



Today's Farm

Business, production, environment and countryside issues www.teagasc.ie



Calving sucklers at two years old

16

Minding your silage bales	10
Managing 30 dairy births/day	12
The potential impact of Greenhouse Gases	14
Options for finishing hill lambs	24
Why Greening can mean beans	28
Budget 2015	32
Countdown to tree planting	36
Distance learning at the Botanic Gardens	38
And more...	



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4 Etc

6 Events

Dairying

- 8 Moorepark milk quality workshops
- 10 Mind your bales
- 12 Compact calving

Environment

- 14 Greenhouse gases - balance is key

Drystock

- 16 Meeting the two-year target
- 20 Vigilance is key

- 22 Why calving date is so important
- 24 Options for finishing hill lambs

Tillage

- 28 Why green means beans
- 31 Break crop research at Teagasc Oak Park

Farm management

- 32 Budget 2015

Forestry

- 36 Countdown to planting

Botanics

- 38 Learning at your own pace

COMMENT



Mark Moore
Editor,
Today's Farm

Willingness to pay

I recently heard an economist describing the situation of any producer be it of cars, furniture, or closer to home: beef. He pointed out that the producer is squeezed between the willingness to pay of the buyer and his cost base. This is perhaps so blatantly obvious as to irritate the reader.

The debate about the willingness to pay of cattle buyers is a thorny one. Certainly, most cattle producers are not happy (understandably) with the price available. Hopefully, demand will grow faster than supply and the willingness to pay of cattle buyers will improve and be reflected in prices.

In the meantime, producers have little choice but to focus on the cost side of the equation. In this edition, several articles emphasise the benefits of having cows calve when, or just before, grass growth accelerates in the spring. Well-managed fresh grass is relatively cheap and highly nutritious. It's our key weapon in producing beef or milk cost effectively. Are you using it to maximum effect?

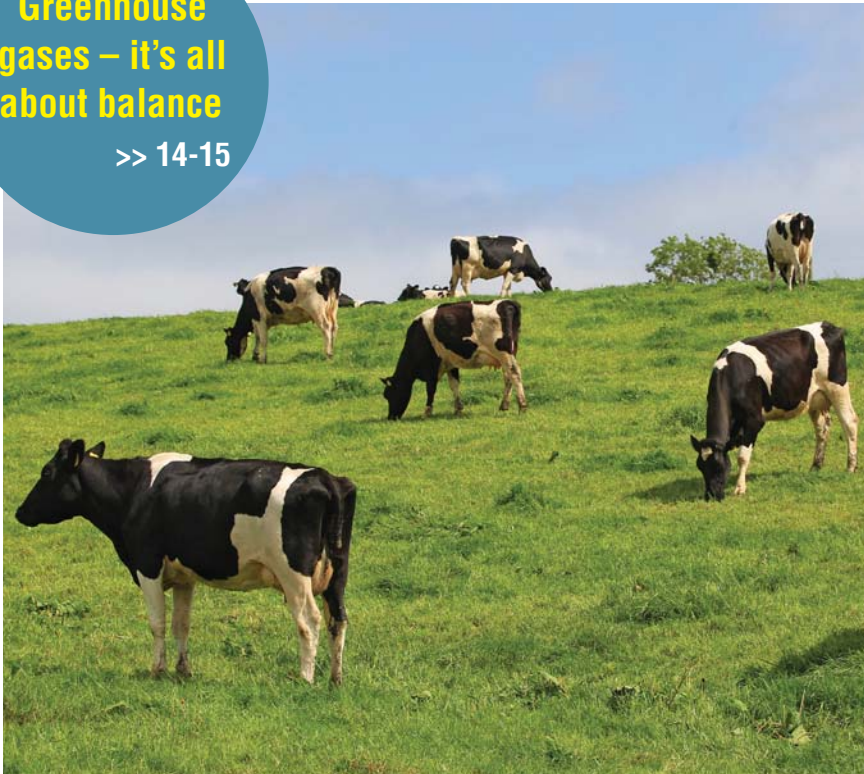
An rud follasach soiléir

Chuala eacnamaí le déanaí ag déanamh cur síos ar chás aon táirgeora: bíodh sin táirgeoirí gluaisteán, troscáin, nó ar bhonn níos cóngaraí dúinn féin - táirgeoirí mairteola. Dúirt sé go bhfuil an táirgeoir saite sa tsáinn idir 'Toilteanas Chun Íoc' ar thaobh an cheannaitheora agus a bhonn costais féin. Gach seans go bhfuil sé seo chomh follasach soiléir sin chun fearg a chur ar an léitheoir. Sa chás sin, gabhaimid leithscéal.

Idir an dá linn ní mór in aon chor an rogha atá ag táirgeoirí ach díriú ar thaobh eile an scéil: costais. San eagrán seo tá go leor alt a leagann béim ar na buntáistí atá le laonna a bheith ar tí breith do bha tráth a luathaíonn fás féarach san earrach, nó díreach roimh an ama sin fiú. Tá féar úr dea-bhainistithe sách saor agus scamhardach go maith. Is é an féar an príomhuirlis atá againn chun mairteoil nó bainne a tháirgeadh. I gcás roinnt feirmeoirí, áfach, tá sé fós ina rún nó ina uirlis tearcúsáidte ar a laghad sa chomhrac chun costais táirgthe a rialú.

Greenhouse gases – it's all about balance

>> 14-15



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Cover | Margaret Lehane who farms near Kanturk, Co Cork, manages breeding and culls late calvers, to ensure a tight calving pattern close to when grass growth accelerates in the spring.

Do you have a big idea for a food business?

Could you create and run a successful export food business? Do you have the creativity, drive and business experience to bring a new food product to the worldwide market? If so, Food Works wants to hear from you.

Food Works was set up by Bord Bia, Enterprise Ireland and Teagasc. Food Works is seeking applications from people or businesses with an innovative food or drink product either already developed or in development to take part in Food Works 2015.

