



Today's Farm

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COMMENT



Mark Moore
Editor,
Today's Farm

It's an ill wind that doesn't blow some good

CCOVID-19 is a very ill-wind indeed. One glimmer of hope is that it is forcing us to experiment, find new solutions and question things we have always taken for granted.

Farmers are taking part in virtual discussion groups for example, using their smartphones. These will not replace the real thing, where we meet our neighbours to socialise and enjoy company.

As I said, you have to look hard to find an up-side to this crisis. But virtual meetings may have a use, at busy times for example, saving on travel time, and where the weather is extreme. The main advantage is that they allow groups to remain in touch.

Is olc an ghaoth

Tá laonna agus uain ag teacht ar is gaoth olc é COVID-19 gan amhras agus is deacair a fheiceáil cén chaoi a bhféadfadh aon mhaitheas a theacht as. Léaró dóchais amháin go bhfuil sé ag cur orainn triail a bhaint as rudaí nua, réitigh nua a aimsiú agus amhras a chaitheamh ar rudaí ar ghlac muid leo riamh gan aon cheist. Tá feirmeoirí ag glacadh páirt i ngrúpaí plé fíorúla lena bhfón cliste, mar shampla.

Is mór idir iad agus an chaoi ar nós linn teacht le chéile lenár gcuid comharsan le só agus sult a bhaint as an saol, ar ndóigh. Ach d'fhéadfadh cruinnithe fíorúla a bheith áisiúil amach anseo freisin, nuair a bhíonn gach mac máthar cruógach, cuir i gcás, de bharr nach gcuirtear am amú ag taisteal ar fud an bhaill, agus nuair a bhíonn drochaimsir ann. Mar a deirim, caithfidh an-iarracht a dhéanamh an taobh dearfach den scéal a fheiceáil.

Farmers providing a giant bird-table

ENVIRONMENT >> 28-29



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Cover | The quality of silage made on farms has plateaued in recent years. How, and why, you can beat that trend is discussed by Joe Patton on page 23 and Peter Lawrence on page 26.

Keeping in touch

Managing uncertainty

Tom Kelly
Teagasc Director of
Knowledge Transfer



The COVID-19 crisis has, and will continue to, test our mental and physical capacity to deal with uncertainty. It seems that we have to adapt different way of doing everyday things that normally we take for granted.

However, life goes on our farms, and the work at these busy times is prioritised as best we can, we are fortunate to be busy and to live in semi-isolated environments already. We, in Ireland, are also very fortunate to have long-established support systems for our inputs and outputs, our farm organisations and support services. These are the people we depend on in a crisis to be innovative and to find solutions to problems quickly.

I am impressed by the response of farmer clients to the workaround solutions put in place by Teagasc staff across all the enterprises and activities. We have many alternative ways to do our work and these have been developing and gaining popularity gradually. YouTube videos, Facebook, podcasts, webinars, Moodle, etc, have grown in usage and popularity in recent years.

Being able to do work without face-to-face contact is a solution for this crisis but I am sure that what we learn will impact on our plans to deliver advisory and education services in future.

For the many who do not have good digital connectivity yet, this is a harder time and maybe it will ensure that the public commitment to rolling out fast broadband to all will accelerate. Mobile phone usage is high among farmers and we have used text messaging for 20 years or more. We are doing a lot of work over the phone and it is quick and efficient with call or text options and for some the possibility to use FaceTime.

For discussion groups, it is really important to continue a schedule of regular meetings by phone. These have started and while current social distance restrictions apply they will

continue. Who knows, maybe we will continue to expand our work through digital formats

Teagasc advisory staff are using a suite of digital advisory and communication tools and operating “virtual offices” to cope with the current COVID-19 restrictions which required the closure of the advisory offices.

The onset of the COVID-19 crisis has speeded up the introduction of digital communications methods that Teagasc had been trialling on a pilot basis. Advisors and their clients have taken to the new approach quickly and most of the farmers are accessing the new services on their smart phones.

• **Basic Payments Scheme (BPS):**

All BPS consultations with clients are now being done over the phone. Rather than come into the office the clients just ring in at the appointed time. All clients get a hard copy of their application posted or emailed to them as a permanent record.

• **Helpline:** Teagasc has put in place a helpline for farmers to get advice on the range of issues that they may face as they continue to do their essential work in maintaining the food supply chain. This helpline is open to all farmers.

• **Labour database:** Teagasc has set up a national database to link farm families where a farmer or a farm worker becomes ill with COVID-19, with an available relief worker. This is being done in collaboration with the Farm Relief Services (FRS), and with the support of the IFA and ICMSA.

• **Teagasc Daily** is a new service to supply farmers with timely daily management tips across all enterprises. Each day, new topics are dealt with in a short article that is added to the Teagasc website, Teagasc Facebook and Twitter pages.

• **Education courses:** Teagasc education officers and teachers are working with students by phone and via online channels providing guidance for self-study of theory elements of courses. Student discussion groups are being conducted just like the regular discussion group meetings using a range of platforms and course assessment



Wexford drystock farmer and Teagasc client Debbie Sunderland (above) says she was pleasantly surprised by how well a recent ‘virtual’ discussion group worked.



“ We are doing a lot of work over the phone and it is quick and efficient with call or text options and for some the possibility to use FaceTime

Advisors in all Teagasc regions have been using a range of digital communication technologies including telephone and video conferencing to hold “virtual” discussion groups.

“I was surprised how well it worked,” is Debbie Sunderland’s comment about a ‘virtual’ discussion group meeting recently facilitated by Teagasc Wexford drystock advisor James Doran. Debbie farms at Aske, Gorey, Co Wexford and is a member of the Enniscorthy East Beef group.

“I was concerned that we might be all talking at the same time, but that didn’t happen and we were able to address all the issues people wanted discussed, in particular about the new beef scheme.

“James had given us good instructions (via WhatsApp) in advance about how to ring in, etc, so there were no problems there. I’d say a virtual meeting is not as good as where we all meet face to face, but you save on travelling time and I could see how it would be very useful to have a virtual meeting during a busy time such as sowing or calving.”

Will Griffin, who is a dairy farmer located between Tullow and Shillelagh in Co Wicklow, saw some distinct advantages during a recent ‘virtual’ discussion group facilitated by Tinahely Teagasc advisor Paul Keogh. That meeting was held on a video platforming service Zoom.

“Paul was able to go into Pasture-Base and pull up everyone’s grass wedge – that part worked really well. You couldn’t do that on a farm. We are fairly remote but the link seemed to work well, only one farmer had minor issues.*

“Not actually meeting other farmers is a disadvantage but I could see a role for virtual meetings in the future. They might be shorter but more frequent, with face-to-face meetings in between.”

*Teagasc is conscious that broadband is not universally available across the country but phone-based conferencing is universally available using the Teagasc Lync communication system.

is being done using assignments and other methods.

Teagasc regions keeping in touch

Advisors communicate with their clients through a range of digital communication channels including the local website, social media such as Facebook and Twitter, as well as

other communication tools such as WhatsApp, texts, phone, etc.

Virtual discussion groups

Teagasc advisors facilitate over 700 farmer discussion groups across the country. Social distancing and limits on travel due to COVID-19 have prevented these groups meeting.

Apps keeping Teagasc and agricultural college students engaged

Claire Bambrick

Crops lecturer, Teagasc, Kildalton College.



Completing the academic year during a lockdown caused by the COVID-19 pandemic has seen lecturers and students adopt new ways of working. Rural broadband challenges aside, the level of engagement from students has been very strong.

Teagasc Kildalton College says 112 students out of 125 had logged in to the Moodle app and completed a revision quiz within three days of being asked. "Students' online engagement is being monitored and each first year agriculture, horticulture and equine student in Kildalton is receiving phone calls from an allocated teacher each week, to make sure they have no issues," said Tim Ashmore, Kildalton College principal.

College principals have said it's been a challenge to convert a very practical course to online learning, but students and staff have risen to the challenge. Keith Kennedy, principal at Clonakilty College, said: "We've a young group of teachers that are very enthusiastic and willing to try out new technologies."

Jon Parry, principal at Gurteen College said: "Students are keen to keep in touch with activity on the college farm and have responded well to online learning material that links to ongoing activity at Gurteen farm."

Changes

Some final exams have been converted into online Multiple Choice Question (MCQ) assessments, while others are being turned into assignments for students to complete at home. Short quizzes and study guides are being developed by staff in lieu of classes, with revision exercises for exam preparation being made available to students.

Contingency plans are also in place for students with poor, or no, internet connections. All courses are currently aiming to finish within the timeframe originally allocated before the coronavirus outbreak.

The online platforms that colleges are now using are new to both the teachers and students, but seem to be working well. John Kelly, Ballyhaise College principal, said that students "are eager to engage on their phones,

so for any software we use, we have to ensure there is an app available for them to download."

Online resources colleges are using include the following:

Moodle

Moodle is a worldwide learning platform that allows educators to virtually engage with students. Lecture notes, text books, videos, quizzes, assignments, along with question and answer sessions are uploaded by the lecturers. In turn, students can upload their completed assignments for the lecturer to grade. MCQ exam quizzes, in lieu of final written exams, are also being carried out by the colleges using this platform. Moodle is the main platform that Teagasc students are currently being engaged through. All Teagasc students, including distance and part-time learners, have been set up with accounts.

Zoom

Zoom is an online video and audio conferencing tool, Teagasc has a corporate version, which could potentially be used in education. However, freeware versions of Zoom are also available, which allow a lecturer to set up a class or tutorial for a specific time and send out an invitation to the students, who are required to join.

Class notes are being uploaded to Moodle or emailed out to students before the Zoom class. Lecturers are able to turn on their video so students can see them, as well as share their screen with students and work down through class notes, as would normally be done in lectures.

Students can verbally ask questions if the lecturer chooses to allow the student microphones to be on, or they can type in a question, which will appear for the class to see. Zoom classes can also be recorded for students to look back on.

Discussion groups are also being carried out using zoom, where both the teacher and the students have their videos turned on and can see all the other participants.

You Tube

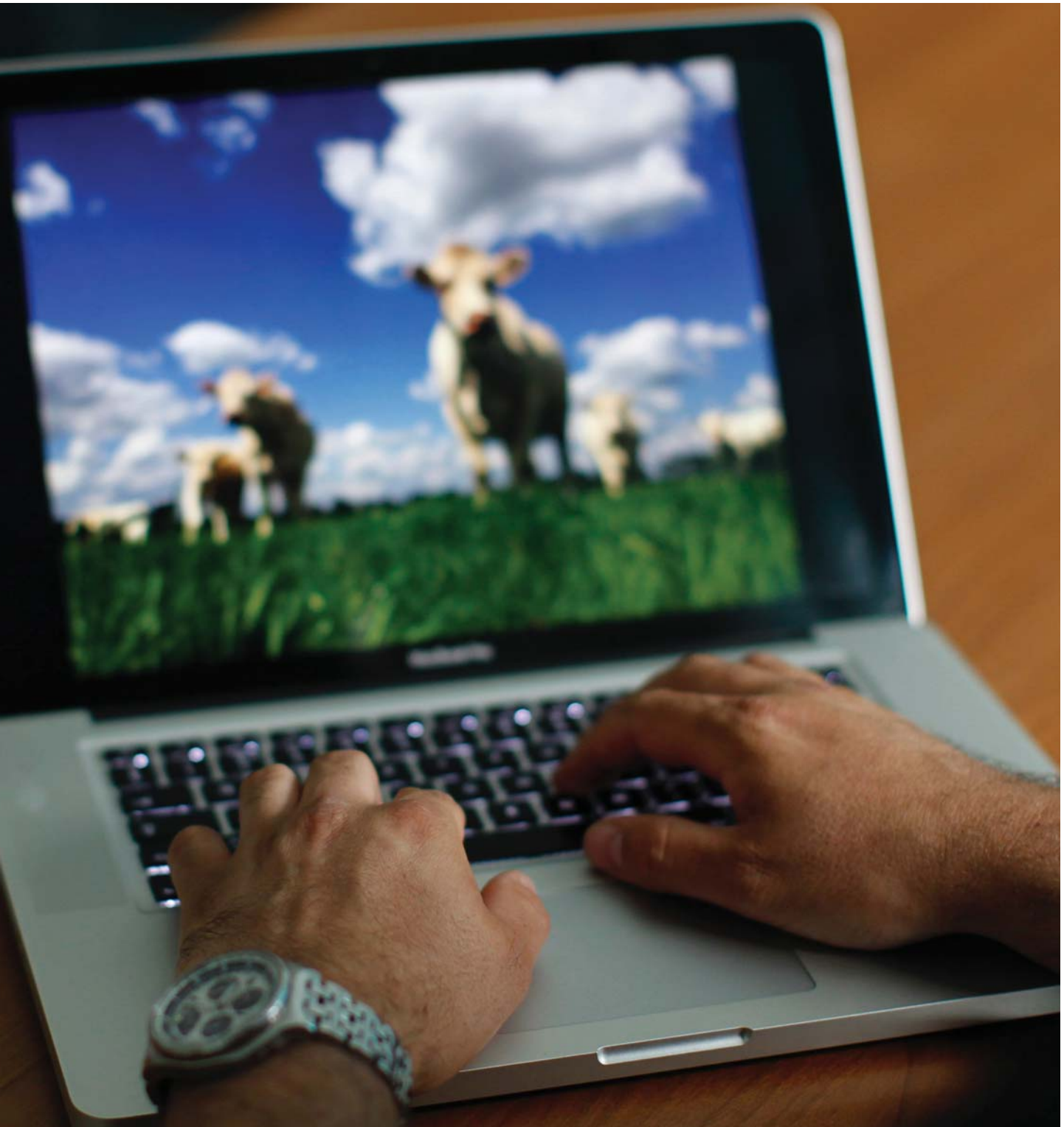
As recorded lectures or tutorials can be quite large in size in terms of data, they are being uploaded to a private You Tube channel and the link to these videos can be sent out to stu-



dents or uploaded to Moodle. Students can watch these videos in their own time or can use them as guidance to work through assignments, playing and pausing as they come to each assignment section.

Kahoot

Kahoot is a game-based learning platform. "Kahoots" are multiple choice quizzes that allow lecturers to create challenges for students and set specific times that they must be carried out in. These quizzes are mainly



being used as revision, but some colleges are also using them to assess students.

Google Classroom

Google Classroom is another online learning platform, similar to Moodle, where presentations, notes and articles are uploaded before Zoom classes. Students can also use this platform to ask questions about class material or assignments, which can be answered by lecturers or other students.

Everyone linked to the group can

see the questions and answers, which saves multiple responses from the teacher to individual students, who may have had similar questions.

