the potential for any bathing location to be contaminated with pathogens such as E.coli/intestinal enterococci. Humans or animals can be the origin of these nasties and they can arrive via waste water treatment plants, slurry spreading or animal access to streams/lakes.

Teagasc advisor David Webster works with the Agricultural Sustainability Support and Advisory Programme (ASSAP) in Co Westmeath, providing a water focused advisory service to farmers in Priority Areas for Action (PAAs), in collaboration with the local dairy co-ops and the Local Authority Waters Programme (LAWPRO).

"Westmeath has three bathing water monitored lakes and we have been working closely with farmers to minimise any impact on them from farming activities," says David.

"The bathing waters are a great resource to have in the county from a recreational and tourism point of view and there is great pride in seeing the public availing of these facilities.



"The activities that have the potential to lead to pathogen losses are applying slurry during the summer and allowing cattle access to the lakes or streams that flow into them.

"Cattle slurry is a source of pathogens and this needs to be carefully applied all year round, but especially so during the summer months when it can have the greatest impact on bathing waters."

Applying sufficiently wide buffers when spreading will help break the pathway and reduce pathogen losses.

Farmers are advised to adhere to the required buffer zones for slurry spreading: 5m from drains/streams and 20m from the lakeshore.

However, these distances should be increased in fields that are high risk, and in some cases, slurry shouldn't be applied at all.

"The greatest risk is when you have a wet summer," says David Webster.

"Farmers need to empty the slurry

tanks after the silage is cut and even though slurry may be spread in dry weather, subsequent rainfall can lead to surface runoff of slurry into the drainage network."

Allowing cattle access to streams to drink can also lead to an increase in pathogens, due to excretion of faeces. Providing alternative water sources to livestock can greatly reduce the impact of drinking points on water quality.

By being aware of the potential issues that can lead to impacts on bathing waters, farmers can adapt their farming practices to minimise losses and play their part in protecting an important resource for their communities.

Local farm families, as well as visitors, are keen to swim and paddle in these waters – with simple steps we can protect them from water-borne infection.

Why a sunny day spells danger

Frances Bligh
Teagasc Health and
Safety Specialist



Skin cancer is the most common form of cancer in Ireland, with over 13,000 cases of skin cancer diagnosed annually. You can do a lot to reduce the risk. CSO figures (2018) suggest that almost one in four (26.6%) of skin cancer deaths are related to the construction, outdoor and farming industries. One death every week in Ireland is at least partly due to sun exposure at work.

We live in a cloudy, often rainy, country. Why be concerned?

Farmers are one of the highest-risk groups for skin cancer. Ultraviolet (UV) radiation is damaging all year around, even on cool, cloudy days. Farmers are at risk because they spend a large amount of time outdoors. Overexposure to UV can cause sunburn, skin and eye damage and skin cancer.

What does UV light do?

Dr Triona McCarthy, consultant in public health medicine, National Cancer Control Programme (NCCP), explains how UV rays affect your skin: "As with many cancers, malignant melanoma skin cancer develops when cells are damaged and grow uncontrollably. Exposure to [UV] rays from the sun, even on cloudy days, or from artificial sources like sunbeds, is the most common cause of skin cancer."

Earlier research by Dr Breda Smyth indicates that farmers have three times higher cancer mortality than blue/white collar workers, with skin cancer being a major source.

What can farmers do to avoid skin cancer?

Getting sun burnt increases your risk of melanoma skin cancer, the most serious form of the disease. While being burnt is very damaging, long-term exposure without burning can



Melanoma.



also significantly increase the risk of skin cancer.

If you work outdoors, you are exposed to two to three times more UV than someone who works indoors, so you have a higher risk of developing skin cancer. Exposure to UV damage is irreversible, permanent and cumulative with each exposure. Review your UV exposure – how long are you outside during the day and how many days of the week?

When is the highest risk?

When the UV index is 3 and above, you need to protect your skin, even if it is cloudy. UV from the sun is strongest between 11am and 3pm – plan for this in your daily schedule if possible and try to take lunch breaks or work in the shade at this time. UV is strongest between April and September. You can check the UV index on the Met Éireann website and app (see www.met.ie/uv-index).

How can you protect yourself when outdoors?