Through a series of workshops and one-to-one mentoring, successful participants are given an invaluable range of practical business supports required to develop an initial concept into a winning food product with international appeal and global export potential.

The available supports include consumer market research, business plan development, technical advice, commercial viability testing in addition to access to fast-track access to research and development (R&D) facilities and possible investors and state funding.

Ideal applicants are ambitious food or drink entrepreneurs, or companies trading for less than four years that wish to target export markets and scale their business. The company will likely have an innovative product either already developed or in development.

The Food Works programme aims to help these young companies to realise their full potential to achieve significant scale and become major international businesses in markets across the globe while creating new jobs at home. Successful companies will be introduced to suitable investors to help them to fund a scalable business during the programme.

Interested participants are invited to learn more about the programme at the remaining seminar:
4 November – Cork Institute of Technology – 5.30pm to 8pm

To register to attend the seminars, or for more information on Food Works 2015, visit www.foodworksireland.ie. The deadline for applications is 20 November.

BOOK REVIEW

Homegrown Pork Sue Weaver

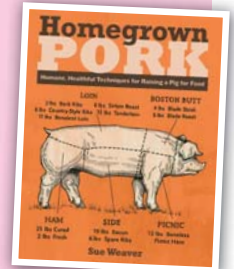
Subtitled *Humane, Healthful Techniques for Raising a Pig for Food*, this is a book aimed at anyone raising pigs on a small scale for home consumption.

After an introductory section on the physiology and behaviour of pigs, there are chapters dealing with breeds, housing, fencing, feeding and health. The final part of the book considers slaughter options and home processing.

The farm-owning author knows her subject and she writes clearly and purposefully. There is an appreciation of pigs' special qualities (the Einsteins of the farm animal world) without being whimsical, and the text throughout is grounded on practicalities. There is an appendix on how to shoot a pig and an informative breakdown of the different common breeds available for the small farmer.

– Sean Sheehan

Homegrown Pork
(Storey Publishing)
Costs €14.76,
www.bookdepository.co.uk (including worldwide postage)



Milk processing – increasing energy efficiency



Teagasc researchers have succeeded in assessing the potential supply of energy wood from forest to a major heat user.

Teagasc researchers have succeeded in assessing the potential supply of energy wood from forest to a major heat user. The Supplychip project provides forecast estimates of energy wood assortments, based on realistic outputs from farm forest holdings, representing 5% of the private forest resource nationally, and will be an important decision-making tool for potential major users of renewable heat.

Over 3,000 individual private plantations, clustered around Ballaghaderreen, Co Roscommon, were assessed for site productivity and road access and suitability for thinning.

The use of forest-based biomass can improve the overall energy efficiency of milk processing plants through the replacement of heavy fuel oil with indigenous biomass, reducing costs and creating more carbon-efficient products and may assist in the sustainable

development of agriculture toward Food Harvest 2020.

The outputs of the research have coincided with the decision by Aurivo (formerly Connacht Gold) to invest €5.5m in a state-of-the-art 12MW steam boiler plant in its dairy ingredients plant in Ballaghaderreen.

Biomass

The steam boiler will allow Aurivo to further improve the overall site energy efficiency at Ballaghaderreen through the replacement of heavy fuel oil with indigenous biomass, the phased introduction of electrical generation through the move to combined heat and power (CHP) and the reduction in energy consumption of the milk processing activity. It also offers a significant marketing opportunity to bring carbon neutral products to market to the increasingly conscious consumer.

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upcoming events

DAIRY CONFERENCE

The Department of Agriculture and Teagasc will jointly host a major conference on the future of the dairy sector in Moran's Red Cow Hotel on Wednesday 19 November.

A range of high-level international and domestic speakers will address three themes: market opportunities for the Irish dairy sector to 2025, the management of risk in a post-quota environment and the on-farm efficiencies required to drive profitability at farm level.

See <http://www.agriculture.gov.ie/press/pressreleases/2014/september/title,77841,en.html>

ORGANIC FARM WALKS

- **Wednesday 5 November, 2pm:** Mark Duffy, Bellview, Cloger, Ballybay, Co Monaghan – beef.
- **Wednesday 19 November, 2pm:** Pat Booth, Heath, Killone, Stradbally, Co Laois – beef.

ORGANIC PRODUCTION COURSES 2014-2015

On completion of the Teagasc organic production course, participants will be proficient in:

- Interpretation of organic standards.
- The principles of organic production.
- Assessing economic viability and market opportunities.

25-hour FETAC Level 5 introduction to organic production courses

These courses qualify applicants to the 2015 Organic Farming Scheme.

- Teagasc, Mallow: 18 and 26 November; 2 and 10 December.

- Teagasc, Athenry: 21 and 28 November; 5 and 12 December.
- Teagasc, Ballyhaise: 13, 21 and 27 January; 4 February.
- Teagasc, Portlaoise: 22 and 29 January and 5 and 12 February.

FARM HAZARDOUS WASTE BRING CENTRES

Hazardous waste should not be stored on farms and, in many cases, the presence of this waste on farms is illegal and may leave a farmer open to prosecution.

Because of this, the Environmental Protection Agency (EPA) in association with Teagasc, the Department of Agriculture, Food and the Marine and local authorities, is operating 10 bring centres for farm hazardous waste across the country in November. See Table 1.

- Each waste type must be segregated and packaged to avoid leaks and minimise risks.
- Mixed wastes will not be accepted.
- All needles and syringes to be delivered to the centres in separate sealed containers.
- Cash, cheques and credit/debit cards will be accepted.
- Farmers will be issued with a receipt of payment and a certificate of acceptance.

