



# Today's Farm

Business, production, environment and countryside issues [www.teagasc.ie](http://www.teagasc.ie)



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# REDUCE LABOUR NEXT SPRING VACCINATE THIS WINTER

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**COMMENT**

**Mark Moore**  
Editor,  
Today's Farm

## Infrastructure

We are unashamedly 'plugging' infrastructure in this edition. Investing in infrastructure can seem a bit dull compared with buying machinery, buildings, parlours and other big-ticket items. In fact, it's the Cinderella of farm investments. But it generates fantastic returns of at least 10-15% per annum. Having good roads will also make life easier for you and your cows. Hopefully spring 2019 will be nothing like this year's but if it is, those with good roads and spurs will reap the benefits through better grass utilisation.

Lest anyone thinks good infrastructure is just for dairy farmers, we feature Niall O'Meara, a beef suckler farmer who achieves astonishing performance using what he describes as 'Cheap and cheerful' infrastructure. Inexpensive and extraordinarily effective is how I would describe it.

## Bonneagar

Déantar cur síos inár scéal clúdaigh ar na buntáistí a fhaigheann feirmeoirí ó infheistiú a dhéanamh sa bhonneagar, amhail bóithre nua, claíochas agus píopaí chun uisce a sheachadadh, úsáid níos éifeachtaí as a gcuid féir, feidhmíocht níos airde as ainmhithe, níos lú obair chrua, agus saol níos éasca don duine agus dá ainmhithe. Nuair a chuirtear é sin san áireamh le toradh 10-15% ar an infheistiú, is léir go mór buntáistí an bhonneagair.

Ach meastar go bhféadfaidh sé go bhfuil oiread agus trí cheathrú de bhanracha gann ar bhealaí éagsúla ó thaobh an bhonneagair de. D'fhéadfadh sé go gcaitear an oiread sin airgid ar earraí costasacha amhail innealra, bleánlanna agus foirgnimh nach mbíonn mórán fágtha le haghaidh cúrsaí bonneagair. Ach tá an toradh ar infheistiú sa bhonneagar chomh maith sin go bhféadfaí go díreach an t-airgead a fháil ar iasacht agus ansin íoc as. Ar an rud is lú a d'fhéadfaí a dhéanamh, déan iniúchadh bonneagair le feiceáil cén staid ina bhfuil tú.

### INFRASTRUCTURE

An unbeatable investment on your farm

>> 19-23



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**Cover** | Near Castleisland in Kerry, Teagasc advisor Denis Brassil, Liam and John O'Sullivan inspect John's new farm infrastructure.

## NATIONAL DAIRY CONFERENCE

27 November 2018 - 28 November 2018

- **Event time:** 9am
- **Venue:** Rochestown Park Hotel, Cork, and Hodson Bay Hotel, Athlone.
- The theme of this year's National Dairy Conference is 'Making Dairy Farming More Sustainable'.
- The 2018 dairy conferences take place as follows:

• **Tuesday, 27 November**

- Rochestown Park Hotel, Cork.

• **Wednesday, 28 November**

- Hodson Bay Hotel, Athlone.

• **AGENDA**

- **9.00** Registration.

- **9.45** Welcome.

- Billy Kelleher, regional manager Teagasc (Cork conference).

- Tom Kellegher, regional manager Teagasc (Athlone conference).

• **SESSION 1:**

- Chaired by Liam Herlihy, chairman Teagasc authority (Cork), Gerry Boyle, director Teagasc (Athlone).

- **10.00** Opportunities for Irish grass-fed milk products – Albert McQuaid, global chief technology officer, Kerry Group (Cork); Speaker TBC (Athlone).

- **10.30** Dealing with weather risks; lessons from 2018 – Tom O'Dwyer and Joe Patton, Teagasc.

- **10.55** New insights to the feeding value of grazed pasture – Michael Dineen, Teagasc.

• **SESSION 2:**

- Chaired by Kevin Twomey, dairy farmer and chairperson of Teagasc dairy stakeholder group (Cork); James Keane, regional manager, Teagasc (Athlone).

- **11.20** Managing all calves to a high welfare standard: the Australian experience – Natalie Roadknight, University of Melbourne.

- The new dairy beef index – Andrew Cromie, ICBF.

- What role can sexed semen play? – Stephen Butler, Teagasc.

- **12.30** Lunch.

- **SESSION 3 (13.45-16.30):** Choose three workshops to attend from the list of six below:

- **Workshop 1:** Managing our GHG and ammonia emissions targets.

- **Workshop 2:** Grassland decisions made easy.

- **Workshop 3:** Coping with the spring workload.

- **Workshop 4:** Contract heifer rearing.

- **Workshop 5:** Building fodder reserves in 2019.

- **Workshop 6** Making our dairy farms better places to work.



## IMEACHT FEIRME CHONAMARA - A CONNEMARA FARMING EVENT

15 November 2018

- **Event time:** 6-8pm.

- **Venue:** Peacockes Hotel.

- Many events have been organised throughout the year for Bliain na Gaeilge to celebrate the Irish language and indeed to promote it. Teagasc, with support from Conradh na Gaeilge, is delighted to organise a unique event for sheep and beef farmers. A mixture of both Irish and English will be used throughout the presentations. The event is KT approved and will take place in Peacockes Hotel, Maam Cross, on 15 November from 6-8pm. The guest speakers are:

- Michael Diskin (Teagasc) – sheep technologies update.

- John Graeney (Teagasc) – beef technologies update.

- Muiris Ó Scaill (former vet) – herd and flock health (video).
- George Graham (sheep farmer) – farmer physical and mental health.

## AGRI-FOOD & RURAL TOURISM WORKSHOP, MAYO

14 November 2018

- **Event time:** 9.15am-4.30pm.

- **Venue:** Glen Keen Farm and Visitor Centre, on the Leenane Road (R335).
- This workshop is targeted at Farm Family members with a business idea and an interest in agri-food and rural tourism. Farm families are always improving and learning and developing the land, building, farm and enterprise whether cattle, sheep, dairy, equines or other. Diversification is another development and is not a threat, but an opportunity with economic, social and environmental



benefits.

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## CONIFER MANAGEMENT EVENT

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**9 November 2018**

- **Event time:** 10:30am.
- **Venue:** Tullamore GAA, O'Brien Park, Arden Road, Tullamore, Co Offaly. Eircode: R35 XK35. The event will be signposted locally.
- Preparation and first thinning of Norway spruce.

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## THE FESTIVAL OF FARMING AND FOOD – SFI SCIENCE WEEK AT TEAGASC

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**Featured events**

**60 Minute Science**  
Thursday, 15 November - 7.30pm  
River Court Hotel, Kilkenny

Rick O'Shea, RTÉ, brings his inimitable style of hosting to the 60 Minute Science event at the Kilkenny River Court Hotel on Thursday November 15 at 7.30pm. The event celebrates local science in Kilkenny with speakers from Costellos Brewing Company (beer magic), The School of Food (scobys, starters and more...), Glanbia (why small is beautiful), Teagasc (think before you tidy), and Cartoon Saloon (bringing food to life). Audience participation is encouraged!

### A Slice of Science

Thursday, 15 November - 4pm  
Teagasc, Ashtown Food Research Centre, Dublin 15  
Find out more about the science of food and how this relates to you and what you eat. How do we use all our senses to relate to food? How clean are your hands? What makes a good steak? What exactly is gluten? Get the answers to these and many more questions at this open evening. You will also see the invisible world revealed by satellite images and a food 3D printer in action!

### Plant Power

Tuesday, 13 November - 12.30pm  
National Botanic Gardens, Glasnevin  
Plant Power is new to the Festival of Farming and Food - SFI Science Week at Teagasc this year. The theme is the importance of plant breeding in sustainable food production. Local food producers will showcase locally-grown sustainably-produced food. There will be interactive lab sessions looking at how biological control agents can be used to control plant pests. Visitors can visit the national herbarium, which is not usually open to the public.

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## TEAGASC FOOD GATEWAYS EVENT

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**21 November 2018**

- **Event time:** 9am.
- **Venue:** Moorepark, Fermoy, Co Cork.
- This unique event will showcase the latest developments in food structure research and design.
- See how understanding of food material science can be applied to the production of high-quality products and contribute to competitive advantage

for the Irish food industry.

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## OUTLOOK 2019

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**4 December 2018**

- **Event time:** 1pm to 4pm.
- **Venue:** The Alex Hotel, Fenian Street, Dublin 2, D02 H678.
- **Programme**
- **1.00** Light lunch and registration.
- **1.30** Welcome and opening remarks - Prof Gerry Boyle:
- Short-term macro outlook.
- Agri inputs.
- Cereals.
- Pigs.
- Forestry.
- Cattle and sheep.
- Dairy.
- Farm incomes.
- **4.00** Close.
- Few in the farming community will hold fond memories of 2018, a year dominated by adverse weather conditions that have had a major impact on both grassland and tillage systems. A long winter and extremely dry summer have caused serious challenges at farm level and elsewhere in the food production chain.
- Milk deliveries and the grain harvest have been lower than expected. Input expenditure has escalated dramatically on many farms due to much higher than normal feed requirements. Incomes across all sectors will experience a reduction in 2018.
- Turning to 2019, with Brexit now imminent, there is no clarity on whether the UK will exit via a transition agreement or whether an abrupt hard Brexit will occur.
- This year's conference will include a review of 2018 and the short-term outlook for the major farm sectors in 2019, contingent on an orderly or a disorderly Brexit.
- **Who should attend?**
- This event will be of interest to farmers, farm representative organisations, food businesses, financial institutions, academics and policy makers.
- **How to register**
- There is no fee for this event. However, due to limited capacity, registration is mandatory and closes on Friday, 30 November.
- Register at: <https://outlook2019teagasc.eventbrite.ie>.

# Making dairying more sustainable: Teagasc National Dairy Conference 2018

**Dr. Tom O'Dwyer, Head of Dairy Knowledge Transfer**

As you may have already seen mentioned in the events pages, the Teagasc National Dairy Conference 2018 takes place in the Rochestown Park Hotel, Cork, on Tuesday 27 November and the Hodson Bay Hotel, Athlone, on Wednesday 28 November.

This conference provides an opportunity for farmers and agri professionals to learn about new ideas, share information, get answers to questions and, probably most importantly, be inspired to take action. Teagasc has planned a farmer-focused, practical conference and has invited a stellar lineup of speakers to take part.

The theme of the conference is Making Dairying More Sustainable and each of the speakers will highlight important technologies that can improve the sustainability of dairy farming. This year's conference follows the format adopted successfully at the previous year's event, with a mixture of lectures and workshop sessions.

Another year is coming to a close and dairy farmers will probably be glad to see the back of 2018. Most of the challenges during 2018 were weather related, with five extreme weather events experienced since October 2017. While dairy farmers have managed though the challenges, additional costs were incurred, not to mention the added workload and stress. This will be the subject of a paper by Tom O'Dwyer and Joe Patton: Dealing with weather risks: lessons from 2018.

Michael Dineen, Teagasc, will report on an exciting project between Teagasc and Cornell University which is seeking to gain a better understanding of the nutritional characteristics of grass in unprecedented detail.

An entire session at the conference will be devoted to managing calves on dairy farms. Speaker Natalie Roadnight from the University of Melbourne will share the Australian experience of managing all calves to a high welfare standard. Andrew Cromie, ICBF, will outline the new Dairy Beef index and



how it could be used to assist with the selection of suitable beef sires for the dairy herd, while Stephen Butler, Teagasc, will share the results from the 2018 on-farm sexed semen trial.

As in previous years, we are providing six workshops on both afternoons. Attendees can choose to attend three workshops from a list of six on each afternoon (see list below). The workshops this year again cover a varied range of topics with a great mix of Teagasc and other professional and farmer

presenters. All of the workshops will be interactive, with plenty of time for audience involvement. This format has proved very popular in the past, and I am confident this year's workshops will stimulate much discussion and provide a range of perspectives on six different topics.

Further details about both events are available on the Conference webpages at [www.teagasc.ie](http://www.teagasc.ie). Spaces are limited by venue capacity on both days. Consequently, early booking is recommended. Attendees will be asked to indicate the workshops which they wish to attend when booking. The cost of attendance is the same as previous years: €30 for students, €60 for Teagasc farmer clients and ConnectEd members and €120 for all other attendees. Registration includes: entrance to Conference, including choice of three workshops; morning/ afternoon teas, lunch; and a copy of the conference proceedings.

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

## Workshops

Three sessions from the six listed can be selected at time of booking.

1. Managing our GHG and ammonia emissions targets
2. Grassland decisions made easy
3. Coping with the spring workload
4. Contract heifer rearing
5. Building fodder reserves in 2019
6. Making our dairy farms better places to work

# TEAGASC DAIRY MANUAL

REVISED AND  
EXTENDED  
IN 2018

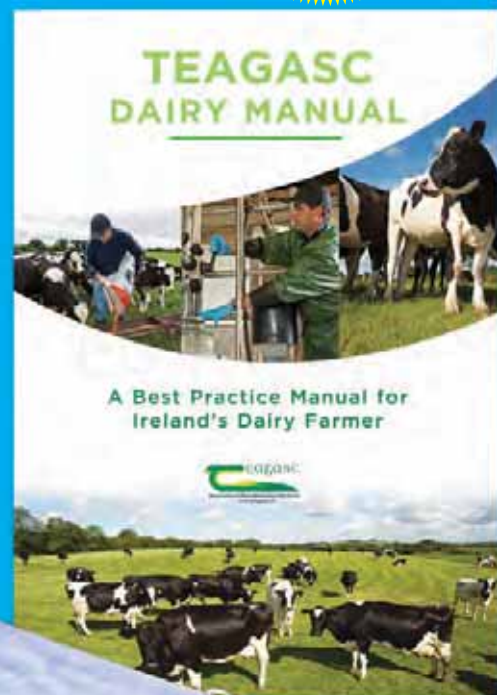
A comprehensive source  
of practical advice  
for any dairy business.

- Why dairy farming?
- Business management
- Dairy facilities
- Dairy farming and the environment
- Milk quality
- Feeding dairy animals
- Dairy breeding
- Dairy animal health

These sections are further divided into a total of 49 chapters with titles such as: Creating a Business Plan, Winter Facilities, Feeding the Dairy Cow, Managing Your Grass, Replacement Heifer Management etc.

The information within each chapter is built on feedback from farmers and is laid out as Questions and Answers, How-to's, Key Performance Indicators, Key risks, etc. making the Manual extremely easy to read and use. The Manual will be of particular interest to anyone planning to expand over coming years.

A must for anyone with an interest in dairy farming the 310-page Manual is produced using tear-proof, water-proof paper for real world conditions.



Price €25, non-clients €50).

# All I want for Christmas is ... two pallets of nitrogen!

Having nitrogen in the yard in December will ensure you can apply it as soon as the closed period has passed and conditions allow. Prompt application means you won't miss out on precious early grass growth.