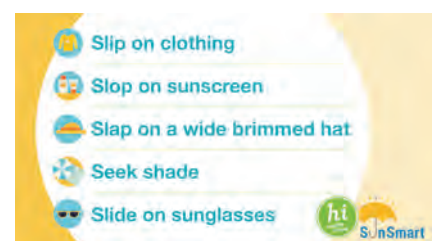
Never rely on sunscreen alone. Use protective clothing that covers your exposed skin, such as long sleeves, collared shirts, wide brimmed hats

and sunglasses (wraparounds are best). To help protect your skin, use broad spectrum water-resistant Sun Protection Factor (SPF) of at least 30+ and apply every two hours.

How can you catch skin cancer early?

Check your skin regularly for changes and contact your GP if you notice a lump or discoloured patch. Look out for a new growth or sore that does not heal in a few weeks, a spot or sore that itches, hurts, crusts, scabs or bleeds, constant skin ulcers with no other explanation for their cause and new or changing moles.

If you would like more information about supporting outdoor workers to be sunsmart, contact prevention@cancercontrol.ie or check out www.hse.ie/cancer and www.cancer.ie.



Are diesel's farm days numbered?

Farm machinery prototypes that operate with zero carbon emissions are now available.

Barry Caslin

Teagasc Energy & Rural Development Specialist,
Teagasc Rural Economy Development Programme



Transport counts for the largest share of energy use in Ireland and 97% of transport energy was sourced from oil-based products in 2018. The Government is committed to decarbonising Ireland's transport sector, which currently makes up 20% of Ireland's greenhouse gas (GHG) emissions.

Biofuels bring a wide range of environmental benefits, including the reduction of greenhouse gases and other emissions. Bioethanol, for example, is typically produced from crops such as maize, wheat and sugar cane, with biodiesel produced from oil crops such as rapeseed as well as from wastes such as used cooking oil and animal fats.

So, while farms can be big users of energy, they also have a great capacity for energy generation and storage. But biofuels alone won't be the answer.

Alternative fuels to diesel include biogas, hydrogen and electricity. Non-diesel tractors are not a new phenomenon. Engines such as the Brutschke electric tractor in the early 1900s and the Allis Chalmers fuel cell tractor from 1959 were interesting developments, but weren't viable in the 20th century when oil was relatively cheap for the user.

The full cost in terms of global warming was never included in the retail price. We are now seeing prototypes run on innovative fuels, particularly hydrogen, in battery

electricity and biomethane. We are also increasingly seeing the use of autonomous vehicles (machine robots) as a means of cultivating fields, harvesting, etc.

So large, heavy, 100hp – 200hp tractors may be replaced by lighter multi-purpose vehicles powered by electricity or even hydrogen.

The components needed to make batteries and the sources of hydrogen, including the cost of materials, need to be kept in mind. Nonetheless, interesting transport and fuel technologies are emerging.

Electric

The case for solar and wind as renewable energy sources is continually improving and renewable electricity from such technologies is now supported by Renewable Electricity Support Scheme (RESS) auctions. Fendt are working on electric battery-powered vehicles, as are New Holland and John Deere.

“ We are facing into exciting times with opportunities to decarbonise our heat, transport and electricity sectors

John Deere presented the first fully electric tractor, known as the SESAM (Sustainable Energy Supply for Agricultural Machinery), back in 2016.

More recently, John Deere's autonomous tractor concept is powered by a very compact electric drive unit.

The tractor has a total output of 500kW and can be equipped with either wheels or tracks. Flexible bal-

lasting from 5t to 15t is possible, to help reduce soil compaction. Thanks to the electric drive, there are no operating emissions.

JCB recently announced their all battery 24kWh electric 5256-60E telehandler. It powers a full day on a single charge.

This is a good step forward, which may not be out there ploughing and harvesting in the fields yet, but the direction looks clear. It's not cheap, but is a good example of how a company like JCB is moving forward, not only with battery vehicles but also with hydrogen for some of their earth moving equipment.

Biomethane

Switching from electricity, consider biomethane, which is an upgraded biogas that can be used to power





Picture courtesy of John Deere

vehicles. Biomethane, or renewable natural gas (RNG), is methane produced by anaerobic digestion (AD), plants fed with energy crops, animal manures and the food sector.

In Ireland, we have the potential to produce biogas and upgrade that biogas to biomethane for fuel cell vehicles. This is proven technology. The Valtra N101 is developed as a prototype biogas tractor. The idea of using the farm as a filling station could be an interesting concept in the future.