Teagasc environment specialist, Tim Hyde said: "Safe disposal of farm hazardous waste is important for every farmer in producing quality-assured products for the end user and maintaining Ireland's green and sustainable image. This scheme is an excellent opportunity for farmers to safely dispose of their farm hazardous waste at an extremely competitive rate and I am encouraging all farmers to bring their farm hazardous wastes



to one of the 10 locations points where it will be collected, transported and disposed of in a safe and environmentally sound manner."

Table 1: Waste types accepted at hazardous waste bring centres

Items	Price
Out-of-date pesticides; veterinary medicines and animal healthcare wastes; needles and syringes; waste paints; aerosols; corrosives (acids, detergents); oil and air filters; oily wastes; brake fluids; brake pads; antifreeze; adhesives; coolants	€2/kg
Waste packaging	€8/200-litre drum €4/25-litre drum
Waste engine oil and waste hydraulic oil; waste oil containers	Free of charge
Waste electronic and electrical equipment (e.g. TVs, computers, fridges, freezers, power tools, kettles); all batteries and light bulbs	Free of charge

Location	Dates
Whites Agri, Lusk, Co Dublin	Tuesday 4 November
Ballyjamesduff Mart, Co Cavan	Thursday 6 November
Raphoe Mart, Co Donegal	Tuesday 11 November
Balla Mart, Co Mayo	Wednesday 12 November
Dungarvan Mart, Co Waterford	Tuesday 18 November
Kanturk Mart, Co Cork	Thursday 20 November
Abbeyfeale Mart, Co Limerick	Tuesday 25 November
Enniscorthy Mart, Co Wexford	Thursday 27 November

Bring centres will open from 9:30 am to 3:30pm

FAMILY FARMING CONFERENCE

Teagasc/IFA international conference on family farming
Date: 1 December
 Location: Shelbourne Hotel, Dublin

Programme

- 9.30am: Registration and coffee.
- 10.30am: Welcome and introduction IFA president *Eddie Downey* and Teagasc chairman *Dr Noel Cawley*.

Session 1: The international context

- IFA president *Eddie Downey*
- 11.30am: Family farming in a global context: responding to challenges *Gerd Sonnleitner, UN Good Will Ambassador for the 2014 International Year of Family Farming (IYFF)*.
- 12pm: Long-term vision for family farming in Africa *Prof Mandi Rukuni, Barefoot Education for Africa Trust (BEAT) establishing Africa's Barefoot University*.
- 12.20pm: Role and rights of women in family farming



Dr Evelyn Mulleka, president, Zambia National Farmers' Union

- 12.40pm: Discussion
- 1pm: Lunch

Session 2: Irish family farming: Opportunities and challenges ahead

Teagasc chairman Dr Noel Cawley.

- 2pm: Future of Irish family farming
Dr David Meredith, Teagasc
- 2.15pm A young farmer's perspective
Macra na Feirme national president Kieran O'Dowd.
- 2.30pm: The agricultural adviser's perspective
Teagasc adviser
- 2.45pm: The farm family perspective
Maura Canning, IFA Farm Family Committee chair

Session 3: Panel discussion

Moderator: Joe O'Brien, former agriculture correspondent, RTE

- Tom Moran, director general, Department of Agriculture, Food & the Marine.
- Professor Gerry Boyle, director, Teagasc.
- Pat Smith, IFA general secretary and chief executive.
- Mairead Lavery, editor, *Irish Country Living*.

Ten bring centres for farm hazardous waste are open across the country in October and November.

- Tim O'Leary, IFA farmer and deputy president.
- Richard Moeran, farmer.

Session 4: Closing and presentation

Chair: Dr Noel Cawley, Teagasc chair.

- 4pm: Closing address
Minister for Agriculture, Food and the Marine Simon Coveney.
- 4.30pm: Presentations to winners of the FBD and *Irish Farmers Journal* UN Year of Family Farming Awards in association with Teagasc and the IFA Farm Family and Social Affairs Committee.
- 5pm: Close of conference.

COLLEGE OPEN DAY

Pallaskenry Agricultural College
Salesian Agricultural College,
Pallaskenry, Co Limerick
Principal: Derek O'Donoghue
Phone: 061-393100
Email: info@pallaskenry.com
Thurs 4 December, 10am to 2pm
(Tours ongoing)

CENTENARY LECTURE

Dr Tom Walsh centenary lecture,
Johnstown Castle, Co Wexford,
Friday 5 December

18 July last marked the centenary of the birth of the late Dr Tom Walsh, an internationally-renowned scientist and leader, who over a career of more than 40 years, made fundamental contributions to the development of Irish agriculture, the economy and society. As the first director of An Foras Talúntais, and later of ACOT (the national agricultural advisory body) (now Teagasc), Dr Walsh worked untiringly for the development of Ireland's natural resources and for the agricultural and food industries, in particular.

To mark the centenary of Dr Walsh's birth, Teagasc will hold a special centenary lecture in Johnstown Castle, Co Wexford on 5 December – world soils day.

The lecture will be delivered by Professor John Ryan on the "Evolution and Achievements of Irish Soil Science".

Professor Ryan is himself an internationally distinguished soil scientist and was the recipient of the prestigious International Service in Agronomy Award for 2004 from the American Society of Agronomy.

This lecture will highlight the contribution made by Dr Walsh, both as a practising soil scientist and through his role in establishing Johnstown Castle and An Foras Talúntais as a leading research centre in soil science.



Waste that is potentially hazardous should not be stored on farms and, in many cases, the presence of this waste is illegal and may leave a farmer open to prosecution

dairying

Moorepark milk quality workshops

The Moorepark milk quality workshops held on alternate years are scheduled for December. The workshops will be held at two venues: Slieve Russell Hotel, Ballyconnell, Co Cavan on 2 December and at the Teagasc Food Research Centre, Moorepark, Fermoy, Co Cork on 9 December. These events are targeted at dairy industry personnel and the programme includes topics relevant to the production of quality milk.