Mental health

A group of 15 equine students started two Zoom classes a week with 15 minutes of mindfulness, including Pilates-type stretches. This energises the students at the start of the classes and keeps them involved, according to their teacher Joan Lenihan.

“Their mental health is the most

important part of their education at the minute,” she said.

“Colleges are mindful that online learning and undertaking online assessments are a big change for many Teagasc learners,” concludes Tony Pettit, Head of Education in Teagasc.

“It requires a greater degree of learner self-motivation and may prove challenging to some. Colleges are aware that not all learners have equal access to smartphone, computer and broadband and are taking this into account.”

fertiliser

Why it's time to change nitrogen fertiliser

Replacing CAN with protected urea is good for the environment, and your pocket

George Ramsbottom
Teagasc Oak Park, Carlow



William Birchall
Teagasc Moorepark



National nitrogen (N) fertiliser usage has increased in recent years, primarily due to expansion of the dairy industry post-quotas. There are over 370,000 extra dairy cows in the country today, compared to 2009. Irish agriculture has been given the challenging target of reducing greenhouse gas emissions (GHG) 10-15% by 2030 and ammonia emissions 5% by 2030.

Switching to protected urea is part of the solution. Its granules are the same as those of the normal urea that we have been spreading for years. The only difference is that a tiny amount of a chemical 'urease inhibitor' has been added. The most common inhibitor used is called NBPT.

Teagasc has carried out extensive, published, research using this urease inhibitor – newer inhibitors also have potential. The urease inhibitor 2-NPT is now on the market with potential for a third option, NBPT+NPPT,

to also join. These inhibitors help prevent ammonia-N gas emissions from urea, which means that more of the fertiliser N is available for grass growth.

How does protected-urea compare to normal urea and CAN?

Teagasc has conducted a large amount of work comparing protected urea with normal urea and CAN. Trials conducted by Teagasc Johnstown Castle measuring grass yield, GHG emissions and ammonia-N emissions were conducted at three locations across the country (Cork, Wexford and Down).

These were carried out for two growing seasons and included a range of soil and weather conditions at different fertiliser N rates. The trials found that protected urea produced the same amount of grass as CAN (Figure 1) and has higher N use efficiency than normal urea, due to reduced ammonia emissions. No difference in grass yield was observed at any of the three sites evaluated.

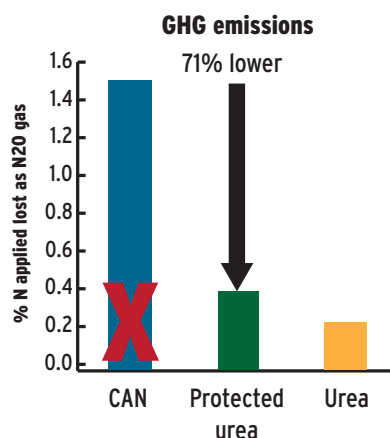
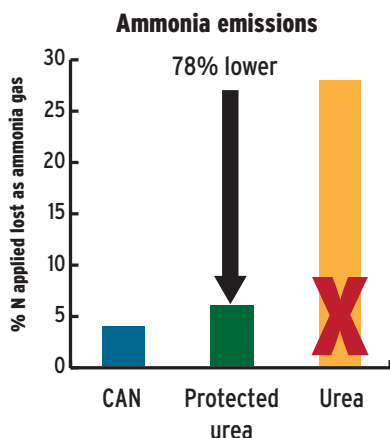
Critically, these trials also found that protected urea had 71% lower GHG emissions than CAN and 79% lower ammonia-N emissions than urea (Figure 2). If Irish farmers switched entirely to using protected urea instead of straight CAN, GHG emissions would be reduced by the equivalent of more than 200,000 dairy cows.

Where does protected urea fertiliser fit in?



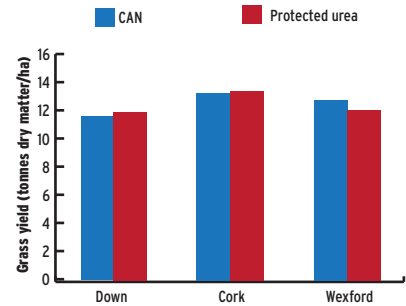
Protected urea is suitable for spreading throughout the whole grazing season and can be used on both silage and grazing ground. The place to start with protected urea is the rotations where straight N or N + Sulphur is spread.

Standard N:P:K products can be used in other rotations, depending on your fertiliser plan. Remember that if you use protected urea and growth is excellent, response will be excellent. If growth conditions are poor due to low temperature or moisture issues, response may be limited. Of course, this is the case for all N fertilisers.



• Available compounds with protected urea at present include:

- 40% N + 6% S
- 38% N + 7.5% S
- 35% N + 10% S
- 29-0-14 + 2% S
- 29-0-14 + 3.5% S



applying conventional urea instead of CAN is greater, but conventional urea cannot reliably be used from now on.

Using protected urea

In practical terms, protected urea will work as fast as CAN or normal urea for growing grass. Once the protected urea granule melts, some of the urea is converted to plant-available N, which feeds the initial grass requirements. Over time (typically 10 days), all the urea will be plant available.

It's important to remember that grass and other crops take up the N applied over several weeks (i.e. all the N is not taken up at once). Ongoing trials at Teagasc Moorepark have compared protected urea and CAN across nine to 10 grazing rotations in a year and found no difference between the fertilisers in terms of grass growth rates.

It's also worth remembering that protected urea has a lower density (similar to normal urea) than other fertiliser products. This needs to be considered when spreading during windy weather conditions (spreading in windy conditions is not recommended). Working widths of 18 to 24 metres can be achieved under calm conditions.

Calibration of your fertiliser spreader is important, the same as spreading any other fertiliser. The urease inhibitors in protected urea have a shelf life and degrade slowly once in storage. Use protected urea within the year that you purchase it. As for other fertiliser products, protected urea can be spread within seven to 10 days of slurry application.

Using protected urea is good for your grass production, good for the industry, good for the environment and good for your pocket. Why wouldn't you do it?

- Change from using CAN to using protected urea this summer.
- Protected urea is proven to maintain the same grass growth rates as CAN across the main grazing season, while costing less.
- Full transition from straight CAN to protected urea in Ireland will reduce greenhouse gas emissions by the equivalent of more than 200,000 cows.

Bear this in mind if you are trying it for the first time. At present, protected urea comes as straight N (46%), or in a compound with potash and/or sulphur.

The Teagasc Johnstown Castle Soil Fertility website gives examples of fertiliser plans incorporating protected urea and a list of protected urea products for which evidence of efficacy is available (<https://www.teagasc.ie/crops/soil-soil-fertility/protected-urea/>). This list will be updated as new information comes to light.

Typically, applications of between 23 and 30 units of fertiliser N per acre (29-38kg N/ha) are spread every three to four weeks across the main grazing season, depending on stocking rate. Replacing CAN with protected urea will also result in a cost saving (see Table 1).

Relative to CAN, the price reduction per tonne of protected urea seems small, however the total saving can be considerable. Take, for example, 40ha receiving five applications of protected urea rather than CAN. The total saving is €680. The saving achieved by

Table 1: Approximate costs of CAN, protected urea and conventional urea, cost per kg of fertiliser N and saving relative to CAN nitrogen at an application rate of 27 units/ac (34kg N/ha).

	€/tonne	kg N/tonne	€/kg N	Saving relative to CAN (€/ha)
CAN	255	270	0.94	-
Protected urea	385	460	0.84	3.40
Urea	355	460	0.77	5.78

Are you ready?

Beef breeding management is the basis for profitability

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



How to optimise breeding efficiency:

1) Have a plan

- A simple action plan for a four-year period with achievable breeding targets should be the starting point on every farm.
- Select defined calving dates, sires with easy-calving and high reliability and increase maternal bloodlines in the herd.

2) Tighten calving spread

- Regardless of when calving season starts, a key goal is to keep the calving spread to a maximum of 12 weeks. A tight calving pattern allows for easier management of stock.
- When calves are all around the same age, they can be managed as one group and to make grassland management easier.
- Pulling back late-calvers and breeding heifers two weeks before the main herd is central to achieving this target.
- Removing the bull a fortnight earlier and culling cows that are calving outside the planned 12 week period will help tighten calving spread.

Table 1: Sample plan to compact calving spread (Gestation 283 days)

Breeding date	Calving due date
1 January	10 October
1 February	10 November
1 March	9 December
1 April	9 January
1 May	8 February
1 June	11 March



Year 1: 1 August 2020 Take-out bull	No calves after 11 May 2021
Year 2: 15 July 2021 Take out Bull	No May-born calves 2022
Year 3 July 1 2022 Take-out bull	10 April – 2023
Year 4: 15 June 2023 Take-out bull	24 March – 2024

• A calf born from 1 to 22 February has 245 days to weaning. Assuming 1.1kg average daily gain and a birth weight of 40kg, the calf will wean at 310kg. However, a calf born from 26 April to 17 May, if weaned at the same time,

only has 161 days to achieve the same weight gain.

Assuming all calves are weaned on the same day, the calf would only weigh 217kg, a difference of 93kg. If weanlings were worth €2.30, this is a difference of €214/calf.

Date	Age at weaning (days)	Weight at weaning
1 Feb – 22 Feb	245	310kg
22 Feb – 15 Mar	224	287kg
15 Mar – 5 April	203	263kg
5 April – 26 April	182	240kg
26 April – 17 May	161	217kg



Cow 1 Calving interval 367 days		Cow 2 Calving interval 444 days	
DOB	Calf weight (kg)	DOB	Calf weight (kg)
01/02/2015	324	01/02/2015	324
02/02/2016	322	02/04/2016	245
04/02/2017	320	08/07/2017	166
06/02/2018	318	25/09/2018	87
08/02/2019	316	01/11/2019	No calf
Output	1,600 (five calves)	Output	822 (four calves)

or natural service.

- Weaning weight is important for every farm, but particularly so on farms producing weanlings for sale. As is highlighted in the table on page eight, if all calves were born in the first six weeks, the average weaning weight would be 299kg. If calving is spread equally across a 15-week period, the average weaning weight would be only 265kg. This is 34kg/cow less or, in monetary terms, if weanlings were worth €2.30, you are losing €78/weanling.

4) Calving interval

A poor calving interval can severely affect output on the farm and the number of calves produced by a cow over her lifetime. As shown above, Cow 1 has a calving interval of 367 days, in comparison to Cow 2 with a calving interval of 444 days. Over the five-year period, Cow 1 will produce

1,600kg in comparison to Cow 2, who is only producing 822kg and one less calf. This is equivalent to 778kg at €2.30/kg = €1,790/cow.

5) Calves/cow/year

Increasing the number of calves produced in the herd from the national average to the target would increase output produced equating to €80/cow. In a 20-cow herd, this would be worth €1,600.

	Target	National Average
Calves/cow/year	0.95	0.85
Average sale value €	800	800
Output/cow €	€760	€680
Difference	€80	

» Targets to aim for include:

- An average calving interval of 365 days.
- 0.95 calves born per cow to the bull.
- 60% of cows calved in the first month of the calving season.
- 80% of cows calved in first two months.
- All cows calved within 12 weeks.
- Calf mortality <2.5% at birth and <5% at 28 days.

3) Improve six-week calving rate

- The six-week calving rate is the number of cows (%) that have calved in the first six weeks, as a proportion of all the cows calving in the spring or autumn.
- Extra replacements may need to be introduced for a few years to improve the six-week calving rate. This may be the fastest way to achieve your target.
- Having cows in the correct body condition score at calving and breeding is critical. Cows need to be cycling at the start of breeding. Good-quality silage or excellent grazing will play a significant role in this.
- Record service dates: This is important to monitor conception rates to AI

Date	Age at weaning (days)	Weight at weaning	Effect of calving spread on weaning weight
1 Feb – 22 Feb	245	310kg	Avg weaning weight
22 Feb – 15 Mar	224	287kg	First 6 weeks 299kg
15 Mar – 5 April	203	263kg	First 9 weeks 290kg
5 April – 26 April	182	240kg	First 12 weeks 277kg
26 April – 17 May	161	217kg	First 15 weeks 265kg

Stock bull fertility: 10 key considerations



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



Four out of every five calves born on beef farms are sired by a stock bull. So, stock bull fertility is vitally important. The stock bull on your farm is key to maintaining a compact calving period, maximising the genetic potential and value of the calf crop, and overall herd profitability.

•**1) Bull fertility check:** a bull's fertility status can change from year to year. Therefore, it is good practice to have a fertility test carried out on the stock bull prior to the start of the breeding season (at the time of writing, this is still possible while bearing in mind COVID-19 restrictions). It is estimated that one stock bull in four is sub-fertile.

The cost of the test is very low, if you compare it to the cost of carrying empty cows for the summer. Results are available before the technician even leaves the yard.

•**2)** A bull must be able to maintain body condition score (ideally BCS 3), repeatedly mount and serve cows for

12 weeks and have a long working life in the herd.

If you have bought a bull, find out from the seller what diet and concentrates he is being fed, and the vaccinations he has received.

•**3)** A blood test is useful to check for BVD, IBR, Johnne's disease and Leptospirosis. If vaccinating or treating for parasites, these should be administered at least six to eight weeks in advance of the breeding season, as they could lead to reduced fertility. Consult your vet for advice on the health of the bull. Remember, a young bull in his first season should serve no more than 20 cows.

•**4)** It is important to avoid sudden changes to diet and not over-feed the bull, as this can reduce fertility and lead to feet problems. He needs to be fit, but not over-fat.

•**5)** In advance of the breeding season, check feet and legs well and take remedial action if required.

•**6)** Watch the bull working to check he is serving cows correctly.

•**7)** If possible, rotate bulls or scan cows early, so that an infertile bull or sub-fertile bull can be identified early.

•**8)** Record when you see a cow being mated and watch for signs of cows coming on heat repeatedly.

•**9)** If a large number of your cows are repeating, you need to take action to find out what is wrong. You must be prepared to start using AI, or if you have a second bull with another group of cows, he may be utilised to serve more cows.

•**10) Pregnancy scanning:** when it is at least 35 days since the last cow in the herd could have been served, then you should consider scanning the cows. It offers many advantages:

• Firstly, it will identify which cows are in-calf and which cows are not. This will allow you to cull empty cows instead of expecting these cows to calve next year.

• Secondly, most scanners are able to give you a good estimate of the number of weeks that each cow has been in-calf. This is extremely helpful when a stock bull is used on the farm to identify expected calving date.

• Thirdly, if the scanning reveals, for example, that more than 5% of your cows are empty, then this may indicate that there is a fertility problem in your herd.

Maybe it was a bull issue, or perhaps a mineral deficiency or a disease problem – either way, it should prompt you to investigate the issue further.