Hydrogen

There are already prototypes such as the New Holland hydrogen tractor. We are also seeing prototypes in buses from Linde and in cars from Toyota. But with 95% of global hydrogen production currently coming from fossil fuels i.e. 'grey' feedstocks, it does not help any 'net zero' ambitions. It may

be possible to generate hydrogen using renewable energy in the future.

There is a distinction between blue hydrogen, which comes from carbon capture and storage generation, and green hydrogen, which come from electrolysis, usually through solar and wind.

The general feeling is that until the hydrogen infrastructure improves, progress will be slow, but within the next 10 years, it could have a significant impact on the farming and transport fleets.

So, we will have a growing range of low emission vehicles available. Larger vehicles such as refuse trucks and farm tractors will require hydrogen and biogas for the necessary power to weight ratio.

Government funding will be needed to support the integration of on-farm power generation and its use as trans-

port fuels.

Farms are ideally placed to help meet Net Zero targets and our renewable energy targets, but our rural electricity grid was not built for 'two-way traffic'. It was built to put power into our homes and farms, and it has done so spectacularly well.

But we need to look at an enhanced electricity grid with a decentralised programme, with much more storage and vehicle-to-grid technologies possible. A weak rural electricity grid will restrict deployment of electric vehicles.

We are facing into exciting times, with opportunities to decarbonise our heat, transport and electricity sectors, and farms and farmers can be sure that they will not only have new sources of power for their vehicles, but also potentially new markets for farm-produced energy.

A good return and a growing legacy

This Cork farmer says there are short and longer-term benefits from prudent planting.

John Casey
Teagasc Forestry
Development Officer



I always aim to do the right thing, even if not at exactly the right time,” jokes James O’Sullivan, Clara, Millstreet, Co Cork, as he describes his experience managing his farm forestry and building his forestry knowledge and confidence over the last 30 odd years.

In 1989, James’ late father, Matthew was rearing cattle part-time on 34ha just outside the town. James encouraged his father to plant trees on 10.5ha of marginal agricultural land away from the main farm. At the time, his father was unsure about this decision, due to the permanency of the land use change.

However, he also felt on balance that that the land was “of no real farming use” since the cost of reclaiming and maintaining the wet, marshy ground couldn’t be justified.

James freely admits that they were looking no further than the grant aid when they planted the mainly Sitka spruce crop.

A further 1.5ha of Sitka spruce and ash were planted in 1994 by SWS Forestry. “The subsequent performance of the trees certainly convinced us of the strong credentials of farm forestry,” he says.

The majority of the 1989 crop was ready for first thinning in 2010. Conventional harvest management of a Sitka spruce plantation may result in just 20-25% of the initial tree stocking being left at the clearfell stage, following a number of regular thinning operations.

The remaining trees are left with more light and room to grow to their full sawlog potential.

The thinned trees can be sold to make a variety of products such as

stakes, pallet, paper, or medium density fibreboard (MDF).

The thinnings from James’ spruce crop were sold ‘standing’ to Grainger Sawmills of Enniskeane, Co Cork, (known as GP Wood since 2013). There was good road access to the forest site, with a gated barrier in place.

To monitor how much timber was leaving the site, James requested that the haulage contractor ring him 30 minutes in advance to open the barrier for each of the 14 loads. Approximately 350t were harvested and James received €11/t directly – nearly €3,900 in total.

Planting

The successful and profitable thinning of his first crop prompted James to consider further planting. I walked his farm in 2010 and we went through the various planting options.

The proposed new planting area was nearer the farmyard and James felt that he would prefer broadleaves closer to the house to provide landscape and biodiversity enhancements. The higher premium for broadleaf species was also an incentive.

According to James: “Planting broadleaves was better for the environment and future generations in the long run and better for my pocket in the short-term.”

In the end, James planted 5.6ha and 4.5ha of mainly oak, with some ash and birch, in 2011 and 2012 respectively. Collectively, the afforested land earns James €6,000 per year in premium.

“A wonderful start to any new year,” says James. “My only regret is that I did not plant more 20 years ago.”

In May 2011, James hosted a joint Teagasc/Forest Service early management walk, which shared valuable insights on early broadleaf management, vegetation control, shaping and stocking with new forest owners.



James reckoned that he also gained “huge information” from the questions posed by the attendees.