The programme will include presentations and discussion on:

- Recent results on the effect of milk storage temperature and duration on the quality of milk and the effect of prolonged storage on the suitability of milk for processing;
- Detection and enumeration of spores in milk, which is very relevant to the production of milk for the infant milk formula sector;

- Progress outline of a new thermodynamic testing method being trialled by Tecnopath/Glanbia;
- Moorepark studies on the effect of grass-based diets with different levels of supplementation on milk protein composition;
- Report of mineral analysis and seasonal variation in compositional parameters of Irish manufacturing milk;
- An overview of the CellCheck programme/activities to date by AHI;
- Details of the IMQCS training programme on both testing and installation.

There will also be discussion opportunities on new research projects, relevant residue issues, milk lactose levels and discussion issues from the audience will also be welcomed.

You can register for the workshop by contacting niamh.obrien@teagasc.ie



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These events are targeted at the dairy industry and comprise topics relevant to milk quality



MILK QUALITY ISSUES TCM residue

How to avoid problems with Trichloromethane (TCM) residue:

DO

- Choose registered cleaning products.
- Choose a product with chlorine content less than 3.5%.
- Mix the cleaning solution as instructed by manufacturer.
- Follow a cleaning routine. See website link below.
- Rinse detergent/steriliser solutions from plant immediately after circulation.
- Use adequate rinse water for removing milk and detergent residues – 14l/unit
- Check that the level of bulk tank rinse water is adequate for the tank size.

DO NOT

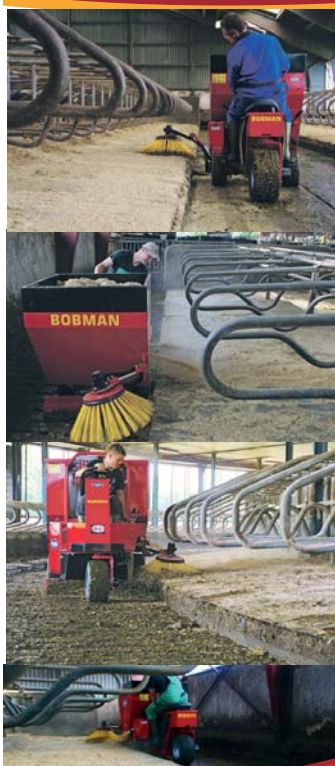
- Add chlorine to final rinse of the milking plant/bulk milk tank.
- Re-use rinse water (if used to remove detergent, discard).
- Re-use the cleaning solution more than once.
- Add additional chlorine to detergent/steriliser solution.
- Dip clusters in chlorine.

Signs of inadequate rinsing of milking equipment:

- Smell of chlorine from bulk tank after cleaning.
- pH of rinse water (in the plant after completion of cleaning) greater than 8.5.
- Milk residues in detergent cleaning solution.

<http://www.agresearch.teagasc.ie/moorepark/milkquality/>

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Mind your bales

Padraig O'Kiely
Teagasc Animal, Grassland
& Innovation Programme, Grange

The challenge

Bales of silage can be stored safely for as long as the plastic film in which they are wrapped continues to exclude air. This means that, if properly made and stored, two-year-old bales of silage will still be in good condition.

On the other hand, damaged plastic film allows air entry over an extended duration, resulting initially in mould (or mushroom) growth and, ultimately, in localised or general rotting of the silage.

The scale of this impact is shown in Table 1 where wilted stemmy grass was satisfactorily preserved within properly wrapped bales, but silage adjacent to punctures created by rooks had become wetter (reduced dry matter DM), had a greatly diminished feed value (reduced DM digestibility and increased ash) and was no longer adequately preserved (elevated pH).

The response

Silage bales should always be regular-shaped and very firm. This helps both in applying the plastic film correctly and in reducing the risk of damage while the bales are being mechanically handled. Bales should also have sufficient film properly applied.

The following are pointers for ensuring that once the bales have been wrapped in plastic film, the seal provided by the film continues to keep out air until the time of feedout.

1 Transport the bales to their final storage destination immediately after baling/wrapping. This reduces the risk of them being attacked on the stubble by crows, and facilitates efficient mechanical handling of the bales while their shape is still fully cylindrical. Wrapping bales at the storage site, if feasible, is an alternative option.

2 Mechanically handle the bales gently and carefully. Bales of silage can weigh from 350kg to over



1,000kg, and much of this weight will be pressing the plastic film surrounding the bales against the metal arms of the bale handling equipment, while the bales are being transported to and are being placed in their storage location. This film is delicate and easily damaged.

Therefore, the metal arms of the bale lifter need to be smooth (no rust) and the bales must be lifted and carried very gently.

3 Place the wrapped bales on a smooth surface (no sharp stones).

4 Be careful when lifting the bales into their storage position/orientation – damage is often done to the plastic film if bales are being tipped from a standard to an upright (stored on their flat end) orientation.

5 Bales can be successfully stored on their curved side or flat end, with the former stored up to three tiers high. In each case, what matters is that the required bale handling equipment is available and is used appropriately.

6 Store bales on level ground (this reduces the risk of secondary movement). If storing them on sloping ground, store the bales either with their flat ends facing the slope or on their flat end.

7 Fold in the loose ends of the film, or press them beneath the bales, to avoid them unravelling in the wind.

Bales of silage can be stored safely for as long as the plastic film in which they are wrapped continues to exclude air.



Table 1: Chemical composition of silage in a bale – silage beneath intact or punctured plastic film

	Intact film	Punctured film
Dry matter (DM; g/kg)	326	272
DM digestibility (g/kg)	669	578
Ash (g/kg DM)	92	124
pH	4.6	7.3

Source: Teagasc Grange

8 Prevent damage by livestock. If the bales are stored in a field, this may require fencing off the bales from livestock.