**Stuart Childs,**  
Dairy Specialist, Teagasc Moorepark

A reasonable amount of organic soil nitrogen builds up in the soil over time and some of this can be mineralised over the summer and autumn. This trickle, coupled with some recycling of applied nitrogen, provides enough nitrogen to support the minimal amount of growth that takes place over a normal winter (3kg to 5kg DM/ha).

January and early February are the coldest periods and we can't expect much growth (grass production of just 5kg to 15kg DM/ha/day is the Pasturebase Ireland estimate for the month of February).

But after mid-February, grass growth can rapidly take off, particularly if nitrogen is available in the soil. However, there is a lag period between applying nitrogen and when it starts to give a response.

In fortunate early areas, grass growth tends to get moving from mid-February onwards, the exception

being if prolonged cold weather or wet weather occurs – like the spring of 2018, when ground was saturated even in some of the driest areas.

It is due to this lag that mid- to late January has to be the target date for first nitrogen application in the south and about two weeks later in the north – as allowed under the nitrates directive (Zone A – Jan 13th; Zone B – Jan 16th and Zone C – Feb 1st).

Grass growth needs a temperature of over 6°C for significant growth, and growth increases rapidly as the temperature rises from 6°C up to 12°C and then more slowly from there on.

As stated previously, there will only be a moderate response to this applied nitrogen; indeed, some will say they see only a very limited response to it, but it is vitally important in priming the plant for growth.

As there is only a modest growth response, application rates should be kept to approximately 28kg to 29kg/ha (23 units/acre or a half bag of protected urea).

The average grass growth response to early nitrogen applications is 10kg

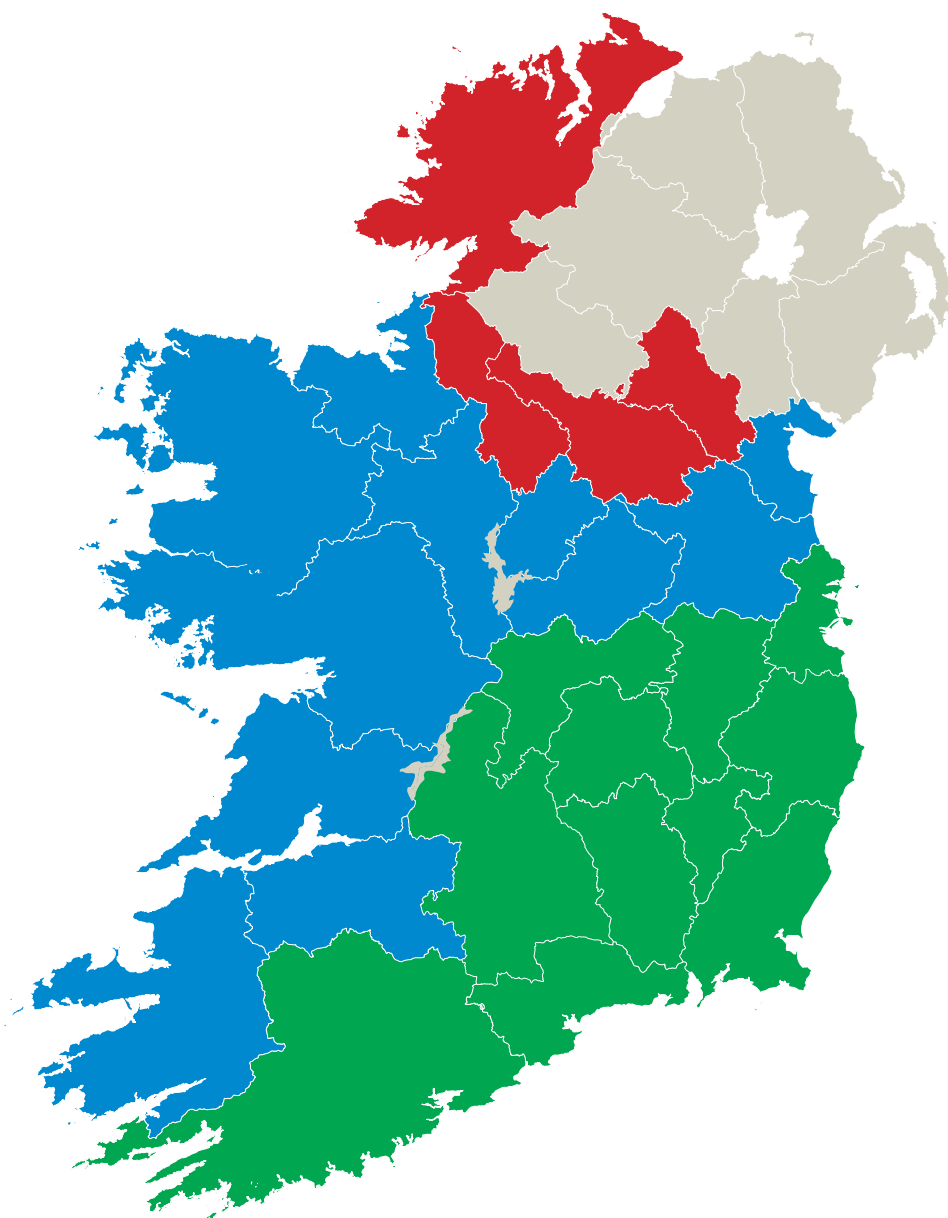


The average grass growth response to early nitrogen applications is 10kg DM/kg N applied, ie 280kg grass DM/ha for 28kg N/ha applied. On a 40ha farm, this is equivalent to 11.2t of grass DM, which would feed 80 cows on grass full-time along with 4kg of concentrate for a 10-day period – a return that is not to be sniffed at





## Prohibited application periods for fertiliser



Prohibited application period

| Fertiliser type | Start     | Zone A | Zone B | Zone C |
|-----------------|-----------|--------|--------|--------|
| Chemical        | 15 Sep to | 12 Jan | 15 Jan | 31 Jan |
| Organic         | 15 Oct to | 12 Jan | 15 Jan | 31 Jan |
| Farmyard manure | 1 Nov to  | 12 Jan | 15 Jan | 31 Jan |

DM/kg N applied, ie 280kg grass DM/ha for 28kg N/ha applied. On a 40ha farm, this is equivalent to 11.2t of grass DM, which would feed 80 cows on grass full-time along with 4kg of concentrate for a 10-day period – a return that is not to be sniffed at.

Two-thirds of the farm should get this amount, either all in one run, if

the farm is dry enough to do so, or over a period of weeks as ground conditions improve on heavier soils.

The rest of the land should get slurry as its initial nitrogen source, with the balance of the fertiliser N being applied four to six weeks later. Slurry can be applied to the ground that has already received N fertiliser

post-grazing.

From an environmental perspective, the greatest risk of loss of nitrogen from grassland is through run-off. This can occur if the soil is saturated at the time of application or heavy rain occurs soon after application and the nitrogen is carried away before it can be absorbed into the soil.

Don't spread if ground conditions are marginal or if heavy rain is forecast within two days.

Trafficability of land can turn quite quickly though, with the help of increasing day length and some dry weather, even if it is only short lived. When it does you need to be ready to strike. The biggest stumbling block to early application of nitrogen is lack of availability. How can this be?

There are co-op and merchant yards full of fertiliser in preparation for the peak delivery season in January.

Therein lies the problem, as fertiliser in a merchant or co-op yard is not in your yard. The logistics around delivery of these huge quantities creates problems for co-ops, merchants and transport companies, but, most of all, it will create a problem for those who don't have fertiliser in the yard when the spreading season commences, while time is available to spread before the start of calving.

You could be lucky or unlucky as to whether you have fertiliser available when the window of opportunity to spread comes.

A very obvious, simple, but extremely effective solution to this issue is to plan to have enough nitrogen in the yard just to complete the first application.

The average dairy farmer (80 cows) is now farming 40ha (100acres). To give every acre of this farm a half bag of fertiliser is going to take 2.5t of fertiliser, equivalent of two pallets of urea or protected urea with a bit to spare.

Planning to have this in the yard for Christmas or shortly after will allow you to apply your early nitrogen at the time that suits you, and in the most appropriate conditions, once the closed period has passed.

This is important on all farms, but even more so on heavier farms where opportunities to spread can be limited in the early season. Plan ahead and be prepared.

In the past, straight urea has been the product of choice for early application. However, from an environmental perspective, protected urea is preferable due to its significantly better environmental characteristics: reduced ammonia emissions and reduced nitrous oxide losses, both of which are significant issues for our industry in the context of our gaseous emissions targets.



# Grab the opportunity!

## Building soil P fertility on intensive livestock farms

**Mark Plunkett**  
Teagasc Crops, Environment and Land Use programme, Johnstown Castle

**U**nder the new Nitrates Action Programme (NAP), Ireland has been allowed additional fertiliser P application on very low fertility grassland soils (P Index 1 and 2) for four years starting in 2018 and finishing in 2021. This is to help build up soil P levels to increase the grass-growing ability of soils to meet the extra feed demand on livestock farms stocked above 130kg Organic N/ha.

Building soil P levels for example from Index 1 to Index 3 will increase

grass yields on average by up to 1.5t DM/ha annually. This is worth €270/ha in extra grass on a dairy farm and €160/ha on a drystock farm.

### Why correct soil pH before applying additional P?

The first step on the road to building up soil P levels is to correct soil pH to the optimum 6.3 to 6.5 on mineral soils and on peat soils to 5.5. This will increase soil P availability and may increase the soil P Index (Index 1 to Index 2) on some soils. For example, acidic mineral soils (pH <5.9) fix and bind up applied P and once these soils are limed P is released and is more plant available. Therefore, check soil test results and apply lime as recommended on the soil test report.

Lime is a low-cost input and will help reduce initial P fertiliser costs when building soil P levels. Lime increases the availability of both soil and applied P as either manures or

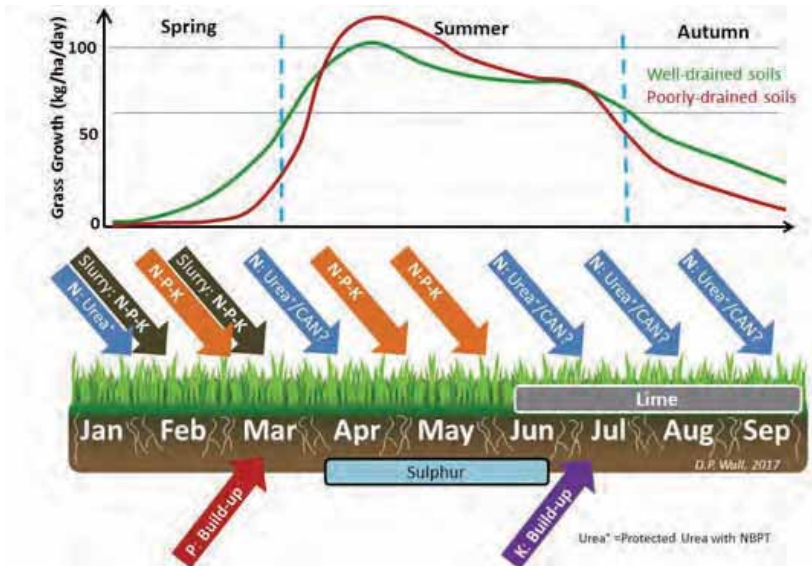
fertilisers. The return on investment from applying lime and correcting soil pH on mineral soils is between €4 to €7 of extra grass production for every €1 spent on lime for dairy and drystock farms.

### How do I set about availing of this chance to increase soil P?

- Have soil test results for every 5ha on the farm and check soil organic matter status map.
- Engage with a FAS Advisor to complete a farm fertiliser plan.
- Complete a short training course on fertiliser planning.
- Apply to DAFM to avail of this P buildup.

### How much extra P can I apply on my farm?

Once the fertiliser plan has been completed for your farm it will outline on a field-by-field basis the recommended rates of P required. Aim to apply 50%



of the recommended P in the spring (March) and apply the remaining 50% between April to June in 2 or 3 applications (See figure 1).

Can I apply P build-up rates on mineral and peat type soils?

At time of soil sampling, soils need to be classified as mineral- or peat-type soils. See the soil organic map of Ireland (Source:- DAFM) consult this map before soil sampling.

If you are not sure, it is worth testing the soil organic matter percentage. Soils that are above 20% organic matter on the soil test are classified as peats. On peaty-type soils, P build-up rates are not permitted as peat soils cannot store phosphorus. On peat-type soils it is only permitted to apply maintenance rates (Index 3) of P. The P fertiliser strategy on peat-type soils is to apply maintenance rates of P during the growing season. On mineral soils P build-up rates can be applied. Mineral soils have the ability to store soil P due to their mineral (sand, silt and clay) content.

### Which fertiliser type is most suitable for building soil P levels?

A high P fertiliser type will be required, for example straight P as in 16% Super P is an option. Alternatively, a fertiliser that will supply a good balance of N, P and K is preferable, for example an 18-6-12, 15-10-10, 10-10-20 etc type fertiliser. Where soil K levels are medium to high, an N and P type fertiliser will be required to deliver high rates of both N and P, for example 23-10-0, 25-5-0, 24-7.5-0 type fertiliser blends.

### When is the best time to apply P fertiliser build-up?

Once significant grass growth kicks off in spring, for example March/April, aim to apply 50% of the recommended P fertiliser. The first P application is required early in the grass

growing season to drive grass yield and early grass production. Apply the remaining 50% in the following two to three months with each round of N fertiliser (see figure 1 above). These later applications ensure there is adequate P content in grazed grass for animal nutrition.

## WANT HEALTHIER COWS PREGNANT SOONER?

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# Don't overlook your cow's body condition score

**Aidan Murray,**  
Drystock specialist, Teagasc Animal and Grassland Research & Innovation Programme.

It's people rather than cattle which come to mind when you hear body condition scoring (BCS) mentioned these days. Human nutritionists refer to body mass index (BMI) as the way to measure our individual condition.

A growing fraction of the population are categorised as obese on the human grid and many work hard to lose their unwanted kilos.

The condition of suckler cows also fluctuates. Suckling, originally begun in marginal land areas where the goal was to calve cows to grass, allows them to build up body condition and get them back in calf over the summer. House them at the end of the season in good condition, allow them to lose some of this condition over the winter months and calve them down, fit and healthy. Then the cycle would begin all over again.