Beef Environmental Efficiency Programme Suckler 2020 (BEEP – S) – what you need to know

Aidan Murray

Beef specialist, Teagasc Animal and Grassland Research and Innovation Programme



The Department of Agriculture Food and the Marine (DAFM) announced an enhanced BEEP scheme for suckler farmers in early March.

Applications

Applications are open until midnight on the 15 May and can be submitted online through your DAFM Agfood account, or by your advisor if they are given the authority to do so by you via a DAFM text service.

Calves born in the herd of the applicant between 1 July 2019 and 30 June 2020 will be eligible for payment in the programme if the various actions are selected by the applicant.

Compulsory action

• **Weighing (cows and calves):** This is essentially the same action as in last year's programme, where participants must weigh each unweaned calf and dam, and submit weights to ICBF within seven days – all calves being submitted for weighing must have been born between 1 July 2019 and 30 June 2020.

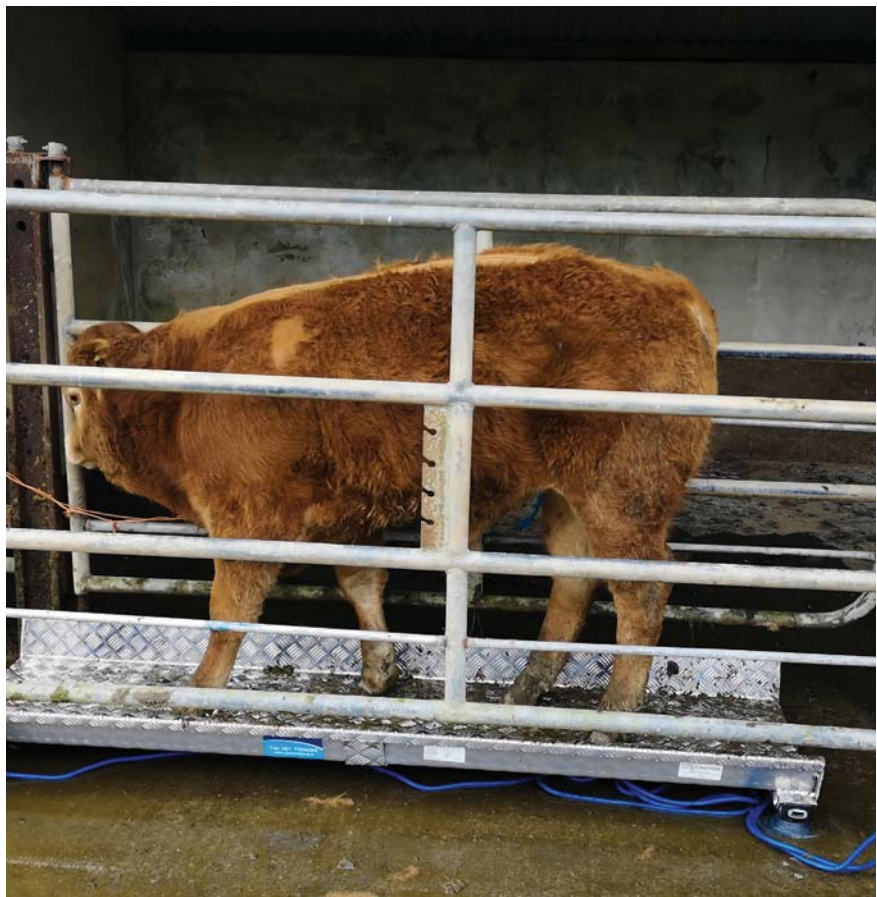
Unweaned live Calves and dams must be weighed on the applicants holding on the same day. Only scales registered can be used and they can be rented, owned or borrowed from a third party.

Weights must be submitted between 1 January 2020 and 1 November 2020.

Optional actions

• **Meal feeding pre- and post-weaning or vaccination:** These are optional actions, but only select them at the time of application if you are going to carry them out, otherwise penalties will apply.

Meal feeding means feeding concentrate to eligible calves in the four



weeks prior to and for two weeks after weaning. Proof of meal purchase and weaning dates will have to be recorded.

Vaccination refers to the use of vaccines to prevent respiratory disease (pneumonia) pre-weaning. Again, you will need to choose particular vaccines that target the causal organisms, retain proof of vaccination purchase and record the dates of administration to calves.

• **Faecal Egg Testing for Liver and Rumen Fluke in Cows:** Again, this is an optional action that you can select in addition to the actions above, where you collect 10 dung samples from cows. They will be sent to a DAFM-approved lab where they will be pooled and checked for evidence of

liver and rumen fluke. You can then use the results to decide on the dosing strategy.

Rates of payment

The additional options greatly improve the rate of payment:

- **Action 1 (Mandatory) – Weighing** €50 for first 10 cow/calf pairs weighed €40 thereafter, to a maximum of 100.
- **Action 2 (Optional)** – Can select one of the following: Meal feeding at €30 per calf weighed, to a maximum of 100 calves.
- Vaccination at €30 per calf weighed, to a maximum of 100 calves.
- **Action 3 (Optional)** – Can be selected in addition to Action 1 and/or Action Faecal Egg Testing at €10 per cow, to a maximum of 100.

A major sheep open day had been planned for the Athenry Teagasc Research Centre in June of this year. In light of the current restrictions, this event is likely to be deferred to a later date and digital communication methods will be used to transfer research updates and technical messages to the sheep industry.

The Teagasc Sheep Better Farm

Programme has consistently shown that adopting the key research technologies at farm level can have a significant impact on the productivity and profitability on sheep farms.

Below, we feature a number of research updates including the areas of grassland systems, anthelmintic resistance, breeding and genetics, mineral supplementation, lamb mortality, flock

productivity, and hill lamb finishing options.



– **Damian Costello**
Sheep Specialist,
Teagasc Animal
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Programme,
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White clover and other companion forages

Philip Creighton
Teagasc Animal and
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Current grazing system research projects in Teagasc Athenry are focusing on what the impact incorporating white clover and other companion forages into sheep-grazed swards has on the productivity of pasture-based lamb production systems. There is special focus on the animal, environmental and economic impacts.

These projects are split into two main studies:

- An evaluation of incorporating white clover into sheep-grazed swards at two fertiliser nitrogen and stocking rate levels on the productivity of pasture-based lamb production systems.
- An evaluation of alternative forages, in combination with perennial ryegrass, to increase animal intake, performance and output in sheep pasture-based production systems.

Study one is investigating two stocking rate levels (11 or 13 ewes/ha) with three pasture treatments at each stocking rate:

- 1) Perennial ryegrass receiving 145kg N/ha/yr.
- 2) Perennial ryegrass plus white clover receiving 145kg N/ha/yr.
- 3) Perennial ryegrass plus white clover receiving 90kg N/ha/yr.

Key findings to-date show that the inclusion of white clover in the sward relative to perennial ryegrass alone resulted in lambs reaching slaughter weight nine days faster.

In terms of sward, DM production the grass-only swards grew 13,483kgDM/ha, grass clover swards at 145kg N/ha grew 13,926kg DM/ha and the grass clover swards at 90kg



N/ha grew 13,590kg DM/ha.

While a small difference is evident between treatments, a positive aspect is that the low N treatment (90kg N/ha) is growing just as much grass or slightly more grass than the other high N treatments (145kg N/ha), with or without white clover inclusion.

This is the third year (including establishment year) that this has been achieved. Sward clover content averaged 7% of the sward pre-weaning and 15% post-weaning for the grass and clover treatments. This has major implications from both an economic and an environmental point of view, while also improving animal performance. Study two consists of five forage or forage mixture treatments:

- 1) Perennial ryegrass only.

- 2) Perennial ryegrass plus white clover.

- 3) Perennial ryegrass plus grazing-tolerant red clover.

- 4) Perennial ryegrass plus plantain.

- 5) Perennial ryegrass plus chicory.

This study is part of the PhD studies of Walsh Scholar Lisa McGrane.

“A key focus of this study will be plot-based trials, which will be grazed by sheep, investigating establishment method, post-grazing height and establishment seeding rate effects of the grass and companion forage mixtures, in an effort to identify if any of these key management steps influence the persistency and longevity of the companion forages, as well as their contribution to animal and sward performance,” says Lisa.

Anthelmintic resistance

Orla Keane
Teagasc Animal and
Grassland Research and
Innovation Programme,
Grange



Grazing sheep are naturally exposed to stomach and gut worms, which can cause disease including scour and ill-thrift. Sheep develop immunity to gut worms over time and usually have good immunity by a year old.

Despite the large number of wormers on the market, there are only five different groups of wormer for the control of gut worms in sheep. These are benzimidazole (commonly known as white wormers), levamisole (commonly known as yellow wormers), macrocyclic lactones (commonly known as clear wormers), an amino-acetonitrile derivative (orange wormer) and spiroindole (purple wormer).

The orange and purple wormers are veterinary prescription-only medicines. However, worms are developing resistance to the wormers that we use to control them – this is known as anthelmintic resistance. The overuse of wormers can lead to anthelmintic resistance. Therefore, it is important



that wormers are used appropriately.

Four key, cost-effective steps that every lamb producer can take to slow the development of anthelmintic resistance on their farm are:

- Do not dose mature ewes for worms unless there is a demonstrated need. Mature sheep generally have good immunity to gut worms and should not require dosing. Lactating yearling ewes, thin or immunocompromised ewes may require treatment, but this should be targeted to individual animals on the basis of need. Mature sheep may require treatment for fluke, however.
- Use a benzimidazole (white wormer) to treat *Nematodirus* in lambs, as resistance to this wormer group among *Nematodirus* has not been detected.

- Implement a biosecurity protocol for all bought-in animals, to prevent bringing resistant worms onto the farm. Treat incoming stock with one of the new wormers (orange or purple) and house them for 48 hours. Then turn out to a pasture recently grazed by sheep.

- Find out what wormers are effective on your farm. Discuss how to test which wormers are working with your veterinarian or Teagasc advisor.
- Use wormers only when necessary, based on indicators such as flock-level faecal egg count. In lambs, a group faecal egg count of greater than approximately 500 to 600 eggs per gram may have an impact on performance and may indicate a need to treat for gut worms.

Frank Campion
Teagasc, Animal and
Grassland Research and
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lows Campus, Athenry



» Farm experience – John O'Connell, Ballinamore, Co Leitrim

These four key steps are adopted by participants in the BETTER Farm sheep programme, including Co Leitrim sheep farmer John O'Connell. John operates a sheep and cattle farm near Ballinamore, Co Leitrim, where the land is best described as heavy.

The comparatively wet weather and land John farms means he has to keep a close eye on fluke burden in his sheep and dose accordingly.

However, he is careful not to worm dose his ewes unless they meet the criteria outlined above. To do this, he uses fluke-only drench products on his ewes and does not drench ewes with products that also kill stomach and gut worms.

In 2018, a detailed faecal egg reduction test showed that among mid-season stomach and gut worms, there was resistance to benzimidazole

(white wormer) products on John's farm and low level resistance to levamisole (yellow wormer) and ivermectin (clear wormer). Despite this, he still uses a white wormer as his first dose for *Nematodirus*, as no resistance to it was detected. The timing of the *Nematodirus* treatment is based on the Department of Agriculture forecast in the spring.

"During the summer months, I collect faecal samples from the lambs to carry out FECPAK analysis and dose based on the results," says John.

He follows a simple procedure, firstly collecting a composite faecal sample (5g: approximately a large teaspoonful) from 12-15 lambs. It is important that it is a fresh sample and from lambs only, not from ewes or older sheep on the farm.

In John's case, collecting the sample is usually done by standing the lambs on a clean yard for a short period of time and collecting the droppings left behind.

These samples are then put in a plastic tube (airtight, ziplock bags will also do) and posted to the lab. Samples need to be refrigerated until posting and should only be posted early during the week, to avoid them sitting in a post

box over the weekend, which could cause the eggs in the sample to hatch and render the sample useless.

The results are then used by John to make decisions on dosing lambs, with worm counts in excess of 500-600 eggs per gram required before John doses his lambs.

From mid-May to early August, when the risk from *Nematodirus* has receded and stomach worms become an issue, a levamisole (yellow) and a macrocyclic lactone (clear product) are used when needed (i.e. when the faecal egg count reaches the threshold for dosing).

"We aim to dose sequentially with these products, to try and reduce the increase in resistance to the products on the farm," adds John.

Although both Group 4 (orange) or Group 5 (purple) wormer products are working fully on John's farm, to ensure they stay working on the farm, they are only used as part of the bio-security protocol and for his ewe lambs in early autumn.

"Used as part of a bio-security protocol, this reduces the risk of buying in other resistant worms onto the farm when buying in sheep (e.g. stock rams)," concludes John.

Breeding and genetics



Fiona McGovern and Noirín McHugh
Teagasc Animal and Grassland Research and Innovation Programme, Mellows Centre, Athenry

Approximately half the gains in animal performance achieved at farm level can be attributed to superior breeding or genetics. Results from the initial phase of the Teagasc Irish and New Zealand across country genetic comparison (INZAC flock) study are showing that animals of elite genetic merit (five star ewes), regardless of country of origin, are outperforming their low genetic merit (one star ewes) counterparts.

Litter liveweight per ewe was similar at birth, but elite Irish and New Zealand ewes produced more lamb liveweight at six weeks post-lambing compared to the low Irish ewes – 27.36kg, 27.26kg and 24kg, respectively. This trend continued to weaning and subsequently, the overall length of time it takes for lambs to reach the desired pre-slaughter liveweight.

In addition to the above experiment, more recently, we have begun to look at the methane output from sheep production systems.

Agricultural livestock production accounts for 34% of greenhouse gas emissions in Ireland and therefore, the agricultural sectors are under pressure to reduce methane emissions without compromising animal productivity.

Methane emissions have never been reported for Irish sheep systems. The overall aim is to determine the impact of genetic selection on methane output and to investigate the possibility of breeding a more climate-friendly animal.

Portable accumulation chambers (PAC) are being used to measure methane output and are currently undergoing a validation experiment whereby the PAC are being compared to the 'gold standard' method of measurement, the respiratory chamber, and a robust protocol for determining the most accurate measurements is being developed.

Initial results are showing that the daily output of methane from dry hoggets is 8.6 CH₄ g/day, relative to



liveweight and feed intake.

Teagasc continue to work closely with Sheep Ireland to update the new genetic evaluations for sheep. The focus for 2020 was to implement genomic selection for the Irish sheep industry. Genomic selection is a new tool that can increase the accuracy when identifying genetically elite animals at a younger age and also provide accurate parentage information for individual lambs.

Genomic selection was launched for sheep in spring 2020 and has resulted in an increase in the accuracy of replacement and terminal indexes by 15% and 17%, respectively. For difficult-to-measure traits such as lamb mortality, this is the equivalent of a ram having an additional 14 progeny records.