9 Prevent damage by birds. This can be done by placing tyres on the bales and covering this with a net. It can also be prevented by painting eye-designs on the bales (not oil-based paint), placing monofilament lines 0.5m apart and 0.5m above the bales, suspending streamers or kites over the bales, etc.

10 Prevent damage by cats. A survey by Teagasc Grange identified cats as a frequently significant source of damage when bales were stored in the farmyard (rather than in a field). Most damage occurs when they are climbing up onto the bales.

11 Prevent damage by rodents. It is important to include the bale storage area within the rodent control practice for the farmyard. If storing the bales on grass, it is preferable to avoid providing cover for the rodents – thus, if feasible, put the bales on short grass and prevent a build-up of vegetation around the bales.

12 Trim away overhanging branches, briars, etc, around the stored bales to avoid any damage to the bale wrap film.

13 Inspect bales frequently and immediately patch any damage found.



Silage bales should always be regular in shape and very firm. This helps in applying the plastic film correctly and also in reducing the risk of damage while the bales are mechanically handled

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dairying

Compact calving

Preparation is key if you expect a large number of cows to calve in a short period

Pat Clarke
Teagasc Animal, Grassland & Innovation Programme

Since the introduction of EBI, herd fertility has received closer attention. Increasing the fertility sub-index of bulls selected; the use of heat detection aids; improving cow body condition; improved veterinary intervention are all beginning to improve six-week calving rates. Some farmers are now approaching the target of 90% cows calved in six weeks.

The benefits for seasonal grass-based milk production were emphasised at the International Cow Fertility Conference held in Ireland this spring by Laurence Shalloo of Teagasc Moorepark.

Laurence concluded that changing the six-week calving rate by 1% increased herd profits by €8.22/cow in the herd. So, the technologies are available and the financial benefits are substantial but some farmers are legitimately concerned by the concentrated workload in February.

This peak workload is unquestionably a challenge that must be managed well, whether you have a 100-cow or 500-cow herd. Farms that have a 90% six-week calving rate will expect half the herd to calve in about 16 to 18 days. This is referred to as the median calving date.

For 100 cows, this is about three calvings per day during this period; for 300 cows, it is an average of 10 calvings/day. At farm level, twice these numbers could calve on a particularly busy day, so the farm must be prepared for this spike in workload.

The following two farmers have different scale but both are increasing herd size and improving the six-week calving rate. How they approach the calving season is outlined below.



Farmer 1: New calving facility

Michael Hayes farms at Tulla, Co Clare, and has increased his herd size to over 140 cows in recent years. Michael says assistance from family members, particularly his wife and father, is crucial to the operation.

His six-week calving rate has averaged 72% over the last three years. This results in about four cows calving per day during the first three weeks. Next spring, Michael will calve 160 cows.

In 2013, Michael decided to build a new calving facility. He wrote down all the issues he had with his old calving and calf-rearing facility and then built a new one to eliminate all of these issues. Features of the new shed include:

- Lots of room, resulting in less movement of calves.
- Wide passage between calf pens so a bale of straw can be rolled out.

- Big square pens, which are easy to clean out with a tractor.
- Isolation pens for sick calves.
- Provision of hot water and a fridge.
- Straw storage within the shed and in the loft over the calving area.
- Location beside milking parlour where vacuum can be used to milk cows in calving area.
- Group pen that can accommodate up to 20 cows.
- Feed barrier for group pen which is lockable.
- Good slopes and drainage from the whole shed.
- Bull calves near the shed door for quick exit.
- Milk pumped from dairy to calf shed and then pumped to pens.

The cost of the new facility was €270/cow (€43,000) for a 160-cow herd but Michael said he could probably calve 200, if required. In the long

term, the shed is designed to take cubicles.

Before the new facility arrived, Michael had focused on getting the cow right for calving. "I calve all the cows on my own and I cannot overemphasise the importance of easy calving bulls for my system, I use all black and white bulls," says Michael.

Scanning

Cows are scanned in autumn and grouped according to calving date and condition. They are drafted twice-weekly during peak calving and once later. "At night, I'll get up and tube newborn calves, mark the cow and calf with marker, and leave them in the pen," says Michael.

"They are separated in the morning. I don't milk at night, but I always make sure to have first-milking colostrum on hand."

 Key messages

Although the farms featured differ greatly in scale, they still have a common approach to calving a large number of cows in a three-week period. These include:

- Easy-calving bulls.
- Correct cow body condition.
- Plenty of calving spaces.
- Mechanical feeding and cleaning.
- Store of frozen colostrum, stomach tubes.
- Well located calving pens.
- Once-a-day milking.
- Employed labour – when scale increases.
- Once-a-day (OAD) feeding of calves.
- Bedding: Adequate supply in a convenient area.

Farmer Michael Hayes and his Teagasc adviser Sean Bugler.

“ Farms that have a 90% six-week calving rate can expect half the herd to calve in about 16 to 18 days. This is referred to as the median calving date

Farmer 2: Managing high numbers (up to 30 calving a day)

Large herds, which calve compactly, also require meticulous preparation. Animals must be right, facilities right, humans (the workforce) must be right and the system must be prepared for the unexpected.

Seamus Quigley farms just outside Loughrea, Co Galway, and over the last three years has calved 535 cows on average, with a six-week calving rate of 72% and median calving of 26 days. This results in about 10 calvings per day during this 26-day period.

This year, Seamus expects 340 cows to calve in February alone. So, what are the key aspects of management?

• **Adequate labour:** “Two additional labour units are employed for about 10 weeks around calving,” says Seamus. “One does general work and the second unit is made up of a number of relief milkers. They free up time for employees to focus on calf rear-

ing. Farm manager John Tully covers the night, so there is 24-hour supervision at calving.”

• **Cow selection:** Cows are grouped according to body condition and moved to the calving area twice a week.