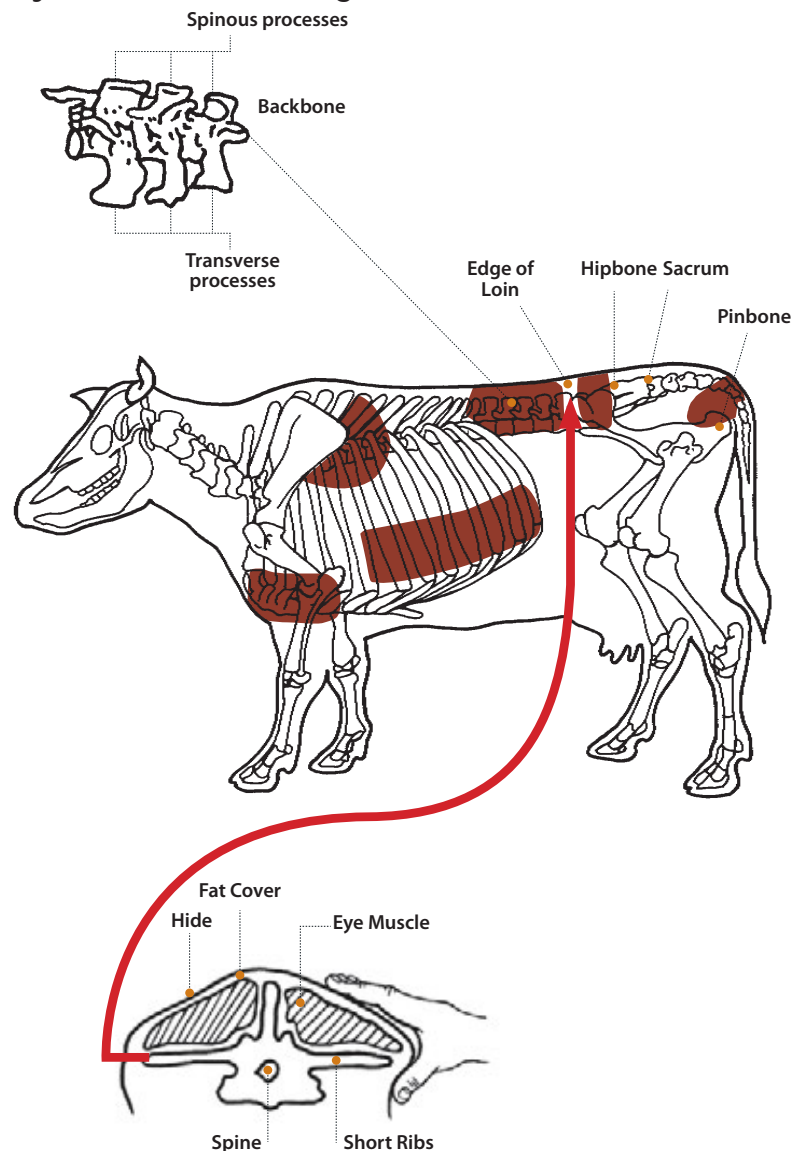
## Principles

It is important that we are reminded of these principles this winter; in particular, as some farms face the winter with tight fodder supplies where rationing may be needed.

Other farms have cows coming in in excellent condition and with an abundance of fodder. Either way, cows calving down too thin will give as much trouble as those calving down too fat and the consequences don't stop at calving.

Body condition scoring is a good method of assessing body fat levels in cows and it is one of the most important factors in determining reproductive performance.

## Body condition scoring

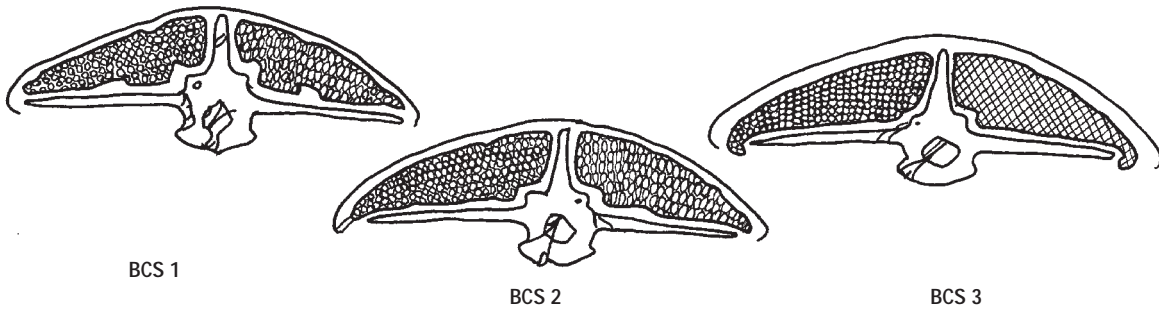


When it comes to assessing body condition score, we usually follow the Scottish method, where animals will fall into categories 0 to 5 as listed on page 13.

Animals are assessed by feeling the level of fat cover along the edge of

the loin and around the tail head. You can also place the palm of your hand along the ribs and, using your fingers, assess fat cover.

It is important to remember that it is fat cover you are assessing and not muscle mass.



**Score 0**  
Emaciated.

**Score 1**  
Individual spinous/transverse processes fairly sharp to the touch and no fat around tail head. Hip bones, tail head and ribs visually prominent.

**Score 2**  
Spinous/transverse processes identified individually when touched, but feel rounded rather than sharp. Some tissue cover around tail head and over hip bones. Individual ribs no longer obvious.

**Score 3**  
Spinous/transverse processes can only be felt with firm pressure. Areas either side of tail head have fat cover that is felt easily.

**Score 4**  
Fat cover around tail head evident as slight rounds, soft to touch. Spinous/transverse processes cannot be felt, even with firm pressure. Folds of fat developing over ribs.

**Score 5**  
Bone structure no longer noticeable and animal presents a blocky appearance. Tail head and hip bones almost completely buried in fat, folds of fat are apparent over ribs. Spinous/transverse processes are completely covered by fat, the animal's mobility is impaired.

## When should you condition score?

As a minimum, cows should be condition-scored three times in the year.

• **I. Housing/weaning:** Many spring-calving cows will be housed over the next few weeks. It is an ideal time to check condition, because it will identify cows that need to gain condition (BCS<2.5) prior to calving. This period will often coincide with cows being weaned and thinner cows that are dried off will be given every chance to build condition even on good-quality silage.

These thinner animals should ideally be grouped together if they are to get preferential treatment. Equally, overfat cows (BCS 4 to 5) can be thinned down over a more prolonged period if they are identified early. Research has shown that allowing an overfat cow to reduce condition score by 0.7 will save the equivalent of 1.5t of fresh silage.

• **II. Pre-calving:** The reason to condition score again in the two to three months before calving is to make sure that cows will calve down in the 2.5 to 3.0 range. If they calve down too thin (<BCS 2), you can run into issues of increased calving difficulty, poor calf vigour and delayed return to oestrus after calving.

Scoring animals at this time will also flag up cows that may have lost extra condition because they may have a parasite burden or be carrying

Table 1: Target body condition scores

|          | Spring-calving herds | Autumn-calving herds |
|----------|----------------------|----------------------|
| Calving  | 2.5-3.0              | 3.0                  |
| Breeding | 2.5-3.0              | 2.5-3.0              |
| Housing  | 3.0-3.5              | 3.0                  |

twins, etc. Older cows, heifers and first calvers will be most vulnerable if feed space is limited; cows that become lame can often lose condition rapidly.

• **III. Breeding:** After calving, if cows are to remain indoors for longer than two to three weeks, thin cows and first calvers should be grouped and supplemented to at least maintain condition and ideally be on a rising plane of nutrition. Cows should be gaining condition right through the breeding season.

Thin cows will be slower to resume oestrus and, if your system is to be efficient, then cows need to be bred and back in calf within 10 to 12 weeks of calving, which is a tight target to achieve if cows are in poor condition.

As Table 1 shows, cows should ideally be fluctuating in the BCS range 2.5 to 3.5 throughout the year. Falling outside this range means that there are times of the year that your cows are too thin or overfat.

## Summary

- Condition score cows now at housing and group accordingly if cows are thin or overfat, so that feeding can be targeted.
- There is a danger this winter, where forage supplies are tight, that if adequate feed space is not available, then some individual cows will lose excessive condition pre-calving. Young cows and older cows will be most at risk.
- Make sure that cows are well covered against parasites, such as fluke, and treated for lice at housing. It is another factor that will draw nutrients away from preserving body condition.
- Where meals are being used to supplement scarce fodder supplies, feed space is critical if animals are to maintain condition. If, in the six weeks pre-calving, you feel cows are gaining excessive condition (3+ BCS), you may need to ease back to avoid calving issues.
- Some cows will be out-wintered on forage. Even with the correct minerals and forage allocation, cow condition should be monitored closely. Some cows during prolonged wet periods on these crops may lose quite a lot of condition and then have to be housed.

# Getting the most from your grazing block

– utilising grass in Co Louth

**Frank Campion and Ciaran Lynch**  
Teagasc Animal & Grassland Research & Innovation Programme, Hugh Rooney, Teagasc, Louth.

**P**eadar Kearney farms 27ha near Ardee, Co Louth, where he runs a mid-season lambing flock. The farm itself is split into two blocks, with each managed as a separate grazing unit. It's a high-output system. Last year, Peadar lambed just over 300 ewes, and when the 80 replacements that were retained are also accounted for, the farm is stocked at just over 12.5 ewes/ha.

In 2014, after joining the BETTER farm programme, Peadar began to streamline his sheep system.

Previously, he had operated a split flock, with both early and mid-season lambing ewes. To simplify the overall farming practice, he moved fully to a mid-season flock.

Coinciding with this, he also delayed lambing until the end of the first week of March to better suit his grass supply. This has allowed Peadar to transform his flock from an early-lambing high-input system into a mid-season flock maximising the use of grazed grass and reducing input costs.

## Getting the basics right

With nearly 900 sheep (300 ewes, 80 replacements and over 500 lambs) all consuming grass each spring, good grazing infrastructure and grassland management are vital.

The first element of any grazing system is to ensure soil fertility is monitored and any issues addressed.

To do this, Peadar soil-samples the farm every two to three years and uses the results to inform decisions on fertiliser and lime applications for the subsequent years.

As shown in Figure 1, 47% of the farm has a pH > 6.2, which is considered ideal for grassland. Of the remaining land, 39% is just below this target with a pH ranging from pH 5.9 to 6.2.

## Infrastructure

Peadar has also put a major effort into increasing the number of pad-

Figure 2

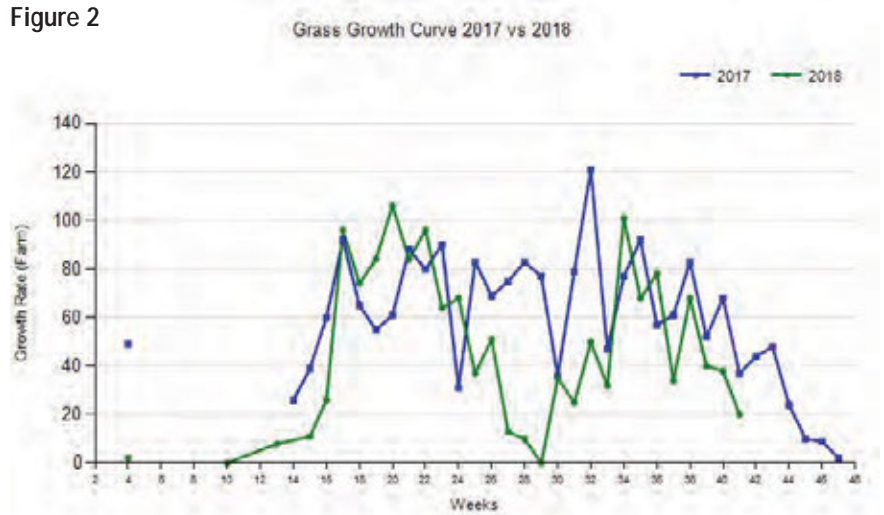
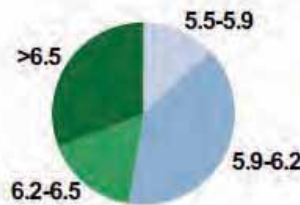


Figure 1

## Lime

Soil pH > 6.2



docks on the farm to increase grass utilisation and grass production.

For the grazing block shown in Picture 1 (p15), this area was originally divided into seven paddocks, but is now divided into 24 permanent divisions, with TAMS grants used where possible for permanent fencing and other areas divided by electric fencing.

## Temporary divisions

Temporary divisions also play a pivotal role in how Peadar manages his grass.

“They give me better control over grass and help improve grass utilisation,” he says. “They also facilitate dropping out areas for silage as required when there’s excess grass.”

This system now forms the basis for his winter feed. While he has tried several different options for

temporary fencing, his preferred option is the three strands of poly wire and plastic stakes, seen in Picture 2. These temporary divisions are powered by battery-operated fencers.

Additionally, he has adopted a 1,000-litre IBC tank to provide a portable drinker, which improves flexibility to divide.

## Grass measuring

Grass measuring is how Peadar controls and manages his grass and it allows him to make grazing decisions based on facts every week.

“I measure the grass covers every weekend and input the data into PastureBase Ireland,” he says. “This allows me to calculate growth rates on the farm and how much grass I have in front of me.”

From this data, Peadar is also able to make decisions on when to drop out surplus paddocks for silage or introduce feeding to meet deficits.

## Reseeding

Most of the strides Peadar has made have been on permanent pasture. However, he has begun a reseeded programme. Over the past two years, Peadar has begun reseeding a proportion of the home grazing block with monocultures as part of a monoculture evaluation trial.

The measurements Peadar collects from these monocultures provides



Hugh Rooney and Peadar Kearney.



Picture 1.



Picture 2.

data for the Teagasc Pasture Profit Index.

While no reseeding has been done this year as a result of the difficult spring and summer, it will form an important part of Peadar's grassland management for the future.

The changes and strides made by Peadar in how he manages and utilises grass on his farm were evident when he was awarded the Grass10 Sheep farmer of the year for 2017.

### Managing the drought in 2018

Over the past couple of years Peadar's strides in grassland management have allowed him to go from a

position where he was buying all his silage to making all his own silage.

However, this year it was a different story. As presented in Figure 2 (p14), growth rates for this year have been well below 2017 figures for long periods in the summer.

In order to manage the 900 sheep on the farm during this time, Peadar began supplementing lambs with concentrates from early July.

The ewes were kept in two batches to spread the pressure across the two grazing blocks, with concentrate supplementation offered to some of the ewes and others supplemented with some of the 2018 silage.

### Winter ready?

Peadar has completed his fodder budget for the coming winter and, in addition to silage he made prior to the drought and in September, he has purchased an additional 50 bales of silage locally which will give him 100% of his fodder requirements.

In addition, Peadar and Joanne Martin, who works with him at the busier times of the year, also went through his breeding flock and culled a further 20 underperforming ewes within the flock, which will also ease pressure on fodder supplies.

# Investing in the future

- new pig farm manager's course

**Ciarán Carroll,**  
Head of pigs – knowledge transfer,  
Moorepark

**P**ig production in Ireland is a major business, third in importance behind beef and milk production, with exports valued at over €715m in 2017. The sector employs over 8,000 people, with approximately 1,300 of these on farms.