In addition, the number of lambs born has also been updated. Until 2020, the more lambs a ewe was expected to produce, the greater the replacement index of the ewe. However, new research from Teagasc shows that once a flock's number of lambs born increases over 2.18, there is no economic benefit.

So, to reflect this in the replacement index, the reward that an animal will receive for having prolific genetics will be capped at the equivalent of 2.18 lambs. This change will only affect the most prolific animals.

Labour saving

Work is underway to include new labour-saving traits in the genetic indexes. Lambing alone accounts for over 25% of the labour requirement

across the sheep farming year, more than double the labour required at any other key time like weaning, mating etc. Therefore, any measure that could potentially reduce the labour required or time spent per ewe at lambing should be considered.

Lamb vigour is a measure of how long it takes a lamb to stand after birth and is measured on a five-point scale where 1 is very poor (the lamb is still not standing after one hour) and 5 is very good (standing within five minutes).

Ewe mothering ability is a subjective measure of the ewes behaviour towards her lamb(s) and is scored on a five-point scale, where 1 is very poor (the ewe shows no interest in her lamb(s)) and 5 is very good (the ewe is very protective, licks the lamb(s) immediately, follows lamb(s) closely).

Differences existed among sire groups in the prevalence of poor lamb vigour (i.e. the lamb was not standing within 30 minutes) and poor mothering ability of their progeny. Taking lamb vigour for example, 90% of the progeny of one sire had a lamb vigour score of 1, 2, or 3, meaning these animals took at least 30 minutes to stand after birth.

A similar trend was observed for ewe mothering ability. Given that management and environment were expected to be the same for progeny of all sires in the same flocks, this would indicate that genetic differences between sires accounts for most of the difference in prevalence of poor lamb vigour or mothering ability in progeny.

Aspects influencing flock profitability

Tim Keady

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If EU ewe productivity rose by 0.1 lambs reared per ewe joined, it would increase EU self-sufficiency to 92%. In Ireland, ewe productivity is 1.3 lambs reared per ewe joined. This has not improved in the past 30 years. A number of studies are currently ongoing at Athenry, which focus on factors influencing flock productivity and profitability.

Mineral supplementation: Mineral supplementation is a routine practice on many farms that maybe unwarranted, particularly in non-deficient areas. According to studies undertaken, some of which formed part of the PhD studies of Walsh Fellow Daniel Hession:

- 69% of sheep farmers supplement with minerals and vitamins.
- Only 35% of farmers who supplement base their decision on veterinary advice or laboratory analysis.
- Supplementing lambs with cobalt post-weaning increased carcass weight by 1.5kg and reduced age at slaughter.
- Supplementing ewes (a high proportion marginal for plasma vitamin B12 status) with cobalt (drenched every two weeks from seven weeks pre-join-

ing to six weeks pre-lambing or bolus at seven weeks pre-joining) had no positive effect on litter size, number of lambs reared per ewe joined or lamb performance.

Lamb mortality: Nationally, each 1% decrease in lamb mortality is valued at approximately €3m annually. A number of studies were undertaken as part of the PhD studies of Walsh Fellow Dwayne Shiels. The key findings to-date are as follows:

- 52% of neonatal mortality occurs prior to or at birth.
- The main causes of neonatal mortality are infection (38%) and dystocia (19%), which are potentially preventable.
- 34% of farmers do not scan their ewes so cannot manage them according to litter size in late pregnancy.
- 24% of farmers do not clean or disinfect lambing pens between ewes.
- 9% of farmers use only artificial colostrum when colostrum supplementation was required.

Age at first lambing: The cost of replacement ewes at joining (approximately 18 months) is equivalent to 25% of the value of lamb carcass output that they produce during their lifetime. Results from an on-going long-term study show that:

- Prolific ewe replacements and breeding them as ewe lambs rear at least an extra 2.3 lambs during their lifetime, increasing flock profitability by €26/ewe per year.

• Neither ewe genotype nor age at first lambing impacted on lamb drafting pattern and ewe culling rate.

• All lambs were finished from grazed grass only. Prior to mid-December, mean carcass weight was 21kg.

• Ewe age at first joining (seven or 19 months) had no adverse effect on the performance of lambs from lambings at two to six years of age.

• Lambs born to Belclare X Suffolk ewes had higher daily gain and were drafted for slaughter at a younger age than lambs from predominantly Suffolk genotypes.

EuroSheep and SheepNet: SheepNet is a project involving the EU's six main sheep-producing countries. Sheepnet produced 218 articles and videos, including 42 solutions (many of which were evaluated on-farm) and 73 'tips and tricks' on impacting ewe productivity (number of lambs reared per ewe joined), which are available on the SheepNet website (www.sheepnet.network).

EuroSheep follows on from SheepNet and involves eight countries (Ireland, France, Greece, Hungary, Italy, Spain, Turkey and United Kingdom). EuroSheep focuses on improving flock performance and profitability through nutrition and animal health management by exchanging existing scientific and practical knowledge, technologies and best practices among farmers, advisors, consultants, researchers and other stakeholders.

Store lamb finishing systems



Frank Campion and Michael Diskin
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Previous research carried out in Teagasc Athenry has shown a potential to finish hill-bred male lambs to carcass weights in excess of 18kg, while meeting market muscle and fat score specifications satisfactorily, when finished using ad-lib concentrate diets.

Recently, these studies have moved towards looking at finishing hill-bred store lambs using forage-based diets and finishing lambs to comparatively lighter carcass weights following ad-lib concentrate feeding.

A new research project started in

2019 is investigating if using forage crops to finish hill-bred and cross-bred hill store lambs compares to using grass swards or finishing lambs indoors on ad-lib concentrates during the autumn/winter. The results from this experiment will lead to guidelines and targets for using forage crops to finish hill lambs for the industry to use in the future.

In 2019, nearly 400 Scottish Blackface lambs were purchased and divided across six different diets, namely: Ad-lib concentrates (indoor), permanent pasture, newly re-seeded pasture, forage rape, kale and hybrid brassica. Just one year's data has been collected so far and the project will run over the next three years, during which time the results of the various systems will become evident. Studies are also being carried out to establish if it is possible to finish light Scottish Blackface hill lambs to produce market suitable carcasses of 12kg to 16kg. Lambs were purchased

directly from hill farms in the west Mayo/Connemara area at weaning time and were housed immediately at an average liveweight of 25kg.

These lambs were slowly built up to ad-lib concentrate intake. Both entire ram lambs and castrate lambs and were used for the studies and were drafted for slaughter once they had a sufficient covering of fat (determined by condition scoring) and reached over 30kg liveweight for castrates and over 31kg liveweight for ram lambs.

It took approximately 67 days for ram lambs and 74 days for castrate lambs to finish at light lamb specification, during which time, the lambs consumed approximately 1.15kg DM of concentrates per head per day once eating ad-lib.

Average carcass weights for castrates and rams were 14.5kg, with a kill-out percentage of 43.3% and 44.2% respectively. It's expected that these studies will look further into light lamb systems.

Diversification and innovation can yield new income streams

Barry Caslin

Energy & Rural Development Specialist, Teagasc Rural Economy Development Programme



Thanks to COVID-19, Brexit and the new European agricultural policy we live in a sea of uncertainty. Diversification and innovation can help counter any downsides to these seismic events by generating new income streams, in particular from renewable energy, and should be considered by every farm business..

Farming causes around 33% of Ireland's greenhouse gas emissions and reaching "net zero" is now top priority, with a new range of incentives likely to feature heavily in future European agricultural policy. Farmers will play a significant part in the replacement of fossil-derived fuels with low-carbon or carbon-negative alternatives. Not only is this crucial for the environment, it's potentially profitable.

By facilitating carbon capture, we can create valuable negative emissions by actively removing carbon from the atmosphere to balance methane (CH₄) and nitrous oxide (N₂O) emissions from food production. Now is a key time for farmers to look at diversifying their income with a wide range of activities that contribute towards "net zero".

We can create more ways to remove CO₂ from the atmosphere within the context of the national Climate Action Plan. Then Minister Richard Bruton launched the Climate Action Plan on 17 June 2019 to give Irish people a cleaner, safer and more sustainable future.

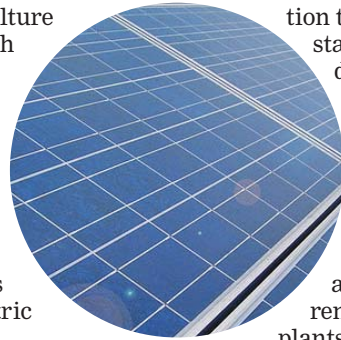
The far-reaching plan sets out over 180 actions, together with hundreds of sub-actions, at a time when the warning signs are growing, and the time for taking action is rapidly reducing. This plan identifies how Ireland will achieve its 2030 targets for carbon emissions, and puts us on a trajectory to achieve "net zero" carbon emissions by 2050.

Types of renewables

We are seeing a resurgence of planning consents for solar PV, which will be supported through the Renewable Electricity Support Scheme (RESS) and the business case for roof-mounted solar is getting stronger.

Technology costs are falling and there are TAMS supports from the

Department of Agriculture Food and Marine which support solar PV at 40%. A support rate of 60% is available for young trained farmers. Most solar installations come with battery storage and there are new opportunities to link this energy storage to electric vehicles.



The SSRH

The Support Scheme for Renewable Heat (SSRH) was introduced in June 2019 to encourage the installation of equipment such as biomass boilers and heat pumps in commercial properties. It will provide eligible claimants with payments for the renewable heat produced – provided it is all used – for 15 years from the date they enter the scheme.

Wood from coppiced energy crops, or other sustainable sources, will be a key renewable fuel source in the future alongside pulp wood from forestry and straw. The SSRH is very relevant to pig, poultry and horticultural units which generally have fairly large heat loads.

It's also relevant to farmers and landowners who want to supply biomass and assimilate it for end users. Instead of the oil depot we could see some farms becoming biomass depots or biomass trade centres.

New prospects are anticipated for biogas generated from anaerobic digestion (AD). Although current support for renewable heat does not cover bio-methane there is a growing expectation that the next Support Scheme for Renewable Heat phase will specifically support bio-methane from AD.

Support through the Biofuels Obligation Scheme for bio-methane used in road transport has been attracting interest and could offer a lifeline to projects that would have otherwise relied on Feed-in Tariffs and SSRH support.

Bioeconomy

At European level, there is ever greater emphasis on the production of renewable biological resources and the conversion of these resources and waste streams into value-added products, such as food, feed, bio-based products and bioenergy. Ways of doing this include linking crop produc-

tion to carbon-negative power stations and anaerobic digestion (AD) plants that recycle or store their CO₂ emissions.

There's also scope to use non-food crops such as hemp and miscanthus as raw materials for bio-fibres and bioplastics, while the renewable CO₂ from AD plants could be captured as a feedstock and turned into synthetic fuels and chemicals. Farmers can be key drivers in this low-carbon transition.

Opportunities in diversification

No one knows what shape farming will take in the coming months and years. What we do know is that Brexit will have a significant impact on farming and all land-use enterprises. Diversification is, therefore, becoming increasingly important for all landowners, farmers and rural business owners. But that doesn't mean it's easy: there are no short cuts.

Attending a Teagasc options course can help you make the most of the opportunities and provides professional advice to steer you past potential pitfalls. To express an interest in a Teagasc options course go to www.opt-in.ie/options or contact your local Teagasc office.

The first stage is to make sure you are embarking on what will be a viable business. There's a good chance someone else has already done something similar and you will be able to learn from their experience during the course. It will all be valuable information for your business plan, which is an essential component in the process.

There are some key considerations that apply to every new business and the most important is to ensure you have a potential market and that you can make a profit from that market. There are so many opportunities: creating new uses for existing buildings, holiday lets and glamping, alternative crops, and many more. At this point, you are limited only by your imagination.

Energy in Agriculture 2020, incorporating a Rural Diversification Expo, will take place in Gurteen Agricultural College on Wednesday 15 July. See www.energyinagriculture.ie



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Succession farm partnerships

Gordon Peppard
Teagasc Rural Economy
Development Programme



With almost one in three farmers over the normal retirement age but only one in twenty farmers under the age of 35, the Department of Agriculture, Food and the Marine launched the Succession Farm Partnership initiative in 2017, to try and change the apparent reluctance to legally transfer lands to the next generation.

What are the objectives?

The main aim is to encourage the transfer of farm assets while also providing security for the transferors, by allowing them to retain ownership of up to 20% of their farm assets.

The initiative allows for young farmers to become involved in the farm business with their parents and to integrate them into the management side of the farm business at an earlier stage.

In order for farms to remain competitive, the partnership also provides an opportunity to increase scale, maintain security of labour and improve quality of life through better work-life balance and enhanced safety on-farm. It will also reduce rural isolation and improve the social demographics of Irish farms.

What are the benefits of joining a Succession Farm Partnership?

- Defined succession and inheritance plan: Under this initiative, both generations are aware of the succession plan. The Succession Farm Partnership allows the successor to integrate themselves into the farm business with their parents.
- The partnership gives them responsibility and decision making powers and is an important step in the development of the young person as a farmer. It provides an ideal transition of the farm business from parent to child.
- All parties remain involved in the day-to-day running of the enterprise. Responsibilities are shared as outlined in the partnership agreement. As the young farmer now has a share in the profits, they are incentivised to really get involved, take responsibility and develop the farm business.

Work-life balance

Improved work-life balance can be achieved when there is additional labour, skills, new enthusiasm and expertise available on the farm.

Workload can be scheduled and managed, and a rota completed so that all partners enjoy time off and can plan holidays safe in the knowledge that the other partner is familiar with the running of the farm.

The enhanced range of skills makes the partnership more capable and can lead to better decision making, as well as more timely and safer work practices. Any investments required can be shared to reduce the burden on the individual partners.

Financial benefits

Financial incentives include taxation benefits and Common Agricultural Policy (CAP) scheme benefits.

Taxation benefits

Succession Farm Partnership tax credit

An annual tax credit of €5,000 is available to Succession Farm Partnerships, for a maximum of five years from the date of receipt of a valid application to the DAFM registration office, up until the year the successor is 40 years old. The partnership will not be eligible for this tax credit in the tax assessment year that the successor turns 40 years of age.

The tax credit is split in the same ratio as the profit-sharing ratio in the partnership. For example, when Tom (father) and John (son) entered a succession farm partnership, their profit sharing ratio in the partnership agreement was a 60:40 split. Therefore, they will receive a tax credit of €3,000 for Tom and €2,000 for John. Another advantage to this credit is that it can be set against off-farm income.