• **Calving area:** It is a combination of a cubicle shed (70 cubicles) and an outdoor pad. “Although cows have access to the shed, most calve on the pad outdoors,” says Seamus. There is a restraining facility at the pad. Effectively, 70 cows are being watched for calving. “We’ve had up to 30 calvings/day,” says Seamus.

• **Assistance:** Crossbreeding is a big help to minimise assistance at calving, according to Seamus. He also emphasises the importance of cows being in good body condition. He feeds dry cow minerals and some Calmag immediately pre-calving to limit the risk of milk fever.

• **Moving stock:** The calving pad, milking parlour and calf house are in close proximity limiting movement after calving. Once calves are born, they are tagged and moved to the calf house by trolley.

• **Colostrum:** Calves always get their first two feeds of colostrum from first milking from the cow.

• **Calves:** Bull calves are sold as quickly as possible and heifers are moved outdoors in early March. They are batch fed in groups of 40.

• **Cows post-calving:** These are moved into a colostrum mob and kept indoors for four to five days. When they clear the CMT test, they join the main herd. “It is a big help keeping these cows separate, it allows us milk the main herd without issues, and we can then take out time with the colostrum group and work on any problems this group has,” says Seamus.

Greenhouse gases – it's all about balance

Long-term solution that needs short-term action

Pat Murphy

Head of Environment Knowledge Transfer, Teagasc Crop, Environment & Land Use Programme

It is now widely accepted that climate change, brought about by greenhouse gas (GHG) emissions, is a real problem which will not go away. In order to keep the rise in global temperature below the critical +2°C, the European Council has set an objective of reducing greenhouse gas emissions by 80% (from 1990 levels) by 2050. The EU has made a unilateral commitment to reduce overall greenhouse gas emissions from its 28 member states by 20% compared with 1990 levels by 2020. It has offered to increase this reduction to 30% if other major economies agree to undertake their fair share of a global emissions reduction effort.

To achieve an 80% reduction, the Commission proposes that agricultural emissions could be reduced by between 42% and 49% in the period to 2050. The question is, can Irish agriculture deliver this level of reduction while at the same time increasing output to meet growing demand for food and provide a livelihood for farmers and those involved in the agri-food industry?

Teagasc has prepared a report which looks at the potential for Irish agriculture to contribute to emissions reductions in this timeframe. The report identifies that there is scope to reduce the GHG emissions of farm enterprises by focusing on achieving improved performance and adopting technologies across a range of measures.

However, given the nature of agricultural emissions, there is a limit to the reductions that can be achieved. Reducing emissions from agriculture is only half the story. Plants take carbon dioxide from the atmosphere and where there is storage of this plant



Bioenergy

Replacing fossil fuel through bioenergy production from bioenergy crops and anaerobic digestion (AD) of grass and slurry has the potential to make a significant contribution to offsetting agricultural GHG emissions. However, the report outlines significant challenges which need to be overcome. These include the availability of land, lack of infrastructure, lack of supportive policy, the requirement for significant capital investment, low returns and high risk.

material over a long period (which is termed sequestration) or utilisation as energy to replace fossil fuels there is a reduction in the net atmospheric carbon dioxide released. The sequestration reduction and energy substitution may be attributable to the farming sector and offset against emissions from food production.

The report concludes that with the combination of emission reductions, sequestration and offsetting, farming can achieve significant reductions in its carbon footprint in the long term but can only do so if action is taken immediately.

Reducing agricultural emissions

If there are significantly increased agricultural GHG emissions, policymakers will react by placing limits or costs on those increased emissions. To avoid this, it is vital that the entire industry works together to deliver reduced emissions.

Teagasc has identified a number of ways in which farmers can reduce their GHG emissions and has incorporated them into a decision support system called the Carbon Navigator. All of the measures included lead to improved farm profitability.

- Extended grazing season improves diet quality and reduced rumen meth-



ane production and also less slurry to be stored and spread.

- Increasing EBI leads to more productive, fertile and healthier animals with lower emissions per kilo of milk solids.
- Increased nitrogen efficiency, through better grassland and fertilizer management, reduces the losses to the atmosphere and reduces the amount of energy required in the manufacture of fertilizer.
- Spring application of slurry and the use of trailing shoe or band spreader reduces the GHG losses to the atmosphere and increases the amount of fertilizer recycled from the slurry.
- Investing in energy efficient dairy equipment for pumping, milk cooling and water heating can significantly reduce energy use.
- Lowering the age at first calving in both the suckler and dairy herd reduces the “unproductive” time in the animal’s life when emissions are still being produced.
- Improved calving rate also leads to a reduction in the animal’s unproductive time.
- Increased weight gain leads to a shorter time to slaughter and/or higher output, thereby reducing emissions per unit of output.

Around the world, a huge amount



of research is being undertaken to reduce the emissions from agriculture. Research in Teagasc points to two particular technologies, which can significantly reduce the carbon footprint over the next few years:

- GHG emissions from urea are lower at both the production and application stage. Increased usage of urea which is aided by the addition of a stabiliser and/or nitrification inhibitor has the potential to deliver substantial GHG mitigation.

- The use of sexed semen in the dairy herd has the potential to improve the quality of calves going to the beef herd by increasing the proportion of progeny from beef breeds. This will lead to higher efficiency in beef production.

Scientists will continue to look for technologies to further reduce emissions. However, it is highly unlikely that efficiency increases and mitigation technologies can deliver the level of reduction required from the industry.

Carbon sequestration

The Teagasc report identifies carbon sequestration as a key potential contributor to reducing the carbon footprint of Irish farming. Carbon sequestration is defined as

the process of removal and storage of carbon from the atmosphere in carbon sinks (such as oceans, forests or soils) through physical or biological processes. For Irish farmers, the two possible processes that may have potential to deliver significant sequestration are an increase in the rate of forest planting and increasing the organic matter content of grassland soils.