It also creates employment in associated services located mainly in rural areas. Direct investment in pig production at farm level is valued at close to €1bn.

Two parameters drive profitability in pig production, productivity and production costs. Significant productivity improvements have been made over the years.

Table 1 shows the average number of pigs produced per sow per year on Irish herds keeping records on Teagasc eProfit Monitor (ePM) during 2000, 2010 and more recently in 2017.

The born alive figure has risen steadily, with a 24% increase when 2017 is compared with 2000 performance. The number of litters per sow per year has also improved steadily and this has contributed to the 26% increase in pigs produced per sow per year in 2017 relative to 2000.

Table 2 shows the performance based upon feed conversion of pigs from weaning to sale during the same years. There is an increase in live sale weight of 20.7kg over the 17-year period. The average daily gain from weaning to sale has improved by 124g per day.

The poorer FCE from weaning to sale may be associated with the increase in sale weights, more feed wastage and perhaps poorer housing

conditions on some of the poorer-performing herds.

The combined benefit of getting more pigs produced and the heavier weights at sale is shown in Table 3. The carcass weight sold per sow per year is 56% higher in 2017 compared with 2000, mainly due to advances in animal genetics, nutrition, healthcare and overall management.

Cost of production is a key factor in determining the cost competitiveness of Irish pigmeat both in competing with imports on the home market and with other pigmeat-exporting countries on export markets.

Feed represents about 70% of pig production costs as reported in Teagasc ePM-recorded herds. Thus, it is important that Irish feed costs are competitive with those of our international competitors.

InterPig results for 2017 (Table 4) show that feed cost per kg dead weight is ~14c higher in Ireland than the average for main EU pig-producing countries (Denmark, France, The Netherlands, and Spain).

Factors associated with this cost gap include higher transport costs for ingredients, feed formulation differences, diet specifications used and efficiency of feed utilisation and feed credit.

There are just over 300 commercial pig farms in the country operating on about 400 sites, making up a national sow herd size of 153,000 sows.

Profitability has traditionally followed a supply and demand cycle, where good returns one year are followed by poor returns the next. Unfortunately, in recent years there have been more poor years than good.

Last year (2017) was a good year. However, 2018 has been very poor, with margins at their poorest level



Back Row (L-R):  
Christopher Brady  
Billy Moloney  
Ciaran Caffrey  
Fintan Murray  
Finbarr Higgins  
Richard Mc Grath  
James Brett  
Sean Mc Glynn  
Front Row (L-R):  
Howard Monds  
Gerard Cowhig  
Colin McGovern  
Arkadiusz Zabiegly  
Ger Mc Cutheon  
Michael Mc Keon  
Jason Mc Grath  
James Mc Grath



The sector employs over 8,000 people, with approximately 1,300 of these on farms

Table 1: Pigs produced per sow per year from 2000, 2010 and 2017

|                        | 2000  | 2010  | 2017 |
|------------------------|-------|-------|------|
| Litters/sow/year       | 2.29  | 2.32  | 2.36 |
| Born alive/litter      | 10.85 | 12.01 | 13.5 |
| Piglet mortality %     | 9.0   | 9.9   | 10.7 |
| Weaner mortality %     | 2.6   | 2.4   | 2.9  |
| Finisher mortality %   | 2.3   | 2.5   | 2.2  |
| Pigs produced/sow/year | 21.5  | 23.9  | 27.0 |

(Source: Teagasc ePM)





ever. High pig margins in 2017 stimulated a sow herd expansion (+2%) across most of the major European pig-producing countries, which resulted in a 3% increase in the volume of pigmeat produced.

This extra pigmeat has depressed pig prices. On top of a difficult pig price, feed prices have increased, adding to the pressure on pig farms here.

Despite all the challenges in the sector, those involved at the coal face continue to try to work their way through the current crisis.

No producer has control over pig or feed prices, so they must focus on what's inside their farm gate. One of the key factors inside the gate is farm staff.

Skilled staff, motivated to deliver a high level of technical performance, are essential in pig production. Large, specialised farms with skilled, well-trained staff were the drivers of the

Table 2: FCE weaning to sale in 2000, 2010 and 2017

|                            | 2000 | 2010  | 2017  |
|----------------------------|------|-------|-------|
| Liveweight at sale (kg)    | 90.1 | 103.6 | 110.8 |
| Deadweight at sale (kg)    | 68.1 | 78.9  | 84.6  |
| ADG (g)                    | 584  | 668   | 708   |
| Feed conversion efficiency | 2.37 | 2.47  | 2.44  |

(Source: Teagasc ePM)

Table 3: Pigmeat produced and FCE Weaning to Sale in 2000, 2010 and 2017

|                                    | 2000 | 2010 | 2017 |
|------------------------------------|------|------|------|
| Carcase weight sold/sow/year (kg)* | 1464 | 1884 | 2285 |
| Total feed per sow (kg)            | 5358 | 6952 | 8141 |
| kg feed per kg of carcase          | 3.66 | 3.69 | 3.56 |

\*This is the pigs produced /sow/year multiplied by the average deadweight at sale.

Table 4: Feed costs for Ireland and our main EU competitors, 2017

|                              | Denmark | France | Netherlands | Spain | Ireland |
|------------------------------|---------|--------|-------------|-------|---------|
| Feed cost, c /kg dead weight | 79      | 83     | 90          | 91    | 100     |

\*This is the pigs produced /sow/year multiplied by the average deadweight at sale.



Continued  
on p18

world-class productivity in the sector in the past.

Currently there is a deficit of skilled farm staff and managers. These are well-paid positions, with regular working hours and time off. Many of these roles would be suited to part-time farmers who may be looking for extra work to support their income.

After a 30-year period when Teagasc/ACOT/Department of Agriculture recruited and trained personnel to work in pig production, the course (at Athenry) lapsed in 2000 due to lack of demand.

It coincided with the availability of better-paid employment outside of agriculture, especially for semi-skilled labour in construction and haulage, which resulted in a mass exodus of Irish workers from the pig sector in the early 2000s.

The vacuum created led to a serious deficit in training and to demands from the sector for a new training programme. In the absence of any significant pig content in existing Teagasc agricultural college courses,

the pig development department, in conjunction with Ballyhaise and Clonakilty agricultural colleges, initiated a FETAC (now QQI) Level 5 course in pig husbandry at Ballyhaise and at Moorepark/Clonakilty.

Both courses commenced in the summer of 2009 and, since then, over 160 students have been trained and upskilled in pig production.

These courses help to ensure pig farm operatives are trained to the highest standards of animal husbandry.

However, as well as the deficit of skilled farm staff, there is also a dearth of qualified and competent farm managers. Yet again, this resilient sector, with the help of the Teagasc pig development department, has shown great commitment to their business by investing in the future and developing a new pig farm managers' course.

This course, the first of its kind in Ireland for pig production, offered by the Teagasc pig development department, commenced in Portlaoise in September. It follows considerable consultation with key pig industry stakeholders.

It is a Quality and Qualifications Ireland (QQI) accredited Level 6 (component award) course aimed at pig farm

staff with a good knowledge of pig husbandry and production, who have been identified by their employers as potential pig farm managers.

Teagasc is delighted with the response to this first course. There are 20 students enrolled. The pig sector has been under pressure in recent months.

No different to our colleagues in the dairy sector, there is a shortage of skilled farm staff and also quality pig farm managers.

We in the Teagasc pig development department hope that this course will help to somewhat fill that void and lay the foundations for subsequent courses that will ensure the future viability and success of the pig sector, as mentioned the third-most important agricultural sector in Ireland after milk and beef.

The course is led by the pig development department specialist pigs advisors and delivered by a mix of Teagasc pig development department staff and invited guest speakers.

Exams and project assignments will form the main part of the course level 6 assessments, which will be verified by QQI, the independent State agency responsible for promoting quality and accountability in education and training services in Ireland.



# Infrastructure: an unbeatable investment

Good roads, fences and water systems increase grass utilisation and farm profits. An audit will identify any deficiencies in your infrastructure.

Mark Moore

As prospects go, an audit is up there with a dental check-up. Nonetheless, John O'Sullivan, John Leahy and Danny Bermingham, who are all part of the Teagasc joint Programme with Kerry AgriBusiness, volunteered to have their farm infrastructure audited this spring.

"It involved walking the farm with my local Teagasc advisor Denis Brassil, Ger Courtney, James O'Loughlin and Pat Tuohy (both of the Teagasc Heavy Soils Programme) to see whether my farm roads and spurs, water piping and troughs and paddock sizes were fit for purpose," says John O'Sullivan, who farms at

Ballygree, near Castleisland.

In Kerry, rainfall is high at 1,600m and many soils (like some of John's) have limited porosity, which makes good infrastructure essential in order to avoid poaching and soil damage. In the county, farmers budget for a six-month winter and maintain a fodder reserve too.

John O'Sullivan has 105 cows on 43ha, with an additional 15ha as an outside farm. "As in most of the country, we had a really wet difficult spring and it showed up some of the shortcomings of our infrastructure and because we couldn't get cows to some paddocks without causing huge damage, we had them indoors for more than we wanted in February and March."



Like his two colleagues, John O'Sullivan demonstrated the changes he made as a result of the audit at an open day in October.

"The benefit of having really good infrastructure is that you can achieve more grazings in the shoulders of the year when conditions are borderline," says Denis Brassil.

"Work at Teagasc Moorepark has shown that it's worth €3/cow for every extra day she is grazing in the spring and €2 in the autumn."

The traditional farm diary is a good place to record on which days cows were in or out during the early spring.



"You only need to get 10% more grazings between mid-February and mid-April to pay for really good infrastructure," says Ger Courtney. "There are 120 potential grazings in this period and if the infrastructure enables you to get out for an extra 12 of them, you are already ahead."

"In the Teagasc Heavy Soils Programme, there are farmers who are achieving 60 grazings, which is very good, but there are also farmers who are only getting 20 grazings in this period. The grazing targets are inevitably going to be lower on heavy farms, but progress can still be made in getting more grazings in spring."

"It is important to highlight however that the objective is not to get cows out regardless of weather or ground conditions, but rather that when conditions are improving, cows may be able to be put out if infrastructure is good. Even if that's only for three hours, you are improving grass utilisation."

"Upgrading your infrastructure is a really good investment," says John O'Sullivan. "A rough figure is that you will need to invest €1,000/ha for a fairly comprehensive upgrade to include additional roads or spurs, piping and troughs. Drainage or digging a well would not be covered in



Christopher, Marion, John, Liam and Sean O'Sullivan.

this cost, but the investment will still generate a very healthy return of 10% to 15% per annum.

"We're always looking for ways to make better use of grass. For example, the cows are usually keener to go out in the evening if it's still bright, so we will often milk earlier in the afternoon to make that possible."

"Having good infrastructure is also better for people, because it reduces

drudgery and makes the job easier and possibly more attractive for the next generation."

"The benefits are seen in extra solids and greater labour efficiency," says Denis Brassil. "The cows are not in the yard eating silage and they bring their slurry to the field. By grazing the grass, they stimulate extra growth. The goal of the Teagasc Grass10 campaign – 10 grazings in

## Necessary investment

"Farmers have had to spend money in yards on cubicles, parlours, slurry storage, etc, as they increased cow numbers when quotas went to remain compliant and for ease of management," says Denis Brassil. "Grassland infrastructure was the Cinderella and was, to some extent, neglected. So now you have 100-cow herds in an infrastructure setup for 60 to 70 cows, for example."

"It's important to consider if paddock size is still appropriate for the size of your herd and also the size you intend it to become. A rule of thumb is that paddocks should be able to allow 36-hour grazings in the main season, but have the flexibility to support three- to four-hour grazings in the shoulders of the year."

"As herds get bigger, you may need to look at your paddock structure; flexibility is key and that's what good infrastructure gives you, particularly in wet areas. The good news is that the return on grazing infrastructure investment is higher than for many other on-farm investments."

But do these roads take up a lot of area reducing production? "Even on John O'Sullivan's farm, less than 1% of the farm is covered by roads," says Denis Brassil. "The economics of production are greatly improved and any loss of production under roads is inconsequential."

the year on each paddock – will not be possible if you don't get at least one grazing done by late March."

**Getting the work done**

So how should the farmer go about getting the work done? "Well the farmer will be dependent on a contractor to remove topsoil, etc," says Ger Courtney.

"A quarry will need to deliver the hardcore and aggregate. While you might be able to do the fencing yourself, it is usually a good idea to contract it out.

"Farmers are busy enough. Often they don't get infrastructure done because they don't have the time. There are plenty of contractors available in the relatively quiet times of July and August.

"This was a year which had a dreadful spring followed by a wonderful summer for getting work done," says John O'Sullivan. "The ground was so hard that lorries from the quarry were able to drive to where new roads were being constructed rather than leave aggregate in the yard. Mostly, the work is done over the summer, but you could improve existing road surfaces over the winter."

Ger Courtney says the lessons learned in Kerry are relevant for the

**Water supplies**

The summer was also a year that showed the need for adequate water troughs and piping. John said he can see exactly how much cows are drinking from his meter. Even when they are eating moist juicy grass, they will drink 40 litres/day.

Speaking at the open day on John's farm, Pat Tuohy of Teagasc spoke about different aspects of water pipes, pointing out that doubling the diameter of the pipe increases its flow rate fourfold.

"Cows need to drink four litres of water for every litre of milk they produce. On hot days, cows could drink up to 120 litres each," says Pat.

"You can quickly see whether you have enough trough space. If they are crowded around the trough waiting, you don't have enough. Five per cent of cows (one in 20) should be able to drink at any one time. You need about two and a half feet of trough rim per cow at any one time. John's troughs have a nice feature, which is a plug to let out all the water quickly, which allows the water and the trough to be cleaned. Another nice feature is aggregate around the circular trough, so mud doesn't develop there."



John O'Sullivan and his Teagasc advisor Denis Brassil discuss paddocks.

whole country; even farms in much drier areas will have parts of the farm which are wet and good infrastructure is needed to get to the dry paddocks possibly passing through wetter (ungrazable) areas of the same paddock.

"The best way to follow up on an audit is to make a plan on a map with your local Teagasc advisor," says Ger. "If the dimensions and locations are clearly marked on the map, most farmers can project manage the implementation."

Continued on p22



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Table 1: Infrastructure audit

|                         | Adequate | Needs attention | Not fit for purpose |
|-------------------------|----------|-----------------|---------------------|
| Paddocks                |          |                 |                     |
| Size                    |          |                 |                     |
| Access                  |          |                 |                     |
| Drainage                |          |                 |                     |
| Fragmentation           |          |                 |                     |
| Roadways                |          |                 |                     |
| Sufficient              |          |                 |                     |
| Width                   |          |                 |                     |
| Cow flow/quality        |          |                 |                     |
| Spurs                   |          |                 |                     |
| Water supply            |          |                 |                     |
| Source/pressure         |          |                 |                     |
| Pipe network            |          |                 |                     |
| Troughs number and size |          |                 |                     |

## How do you do an infrastructure audit?

Paddock size, roadways and water supply are the things to assess. Colour coding can help highlight priorities. Green means infrastructure components are adequate, yellow means they need attention, red means they are not fit for purpose. Assign a percentage to each to get an overall picture.