Income tax

As farm profits are shared between the partners, and each partner is treated separately for taxation purposes, depending on the profit sharing ratio the low rate of income tax can be maximised.

This means that a partnership with two sole trading partners can potentially earn up to €70,600 at the low tax rate.



Stock relief

Stock relief is a tax relief given on the increase in value of stock from the start of the tax year to the end of a tax year. A young trained farmer who forms a partnership with their parents can avail of 100% stock relief on their share of the farm profits for a period of four years after joining the partnership.

In addition, there is an enhanced stock relief scheme available to registered partnerships. This allows the parents' stock relief to increase from the standard rate of 25% to 50% in a registered partnership.

Common Agricultural Policy scheme benefits

Young Farmer Scheme

Where a son or daughter (who qualifies as a young trained farmer) forms a partnership with their parents, they may receive a Basic Payment Scheme top-up of in the region of €60-€68 on up to 50 activated entitlements. This equates to a potential €3,000-€3,400 per year for up to five years, depending on the number of years that the young person is eligible for.

National Reserve Scheme

The National Reserve Scheme, where funds are available, will be part of the Basic Payment Scheme. There are two key benefits:

- **New entitlements:** Where a young farmer farms land that has no existing entitlements, they may apply to the National Reserve for new



entitlements at the national average payment rate.

•**Low-value entitlements:** Where a young farmer farms land that has below average value entitlements, they may apply to the National Reserve to have the low-value entitlements topped up to the national average payment rate.

A maximum of 90ha can be applied for. The young farmer must be included on the herd number, the bank account and also sign a declaration of “long-term and effective control of the holding”. The scheme is also subject to an off-farm income limit of €40,000. For further details, it is advisable to discuss with your agricultural advisor.

TAMS II

A doubling-up of the €80,000 investment ceiling to €160,000 is permitted with a Registered Farm Partnership. A parent and child (who is an eligible young farmer) in a Registered Partnership may qualify for 60% on the first €80,000 and the parents may qualify for 40% on the second €80,000. There is a potential grant of €80,000 on an investment of €160,000 or greater, which is a significant boost to any partnership aiming to make a substantial investment.

Collaborative Farming Establishment Grant

This grant is to help farmers with the costs of setting up a Registered Partnership. It is a 50% grant on a maximum spend of €5,000. It covers

administrative costs such as a solicitor; accountancy and consultancy fees.

What do I need to do to establish a Succession Farm Partnership?

There are a number of key criteria that have to be met:

- You must already be in a Registered Farm Partnership (RFP).
- In order to form a RFP, at least one member of the farm partnership must have been engaged in the business of farming on farmland, owned or leased, consisting of at least 3ha of useable farm land, for at least the previous two years. This person is defined as the “Farmer”.
- The other member of the Succession Farm Partnership must not have reached the age of 40 and they also must have completed a minimum Level 6 agricultural qualification or equivalent. They must hold an entitlement to at least 20% of the profits of the partnership. This person is defined as the “Successor”.
- A farm business plan must be completed and submitted to Teagasc for certification, using the Teagasc My Farm, My Plan, booklet. This is available from Teagasc offices and the Teagasc website.
- There are two essential parts in this planning process. The first part is the farm plan, where the process behind what you are intending to do is analysed.
- The financial plan analyses your financial process, to ascertain if your proposed farm plan is viable.

• Complete a Succession Agreement

The “Farmer” and the “Successor(s)” must enter a legally binding Succession Agreement to transfer at least 80% of the farm assets to the “Successor(s)”. This transfer must take place between the end of year three and before the end of year 10 from the date that the application is made to register the succession partnership.

The Succession Agreement will:

- Identify the Farmer and the Successor(s).
- Identify the transfer date.
- List the farm assets to be transferred. This must include the land, farm buildings, BPS entitlements, livestock and machinery.
- Include details of burdens, right of residence, input of banks where securities, guarantees, charges exist, etc.

What should I look out for?

- Be careful where the successor is 31/32 years of age. As the land cannot transfer for three years, the successor could be over 35 years of age at date of transfer, ruling them out of the Young Trained Farmer stamp duty relief. If this is the case, it will be a balancing act as to which is more beneficial – the €5,000 tax credit per year or the Young Trained Farmer stamp duty relief.
- The Successor cannot claim the tax credit in the year they turn 40 years old, so in order to maximise the five years of tax credit, it is best to join before the successor turns 35.
- Companies do not qualify.
- The farm partnership must have at least two natural persons, therefore it doesn't apply to limited companies.

Updating/making a will

It is vital that any previous will made is updated in line with the succession agreement, to ensure that the documents are consistent with each other. In situations where no previous will exists, it is imperative to ensure that a will is put in place that is consistent with the terms of the succession agreement.

Clawback

A clawback of the amount of tax credits claimed will apply where the farm assets do not transfer as specified in the succession agreement (a clawback of up to €25,000 will apply where the full tax credit has been claimed).

As with any major decision, Farm Partnerships should not be entered into without the independent legal advice of your solicitor; advice on taxation from your accountant/tax advisor and related advice from your agricultural advisor.

PROFILE

Succession farm partnership works well on Kilkenny dairy farm

Matt and Brian O'Sullivan farm just outside Kilmanagh, Co Kilkenny. Up until 2018, Matt milked 75 dairy cows on the family farm. In the preceding years, Matt had developed the farm by installing farm roadways, improving grazing infrastructure, embarking on a routine reseeding programme, increasing cubicle accommodation, updating the milking parlour and increasing cow numbers to 75.

In 2018, Matt's son Brian graduated from an agricultural science degree course in Waterford Institute of Technology.

During 2017 and 2018, Matt and his wife Bernie felt they were at a crossroads. "The farm was at a stage where I couldn't progress it further on my own while at the same time I appreciated that Brian was still young and with a third-level qualification, he may well want to explore the world and gain employment for a few years.

"Not having had this opportunity myself I didn't want to curtail Brian's options," says Matt.

Matt and Bernie decided it was best to sit down with the family and discuss what was best for all parties. Bringing all family members together can often be a difficult step but it's hugely important.

Farm development

Following the open discussion the O'Sullivans decided that the time was right for Brian to return home and develop the farm in conjunction with Matt. They agreed, as a stepping stone, to join a registered farm partnership.

This meant that Brian was now fully included in the decision-making processes on the farm in terms of both physical and financial decisions. Matt retained ownership of the lands and buildings and, as well as his work contribution, he was still a guiding figure in terms of day-to-day management of the farm.

Having sought the advice of their local Teagasc advisor (then Gordon Peppard), a solicitor and accountant, the registered farm partnership agreement was drawn up and a profit sharing arrangement was agreed between Matt and Brian.

Following on from this registered farm partnership agreement, the O'Sullivans felt that the time was right to implement a succession plan



Matt and Brian O'Sullivan farm just outside Kilmanagh, Co Kilkenny.

for the farm and therefore decided to enter into a succession farm partnership agreement.

“The farm was at a stage where I couldn't progress it further on my own

The aim of this was to outline a clear succession pathway for all involved parties with everyone aware of what is going to happen in the next few years.

“For us, the main advantages of the succession farm partnership is that I know that between the end of year

three and year 10 of the agreement I am going to transfer a minimum of 80% of the farm assets to Brian,” says Matt.

He and Bernie can adjust themselves over the next number of years by gradually letting Brian take on more and more responsibility.

Brian, on the other hand, now knows that he can develop his farming business, safe in the knowledge that any monies and time committed are not in vain. Further details on the requirements and benefits of succession farm partnerships can be found on pages 16 and 17.

The herd has since grown to 90 cows with plans to expand to 100 in the next year or two and possibly 110 in four or five years' time.



SILAGE QUALITY

Are we stuck in gear?

Follow these steps to get silage as good as the machines making it

Joe Patton
Dairy Specialist, Teagasc Animal and Grassland Research and Innovation Programme



A further casualty of the COVID-19 epidemic will be the vintage silage making displays which have become a fixture on the summer agri-events calendar in many parts of the country. On these days, young and old gather (hence,

the likely ban) to watch single-chop and double-chop harvesters, and all manner of early self-propelled machines put through their paces in heavy June meadows.

Seeing the old silage kit at work demonstrates the significant rate of development in grass-harvesting technology over the last few decades. But have the new mind-blowingly efficient machines delivered in terms of improved feed quality on the ground?

A quick look at the numbers (Table 1) suggests that despite all the improvements in equipment, national average silage quality remains stubbornly in the lower ranges.

For example, dry matter digestibility (DMD), which determines the intake, weight gain and milk yield

potential of the crop, has not really moved in over 40 years. National average quality silage of 63% to 65% DMD is suitable only for suckler cows requiring weight loss in the winter period.

This level of quality will not repair body condition score (BCS) on dry dairy cows; it will not put weight on weanlings; and will certainly not finish cattle or put milk in the tank. You could conclude that as an industry we have just got faster at making bad silage, but not better at making good silage.

With all that said, there are many excellent beef and dairy farms that year-after-year make high yields of good-quality grass silage at first and subsequent cuts. There seems to be a formula, based on good science, good timing, and attention to detail. So what do you need to do to match the performance of these high performers?

Table 1: National average grass silage quality from mid 1970s until 2014 (Source: Teagasc Grange)

	DM %	pH	DMD %	Cr Pro %
1970-81 (Wheeler et al 1983)	21.7	4.3	63	12.7
1985-88 (Wilson et al 1990)	19.7	4.1	65	14.9
1990-92 (Keating et al 1993)	22.1	4.1	67	15.3
1993-96 (Keating et al 1997)	22.4	4.1	67	14.3
2012-14 (McElhinney et al 2016)	27.0	4.2	61	12.3



Continued on next page



From page 23

1 Understand the meaning and value of feed quality: setting out with the objective of making quality feed is probably the most important factor, as every management decision can fit into place after that. The importance of having quality silage has been demonstrated in countless experiments and real farm situations. Table 2, for example, shows the effect of higher DMD on growth rate in Angus/Hereford cattle – the difference in growth rate from 20 May to 15 June silage would total over 45kg per head in a standard four-month winter. Making up that difference with concentrate for growing or finishing cattle would be expensive indeed. The requirement for high DMD with regard to milking cows is self-evident.

2 Accept that delaying harvest will spoil a good silage crop: grass silage is like a perishable food in terms of quality. Every day past heading date can reduce DMD by up to 0.5 units. Ten days' delay from late May into early June can turn your main winter forage from high quality to maintenance-only feed.

Different types of stock require different levels of silage quality within a system – beef cows 66 to 68 DMD, but growing cattle 72+ DMD – so the problem is often that one single date does not suit all stock on the farm.

The best operators tend to focus on securing the best silage needed first. They are generally ready to harvest grass for quality silage in mid-May, and plan for some lower-quality material – if needed – to be taken later in June or as part of a second cut.

This can easily be done in a baling system or by using both pits and bales. One big cut for convenience will not deliver the right quality.

3 Get the balance right between yield and quality: crop DM yield at harvest remains the single most important factor determining the cost per tonne of silage in the pit. Fixed costs per hectare (e.g. contractors' fees) are diluted to some extent by the extra tonnage, and so too are some costs associated with fertiliser and slurry.

The drive to secure adequate stocks for winter has meant many farms have largely abandoned any consideration of feed quality when making first-cut silage. Later, bulky, cuts have become the norm.



But does this approach actually work? Firstly, the dilution of contractor fees is surprisingly small. A 10-day delay into June (assuming 80kg DM growth) will reduce contractor cost by about €1.55/t fresh silage. Would you pay €1.55 more per tonne for 74 DMD versus 69 DMD silage? You certainly should.

Based on differences in cattle performance, it is more than justified. If it's a bale system you're operating, the difference in cost per tonne is even less.

Secondly, it is vital to consider the yield of forage DM across the year as a whole, not just from a single cut.

There is no advantage in total DM production to delaying first cut due to poor yield at the second harvest. Delaying second cut further for the later first-cut swards would reduce availability of autumn after-grass and negate any silage yield benefit.

It has been clear from recent fodder crises that farms which fail to cut first cut by early June, at the latest, were more likely to run short of silage in a bad year due to poor annual yields and problems salvaging second cut crops later in the year.

Those farms routinely producing high-quality silage are usually less likely to run short despite making earlier first cuts – silage yields are maximised by increasing growth rate



in spring (through better management), not by simply delaying first cut harvest.

4 Treat soil fertility and fertiliser as a year-round project: grass silage removes a lot of NPK nutrient from the field without any slurry recycling by animals as happens in a grazing situation. The fertiliser requirements for grass silage crops are well established and widely available. Getting these correct will ensure that high yields of first and subsequent crops are ready to cut before quality declines.

Farms producing high-quality silage recognise the value of meeting the crop's nutrient needs. This is treated as a year-round process, involving soil testing, targeted use of slurry, build-up of P and K through the year, and liming at the correct time. The "one-size fits all" approach of spread-



DIFFERENT TIMES, SAME RESULT: Silage quality has largely remained unchanged over decades in Ireland (above and left).

ing some slurry plus three bags of silage-cut type products performs poorly in comparison

5 Keep the sward fresh: old permanent pasture with low perennial ryegrass content is less responsive to fertiliser nutrients for first-cut crops, leading to delayed harvest and poor DMD. Lower sugar content makes preservation more difficult. The decision to reseed should be based on sward composition and performance.

A good rule of thumb is that silage ground should be reseeded every eight to 10 years (five to six years for multiple cut systems). This can be difficult especially if silage ground is on short-term lease.

Silage-making technology has come a long way, but the fundamentals of good swards, good soil fertility and cutting at the right growth stage have remained constant over time.

There is much work to do to improve feed quality by looking again at these basic principles. There are enough good examples on working farms to see the benefits of excellent sward management.

Table 2: Beef cattle (weight gain)

Silage quality

DMD	75	70	65	60
Harvest date	20 May	2 Jun	15 Jun	28 Jun
Silage tDM per ha	4.6	6.0	7.0	7.7
Intake (kg day)	9.0	8.3	7.6	7.0
Liveweight gain	0.83	0.66	0.49	0.31

Table 3: Soil index

DMD	1	2	3	4
P required kg/ha	40	30	20	0
K required kg/ha	175 (90 in spring)	155 (90 in spring)	125 (90 in spring)	0
N required kg/ha	125 (100 in older swards)			
Sulphur kg/ha	12-14 (10% of N applied)			



It is vital to consider the yield of forage DM across the year as a whole, not just from a single cut

GLAS WILD BIRD COVER SEED



- Sowing Rate 88 Kgs/Ha. Pre-mixed with the preferred recommended varieties and rates
- Triticale used instead of Oats as the oats draws vermin in large numbers
- Contains; 75 Kgs Triticale, 7.5 Kgs Linseed, 5 Kgs Mustard and 0.50 Kg Phacelia
- Sold in 22 kg bags. 4 Bags/Hectare.
- Cost €40/Bag ex Rathcormac.