Forestry

The amount of land under forestry in Ireland has been growing for the last 20 years. In recent years, the level of planting has been approximately 8,000ha per annum, mainly as farm forestry. The report identifies that by increasing this to 20,000ha per annum, the increase in sequestration (and displacement of fossil fuel) would equate to almost half of the current emissions from Irish agriculture. This level of planting has been achieved in the past and the report suggests that, given supportive policies, it should be possible to achieve substantial increases in the area of forestry without substantial impact on agricultural output.

Grassland sequestration

The second mechanism, enhanced

carbon sequestration in grassland soils, is the subject of current international and national research. The sequestration potential of grasslands varies significantly between years and between soils, necessitating long-term experiments and monitoring programmes. These research efforts have not yet provided conclusive evidence to indicate grassland management strategies, which can be shown to deliver net sequestration over a prolonged period of time.

Sustainable food production

Bord Bia, through the Origin Green initiative, outlines to the customers for Irish food that they are buying a product which is produced sustainably and where every part of that food chain is steadily improving its sustainability.

Ongoing GHG emissions reduction is a requirement for all of our major food buyers. The carbon footprint of our food is comparatively low but the target for our food industry is to produce milk and beef with the lowest carbon footprint in Europe and in so doing to achieve better prices for producers.

- Full report www.teagasc.ie/publications/2013/3002/CarbonNeutrality.pdf

Meeting the two-year target

Teagasc cattle specialist **Karen Dukelow** chats to Cork farmer Margaret Lehane about how she manages replacement heifers to calve at 24 months

Q&A

Margaret Lehane farms near Kanturk, Co Cork. She is married to Dermot, with four children aged from 22 to 32. Margaret is kept busy working full-time on the farm and looking after a house and family. There are two enterprises on the farm – an integrated 240-sow pig farm with almost 3,000 pigs in total, which Dermot manages, plus one labour unit. He spends almost 75% of his time in that yard, while Margaret (with the help of a college student for three months of the year) looks after a 70-cow suckler-to-beef unit. Margaret farms 52ha – 46ha grassland and 6ha of tillage (this year spring barley which is now treated and in the shed for winter feed to young bulls).

Margaret, how do you ensure that your heifers calve at two years of age?

“Before I start to talk on this subject, I must stress that anyone aiming to meet this target will need interest, enthusiasm, patience and dedication.

“The most important factor is to know your herd. You should identify individual cows with specific characteristics:

- 365-day calving interval or less.
- Docility.
- Consistently delivers a top quality calf.
- Good conformation and milking ability.
- Tendency to have female calves rather than male.
- All round thriftiness, economical to keep.”

These are the cows that Margaret selects her replacement heifers from – 60% to 70% of her selection is based on the mother's history.

How do you identify your animals?

“I use jumbo tags to identify cows and heifers. Here is an example of how I

use jumbo tags: I have three cows, e.g. jumbo numbers 4, 15, and 21. In 2008, for example, all replacement heifers started with 100, so on the replacement heifers of these I put numbers 104, 115 and 121. In 2009, if these cows had females I put 200 on them, so these replacement heifers would be 204, 215, 221. This is done each year just using the first figure to highlight the year.

The most important information for me is contained in the other figures 4, 15, 21 as these cows are exactly the perfect maternal ones I need to breed from. I am able to go back 10 to 15 years for breeding traits by keeping these tags.”

Talk us through how you look after your heifers from when they are born to calving down.

First grazing system

“Throughout the first grazing season, I am constantly monitoring and observing my young female calves and long before I look up the ICBF's replacement index, I have earmarked my 15 heifers (a 20% rate) approximately.

“Dosing and vaccinations are done routinely during the year – final outdoor one about three weeks prior to weaning. After weaning, all weanlings are left outside for a few weeks. Then all are brought into the yard and weighed, sorted, tail-clipped and penned.”

First winter

“A specially-made cubicle house is provided for my 15 selected replacement heifers. The average weight is 360kg. This house is bright, airy and very cosy. Cubicles have rubber mats and a generous application of sawdust is put on top to attract them up onto the cubicles. Plenty of calf ration is laid along by the wall in front of them. They get no more feed apart from this concentrate for 24 to 36 hours and, by then, usually 100% of them are lying up.

» Continued on page 18





Margaret's system

Margaret Lehane (pictured left) operates the following system:

- Calving starts in December and continues to 15 February each year.
- Breeding season starts on 15 February.
- Cows go out to grass around 17 March (depending on weather).
- The herd is divided into male and female – two bulls.
- Early cycling cows sometimes get artificially inseminated before they go out.
- Weaning starts in late September.
- Housing begins in October.
- All young bulls/cull heifers finished/sold under 16 months.

Top tips

When managing replacement heifers:

- Allow for plenty of replacements (at least 20%, one in five).
- Know your herd and select potential replacements while they are still calves.
- Heifers need to be looked after the whole way along; weighing is essential to monitor weight gain.
- Give it your all. Use a belt and braces approach. Heifers need access to the best grass, adequate feed indoors, minerals and excellent housing.
- Use easy-calving AI/bulls on heifers.
- Calving heifers at two years of age requires dedication but the extra effort brings great rewards.

» From page 16

This exercise, which may seem laborious, is beneficial as all my cows are on cubicles/auto scrapers. On day three, silage is introduced, plus 2kg of concentrate (once a day)."

"As these livestock are young, I want to help them to grow bone and develop their reproductive organs. This is an important area, so they need a high-spec mineral which I get formulated by my nutritionist. Some areas of the country are deficient in selenium or iodine (two very important minerals essential for good breeding). Every autumn, I do a herd blood profile and this tells me if I have any particular deficiency problems. Leave nothing to chance. I want the heifers to grow, get fit – not fat."