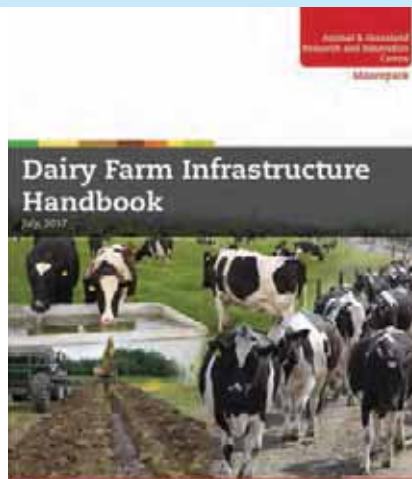
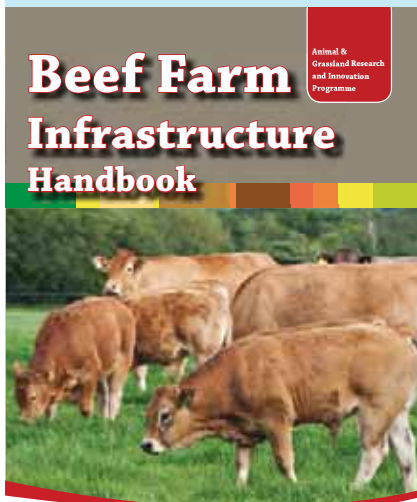
I reckon three-quarters of the farms in the country would benefit from doing an audit, so it is worth doing on most farms, especially if they have done no infrastructure work in the last five years.

"An infrastructure audit is a great topic for a discussion group to address, because members can contribute thoughts and ideas," says Ger Courtney. "It leaves you with a project to do in a quiet time in June, July, August or September when contractors should be available. When the group comes back a year later, it can see what progress was made."

Ger says the intensity of roads has to be greater the wetter the farm. On wet ground, all parts of the paddock need to be within 75m of a spur or main road, otherwise cows will do a lot of damage by trafficking the soil. On drier paddocks, 150m is an adequate limit.

What is the difference between a road and a spur road? A road must be able to carry machinery and would be perhaps 5m wide for a 120-cow herd. Spur roads are simply intended for use by livestock. They might be only 1.6m wide and are of most benefit during the shoulders of the year, especially in wet conditions. Even on relatively dry farms, they might allow you to get animals past a wet area to get to drier areas of the same paddock without causing damage.

Reseeding and soil fertility are not addressed in the audit; these are both key factors for grass output, but are not intended to be in the infrastructure audit.





# Niall O'Meara

Niall O'Meara, who farms between Portumna and Loughrea in east Galway, has 30 suckler cows, which calf from mid-August to the end of October. He has a firm belief in the value of good infrastructure.

"I have 24ha of land, but 45 paddocks," says Niall. "I'm completely convinced of the value of grazed grass. Mine is a rotational paddock system, but it doesn't matter what kind of system you have so long as you are getting grass into them. To do that, you need really good infrastructure."

Niall's bull calves are sold to a local feed lot at 500kg and 12 months. These bulls will have eaten just 70kg of barley and 50kg of beef nuts in that year.

Most heifer calves are kept for breeding and are typically 14 months when they go to the bull. The heifers will only have eaten 70kg of barley. In 2017, the heifers were averaging 485kg when they went to the bull.

"It's about grass utilisation rather than breed," says Niall, who has Charolais, Limousin, Angus and Salers cows. He believes in AI and focuses on milk, docility and gestation length. Their calves have access to grass in winter.

"The paddocks are a huge benefit in the shoulders of the year," Niall says. "I could be letting 75 animals on to a half-hectare paddock in spring. Depending on conditions, they could be there for four, six or eight hours."

Once the animals are moved, Niall will have a contractor put slurry on to that paddock.

All animals come in on November 1. They are on silage and the breeding season starts on November 7.

He will close the first paddock on September 1 and the calves will have creep access to that paddock from November. The calves might have access to as many as 12 paddocks in rotation over the winter.

He says much of his infrastructure is very basic – hundreds of pig tails with white electric fence tape. Occasionally, the calves will break through into the next paddock looking for fresher grass.

Cows rarely do.

Niall adds that he has been gradually increasing the number of paddocks that are accessed from a roadway.

Under half are at the moment, but he says he aims to have it that 75% to 100% of paddocks will be accessible in the future.

"Dairy farmers have one herd," says Niall. "We can have as many as six mobs or groups of cattle in the spring, which makes it much more complicated to manage paddocks."

He says he has a black half-inch water pipe with Ts off it; he calls it cheap and cheerful. He would recommend paddocks to others.

"If someone is letting 40 cattle into a 15ha field, they should do an experiment – simply break it into four divisions. They will see the benefits of fresh grass and I'm convinced that, as a result, would then go for a much more complex paddock systems.

"I know it works, as I weigh my animals as many as seven times in a year and you can see the weight gain from fresh grass. We have no control over the price, so we have to focus on efficiency."



## dairy

# The rain in Spain falls mainly in the winter

Galicia in northwest Spain is the country's main dairying region

**John Lawlor,**  
Dairy Advisor, Teagasc, Co Louth

**D**uring a recent visit to Galicia, a group of Teagasc clients and advisors discovered that Spain's dairy industry has some similarities and some huge differences compared with our own.

The visit was part of a new Inter-Reg project set up using EU funding called Dairy4Future. It's an EU project looking at how new technologies can improve the long-term future of dairy farms in regions along the Atlantic Coast.

Galicia is an autonomous region in northwest Spain with its own language in everyday use. Its best-known city, and capital, is Santiago de Compostella, the final destination for pilgrims on the famous Camino Way.

## Dairy industry in Galicia

The province of Galicia, with a population of 2.7m people, accounts for 40% of total dairy production in Spain. Dairying is a very important part of agriculture here and accounts for 80% of total agricultural activity. There are 8,000 dairy farms in Galicia, more than half of the total number of Spanish dairy farms. In size, it's about one fifth bigger than Munster.

Total annual milk production in Spain totals about seven billion litres, which is almost identical to production in Ireland of 7.2bn litres in 2017 (from 16,000 suppliers).

However, the similarities end there when we look at the systems in use, with 90% of milk production in Galicia being from confined-indoors systems and only 10% from grazing.

## Two metres of rainfall per annum

Who would expect an annual rainfall in this area of almost 2m (80")? Maybe it's not too surprising when we consider that the Galician coast is



adjacent to the wild Atlantic, with its many weather systems, on two sides. However, this rain is quite seasonal, with little falling for two or three months in high summer and very high winter rainfall.

With mild winters, this leads to almost two growing seasons, consisting of April to June and a second season of lesser growth from October to April when there is nonetheless a considerable amount of growth.

## SAT Samperez Farm

An SAT farm is a type of family co-operative farm, not unlike our registered farm partnerships. The farm operators, Pepe Samperez and his wife Maite, together with Dr Cesar Zafra from the Agricultural Research Centre in Mabegondo Ag Research Centre, outlined the farm system and performance, both physical and financial.

The farm was established by Pepe in 2012, with 100 Holstein cows with high solids sourced in Holland and Germany. Milk is sold to Nestlé, a private milk company which pays a premium for high constituents. Two-thirds of the milk price is determined by the level of constituents.

Cows are indoors all year, with large electric fans in operation in the

dairy shed and milking parlour. Dairy sheds are big and spacious, with 4.5m-wide passages and high roofs. Cows calve all year. Bull calves are sold at 15 days and heifers go to a rearing farm.

## Dairy system and production

The area farmed amounts to 50ha. A total of 39ha of maize silage, followed by a catch crop, is grown, with an additional 11ha cut three times for grass silage.

One-hundred-and-thirty cows are kept and 75 heifers, with cows calving all year. The cows' diet is made up of grass silage 3.5kg DM, maize silage 11kg DM and concentrate 10.5kg DM.

Cows currently have an annual yield of 11,067 litres, with 4.11% BF and 3.48% protein (305 days). This amounts to 865kg MS per cow per annum due to his good figures for solids. The farm is in the top 5% of Spanish farms for milk constituents.

The farm is certified under the Nestlé milk quality scheme, which incorporates high standards on vaccination and health, animal welfare and traceability.

## Profits and costs

Costs on these confined systems are high and margins are tight. At



Growing one-year-old heifers spend part of their time on an outdoor pad, with feeding provided indoors.





The Irish Dairy 4 Future group on one of the farms with group leader Eddie Burgess, Teagasc, and host Cesar Zafrá from Ag Research Organisation, INGACAL in Galicia.



A group of growing replacement heifers on the co-op farm, confined indoors and fed TMR.

present, base price for milk supplied under contract to Nestlé is 30c/l at 3.7% BF and 3.2% protein. Pepe earns an additional 5c/l due to his high solids.

However, feed costs alone amount to 16.4c/l, including home-produced forage and concentrate costs. He has calculated his other costs at 14c/l, giving a total cost structure of 30c/l. He also has BPS payments, which were not included in the calculations. This indicates a net margin before BPS payments of just 5c/l.

### Challenges in Galicia

Like Ireland, there is a very large problem with the structure of holdings and small grazing platforms are one of the reasons for the very low percentage of grass-based farming. There is huge competition for land, with forestry accounting for 66% of the arable land area in Galicia.

The main tree species is the rapidly growing and profitable Eucalyptus, which is harvested every 15 years. Many small farmers who leave farming are holding on to their land and planting it with forestry, making it difficult for dairy farmers to increase their holdings. The forestry issue comes up again and again in discussions with farmers and advisors.

Maize production is a huge part of forage production on Galicia's dairy farms, accounting for around 70% of total forage. Yields are high, with up to 16t DM/ha achieved, but summers, including this summer, can be dry, with even maize suffering in certain cases (there was no rain during the 50 days prior to our visit).

The cost structure on confined farms is also of great concern, with high volumes and small margins leaving producers very exposed at times of low prices.

For example, the milk price averaged just 29c/l in 2016, with some producers on poor contracts getting less than 20c/l. A considerable volume of milk is bought by agents or wholesalers, which also adds to price pressures.

### Shortage of processing

There are many milk purchasers in the region, with the result that there is a shortage of milk processing facilities, including milk drying. A lot of milk is transported unprocessed to other parts of Spain. This adds to costs, due to long distances and transport costs, and reduces added value potential of the product.

### Heifer-rearing co-op and TMR station

The group's final visit was to a farm with a difference that none had seen or heard of before. It was to a heifer-rearing co-op, near Santa Comba, rearing over 1,000 heifers from eight farms in the co-op. Heifers are brought in for rearing at 15 days of age and leave at 20 months for calving at 22 months.

They get nine litres of milk replacer (3X3 litres) from arrival to weaning at 95kg at nine weeks. Heifers weigh approximately 615kg at 20 months, when they return to their owners.

The farm is owned by eight dairy farmers with a combined milk production of 30m litres (or 3m to 4m litres each). Each farmer retains ownership of his own heifers and there are a minimum of 140 heifers per owner.

Calves are fed milk in individual pens and spend their final period housed in cubicles. In the middle period, they are loose housed, with access to an outdoor area bedded with timber byproduct.

In addition to rearing the heifers,

the co-op farm makes all the silage centrally for the eight farms in the co-op. The silage is made from lands owned by the farmers and every load is weighed and sampled.

After the maize is harvested in September, a catch crop consisting of a mix of ryegrass and annual legumes is grown and harvested twice in October or November and April before maize planting.

Maize typically yields 16t/ha DM and the forage mix yields approximately 2.5t and 4.5t DM/ha for both cuts. Protein is typically about 19% for the catch crop. A total of 700ha of maize and catch crops is conserved, with a further 100ha of permanent grass silage (four cuts) made on the co-op farm.

TMRs are mixed on the co-op farm and delivered and fed out to the members' farms. This system works well. The farmers have a detailed agreement in place and hold regular management meetings.

### Dairy 4Future

Dairy4future is a €3.8m EU-funded project, made up of 12 regions from eight countries, located along the western seaboard of Europe. They stretch from Spain to Scotland. Countries include Northern Ireland, Republic of Ireland, Scotland, England, Wales, France, Spain and Portugal.

One-hundred-and-ten pilot farms are being studied with the assistance and co-operation of 10 experimental research farms. The project will run from 2018 to 2021.

The project will work to develop and foster innovative and efficient dairy systems and promote better co-operation between research and development groups across these regions.

# Collaborate to your mutual advantage

**Tom Curran,**  
Farm Business Structures Specialist,  
Teagasc Rural Economy Development  
Programme

**W**ant to improve your work-life balance and grow your farm business? A partnership with another farmer can make it happen. But what does this mean? Quite simply, it means putting a business arrangement in place that benefits all parties involved.

There is no time limit to this process and discussions should take place over whatever time period is required by each partner to get their head around the idea. The key issue is to work through the various steps involved in bringing two farms together into one business where the profits will be shared on an agreed basis. This article will look at the key steps involved in forming a partnership.

**1 The initial approach.** This is not easy. How do you approach another farmer about the possibility of working with them in a partnership or some other business arrangement? Firstly, you must think carefully about the benefits that could be gained by both parties from working together. These benefits can include more labour availability, the ability for both parties to take time off, opportunities to increase scale, improve efficiency and enhance work-life balance.

In most cases, a farmer already has someone in mind that they would be happy to work with because they already have experience of working with them in some capacity. At the end of the day, in making that initial approach, all you can do is suggest that you are interested in working together in partnership. Focus on the benefits and give the other party time to digest what you have said.

**2 The practicalities.** In the event that the initial approach is successful and the other farmer is interested in exploring the idea of a partnership, what comes next? A good place to start and to help the two farmers to get their teeth into the arrangement is to talk through the practicalities of bringing the farms

together.

This will lead to the development of a physical plan that sets out where the farmers are now and what changes are required to bring the farms together. There are various steps involved and these steps may include discussion on:

- **Land:** Location, quality, linking-up
- **Farm infrastructure:**
  - Linking roadways, water systems, paddock size.
- **Farm buildings:**
  - Milking facilities.
  - Animal housing.
  - Slurry and soiled water storage.
- **Livestock:** Valuations, sales, purchases, breeding policy, etc.
- **Machinery:** Valuations, sales, purchases.
- Establishing the capital cost of any works required to bring the farms together, prioritising the investment and setting timelines around those priorities.