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Monitor your grass and manage your plan



Planning and flexibility will optimise your return from silage

Peter Lawrence
Teagasc Drystock Advisor,
Tinahely, Co Wicklow



Research from Teagasc Grange detailed in Table 1 shows that as harvest date is delayed, and plants enter the flowering stage, grass yield increases but digestibility declines. This is because leaf sheath, stem and seed heads, which are high in lignin increase as a proportion of the grass plant. Cattle can't digest lignin so the feed value of the silage plummets.

So when aiming to harvest high-quality silage, plan to have your silage crops ready for harvest from

mid- to late May before most species have begun flowering. Monitor the growth stages of your grass swards from early May as warm weather will accelerate the flowering process.

Grass varieties

Older grass swards generally contain grass species with different heading dates. This can make management tricky. Intermediate perennial grass varieties generally head out in mid-May and are suited to producing high-quality silage with good yields in May and mid-July.

Late heading varieties tend not to head out until early June. If reseeding silage pasture it is important to include intermediate or late heading grass varieties with a narrow range of heading dates (within six days of each other) in your grass mixture.

Digestibility

The quality of silage measured as dry matter digestibility (DMD) should be

matched to the dietary needs of the animal (Table 2.). For example, a dry spring-calving suckler in good body condition will have a lower dietary requirement than a 600kg finishing steer.

Research has shown that digestibility of grass silage drops up to three units for each week that harvest is delayed. Heavy silage crops that lodge or have received a large dressing of nitrogen and possibly slurry may decline in digestibility at a faster rate due to leaf decay at the "but" of the sward.

Similarly, swards that were not grazed in the spring or late winter and had a high cover of grass before closing up, will be six to seven units of digestibility lower by late May/early June compared to swards that were grazed in March.

Harvest these swards in early to mid-May to avoid a buildup of dead material at the base of the sward to produce silage in excess of 72 DMD. Spring grazing allows a delay of about one week in harvest date, maintaining digestibility and recovering yield loss incurred in spring grazing.

Mowing

Before mowing, it is valuable to assess the nitrate levels and water soluble carbohydrates (sugars) in the grass. As a rule of thumb, grass

Table 1: Effect of harvest date on grass silage yield and digestibility

Harvest date	1 May	8 May	15 May	22 May	29 May	5 Jun	12 Jun	19 Jun	26 Jun	3 Jul
Yield (t DM/ha)	2.92	3.99	4.98	5.96	6.79	7.82	8.48	8.93	9.50	9.83
DMD %	79.9	77.9	77.5	76.6	74.6	69.2	67.9	64.3	63.5	58.2

Source: Teagasc, Grange

Table 2: Silage quality guidelines for different types of stock

Silage digestibility (DMD %)	Stock type
75 +	Freshly calved dairy cow (autumn cow)
74	Spring calving cows in milk, finishing cattle/lambs, pregnant ewes
72	Dairy young stock, growing cattle
70	Dry dairy cow (low BCS), suckler cow in milk
68	Dry dairy cow (adequate BCS)
66	Dry suckler cow (adequate BCS)

Source: Teagasc, Grange



Research has shown that digestibility of grass silage drops up to three units for each week that harvest is delayed.

utilises 2.5kg N (2.0 units) per day on average, so final N should be applied 50 days before the planned cutting date.

If weather conditions are good, the crop can be safely harvested sooner if the Brix refractometer sugar levels are at the target 3% or more. Grass sugar content is more critical to good preservation than nitrate readings.

The ideal conditions to achieve high sugars in grass are: dry sunny weather, perennial ryegrass dominant swards, cool nights and mowing in the afternoon by when sugar levels will have built up. If sugar levels are reading low and conditions are suitable for harvesting, add a sugar source such as molasses to help the fermentation process.

Alternatively, increasing the dry matter (DM) of the grass by wilting will help increase sugar levels. Successful wilting depends on having the crop dry at mowing and swathes sufficiently wide that they can dry in good weather.

Ideally, grass should be wilted as quickly as possible to avoid losses through respiration in the swath. The dry matter of grass cut into large rows (30ft) will change little in 48 hours. Tedded swathes wilted for more than 24 hours may become excessively dry as shown in Table 2.

It is important not to over wilt grass

Table 3: Effect of wilting duration and swath width on grass DM % values

	Grass mown at 9am on day one			
	Day one			Day two
Swath treatment	9am	2pm	5pm	2pm
Triple swath mower conditioner	17.2	18.9	19.2	22.6
Mower conditioner – standard	17.2	20.2	21.8	29.5
Mower conditioner– wide	17.2	20.5	23.4	35.8
Spreading/teading	17.2	21.7	28.7	42.9

3 x 2.4m mower conditioner (MC) swathes combined into a 1.4m-wide swath; 2.4m MC producing a 1.2m-wide swath; 2.4m MC producing a 1.6m-wide swath; 2.4m MC with immediate spreading and tedding twice per day.

Source: Teagasc, Oak Park

(above 30% DM) for pit silage as it may lead to poor stability and secondary fermentation at feed out.

Harvesting silage in difficult conditions

It's best to delay mowing until the harvest can be completed once commenced – admittedly a difficult call. Avoid harvesting if soil trafficability is poor to avoid soil contamination and soil compaction.

It is very important to assess grass sugar levels and apply an additive if necessary as wet conditions will prevent wilting. Absorbent material such as beet pulp or soya hulls can help to reduce effluent losses and retain some of the grass juices for preservation.

On steep land don't overfill trail-

ers or consider baling and wrapping these areas at a later date instead.

Preparation

Finally, silage season can be a stressful time for farmers and contractors. So, be organised, have a plan and harvest a few days earlier, or later, than expected if weather conditions dictate.

Preparation begins with planning your intended harvest date, notifying your contractor on your proposed cutting date or having your machines serviced and ready to work.

Prepare silos and effluent channels and having plastic covers or bale wrap on site. Above all, plan for you, your family and everyone involved to be safe.

Farmers providing a giant bird-table

A few acres of the right crops can support bird numbers and diversity

Catherine Keena
Teagasc Crops, Environment and Land Use Programme

A bird's beak indicates its food source. Birds of prey, such as owls and hen harriers, have a hooked beak to kill and feed on small mammals. Breeding waders, such as curlew and lapwing, have long beaks to probe deep into soft wet ground. Insect eaters like the wren and dunnock have a fine beak. Seed-eating birds have short strong beaks to break open seeds. As specialists, birds suffer if their particular food source is in short supply.

With the reduction in mixed farming, winter stubbles and the absence of tillage crops from many areas, there is a shortage of seed during the winter. The purpose of growing wild bird cover crops is to provide seed for such birds during the winter when demand is highest. Approximately 12,000 farmers are growing 20,000ha under GLAS.

Birds of Conservation Concern in Ireland (BoCCI) is an assessment of the conservation status of all regularly occurring birds on the island of Ireland. The conservation status of species is signalled using a traffic light system. Of the 202 species assessed, 37 were placed on the Red list, 91 on the Amber list and 74 on the Green list.

Small seed eaters

•**Skylark:** is Amber-listed. Known as the lark it was well-loved in Ireland for its beautiful song, which on first hearing heralded the arrival of spring. If the lark sang on St Brigid's Day, it was an omen for a good spring. Early risers were 'up with the lark'. Skylark like open areas and build grass nests on the ground. It likes small seed such as kale and linseed.

•**Linnet:** is also Amber-



Skylark.



Linnet.

listed. It is a long-tailed finch that likes open areas and nests in small trees. Their jerky bounding flight action makes it difficult to see their plumage. The finches have a beak suited to small seeds only.

•**Twite:** is Red-listed. It has declined by 78% since the 1970s. It is found in Donegal and Mayo and there is a specific-twite measure in GLAS. Twite like seed from dandelion, sorrel, catsear and yellow rattle.

Twite.



Large and small seed eaters

•**Yellowhammer** is Red-listed. It was a member of the bunting family as was the corn bunting which has become extinct in Ireland. Yellowhammer is now mainly found in the eastern half of Ireland. It prefers cereal and nests on or near the ground under hedge vegetation.

•**Reed bunting** is on the Green list. It is widely distributed, present in all counties. It eats all seeds especially oilseed rape and kale.

•**Tree sparrow** is Amber-listed. It is smaller than the house sparrow, but makes the same chattering call from a group in a hedge or tree. They nest in colonies inside holes in trees or banks.

To cater for all tastes, the GLAS wild bird cover seed mix must contain a large seed (oats, barley, wheat or triticale) and a small seed (oilseed rape, linseed, mustard or kale).

An unharvested crop is a giant bird table, provided seed is produced. Broad-leaved 'weeds' in these crops are beneficial, as long as they don't smother out the crop. They provide flowers for bees and a choice of smaller seed for birds.

Weedy crops are also full of insects, which provide food for



Yellowhammer.



Reed bunting.



Tree sparrow.

other insect-eating birds such as the swallow and great tit, as well as bats. Beneath the wild bird cover on the ground, birds such as the blackbird and song thrush find earthworms easily, provided the crop is not too dense to access.

An open crop is required, so the seeding rate is much lower than that for normal crops. The crop is an ideal habitat for shrews and field mice, which in turn attract owls and kestrel.

The most common mix includes linseed and a cereal. While both are sown throughout the field or plot, it is preferable to sow each seed type separately, because large and small seed need different sowing depths.

As kale is a biennial crop, which is





Cropping plan if kale sown

Year	Half plot	Half plot
1	Kale Yr 1	Cereal
2	Kale Yr 2	Cereal
3	Cereal	Kale Yr 1
4	Cereal	Kale Yr 2
5	Kale Yr 1	Cereal

Sowing Depth

- Cereals: 5cm.
- Linseed/Kale: 1cm.

vegetative in the first year and flowers and produces seed in the second year; only half of the field or plot can be sown with kale.

To grow kale, the soil needs to have a high pH, and lime and fertiliser are required

Animal access now may help decom-

position. Pre-sowing weed control is recommended if noxious weeds are present or if vegetation growth will make cultivations difficult.

Any cultivation method is allowed, provided a fine, firm seedbed is achieved. Fertilise at half rate – it may be useful to mix the fertiliser with the seed to help dispersal if broadcasting. Harrow after broadcasting cereal to cover the larger seed.

Broadcast smaller linseed separately and roll. Rolling after sowing increases seed contact with the soil, allowing moisture uptake and facilitating germination. Getting the seedbed right is the key: Fine, firm and fertile are the three words to remember.

Do not apply pesticides after sowing, but spot treat noxious weeds such as ragwort, thistles and docks. Keep the fence stockproof and fit for purpose. The wild bird cover must be grown in

Seed	Seed-ing rate where drilled	Broadcast-ing Seed Rates
Oats, Triticale, Wheat or Barley	75kg/ha	110kg/ha
Linseed	15kg/ha	20kg/ha
Mustard	10kg/ha	13kg/ha
Oilseed Rape	3kg/ha	4kg/ha

the same field or plot for the length of GLAS. Sow by 31 May, unless there is an area of second-year kale.

Over time, your actions will support bird populations. To see more of these birds, most of which were so common when we were all much younger, will be truly satisfying.

What's in your bag of seed?

Control of an undesirable weed invader, blackgrass, bears an eerie resemblance to the issue that will define 2020

Jimmy Staples
Enable Conservation
Tillage (ECT) project advisor,
Teagasc Crops, Environment
and Land Use Programme



We are only in May but 2020 has already been a year that no one will forget anytime soon. An exceptionally wet autumn in 2019, where over 400mm of rain was recorded in Teagasc Oakpark, made autumn plantings difficult, or impossible.

This was followed by an extremely wet February and early March and a daunting spring workload. Thankfully, the weather was with us as we passed the mid-point of March and, as I write, the majority of spring crops have been sown in very favourable conditions.

With the reduction in autumn 2019 plantings, there will be a greater demand than usual for seed this spring. Initial projections from the trade suggested there would be a potential shortage of about 5,000 tonnes of seed. Whether or not this will materialise is not certain but any shortfall will have to be imported from our European neighbours. This presents a potential problem, not just for this season but coming seasons too.

Standards

In order for seed to be marketed freely within the EU, it must be produced in accordance with EU norms and rules.

The criteria for seed production within the EU are defined by a number of directives. These directives

stipulate the quality factors which must be met in the field in order for seed to be deemed suitable for use.

Some of these quality criteria include: percentage varietal purity, percentage germination, disease status and number of weed seeds present in a sample. These criteria can change from category to category of seed (e.g. basic seed will have higher standards than C2 seed).

Ireland, through the Irish Seed Trade Association (ISTA), is one of only four countries in the EU which works to a Higher Voluntary Standard (HVS) when it comes to seed production. As part of this HVS, there is a zero-tolerance approach to invasive or noxious weeds such as wild oats, canary grass, sterile brome and black-grass. Seed crops found to have any of these weeds present upon field inspection are deemed ineligible for seed production.

If we look at the standards which have been detailed within the EU Directives and have been adopted by the majority of EU states you will see that there is a tolerance within all seed categories for seeds of other plant species (Table 1).

With this in mind, farmers who plan to use imported seed should enquire about the origin of the seed and look for certificates to show that it is free of weed seeds.

Farmer focus

A Kildare farmer who operates a plough-based system (who wishes to remain anonymous) has experience of the problems that can arise from importing seed which is not weed free. He details his story starting with



In order for seed to be marketed freely within the EU, it must be produced in accordance with EU norms and rules

Table 1: Analytical purity of wheat, barley and oats

Category	Minimum analytical purity % by weight	Maximum content of seeds of other plant species (number of seeds per 500g)		
		Total	Other cereal species	Other plant species
Basic seed	98	4	1	3
Certified seed, first generation	98	10	5	7
Certified seed, second generation	98	10	5	7



Figure 1: Black-grass beginning to head out.



Figure 2: Black-grass appearing above the crop.



Figure 3: Flowering black-grass.



Figure 4: Sections mowed out of the WW crop.



Figure 5: Black-grass plant with 40 tillers,

the sowing of a crop of winter oilseed rape (WOSR) in the autumn of 2015.

“In 2015, we established a crop of WOSR followed by a crop of winter wheat (WW) in 2016. In the spring of 2017 a grass weed that hadn't been seen on the farm before began to emerge above the WW crop (Figure 1 and 2).

After the weed began to flower (Figure 3) it was identified as black-grass and knowing the experiences in the UK with this weed we took a zero-tolerance approach to it. The worst affected areas of the field were mowed and baled (Figure 4) with the remaining patches rogued up to four times in an effort to minimise seed return.