By 2017, the Sitka spruce plantation was 28 years old and was ready to be thinned for the second time. After shopping around for the best



James O'Sullivan in his 2011 oak plantation.

prices, James again sold the timber – standing – to GP Wood. His relative proximity to their sawmill benefitted both parties.

James stresses the benefits from his good relationships with, and between, his buyer and a competent haulage

contractor. James earned €7,900 from the second thinning.

Knowledge Transfer Group

In 2019, James signed up to participate in a DAFM-funded forestry Knowledge Transfer Group (KTG),

organised by Forestry Services Ltd. KTGs are a well-established method of sharing knowledge and best practices.

These forestry KTGs support private forest owners seeking additional knowledge on issues such as when, and how, to carry out forest management activities in a safe and environmentally responsible manner.

The KTGs also provide a maximum of 20 participants with the essential tools to help maximise the returns from their valuable timber resource. Knowledge of that value plays an integral part in decision making on whether to retain or sell mature and semi-mature woodland.

Forestry KTGs are peer-to-peer discussion groups led by a professional forester and incorporate both classroom style knowledge exchange as well as practical learning elements.

In James' case, the KTG sessions consisted of five indoor and two outdoor meetings and he received €70 per meeting attended.

"I was very interested to tour GP Wood's mill in Enniskeane and see for myself where the thinnings were processed," says James.

James hosted a field trip to his own forest, as it was perfect to demonstrate a range of forest stages, from early management to second thinning, with both conifers and broadleaves on view in abundance.

Future plans

In the spring of 2020, James and I walked the forestry on his farm, assessing both the harvest prospects of the maturing 32 year old conifer plantation and the progress of the younger 10 year old broadleaf forest. The more immediate priority for James is the second shaping of the 10 year old oak forest.

Shaping is the process of removing forks and large competing side branches in order to improve the quality of broadleaf trees, resulting in long, straight lengths of timber for future sale to higher value markets.

Armed with a paint marker and Teagasc's *Silvicultural Guidelines for the Tending and Thinning of Broadleaves*, James is now ready to start marking what he considers to be his 'Potential Crops Trees' (PCTs) – approximately 300 per hectare of the strongest and best quality trees. The overall shape/form of these trees will then be improved by shaping next winter.

"The oak plantation provides me with a great sense of calmness in these turbulent times," concludes James. "And it's nice to feel you are making a good return, but leaving a bit of a legacy too."

Doing less boosts biodiversity

Paul Fitters

Lecturer in the Teagasc
College at the National
Botanic Gardens



In 2001, the owners of the large Knepp estate in West Sussex in the UK found they were no longer making ends meet. They stopped farming altogether, sold their stock, took out all the internal fences and released deer, longhorn cattle, Dartmoor ponies and Tamworth pigs (all relatively close to their wild ancestors). The next thing they did? Nothing.

The aim was to increase biodiversity, but not only did the animals multiply, their behaviour set in motion a cascade of events that led to an explosion of insect numbers, followed by a dramatic increase in birds, bats, mammals etc.

The estate now has the highest number of nightingales, rare turtle doves and purple emperor butterflies, to name but a few species. The owners make a good living by selling organic meat (culling is essential, as there are no wolves or other carnivores to keep the numbers down), organising safaris in their 'wilderness' and offering glamping events for nature lovers. (<https://knepp.co.uk/home>).

Such 'rewilding'* seems to me the way to go in conservation. Rather than actively conserving an area for the sake of one species, why not leave areas do their own thing, so that more species might benefit? However, these protected areas remain vulnerable to extinctions if small and isolated.

We need corridors between these core biodiversity areas, so that animals can travel from one to the next. Corridors can be hedges, road sides, railway lines etc, but also gardens. Private gardens are small, but numerous, and can represent more than one-third of some cities' surface area and are essential for connecting parks and countryside.

What can you do?

Similar to the Knepp estate, perhaps you should do 'nothing' by leaving part of your garden to 'do its own thing'. Start by doing less mowing. A 'well kept' lawn is really a monoculture with just grass and little biodiversity. Not mowing will allow daisies and clovers to flower, which in turn will attract pollinating insects like bees. You can mow a path through your wildflower meadow so that you have access and it will still look kept.

Why not clean up less? When I cut back my herbaceous plants, I drop the



Archway made of locally produced logs creates an attractive entrance into a meadow.

prunings wherever I can. This saves me bringing it to the compost heap, and having to bring it back next year.

This adds a natural layer of organic matter, which feeds the soil and provides habitats for animals.