**3 A financial plan.** Using the information from the physical plan, a six-year business plan should be drawn up to show what the business can deliver in terms of cashflow and potential income to both parties. Included in this financial plan will be a prediction of technical performance based on the previous performance of one or both farmers. This plan should be updated each year with actual performance once the partnership is up and running.

**4 Personality profile and skills assessment.** For farmers who are collaborating with other farmers, it is vital that they establish a healthy working relationship. The foundation of a healthy relationship is based on good communication, honesty, trust, reliability and transparency. At the beginning, it is very useful for each partner to do a personality profile.

The focus of this is for each partner to answer the question: how well do you work with others? This profile will establish each partner's personal attributes, values and life skills. It is vital information which will ensure that both are on the same page with regard to the farm business.

One of the key advantages of work-

ing with another person is the increase in skills and abilities brought to the farm business. A skills assessment is done by, firstly, identifying the skills needed to run the business effectively and, secondly, each partner writing down their own skills.

The third part is for each partner to rate their own ability on each of the skills identified. This process is very worthwhile. It can help to identify key strengths, areas where up-skilling is required and it can also feed into the discussion on roles and responsibilities within the business.

**NOTE:** steps one to four are carried out by the farmers themselves and their families. The input of their Teagasc advisor will be needed when drawing up the physical and financial plan. From step five onwards, the farmers will need to seek the advice of their respective solicitors, accountants and banking institutions.

**5 Getting the structure established.** There are a number of elements to this step and this is the point where professional help will be required. Each farmer will need to speak with their accountant to get advice on the setting up of the partnership from a tax perspective. They will also need to speak with a solicitor who will advise on the legal agreement and the key elements required in that document. The key set-up tasks will include:

- Completing the legal partnership agreement dealing with inclusion of farm assets, profit shares and exit provisions.
- Completing the on-farm agreement dealing with roles, responsibilities, time off, drawings, salaries.
- Deciding on a partnership name.
- Setting up a current account in the name of the partnership.
- Exploring any issues in relation to insurance.
- Making changes to herd numbers.
- Ensuring basic payment entitlements are transferred in accordance with any changes to herd numbers.

A template partnership agreement is available at the following link: [www.teagasc.ie/rural-economy/farm-management/collaborative-farming/registered-farm-partnerships/registration-documents/](http://www.teagasc.ie/rural-economy/farm-management/collaborative-farming/registered-farm-partnerships/registration-documents/)



## Galway partnership

Bryan Hynes returned home to start farming with his father on a small drystock farm. "In the years before returning home, I worked off farm and also did relief milking for other farmers, all the time building my experience of dairy farming," says Bryan. "I wanted to get into dairy farming and considered converting the home farm."

His neighbour David Neilan was dairy farming in winter milk and calving all year. Both farmers had the same Teagasc advisor, Tom Murphy in Athenry. Bryan had discussed his plans with Tom who initially facilitated the discussion about forming a partnership.

Both of the lads were open to the idea and they began to plan in practice how

this could happen.

"We discussed the system of production and agreed that they would work towards a grass-based compact spring-calving pattern," says David Neilan. The partnership was started in 2013 and the enterprise has grown significantly since.

When the farms were amalgamated in 2013, there was 32ha available for grazing and Bryan bought in 49 calved heifers to bring the cow numbers up to 81 cows. Further reclamation works on the existing farms in the early years brought the grazing area up to 48ha.

"The cow numbers were growing gradually, but land availability around the two home farms was non-existent," says Bryan.

In 2017, the option to lease a second

farm a short distance away came up and they decided to grow the business further by taking on this farm. Bryan and his girlfriend Deirdre operate this new farm and David operates the home farms. Bryan was keen to stress the important input of family members in terms of support and help with work on the farm to help the lads to achieve their goals.

"We have grown the herd from 81 cows in 2013 to 167 in 2017 and to 307 cows in 2018," says David. "The goal now is to consolidate and hit the key performance targets on the new farm in terms of grass grown, calving pattern and milks solid produced on the new farm. It's really a case of mutual benefits," says Bryan. "To be recommended."

# Seven steps to better supervision

As farmers become employers we address the basics of staff supervision

**John Mulhern,**  
Principal, Teagasc College at the  
National Botanic Gardens

## 1 Why employ staff?

As businesses grow and expand, it's clear that not all work can be conducted by one individual or one family as in the past. But the decision to hire staff must be accurately costed before you implement it and the business must be able to afford it through the business cycle.

## 2 What are the benefits?

Hiring staff allows the owner to focus more on the business planning side, which is proven to yield better per-hour returns through:

- Increased time available to research and source new technologies and farm inputs.
- Increased planning / thinking time.
- Better work organisation.
- Time freed up to identify opportunities for the business.

## 3 What are the fundamentals of staff supervision?

- Work planning and scheduling.
- Leading the team through the work.
- Implementing the plan surrounding the work.
- Control of the work through performance indicators.

Work planning should include short-, medium-, and long-term goals; ie daily, weekly, monthly and year-to-year goals. Work planning should also focus on the planning of outputs and the (staff) resources needed to achieve

them. November and December, not next February and March, is the time to plan spring work and how labour will be sourced for work peaks.

## 4 How do I motivate staff?

Leading your team through the cycle of work is crucial to success. The supervisor is responsible for letting employees know what is expected of them and inspiring and motivating employees to do good work.

You need to calmly and clearly tell workers what they have to do. Employees must know exactly what their role is. Staff are motivated in different ways and, in many cases, what motivates a business owner might not necessarily motivate the staff member. Communication is a two-way process, so listening to the employee's viewpoint is vital.

All staff invariably want structured work, structured time off and competitive remuneration. Good staff will want to progress in the business or industry. Can you provide this?

## 5 How do I ensure things stay on track?

Implementing and monitoring the work plan is where proper supervision is most important.

Rosters are essential to implement work flows and when gaps appear at critical times, there should be a backup plan.

Key performance indicators (KPIs) should be set and explained clearly to all staff in any business. This will result in more buy-in from staff on the goals that the business is trying to achieve.

It's important to remember that



when targets are met in a business, there must be a mechanism to recognise the contribution of the workforce beyond basic pay. Equally, when targets are not met, there must be a way to relate this to the employees.

Modern farming practise dictates that the aforementioned KPIs are adhered to at all times. This is the supervisor's job to constantly refer to them and to regularly highlight their importance to the business.

There's no point asking your employee to get more days at grass, for example, if they are not aware of



Student Hayley Mills and Teagasc lecturer James Brady discuss effective supervision strategies.

that must be clear from the start and checked regularly to avoid slippage. Some people in the land-based sector claim they are too busy to supervise staff properly and then wonder why they have a big staff turnover. If you take on staff to do work and pay them, then it is important that you also give some time to their training and development. If an employee is not properly trained, then underperformance in that area is the supervisor's issue.

## 7 How important is training?

A good supervisor will teach the employee new skills so that they can carry them out successfully. Training staff can be harder than doing the job yourself, but the payoff down the line is greater because it builds a more resilient group.

Some, maybe a lot, of business owners in the land-based sector need to be better trainers, which requires patience, not a trait that is in huge supply when one is immersed in long days and very busy work.

However, with proper planning, training can be achieved during slacker periods. Training will always be recognised by employees as beneficial and will result in bigger wins all round. Teagasc can help with training requirements.

A good supervisor needs to learn to be both firm and fair. Communicating tasks clearly and concisely is vital in a very busy yard. Having a structured planned time each day that allows a quiet interaction between a supervisor and the employee is important.

Farm offices can be the venue where team or one-to-one meetings take place. Verbal instruction should back up written communications. There should be a whiteboard in every office with clear instructions on daily and weekly tasks.

Even the best working environments have issues that crop up from time to time. The important thing to remember is where you as an employer stand from a legal perspective. The Workplace Relations Commission offers a service to all employers on workplace-related issues. Visit [www.employersdirect.ie/workplace](http://www.employersdirect.ie/workplace).

This advice is free and is well worth a look if you have a question on a staff-related issue. Forewarned is forearmed, so when it comes to dealing with delicate staffing issues, a quick call to the freephone number can go a long way to sorting out problems before they come to the boil.

Another excellent resource is the Teagasc *Labour Manual* available on the Teagasc website.

the value this adds to your business. Why should they care if there is no reference to this from one end of the season to the next?

## 6 How do I deal with underperformance?

Underperformance of the business can be explained by many different factors in our land-based sectors, not least by weather and prices, which are out of our control. Underperformance of a business can also

result from a supervisor's inability or unwillingness to monitor and control the actions of employees.

Telling an employee in a formal way how monthly targets are being met (or not) is a pattern that many employees are very happy with. This allows for proper supervisory guidance to be given and discussed openly.

The difficult part of supervision is when situations and practises develop, and become established with employees, that are not aligned with the overall goals. Timekeeping and rest periods are common issues

## health and safety

# A little less quad might be good for your quads

Quad bikes are a fabulous tool but can reduce beneficial exercise

**Dr John McNamara,**  
Teagasc, Health and Safety Specialist  
**Dr Caitriona Cunningham,**  
School of Public Health Physiotherapy  
and Sports Science, UCD

**I**rish farmers in the working age group (16-65 years) are five times more likely to die due to cardiovascular disease (CVD) than comparable occupational groups.

This alarming fact comes from an examination of CSO death certificates by Dr Breda Smyth MD, a public health specialist with the Health and Safety Executive (HSE).

CVD is largely preventable if you follow the right diet and exercise steps. A regular health check (see your doctor or some pharmacists do this for free), cessation of smoking – should you need to, increasing your exercise levels, changing your diet and controlling your weight will massively reduce your risk.

Teagasc, in association with health professionals, has formed a consortium to research and promote farmers' health, in particular CVD.

### Hugely beneficial

Exercise is hugely beneficial for mental as well as physical health. It reduces your risk of heart disease, diabetes and a number of cancers, as well as being a very good way to manage stress and control your weight.

Traditionally, farming has been considered to be one of the most active occupations. However, tractors, ATVs and offroad SUVs have taken some of the physical work out of farming.

As a result, farmers may not be as physically active as they used to be, though evidence to prove this has not been available. So, a study was carried out by WIT, UCD and Teagasc into the levels of exercise farmers are achieving in their day-to-day lives.

### Farmer exercise study

Fifteen male farmers, with written consent, completed the international physical activity questionnaire – short form (IPAQ-SF). They also wore an accelerometer (ActivPAL) for measuring physical activity from waking until bedtime for seven consecutive days, while doing normal farming and non-work related activi-



ties. The duration and intensity of physical activity level of the farmers was calculated using both questionnaire and accelerometer

Participants were aged between 39 and 69, with an average of 48 years. Most were full-time farmers with various enterprises (intensive dairy, dairy and sheep, suckler cattle, and dry stock cattle) and farms ranging from 21ha to 81ha.

Body mass index (BMI) of the farmers ranged from 22.9 to 30.7, with an average of 26.7, which is classified as overweight.

The accelerometer data showed that farmers achieved a range of 8,047 to 19,768 steps per day (averaging 14,163). This was double the levels reported in the questionnaire.

The general recommendation for health is 10,000 steps or greater. The study indicates that most farmers are gaining adequate steps, but they underestimated their number of steps in the questionnaire.

The study found that farmers spent approximately two-thirds of a day sitting, sleeping or lying down per day (mean 16 hours), with a mean





## The benefits of being active

### The following are some of the reasons why farmers become inactive:

- Farmers spend more time sitting while machinery does the work.
- Some farmers stop taking part in sport when they feel that they can no longer do it competitively.
- Many farmers struggle to find time for exercise when balancing their work and family life.
- Some farmers simply get out of the habit of exercising and are not sure how to start back, or what kind of exercise to do.

### The benefits of taking exercise:

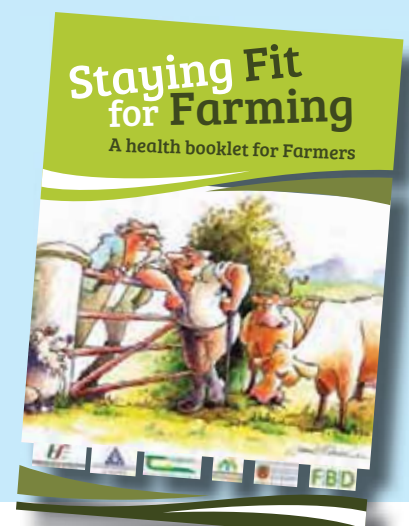
- Keeps your heart strong.
- Helps to manage your weight.
- Keeps your joints moving and flexible.
- Strengthens your muscles and bones.
- Helps you to relax and sleep better.
- Gives you more energy and zest for life.
- Helps recovery after a heart attack.
- Gives you a feeling of well-being.

### Further exercise monitoring

Teagasc has procured a set of up-to-date wrist-worn accelerometers and would like to hear from a number of groups to trial wearing this equipment to monitor exercise levels. Enquiries to david.meredith@teagasc.ie

### Acknowledgement and further information:

Some material in this article was sourced from: *Staying Fit for Farming – A Health Booklet for Irish Farmers*. The production of this booklet was supported by HSE, HSA, Teagasc, and the Centre for Men's Health, IT Carlow, and FBD Insurance plc. The booklet can be sourced at [www.teagasc.ie](http://www.teagasc.ie).



of 4.2 hours standing and 2.9 hours stepping.

In terms of developing guidelines on cardiovascular and overall health of farmers, the study indicates that the following areas need to be explored further: dietary behaviours leading to being overweight, stress associated with higher work intensities, intensity of physical activity undertaken and participation levels in leisure time sport and exercise.

In summary, the study indicated that estimation of physical activity is a poor way to judge physical activity level and that among this group of farmers, most were getting enough steps for health.

### So how much activity is enough?

The experts say that people should accumulate at least 30 minutes of moderate intensity physical activity on at least five days a week.

For some, this could mean going for a brisk walk; for others, it might mean doing something more structured, such as going to the gym or playing an active sport. It doesn't

mean having to run a marathon.

And remember, it's never too late to start – in fact, the more unfit a person is, the more they have to gain.

Just be sure to do what's right for you and if you don't know, get advice from your doctor or an exercise instructor.

If you have not exercised for some time or if you are concerned about a health issue, you should talk to your doctor before you start. Use the guidance below to plan activities you might build into your everyday life.

- **Cut down on:** Watching TV, being on a computer, excessive use of quad bikes, offroad SUVs, tractors when moving around farm, sitting for more than 30 minutes at a time.
- **Two to three times a week:** Do strength and flexibility exercises.
- **Five to seven days a week:** Do aerobic exercise. Accumulate at least 30 minutes five days a week. Jog, cycle, brisk walk, swim, dance, hike.
- **Every day:** Be active. Make a conscious effort to walk or exercise instead of using vehicles.

## cover crops

# How Tyfon can reduce meal fed to finishing lambs

**James Fitzgerald,**  
Teagasc Walsh Fellow, Mayo  
**John Noonan,**  
Teagasc Business and Technology  
drystock advisor, Westport.