In the autumn of 2017, this field was sown down to a ley which will be kept in situ for a minimum of five years in order to deplete the seed bank. The plan for this field is to direct drill a crop of WW into it after the five years in a bid to avoid soil disturbance and avoid moving any surviving seeds into an environment that would be conducive to germination.

At this stage, we still weren't clear on exactly how the black-grass seed had got on to the farm. In the autumn of 2016, a crop of WOSR was established in a different field. As the autumn progressed, it got very patchy and some unused seed from 2015 was stitched into it. A crop of

WW followed in 2017 and in the spring of 2018 black-grass started to emerge above that crop.

“With 2017 still fresh in our minds, we knew straight away that it was black-grass and we implemented the same control strategy as the previous year. We also plan on direct drilling this field with WW when it is due to come out of a ley.

“We traced the source of contamination to the imported oilseed rape seed from 2015. To exacerbate the situation, AstroKerb was not used on the rape in either of those two seasons as Katarmaran was being used to control sow-thistle.

“Since this happened, we have become increasingly aware of the potential for problems to be imported onto farm. As a result we are home-saving a lot of seed and only taking in seed where absolutely necessary. We pay very special attention to where we source the seed from.

“We do the majority of our own work so there is very little machinery coming on to the farm. We sell some straw on the flat but we make sure that the baler is thoroughly blown down in our yard before going to the field and all debris from the baler is disposed of properly.

“Most importantly of all, we make sure we are in our crops regularly and if anything suspect is noticed we

record it and routinely monitor it. This could have been an extremely costly exercise as it resulted in 50 acres of land being taken out of grain production for a minimum of five years. We were lucky that we run a mixed farm enterprise and we had the option of putting fields into grass without causing too much disruption to our business. The main costs we incurred were the loss of a crop where we had to mow patches out and the time and inconvenience of roguing.”

Identification

Early identification was the key to achieving a satisfactory control in this incidence. One black-grass plant with just 10 tillers can produce 1,000 seeds and within a couple of years it can become a significant problem.

The problem is compounded by weed's tendency to develop herbicide resistance.

The unfortunate reality is that black-grass is present in Ireland on a wider scale than some would admit. It is vital that everybody working in the tillage industry, from farmers to advisors to merchants and seed assemblers, is aware of it and how to identify it. Vigilance is key and with early identification we can ensure that this challenging weed does not come to define the Irish tillage industry over the next decade.

Taking control of the COVID-19 pandemic

John McNamara
Teagasc Health and Safety Specialist



Francis Bligh
Teagasc Health and Safety Specialist



It is vital that we all take personal responsibility when implementing precautions to limit the spread of this coronavirus. This involves following the most recent advice of the HSE, with particular emphasis on social distancing, limiting our social interactions and good hand washing (see www.hse.ie).

For farm families, farm staff and persons entering the farm, the additional challenge is to maintain health and safety while continuing with farming operations.

It is important to note that if farm family members have any medical concerns or are displaying symptoms of COVID-19, they should phone their local GP.

Maintain perspective

Many of us can feel overwhelmed by concerns about coronavirus and the number of new cases diagnosed each day. However, it is important that we maintain a balanced perspective on the situation and take control of our own actions.

Professor Paul Fearon, Medical Director, St Patrick's Mental Health Service, has outlined five strategies we can use to reduce the anxiety associated with the coronavirus:

- Follow only reliable information – be sure of the facts.
- Don't forget the basics: the importance of regular, thorough hand washing and good respiratory hygiene – covering our mouths and noses and bent elbows or tissues when we cough or sneeze – in slowing

the spread of viruses.

- Deflect your anxiety: consider talking to family, friends or work colleagues about your shared worries and concerns.
- Use your experience and knowledge: you may already have a range of strategies to cope with anxiety. For example, going for a walk may assist with thinking out matters.
- Stop and do a reality check: If you are constantly worried about contracting the coronavirus think it through logically. Then, looking at all the evidence calmly, ask yourself if there are any realistic reasons to suppose you are at an increased risk at the moment.

Children and young people

With schools closed and children at home, it is vital that farming families lead by example and keep their children safe. Farms are workplaces and, of course, homes too. Children are naturally eager to spend time with adults in the absence of school pals.

When online classes and daily homework are completed for the day, it's natural for children on farms to want to get outside and help with the many jobs that need doing.

Young children should never be allowed unsupervised access to the farmyard and under no circumstances should they be allowed anywhere near working machinery.

Other dangerous areas such as slurry pits, silage pits, grain stores and chemical stores should be off limits at all times. The solution lies in providing safe play for your children and discussing safety positively in simple terms with children on a daily basis.

Children under 14 should never be allowed to drive a tractor or any self-propelled machine on the farm. Only children aged 14 and over should be allowed to operate a tractor under



adult supervision and in line with the limitations outlined in the HSA Code of Practice for Childhood Safety (Available at: www.hsa.ie).

Older people

Older people (aged 70+) are required to cocoon from other members of the community, particularly from younger people who could be carriers of the COVID-19.

Due to age and the increased likelihood of underlying medical conditions, older people are more likely to develop severe illness due to this virus.

Cocooning involves separation from family and friends, loss of freedom, uncertainty over health status and boredom.

Making sure self-care is a priority is crucial for the period of this emergency.

A positive attitude to self-care involves developing a good daily sleep routine as well as minimising alcohol and other treats. These habits contribute to maintaining a healthy immune system.

Regular exercise is vital for everyone and may be done in one's home, outdoors, close to the farmhouse. Accompanying an older person exercising (with appropriate distancing) or helping keep up-to-date with a family



Teagasc telephone helplines for farmers

A Teagasc telephone helpline, which was set up to assist farmers with queries relating to COVID-19, was announced by Professor Tom Kelly, Teagasc Director of Knowledge Transfer in March: "Teagasc have put in place a dedicated helpline for farmers to get advice on the range of issues they may face as they continue to do their essential work in maintaining the food supply chain.

This helpline is open to all farmers for a range of farming issues they face on a day-to-day basis."

The information line phone number is +353 76 1113533 and will be open from 9.30am to 12.30pm and from 2pm to 5pm Monday to Friday.

As usual, the Teagasc website (www.teagasc.ie) is a prime source of information on the full range of issues facing farm businesses. Teagasc clients should continue to use advisors

mobiles and office numbers.

Labour database

Teagasc has also set up a regional farm labour database to link farm families, where a farmer or a farm worker becomes ill with COVID-19, with an available relief worker. This done in collaboration with the Farm Relief Services (FRS) and the support of the IFA and ICMSA.

Thomas Curran, manager of the Teagasc Cork west advisory region said: "If you are available to work on farms to assist fellow farmers, please ring the designated Teagasc regional number in the table below, or your local Teagasc office. You will be registered on the Teagasc regional labour database. With your permission, your details will be passed to FRS and they will contact you in the event of a farmer needing assistance."

Teagasc Region	Office	Contact Number
Cork West	Skibbereen	028-21888
Cork East	Middleton	021-4631898
Kerry Limerick	Killarney	087-3826808
Tipperary	Thurles	0504-21777
Kilkenny Waterford	Dungarvan	058-41211
Carlow Wicklow Wexford	Johnstown Castle	053-9171350
Dublin Meath Louth Laois Kildare	Naas	045-879203
Offaly Westmeath Cavan Monaghan	Tullamore	057-9321405
Roscommon Longford	Roscommon	090-6626166
Clare Galway	Athenry	091-845804
Mayo	Ballina	087-6951432
Donegal Sligo Leitrim	Ballymote	071-9183369

member is especially helpful.

Boredom and isolation predictably cause distress for human beings who are programmed to be socially connected. Older people need a working mobile phone to communicate with family and friends, along with essential services such as a local medical practice or pharmacy.

Step-up the management of any chronic health condition, to minimise challenges to both mental and bodily health from poorly-managed illness. Now is the time to check that medications and supplements are being taken correctly. Gaining support from family members can help with health management and your primary care doctor can be consulted by phone, if needed.

Check-in with elderly neighbours living alone. For older people, ALONE has a dedicated coronavirus support line (0818) 222 024.

Farming issues

Give health and safety the utmost attention at this time of emergency. A farm injury is unwelcome at any time, but currently, an injury would be particularly unwelcome. It could jeopardise the running of the farm, require attendance at a medical facility and place more pressure on our limited health care resources.

This is a busy time of the year for farmers, with a lot of machinery work associated with fertiliser, slurry spreading and silage harvesting, along with work taking place with spraying crops.

Given the nature of this work, there will always be a need for people to visit the farm.

On many farms, this involves contractors spreading slurry or vets tending to sick animals.

It is important to be conscious of the necessary precautions to avoid the spread of coronavirus and ensure these precautions are implemented.

It is important that we, as farmers, have a conversation with these individuals before the job starts, in order to properly plan and organise with coronavirus precautions in mind.

Teagasc advisors are available at the end of the phone for advice and support during this challenging time. Office consultations and farm visits are also taking place by appointment at clients request for urgent issues.

The 'Community Call'

The "Community Call" is a major initiative that links local and national government with the community and voluntary sectors. It is a mobilisation of both state and voluntary resources to combat the effects of COVID-19.

The purpose of the call is to coordinate community activity, direct community assistance where it is needed and marshal the volunteering energy of the country. Contact your county council to access the service.

Follow public health directions

This pandemic will pass, but it needs the continued commitment of all people to defeat COVID-19. The virus needs to gain entry to the human body to survive. This takes place primarily through the respiratory system. For instance, soap and water used correctly in hand washing kills the virus by destroying its fatty outer layer. Keep up-to-date and follow all public health guidelines related to coronavirus.

New regulations on farm roadways and waters

Tom Fallon
Farm Buildings and Infrastructure Specialist
Teagasc Rural Economy Development Programme



New requirements to prevent direct run-off of soiled water from farm roadways have been published by the Department of Agriculture, Food and the Marine (DAFM) and come into effect from 1 January 2021. Specification on Farm Roadways are available on www.agriculture.gov.ie, or <https://bit.ly/2wM6igQ>.

Farmers who have a grassland stocking rate over 170kg N/ha

- Livestock drinking points must be at least 20m from watercourses and animals cannot be given access to streams for drinking. The 20m does not apply if there is a roadway between the trough and the watercourse.
- Fences must be at least 1.5m from edge of the bank, so many farmers may need to move fences. Existing fences alongside roadways that are situated within 1.5m of the watercourse do not have to be moved.
- Livestock will not be allowed to cross (walk through) watercourses. This is not specifically mentioned in the legal documents, but DAFM have confirmed that it is covered under Article 18 of SI No 605 2017. Livestock will be allowed to cross a watercourse to an "isolated land parcel".
- Farmers who export slurry to bring the overall farm stocking rate under 170kg are also obliged to comply with these new measures.

All farmers must prevent direct run-off of soiled water from farm roadways to waters: The Specification also includes measures to prevent direct run-off from farm

roadways to waters, which must be in place from 1 January 2021. Waters are defined in Specification S199 and include all water bodies, but also ditches that may be dry in the summer but convey water in the winter.

Measures to prevent direct run-off from farm roadways to waters

In most situations, it will be a matter of allowing or directing run-off from the farm roadway at regular intervals on to a field. Care must be taken to avoid directing run-off into paddock entrances.

Creating a crossfall

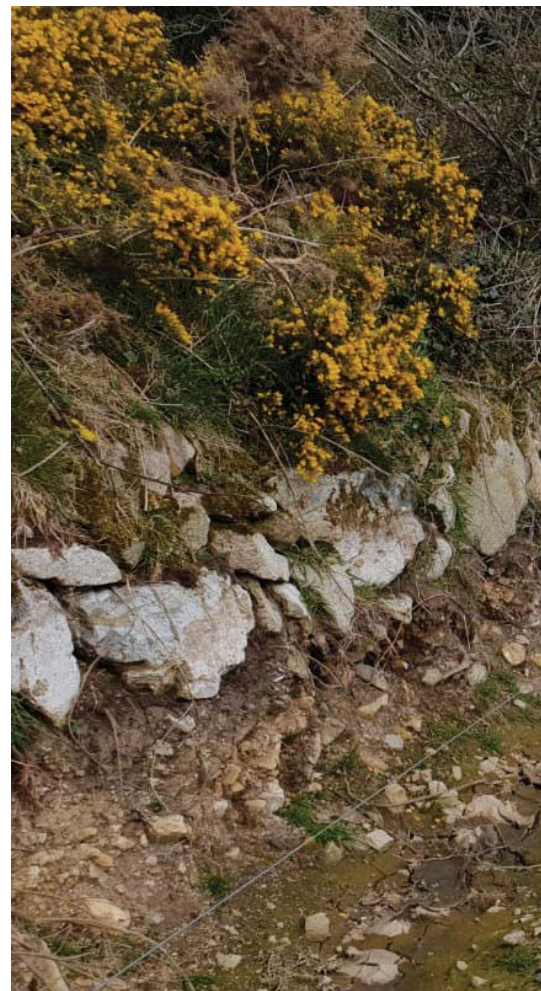
Roadways near watercourses may be level, or indeed, may have a crossfall towards the watercourse. Consider the feasibility of creating a crossfall away from the watercourse, as shown in Figure 1 below.

The cost of creating this cross fall will be approximately €13.50 per metre run for a 4m wide road. An existing road that is not in good order may need an extra 50mm of stone, which would add €5.50 to the cost per metre. Where roadways have a significant fall to the watercourse, it may make sense to evaluate an alternative solution.

Creating an earthen bank or barrier alongside the stream can be a useful physical barrier to prevent the entry of road run-off. This run-off will need to be piped or channelled back on to the land or, if this is not feasible, into a settlement pond.

Create a sediment trap or settlement pond (Figure 3): A settlement pond will only be needed where it is not feasible to direct road run-off onto a field. This may arise on wet or poorly-drained ground, where extra run-off would make the situation worse.

It will be necessary to channel or pipe the water to these settlement



Farm Roadway runoff

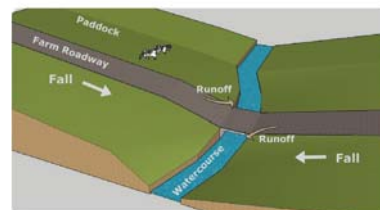


Figure 2 - Existing farm roadway showing bridge over a stream

ponds. The bunds in the settlement pond create three chambers, which will ensure that the full contents of the pond are not disturbed when it receives a big influx of liquid.

There could be a lot of leaves and surface debris on these ponds so the "T" on the percolation pipe will prevent this debris clogging up the percolation area. (The percolation pipe has openings to discharge the liquid. An ordinary drainage or perforated pipe could also be used).