Similarly, if you are pruning trees, leave some of the wood lying around as valuable habitats for fungi and beetles. However, if plant material is diseased, such as black spot-infected rose prunings, dispose of it carefully.

Finally, if you have the space, a pond would really finish off your

garden rewilding project. Ponds are a magnet for wildlife. In short, the more different habitats you can create in your garden, the more wildlife it will attract.

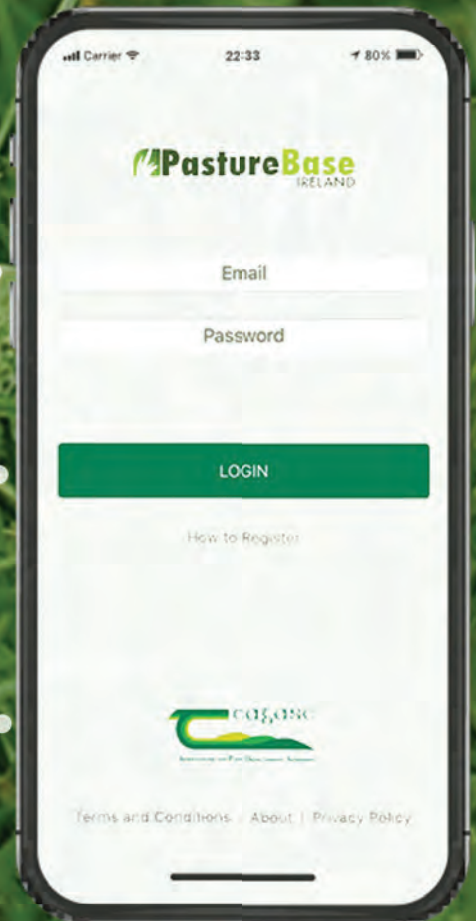
With less maintenance to do, you can start spending time observing and enjoying the biodiversity in your garden.

*Rewilding was coined by conservationist and activist Dave Foreman, (1990)

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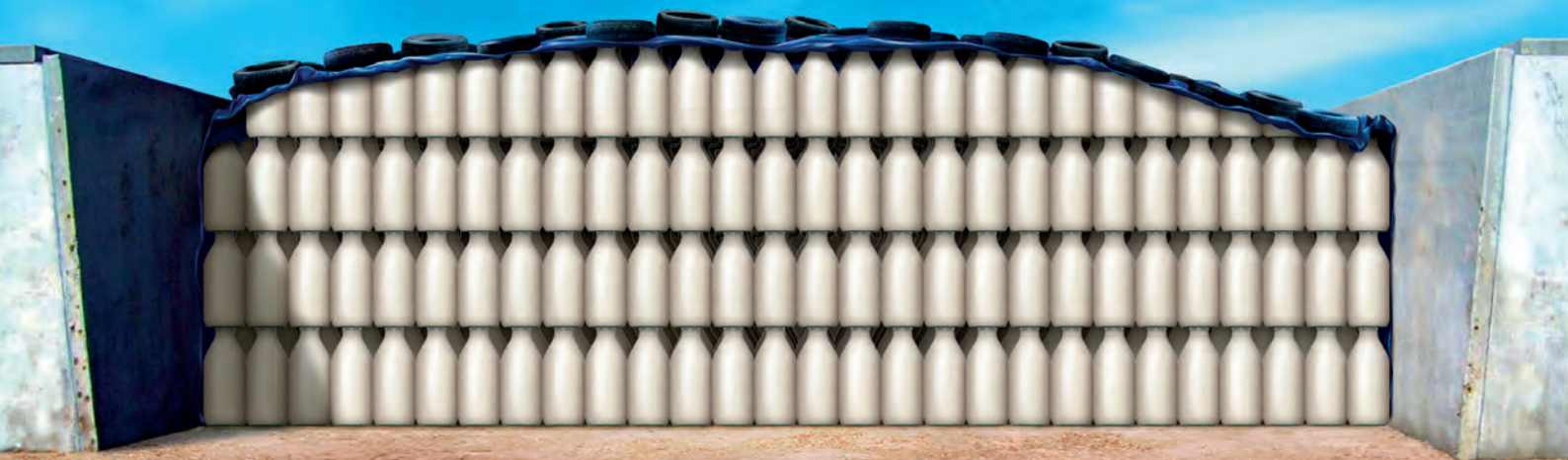
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