**H**aving lambs in good condition so they grade well, have a high kill-out percentage and good carcass weight can be a struggle. Many sheep farmers run up large meal bills in late autumn in a last-ditch attempt to have lambs fit for slaughter.

The problem is greatest in autumn

time, as grass begins to lose its power to fatten lambs.

Mayo sheep farmers are growing and feeding Tyfon as a solution. The plant is a fast-growing brassica, a hybrid of stubble turnip and Chinese cabbage, high in energy and protein and easily digestible. On the farms of Micheál Conway and David Heraty, Tyfon has been added into a normal grass and clover reseed mix at the rate of 2kg of Tyfon, 10kg of grass and 1kg of clover per acre.

In all cases, the land was sprayed off, eaten bare a week later, disk harrowed and seeded with a one-pass

power harrow and seeder.

The sowing date was chosen so that the crop would have eight weeks of growth before being grazed by weaned lambs. Similarly to the requirements of a grass reseed, the crop was fertilised with 80 units of N, 24 units of P and 130 units of K per acre; 2t/acre of ground lime was also spread at seeding.

These farmers have found that Tyfon improves lamb weight gain pre-slaughter and improves kill-out percentage, resulting in higher carcass weights than when finishing lambs on grass alone.

## Micheál and Jonathan Conway

Micheál and his son Jonathan run a flock of 470 purebred Mayo blackface ewes and 50 crossbred ewes, retaining replacements and finishing all lambs, with carcass weights averaging 19kg. The farm selects the best-quality ram lambs to be sold as yearlings at local sales.

On 2 June this year, they reseeded two acres with Tyfon undersown with grass and clover. Due to the drought conditions, the crop found it difficult to establish. Jonathan spread tanks of water on the reseed at night to ensure the crop had every chance to grow.

"Before grazing the Tyfon, all lambs were dosed for worms, given a mineral bullet and wool shorn off both sides of the hind legs and off the tail," says Micheál. "This ensures lambs stay clean and thrive better. On 3 August, two months after sowing, we put 40 spring-born lambs weighing on average 36kg on to the two acres of Tyfon."

### Keep rumen working properly

The lambs were given access to a run-back of permanent pasture, to keep their rumen working properly while on the brassica-based diet. "On 10 September, these lambs were sent for slaughter and had an average carcass weight of 21.2kg," says Micheál.

The average liveweight of these lambs at slaughter was 47.5kg. Therefore, the lambs put on 11.5kg on the space of 38 days on the Tyfon, which is an average daily gain of 300g.

The second batch of lambs went



into the Tyfon on 10 September. These lambs also weighed an average of 36kg on entry, had similar liveweight gains to the first group and were slaughtered on 12 October at an average carcass weight of 20kg.

The crop will be grazed for the final time by ewes in mid-pregnancy. Micheál notes that the hill lambs need about two weeks longer in the Tyfon than lowland lambs do.

"It takes the hill lambs longer to develop an appetite for the Tyfon and do not thrive well during the first two weeks," he says.

Micheál also compared the costs of the Tyfon finishing option with the costs of finishing the lambs on meal.

He explained that the cost of sowing the Tyfon was €500 and that if he was to feed meal at grass to finish the lambs, the meal bill would have been €500 too.

"The reason we chose the Tyfon option is that following the last grazing, we have the land reseeded in grass."

The savings on meal costs cancels out the cost of the reseeding programme, essentially allowing Micheál to reseed his land for free.





James Fitzgerald (left) with Tom Staunton.

## Tom Staunton

Tom farms in Tourmakeady, and has a flock of 320 Lanark and 30 pedigree Blue Leicester ewes. Blue Leicester rams are crossed with the Lanark flock to produce mules. The mule ewe lambs are sold through the Mayo Mule and Grayface group, while weather lambs are brought to finish on the farm. The best quality purebred Blue Leicester and Lanark ram lambs are selected for breeding and are sold either as lambs or as yearlings.

Two acres of Tyfon and grass were sown in late May. When it came time to graze the crop in late July, Tom put

26 mule wether lambs into the crop and allowed access to a field of aftergrass next to the field of Tyfon. The lambs spent a fortnight on the Tyfon and had access to the aftergrass for the full duration.

“I was very impressed with the way the lambs fleshed out in a short period while on the Tyfon,” says Tom. “They also seemed to be very healthy on the new diet. The kill-out sheet was also very impressive. The 26 mule lambs had an average kill-out percentage of 45% and an average carcass weight of 20kg. 25 of the 26 lambs were U grade with only 1 R. Tom plans to finish more of his weather lambs on Tyfon next year.

## Main points on Tyfon

- Time the sowing date to coincide with weaning, the crop needs 60 days to get ready.
- Match stocking rate to amount sown to ensure you can finish a group without running out of Tyfon or letting it get overgrown.
- Lambs need to be a minimum of 34kg going into the crop; smaller lambs do not thrive as well and the heavier lambs will finish on it.
- All lambs need a good-quality mineral drench/bolus with a special focus on a product high in iodine.
- A post-emergence spray can't be used on the reseed to control weeds, as this will kill the Tyfon. However, the reseed can be sprayed the following spring when the Tyfon has been grazed out and is no longer present in the sward.
- Tyfon can deliver weight gains of up to 300g/day for finishing lambs at a time of the year when thrive off grass alone is reduced to around 150g/day. Good grazing management is critical to achieve these gains.
- Brassicas should form no more than 70% of the diet – with 30% coming from a fibre source such as silage, straw, hay or a runback on to permanent pasture.
- There are a number of companies supplying Tyfon in Ireland.

## David Heraty

David runs a flock of 150 ewes at Lis-carney, Co Mayo. Of these sheep, 100 are Blackface Mountain and Lanark sheep and the other 50 are mule and Hiltex ewes.

Replacement hill sheep are bred by mating a Blackface mountain ram, with the best hill ewes and all other sheep are mated with Aberfield rams (Texel-cross-Blue Leicester).

“I reseeded three acres with Tyfon and grass in late May and have grazed two batches of 25 lambs on the crop so far,” says David.

“Each batch grazed the Tyfon for one month, with a fortnight of a regrowth period in between the two batches. The lambs had an average daily gain of 280g while on the Tyfon, with 15 lambs from both batches sold to the factory at the end of each grazing period, which lasted about 30 days.



“I will continue on with a similar system of grazing and the third batch of 20 lambs is currently grazing the crop.

“The aim is to have over 60 lambs sold to the factory off the crop by

Christmas. On the final grazing, the bulb at the bottom of the plant will be eaten as well as the leaves. Tyfon will not recover once the bulb is eaten and so the sward will return to grass and clover.”

David is a firm believer that soil fertility is extremely important when growing Tyfon. He has found that having P and K at index 3, as well as having the pH between 6.2 and 6.5, is vital to ensure that the crop will establish and grow to its potential.

He has also found that lambs need to have good size before attempting to fatten them on Tyfon.

“Some of the smaller hill lambs did not achieve the same level of thrive as the larger-framed lambs, simply because they were not well enough grown,” says David.

“In future, I will allow these lambs more time to develop a larger frame before introducing them on to the Tyfon.”

# Autumn weed control in cereals

**Shay Phelan,**  
Tillage specialist, Teagasc Crops,  
Environment and Land Use Programme

**W**inter cereal farmers have seen a significant change in their weed control strategies in 2018. With the popular Isoproturon (IPU) herbicide no longer available, many growers were left scratching their heads wondering which approach is best.

While there are plenty of alternatives still available, the flexibility which IPU offered is no longer there when trying to control grass weeds.

The debate that has raged over the last 12 months is whether to go pre-emergence or wait and go post-emergence.

The products, in most cases, are the same, but the efficacy, especially on grass weeds, in many cases is better pre-emergence.

Key to using pre-emergence herbicides is knowledge of the field and the predominant weeds that need to be controlled; some weeds are more damaging to the crop than others, so these need to be targeted.

Integrated pest management (IPM) tools, such as stale seedbed techniques, reduced cultivation systems and crop rotation, etc, can also be used to control certain weeds.

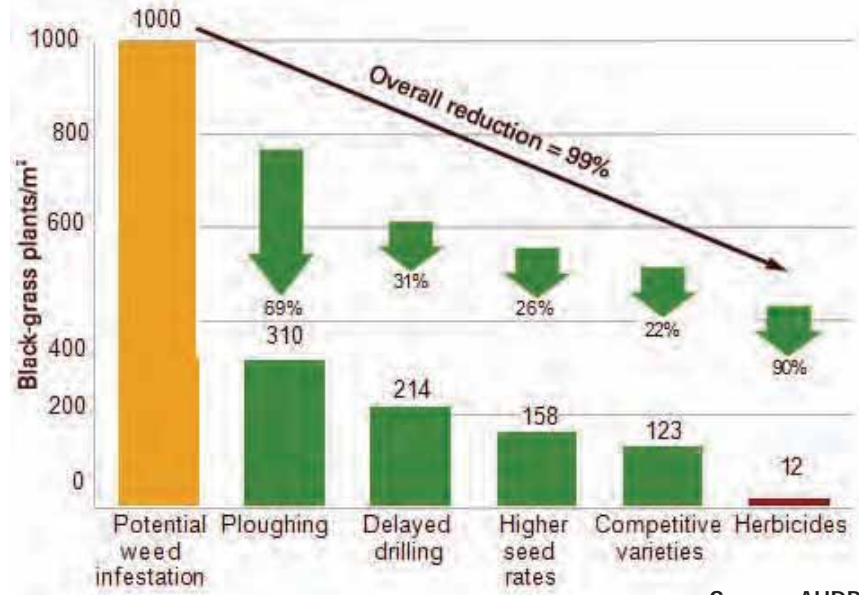
Indeed, more use of these cultural techniques may have to be implemented in the future, as issues such as resistance and availability of herbicides, etc, become more common. For some weeds, especially troublesome grass weeds, the herbicide should be the smallest part of the measures used for control.

Figure 1 shows the AHDB estimate of the control levels achieved by using different measures, including herbicides for controlling black-grass.

For many farmers, moving from a post-emergence application to a pre-emergence application represents a fundamental change in their winter cereal strategy, from a weed control point of view, but also from a workload and aphid control point of view.

The post-emergence herbicide application was usually timed with an aphicide and it was generally applied after all the autumn planting was complete. Switching to a pre-emergence herbicide application can increase workload in late September

Figure 1



Source: AHDB

or early October at a time when it is already very busy.

### Pre-emergence – key points

Pre-emergence application can be useful, but a follow-up treatment is often necessary.

Consider the following points before applying herbicides pre-emergence:

- Field records (weeds) will help herbicide selection.
- Match known weeds in the field to the herbicide.
- Active ingredients such as pendimethalin, diflufenican, flufenacet or prosulfocarb are all recommended at the pre-emergence timing. These are the main active ingredients contained in the most popular brand names.
- Even where Redigo Deter seed dressing has been used, a standard aphicide application is often necessary in early November.

One of the main reasons why growers don't apply pre-emergence herbicides is accuracy, as there are no visible tramlines to follow. Pre-emergence markers on drills and GPS technology are becoming more popular and relatively less expensive than before and will solve this problem. Many growers have already invested in GPS technology through the TAMS scheme which makes it even more affordable.

### Post-emergence key points

Post-emergence applications are still the most popular for a number of

reasons, but mainly because of workload. Most growers, when sowing, don't have the time to switch jobs and start spraying, especially in difficult seasons.

In many cases, this means switching machines on the tractor multiple times, which simply isn't practical.

When applying post-emergence applications, the following points need to be considered:

- Select products based on the target weeds.
- Grass weeds need to be a priority, as early control is vital, ideally at the two- to four-leaf stage.
- A mix of active ingredients will be required to give the most broad spectrum weed control.
- A follow-up application in the spring may be needed for difficult weeds.
- Time the applications to coincide with trace elements and/or aphicide applications.
- Apply to dry crops for best control.
- Avoid applying herbicides at pre-emergence to avoid bleaching of the crop.



Farmer  
Focus on 36



Table 1: Herbicide guide for winter wheat and barley 2018

| Name   | Active ingredients  | Rate/ha                                       | Latest timing                             | Comments  |
|--|---|---|---|---|
| <b>Alister Flex<br/>Wheat only</b>   | Diflufenican 120g/l<br>Mesosulfuron-methyl 9.0g/l<br>Iodosulfuron-methyl-sodium 7.5g/l                                | 0.8-1.0 L                                     | Gs 29                                     | Cleaver control up to 4 whorls, good on fumitory, poppy & vol. osr. Good contact effect on grass weeds. Limited residual effect. Use post emergence.  |
| Firebird<br>Navigate<br>Naceto   | Flufenacet 400g/l<br>Diflufenican 200g/l  | 0.3 L<br><br>(Max total dose 0.6L)            | Gs 22 or end of Dec                       | Good residual control of grass weeds esp. AMG. Use pre-emerge for best effect on BLW. Second application approved for improved sterile brome control. Max single dose 0.3L/ha (Firebird & Navigate) 0.6L/ha Naceto. |
| <b>Nucleus<br/>Wheat &amp; barley</b>  | Flufenacet 400g/l<br>Diflufenican 100g/l  | 0.6 L   |   |   |
| <b>Vigon<br/>Wheat &amp; barley</b>  | Diflufenican 60g/l<br>Flunafenacet 240g/l<br>Flurtamone 120g/l  | 0.5 L WB<br>1.0 L WW                          | Dec 31st                                  | Pre-emerge herbicide for control of a range of broadleaved weeds and grassweeds. Better than Firebird on Ryegrass. Note Max rate on W Barley is 0.5L/ha   |
| <b>Pontos<br/>Wheat &amp; barley</b>   | Flufenacet 240g/l<br>Picolinafen 100g/l   | 1.0 L pre-em<br>0.5 L post-em                 | Pre-em<br>Gs 30                           | Offers excellent grass weed control especially AMG in addition to a range of BLW. Use pre-em for best results or early post-em with PDM.  |
| <b>Broadway star<br/>Wheat only</b>  | Pyroxsulam 7.08%w/w<br>Florasulam 1.42% w/w   | 0.265 kg                                      | Gs 32                                     | Strong brome and grass weed product with main BLW. Needs PDM for AMG control & residual activity. Most effective when used post emergence.  |
| <b>Defy<br/>Roxy 800EC<br/>Wheat &amp; barley</b>  | Prosulfocarb 800g/l   | 2.0 L   | Gs 21                                     | Very good option for high AMG situation. Add DFF 0.1l/ha for additional BLW control. Use pre or early post emergence. Avoid use at peri emergence on Winter Barley.   |
| <b>Diflanil 500<br/>Farmco Dazzle<br/>Hurricane<br/>Stride<br/>Sempra/ Solo<br/>Wheat &amp; barley</b> | Diflufenican 500g/l   | 0.25  | Gs 29                                     | BLW only. No grass-weed control. Poor on fumitory and poppy.  |
| Most Micro<br>Anthem<br>Sharpen<br>Stomp Aqua<br>Fastnet<br><b>Wheat &amp; barley</b>                  | Pendimethalin 365g/l<br>Pendimethalin 400g/l<br>Pendimethalin 400g/l<br>Pendimethalin 455 g/l<br>Pendimethalin 365g/l | 3.6 L<br>3.3 L<br>3.3 L<br>2.2-2.9 L<br>3.6 L | Gs 29<br>Gs 29<br>Gs 29<br>Gs 29<br>Gs 29 | Broad spectrum, good on fumitory and AMG but weak on groundsel. Good residual activity for pre-emergence situations.  |
| <b>Flight<br/>Wheat &amp; barley</b>   | Pendimethalin 330g/l<br>Picolinafen 7.5g/l  | 4.0 L   | Gs 30                                     |   |
| <b>Bulldog<br/>Adept<br/>Wheat &amp; barley</b>  | Pendimethalin 313g/l<br>Diflufenican 15.6g/l  | 4.2L/ha                                       | Gs 30                                     | For AMG suggested pre emerge use 4.0 plus 0.15L/ha DFF. For post emerge use 3.25L/ha plus Defy 2.0L/ha.   |
| <b>Tower<br/>Wheat &amp; barley</b>  | Chlorotoluron 250g/l<br>Diflufenican 40g/l<br>Pendimethalin 300g/l  | 2.0 L   | Gs 30                                     | Amg control plus BLW incl. Fumitory, cleavers, poppy, speedwell. Can be applied pre or post emergence.  |
| <b>Gorgon/Fence<br/>Wheat &amp; barley</b>   | Flufenacet 480g/l   | 0.5L  | Gs 13                                     | Good grass weed control when used early. Tank mix partner for DFF and PDM mixes.  |
| <b>Thor<br/>Wheat &amp; barley</b>   | Tribenuron-methyl 500g/Kg   | 10g before end of Feb                         | Gs 39                                     | Good mixer for BLW control. Will control vol. osr and beans at 10g/ha   |
| <b>Tribe<br/>Wheat &amp; barley</b>  | 750g/kg tribenuron  | 10g+  | Gs 33                                     | Good mixer for BLW control. Will control vol. osr and beans at 10g/ha   |
| <b>Cameo Max<br/>Wheat &amp; barley</b>  | Tribenuron-methyl 250g/kg<br>Thifensulfuron methyl 250g/kg  | Max dose 60g/ha                               | Gs 39                                     | BLW control. Useful for tidy up. Needs growth for best results.   |