It is recommended to line and cover over the percolation trench containing the drainage stone with geotextile. This is a strong synthetic fabric material that is often used on roadways to stop the layers mixing and it also strengthens the soil by spreading the load.

Our experience is that unless very good drainage stone (pea gravel,

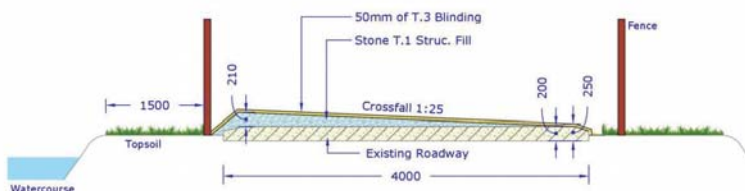


Figure 1 - Farm Roadway resurfaced with T.1 Struc. fill and dust to a 1:25 crossfall away from stream



One farmer's simple solution to the new regulations – he has changed the camber on the road so it slopes away from the stream on the right. He has created a depression on the left that receives and allows the runoff to soak away.

T1/804 or clean stone of 10mm to 40mm in size) is used, big stones just get clogged up with mud and clay over time and become dysfunctional.

These ponds are also likely to be in challenging environments with flooding and mud to contend with. Geotextile is generally sold in 5.5m wide 100m long rolls, so farmers may need to purchase it as a group.

Road run-off, after passing through the percolation area and the adjacent soil, can be discharged through the normal field drainage system. The settlement pond is designed to receive run-off from a 200m by 5m wide road.

Bigger ponds will be needed for bigger catchments. Leaving room to install baffles to slow down the movement of liquid into the pond would also be sensible. In many situations, improving land drainage beyond the percolation channel will be necessary. Please consult your local authority.

Figure 3 also details buffer zones, which will be installed where animals enter a paddock adjacent to a stream. Effectively, the gateway into the paddocks will be moved at least 6m from the top of the bank of the stream or ditch.

Where a farm road slopes down towards a public road, and where there are waters running parallel

with the public road, provision shall be taken to ensure that run-off from the farm roadway does not enter the watercourse or ditch. Steps will be taken to convey the soiled water to a suitable soakage area. This also applies to roadways that are traversing a watercourse.

Herd Management: For some holdings, livestock may have to cross

a public road (where there is no underpass). In this case, cows will be retained in the farmyard until milking is complete. The full herd can then be moved to the grazing area.

This will reduce the both the time cows spend on the farm roadway and the consequent soiling. The farm roadway and the public road shall be maintained as clean as possible.

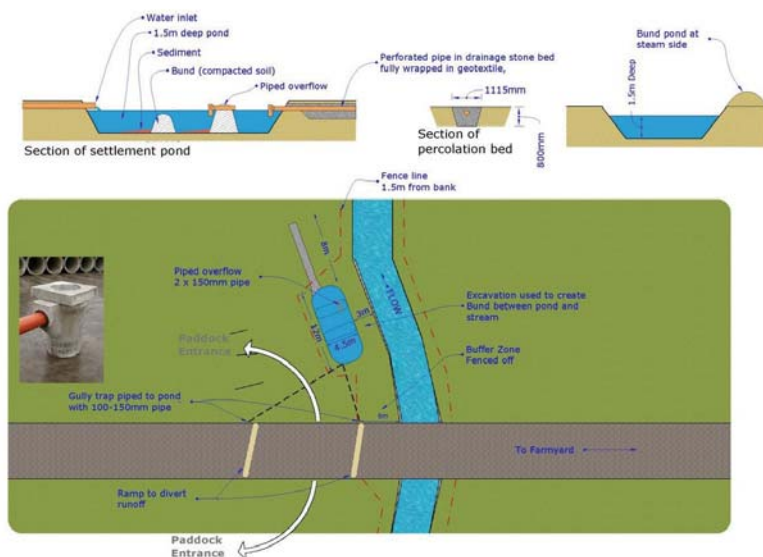


Figure 3 - Farm roadway crossing a stream showing work to prevent runoff into the stream

Farm forestry – integrating for resilient farming

Successfully integrating forestry and farming can have rich sustainability dividends, but it can also be challenging. The RDS Teagasc Farm Forestry Award recognises farmers who are leading the way

Noel Kennedy
Teagasc Forestry
Development Department



More than 19,000 farmers have already chosen to diversify their farming enterprise by planting forests. The area of farm forests has grown to over 300,000ha and now contributes to a forest industry worth more than €2bn annually.

The successful integration of forestry and farming presents a golden opportunity to fully realise the many benefits of trees and boost farming resilience. More recently, the dual emergencies of climate change and declining biodiversity have brought into sharp focus the many intangible ecosystem services forests can offer for farmers, from carbon sequestration and habitat protection, to biodiversity enhancement and protecting water quality.

For those farmers who are success-

fully meeting the challenge of integrating forestry on their farms, the annual RDS Teagasc Farm Forestry Award presents an opportunity for their achievements to be properly recognised by their peers and wider community. The award aims to recognise excellence in the sustainable use of land that incorporates both farming and forestry through the successful adoption of a whole-farm planning approach

Making the most of forestry

The process of integration can be challenging and not all farmers are getting the maximum reward from their forest.

Planning to integrate forestry and farming should begin before any trees are planted, with a vision of the future and a “whole-farm planning strategy” for the proposed planting. This should encompass not only the farm, but also the family and work life balance and the following questions should be considered:



- Where and how will a forest best fit physically, economically and environmentally into the farm?
- Can I utilise forestry with other farming schemes – for example, Basic Payment?
- What do I want my farm and farm-

Forestry ‘allowed me breathe again’

Gerard Deegan won the RDS Teagasc Farm Forestry Award in 2019. The Westmeath farmer successfully combines an organic calf-to-beef enterprise and poultry farming with an integrated forest enterprise.

In 2012, with farming getting more stressful, Gerard decided to plant three-quarters of his 58ha farm, to give himself more quality time to develop the farm and other activities.

“As an organic farmer, forestry suited me from both environmental and financial points of view,” he says. “I worked



Gerard Deegan in his plantation.

with my forester to select the type of trees and organise the layout of the forest.”

Gerard focused on enhancing the farm landscape, optimising biodiver-

sity opportunities and providing good access to facilitate management and timber production. He planted 20ha with commercial conifers and 20ha with predominantly oak, beech, ash and sycamore and has continued to be hands-on in looking after the young forest.

Seven years later and Gerard's role in integrating his forest enterprise with his organic suckler, calf-to-beef and poultry enterprises was recognised when he was named the winner of the RDS Teagasc Farm Forestry Award. In accepting the award, Gerard said: “I feel privileged to accept the award and will enjoy it. Forestry has allowed me to breathe again.”



Pioneers of forestry promotion

The RDS pioneered the promotion of tree planting over two centuries ago, the legacy of which can still be found around the country.

The Dublin Society, now the Royal Dublin Society, was formed at a meeting of the Dublin Philosophical Society in 1731. As part of the philanthropic desire to modernise Irish agriculture, forestry was encouraged at an early stage. The first ever premium for planting trees was introduced by the Reverend Dr Samuel Madden in 1739.

Records of the Society show that premiums were increasingly awarded for afforestation and stocking of nurseries from 1742 onwards. Gold medals were awarded by the Society to landowners, in recognition of their tree planting endeavours and quality of young forests.

In 1783, "a sum of £40 is offered by the Society to each person enclosing a quantity of ground not less than ten acres, with a sufficient fence proof against cattle, and planting the same with a number of oak, ash, beech, elm, maple, sycamore, chestnut, larch, fir or pine at not less than two thousand plants on each acre".

Support for tree planting continued for seven decades, with records showing that between 1766 and 1806 over 55m trees were planted across Ireland on foot of the Society's initiatives. The modern RDS Forest and Woodland Awards are a fitting acknowledgement of the forward-thinking RDS members whose support for tree planting and forest creation remains a legacy to enjoy over two centuries later.

I acknowledge information provided by Dr. Michael Carey from his book "If trees could talk – Wicklow's trees and woodlands over four centuries" (Coford 2009).

Now in their 33rd year, they recognise and reward farmers and woodland owners who are employing the principles of Climate-Smart Agriculture on their properties, including sound commercial management, environmental protection, and encouragement of bio-diversity.

In addition to the Teagasc Farm Forestry Award, there are also award categories for production forestry and community woodlands. All woodland owners, managers and communities, large or small, are encouraged to enter the awards, as all woodlands are of merit.

ing to look like in 10 or 20 years?

•Finally, and critically – what can I do to get the best results from my trees?

Trees will quickly have a meaningful impact on the farm, whether it is sheltering stock, creating a new landscape, protecting an existing habitat or producing timber. To achieve this potential, and successfully integrate new forests with farms, farmers need to plan the logistics in the short-term.

What's more important is for farmers to stay the course with the growing trees, by being actively involved with their management and growing their own forestry knowledge over the longer term.

Getting advice from Teagasc advisors and working closely with an experienced forester are key elements to the achievement of a successful integration strategy.

RDS Teagasc Farm Forestry Award

The 2020 RDS Teagasc Farm Forestry Award is now open for entries. Working farmers who believe they are

doing a good job in managing their forest as an integral part of the farm are strongly encouraged to enter.

Eligibility criteria:

- Forest area minimum 4ha.
- Forest ages five to 15 years.
- Open to farm forests – mainly conifer, mainly broadleaf and mixed woodlands.
- Forest owner must be an active farmer, i.e. have DAFM identifier/s or other evidence of farming.

The winner of the RDS Teagasc Farm Forestry Award will receive €2,000 and an RDS Silver Medal. The runner-up will receive €1,000 and an RDS Certificate of Merit.

Award information and application forms are available at www.rds.ie/forestry. Information is also available at www.teagasc.ie/forestry

RDS Forest and Woodland Awards

The RDS Forest and Woodland Awards, Ireland's National forestry awards, celebrate the best forests and foresters in Ireland.

Plant viruses – the not so threatening kind

Paul Fitters

Lecturer at the Teagasc College at the National Botanic Gardens



Due to the coronavirus (COVID-19), the knowledge about virus infections has increased dramatically for most people, as it has caused havoc to people's health, travel plans and the economy. Plant viruses on the other hand, are not as threatening, but have in the past also caused major problems to people in a number of different ways.

The tulip breaking virus is most famous for its dramatic effects on the colour of tulip petals. This highly sought-after effect led to the tulip-mania in the Netherlands in the 17th century. Prices for one such bulb could be as much as the price of a stately home on the canals in Amsterdam.

As money was so easily made, more and more people joined the trade of virus-infected bulbs, which reached extraordinarily high levels and then dramatically collapsed in February 1637. Dutch commerce suffered a severe shock, but eventually recovered.

At the time of the mania, it was not known what was causing the tulip petals to 'break', as viruses were only identified early in the 20th century. In 1939, there were 129 plant viruses named. Now, we have about 1,000 officially recognised plant virus species. These figures relate only to cultivated plants, which represent a tiny fraction of the total number of plant species. Viruses in wild plants have received relatively little study.

Plant viruses are similar to human and animal-transmitted viruses, in that they are biological agents that reproduce inside the cells of living hosts. When infected by a virus, a host cell is used to produce thousands of identical copies of the original virus. While animals have an immune system that produces antibodies, which may ultimately eliminate the virus and confer lifetime immunity to the host, plants do not. Plants either have to live with it, or succumb.

The first plant virus discovered was the iconic tobacco mosaic virus. The discovery is accredited to A. Mayer (1886) working in the Netherlands, who demonstrated that the sap obtained from infected tobacco leaves



Tulipa 'Orange emperor' with virus infection.

developed mosaic symptom when injected in healthy plants. However, the infection of the sap was destroyed when it was boiled. Viruses cause an estimated \$60bn loss in crop yields worldwide each year.

As plants do not sneeze, travel, congregate and mingle in large groups, how do viruses spread from plant to plant? Just as many viruses are very specific as to which host plant they attack, each virus relies on a particular method for spreading and for that they use vectors.

Vectors are mostly sap-sucking insects (such as leaf hoppers or green flies), but can be other organisms too, such as soil-borne nematodes or gardeners taking cuttings and passing on sap from one plant to the next with their secateurs.

If a sap-sucking insect such as an aphid moves from one infected plant to a healthy plant, and injects its stylet into it, that can transfer the virus. Within the plant, viruses can spread through plasmodesmata (little openings between cells).

Plant virus transmission from generation to generation can also occur through seed (20% of plant viruses), but seed is usually a safe way to start clean again. If cuttings are taken from an infected plant, the virus is automatically taken with it.

Some plant viruses are attractive, such as the Abutilon mosaic virus.



The mosaic symptom is considered more interesting than the healthy plant, and it is often marketed as a form of variegation.

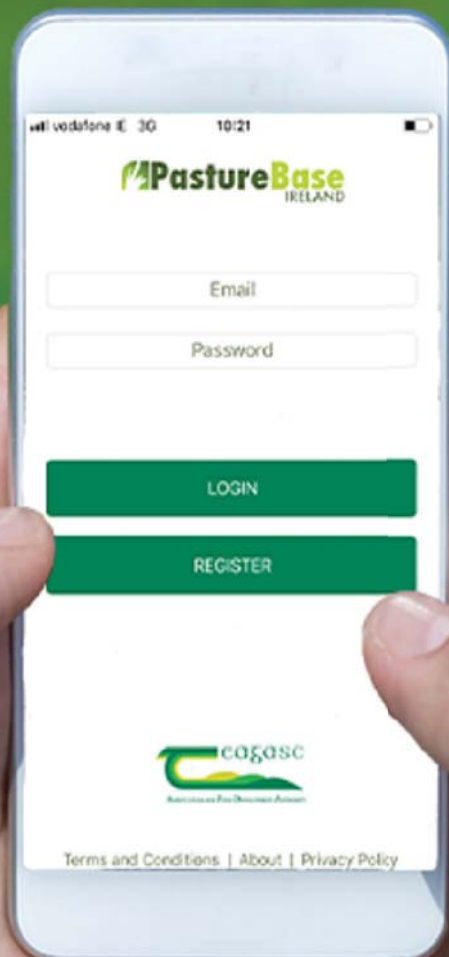
If you have plants infected with an unwanted virus infection, as plants cannot get rid of a virus, the best thing to do is place it on the compost heap and wash your hands.

Download the newly updated PastureBase Offline App now including Spring Rotation Planner

PastureBase Ireland is a grassland measurement database which allows farmers to evaluate medium to long term performance from the farm.

It provides distribution of growth and paddock summary reports which can be used to benchmark farms across enterprises and regions. The background data such as paddock soil fertility, grass cultivar, aspect, altitude, reseeding history, soil type, drainage characteristics and fertiliser applications are also recorded.

PastureBase Ireland also links grass growth on farms to local meteorological weather data.



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