# Farmer focus

One farmer who has made the switch from post-emergence herbicides to pre-emergence is James O'Reilly. James grows a large acreage of mainly winter cereals and oilseed rape with his parents Larry and Ann near Ballyragget, Co Kilkenny.

The farm switched to min-till in 2000, growing continuous winter wheat, for many reasons, mainly soil health, but also increasing scale and cost – it was taking two runs of a power harrow to form a seedbed on some of the land.

“With continuous winter cropping, grass weeds, especially sterile brome, were becoming more of a problem and James felt that glyphosate alone was not the complete solution and too many herbicide applications was affecting the crop growth,” says James’ Teagasc tillage advisor Mark Trimble.

James introduced a rotation in 2013, firstly including winter oilseed rape as there were more options for herbicide. He now operates a five-year rotation of winter wheat, oats, winter wheat, winter barley and winter oilseed rape.

“Our approach to controlling weeds on the farm centres around a full integrated pest management (IPM) approach,” says James. “Starting with weed identification, keeping field records, crop rotation, stubble cultivation, a stale seed bed and, finally, consulting with our agronomist to pick the most suitable herbicide and time of application.”

## Control of grass weeds

The switch to pre-emergent herbicide started in 2014, firstly on the winter oilseed rape. James felt he wasn't getting good enough control of grass weeds with post-emergent sprays, so he switched to pre-emergence application, as this is the most effective timing for the control of grass weeds, especially annual meadow grass.

“The products we used on winter cereals in 2018 were Vigon mixed with diflufenican for extra broadleaved weed control,” says James.

“A second application of herbicide may be required in spring to control some difficult weeds.”

James feels that the herbicide needs to be applied as soon as possible after sowing, so after every two to three days of drilling, he gets on to the sprayer and gets the herbicide on.



He has availed of a TAMS grant for GPS and auto-steer on his tractors and, as a result, the lack of tram lines are not a problem and he can do a lot of the spraying at night. “This has been

a huge help in terms of accuracy also and reducing scorch. In general, the switch to pre-emergence herbicide has resulted in much improved grass weed control on the farm,” concludes James.

# New advisory service

This initiative aims to help farmers improve water quality.

Noel Meehan,  
Teagasc Agricultural Sustainability  
Support and Advisory Programme

**W**e are fortunate in Ireland to have good water quality compared with our European neighbours. This holds true for ground water, rivers, lakes and coastal waters. This is thanks to our high annual rainfall and management of our water resources. There has been much investment in infrastructure and environment schemes designed to protect water and society is benefitting from this.

In Ireland, all water policy and management is guided by the Water Framework Directive. Under this directive, Ireland has been set a target of achieving good status for all waters in the country.

However, despite a lot of hard work over the last 20 to 30 years, we are failing to achieve this target and water quality has remained mainly static.

The Government has decided to adopt a new strategy involving a more collaborative approach to facilitate improvements in water quality.

The EPA has identified 192 catchments or areas for action across the country where the status of the water is at risk of regressing.

There are multiple sources of pressure on water quality: industry, waste water treatment plants and septic tanks, forestry, agriculture and urban pressure.

The Agricultural Sustainability Support and Advisory Programme (ASSAP) will focus on agriculture.

The ASSAP is designed to work closely with the farming community in each catchment and is made up of scientists, who will assess the streams, and advisors who will work closely with farmers.

The advisors will provide a free and confidential advisory service. There are 20 advisors from Teagasc and 10 advisors from the dairy industry on the programme. Acceptance of the service is voluntary.

The team of scientists led by Local Authority Water Support and Advice Team (LAWSAT) will assess the pressures on streams.

Where an agricultural pressure is identified, the farmers in the area will receive the offer of a free farm visit from an advisor.

The purpose of the visit is to meet

with the farmer and assess his farm for any issues that may be having an effect on water quality in the local stream.

In general, the advisor will assess a farmer's farmyard, nutrient management plan and nutrient management practices, use of pesticides and his general farmland management.

At the end of a visit, the advisor and farmer will agree on where the farmer should focus improvements or actions, if required, on his farm.

The practical advice will be designed to break the pathway and prevent nutrients from entering water. There may be a need for more significant actions, eg a TAMS application, and the farmer's existing advisor will complete this work.

A written summary of the advice and actions will be provided and a time frame for completion agreed between them.

The programme is based on col-

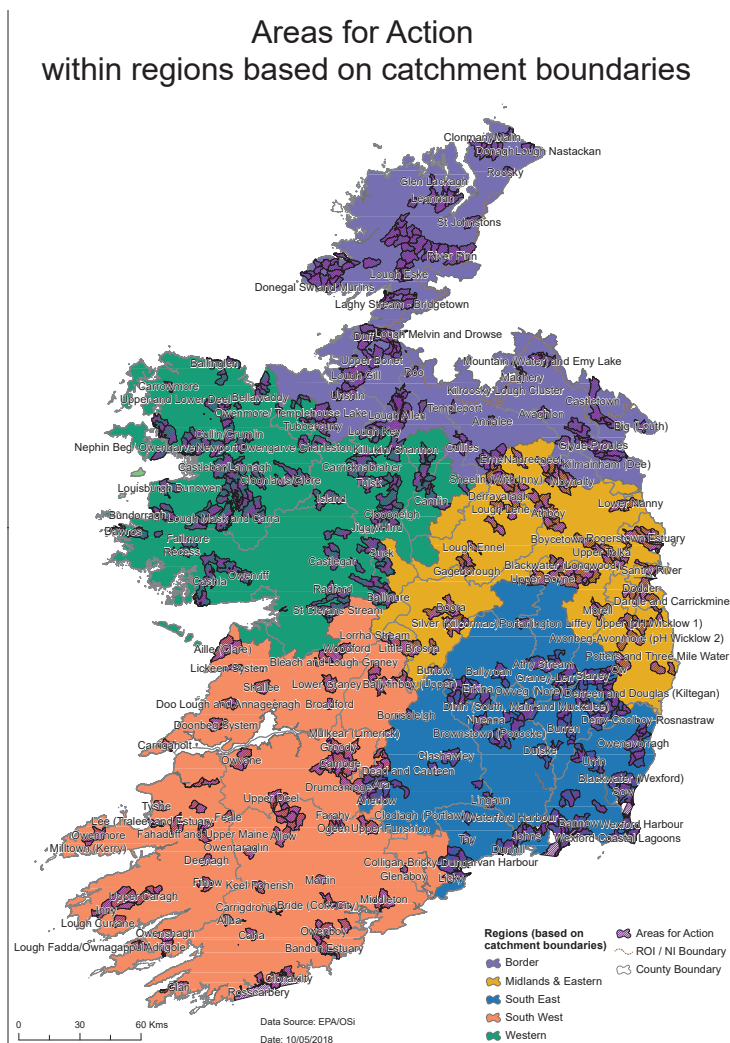
laboration, which is seen as crucial to ensuring that the ASSAP can aid in the collective goal of achieving good status for waters in Ireland.

The funding and support received from the DAFM, DHPLG and Dairy Sustainability Ireland has allowed the formation of the LAWSAT and ASSAP teams which will progress the programme on the ground.

Support from the farming organisations for the programme has been very strong and this is vital in communicating and informing farmers about the ASSAP programme and its key messages.

It is in everyone's interest to work together to improve Ireland's overall water quality. This will benefit local communities and help with achieving Ireland's obligations under the Water Framework Directive. It will also help to strengthen agriculture by reinforcing our green image as food producers.

Areas for Action within regions based on catchment boundaries



# From timber to timbre

Instrument makers use their intimate knowledge of wood to achieve beauty of tone as well as appearance.

**Michael Somers,**  
forestry specialist, Teagasc rural  
economy development programme

**W**hich is the most important wood product? Is it the timber or the timbre? Some might point to wood's role in building nations or sailing the seas. But ash can also leave us spellbound on sporting fields. And from whiskey to mushrooms, certain timbers have a key role in food production, not to mention the magic that oak can work on maturing wine.

Indeed, many would say wood has the power to warm our hearts as well as our homes. And this is where timbre really comes into it. Skilled craftsmen search for different types of wood to create musical instruments which leave audiences spellbound.

One such craftsman is Paddy Cleere from Tullaroan in Co Kilkenny. Paddy has been playing music all of his life. At the age of 10, he started on guitar, banjo and mandolin, and by his 20s was an expert on the bouzouki.

In 2012, Paddy decided to leave the world of construction and return to college. Paddy had a clear vision – to turn his passion and skill into a business. He attended St John's College in Cork, completing a course in musical instrument making and repair. He then set up his workshop in Tullaroan and is regarded as one of Ireland's leading stringed instrument makers.

Getting the right timber can be difficult at times. Paddy cites Paul Doyle and Tommy Cussen from Galway who have a great knowledge of all woods and are two of the most experienced luthiers he works with. Paul himself has a worldwide reputation and is brilliant at sourcing the right timbers.

Like the best guitar-makers, Paddy never needs to advertise: all his work comes through word of mouth. Paddy is the cardiologist of the guitar world. You have to have an eagle's eye and great patience in this business.

"It's a completely different set of skills to making furniture. Instead of rulers, we use digital micrometers. Our product is the very sound the instrument makes," says Paddy. "Precision is everything, there's no margin for error, because it affects the sound."

Paddy makes mandolins, mandolas, bouzoukis, acoustic guitars and tenor guitars.

What may surprise many is that the first species Paddy speaks of is spruce and cedar. The top of the instrument is made with spruce or cedar. Sitka spruce, in particular if grown slowly, is an excellent species for guitar tops. Many may decide on cedar; this is because of colour and tone. Cedar will give a more mellow sound and is better suited for strumming, whereas spruce gives a more punchier sound, which is sometimes better-suited for picking single notes Paddy says. The reason why soft woods are used for tops is because of the vibration.

All these trees are quarter sawn. "We need strength and sound." Some of the Irish spruce does grow quickly. But there are forests out there that may not be as "productive". This is the type of spruce we need in this business.

The next parts of the instrument are the back and the sides. The backs and sides are made from the same species, usually a hard wood. Rose wood, a tropical hard wood, is preferred by many musicians. However, it is hard to source in Ireland. Paddy sources it from suppliers in the UK, Ireland and Spain.

"I'm looking at using Irish walnut at the moment and other native hard woods for this purpose," he says. Currently, Paddy is making a mandola using Irish cherry for the first time. "I experiment with wood, every day is a learning process. It's one of the joys of this job," he says.

Paddy then braces the instruments with spruce. "The tension in the wood is key to generating vibration and



Seeing a new player coming in and purchasing their first bespoke instrument gives me a lot of satisfaction





sound," says Paddy, as he repeatedly taps the surface and makes adjustments to perfect the construction.

"This is where the sound is produced and if well made, the instrument will improve over years of playing."

The necks of the instrument are usually a three-piece construction for strength and appearance. These consist of a variety of woods like mahogany, walnut, maple, ash, sycamore, etc, and is picked by the client. This will have a fret-board usually of ebony or rosewood. This is also important for tonal properties and as a hard-wearing wood as fretboards get a lot of use over years of playing.

The final part of the instrument is the head stock. One guitar Paddy is finishing at the moment has a bog oak head stock, showing that Paddy uses all timbers from many places in time in different parts of the instrument to look beautiful and sound magnificent.

"The lighter soft woods give a punchier sound and the darker woods give a more mellow sound," says Paddy.

The last piece of the jigsaw is the binding. The instrument frame is

routed and then it's banded. If it's a dark tropical hardwood body, it's banded with a light Irish-grown hardwood, such as sycamore or ash. If it's a light coloured body, it's banded with dark woods, such as walnut rosewood or mahogany.

Paddy has sold instruments all over the world. But his craftsmanship lies not simply in his hands. It's his knowledge of woods and how best to bring them together. His key knowledge is how to make pieces and species of wood work together in harmony.

Paddy reflects on his time involved in music. "I look at players playing my guitars and I look to see if the instrument responds to them. I place their initials on guitars to give the owner the real sense of ownership.

"Seeing a new player coming in and purchasing their first bespoke instrument gives me a lot of satisfaction. When that happens I know I've cracked it."

Forest owners can sleep well knowing that there are people like Paddy out there waiting to bring their product to its ultimate destination. To make the world a better place.

When you get hurt,  
**the farm feels it.**