"Six weeks later, all young stock have been dosed and vaccinated and weighed again. The target weight for my heifers is around 430kg to 450kg before mating. Approximately 125 days feeding at 0.7 daily liveweight gain gives 88kg, plus the original housing weight of 360kg, which totals 448kg. Importantly, any bulling activity in the replacements is chalked down on a blackboard in their shed. This helps to keep track of fertile and early maturing ones and the dates can be used again to anticipate heat returns."

"Meanwhile, I hope to have been contacted by my AI stations to discuss suitable easy-calving sires for these heifers. AI chiefs and, indeed, Teagasc could do more to help us here. I feel they should keep up ongoing contact with the farmer sharing their knowledge, advice and guidance. Suckler farmers (in contrast to dairy farmers) are very much left to their own devices and this is one area where AI personnel could visit beef discussion groups to help build up a working relationship with us. It is not good enough to tell us to use various heat detections gadgets without a hands-on meeting beforehand as wrong interpretation could be expensive."

"From January onwards, the level of feed is doubled to 4kg. I allow them out to exercise in the adjoining yard and let them run through the cattle crush freely – it all helps to calm them and ease handling later on. Cubicles are kept clean and topped up daily with sawdust. The combination of good feed, comfortable housing,

“ You should know your herd and select potential replacements while they are still calves



Margaret Lehane's cows have a very high proportion of Limousin genes.

minerals and plenty of light/space helps create a feelgood factor. I know from the pig side that this comfortable environment contributes greatly to the success rate. Our bull is now introduced to adjacent yard and gate and this also helps to induce heifers into heat."

"Throughout the winter, while calving season is in progress, I am observing the heifers at numerous intervals of the day and night, so the workload is multifaceted."

Second season at grass

"Magic day is 15 February. Any heifer on heat from now on is inseminated. If we had a package pre-arranged with AI, the technician could give a second service to ensure 100% timing. This is done routinely with the pigs."

"From now on, these heifers are left out to the small house field where I can observe them with a pair of binoculars. If I have a bulling cow or two, I leave them out for an hour or so with heifers. I suggest that if you are up at any calving (especially at dusk or dawn) that a discreet observation on these heifers often yields results. I realise that there are plenty of other methods like a vasectomised bull, synchronisation and scratch cards and, of course, an easy-calving bull, which can be difficult enough to find as reliability figures are low for stock bulls."

"I end up with my 15 heifers out on good aftergrass and, hopefully, they will take their place in the herd later this year after scanning is completed."

Second winter

"At housing, the heifers are moved into a cubicle house/auto-scraper where they have access to feed through 'self-locking stalls'. Straw and silage are fed alternatively and close monitoring of their condition is kept. Pre-calving minerals are always available to them. Hay is given during calving week. After a bonding week alone with their calves, they join the other calved cows. They get about 2kg of concentrates and even some maize silage for energy if it is available,

otherwise 72DMD silage. Post-calving minerals are dusted daily on silage from now on."

What is two-year-old calving worth to you Margaret?

"There is a strong advantage to calving down the heifers at two years of age – if she is capable of producing a weanling for approximately €1,000, it makes great sense to get your hands on this money as quickly as possible, rather than spending money keeping her for another full 12 months and running the risk of her going overfat at calving."

"Looking at my own Teagasc Profit Monitor last year, I achieved a gross margin of €1,056/ha. I had an average of 73 cows and I had 72 sales with an average weight of 625kg LW and a value of €1,647. If I calved my heifers at three years of age instead of two, I would only be able to carry 65 cows, so 64 sales. This would be eight less sales at €1,647 each, or €13,176 in lost output. There would be some saving in meal as fewer animals would be finished. Allowing 8t saving in meal at €230/t would be a saving of €1,840, so the overall effect on my bottom line would be a reduction in profitability of €11,529 by moving from two-year-old calving to three-year-old calving."

Margaret, do you find it difficult to get heifers back in calf?

"Some farmers may question whether my heifers survive in the herd for their second and third calvings. I allow plenty of replacements to allow for losses along the way. So, I aim to fill my weanling heifer shed which takes 15 heifers. This allows me to cull cows that are empty or other problem cows."

"ICBF recently checked my data, looking at heifers calved in 2008, (calendar year). I had 19 heifers calving for the first time. Twelve of these heifers (63%) calved in the herd for a fourth time. Comparing this to national data, only 33% of heifers that calved in 2008 for the first time calved again for the fourth time. It just goes to show that it pays to look after your heifers."

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Vigilance is vital for bulls and cows

AI requires careful observation of cows, particularly for heat detection. If using a stock bull, close inspection is also key to ensure he is getting the job done. **David Kenny**, Teagasc Animal, Grassland & Innovation Programme, Grange, reports

In Ireland, about 20% – one in five – of calves born to beef cows are sired by an AI bull. Where there is a more predictable risk of calving difficulty, increased genetic merit of replacement heifers and higher overall calf value is desired, AI has a significant role to play in suckler cow herds.

If using AI, effective heat detection is critical. Fertility is highest following AI at 12 to 18 hours after heat onset but is not greatly reduced following early insemination. Avoid late insemination, at 24 hours or later, after the onset of standing heat.

There are a number of practical and relatively inexpensive heat detection aids available to farmers, including devices attached to the tailhead of the cow, which change colour following mounting by a herd mate, tailpaint and a vasectomised bull.

Of these, a vasectomised bull, fitted with a chinball halter, is a particularly effective approach to assist farmers in consistently identifying cows or heifers on heat. Herd owners must be aware, however, that such animals carry the same safety risks as any other bull introduced to the herd.

Stock bulls

With four out of five calves born to beef cows sired through natural service stock bulls, their effectiveness is vital. The bull, of course, is usually a highly effective heat-detector but farmers relying on natural service need to avoid becoming complacent in relation to the fertility of stock, even mature animals.

Ongoing vigilance for mating ability

and fertility is a must for all bulls but, in particular, for young bulls who have recently joined the herd.

There is little doubt that there are significant differences in fertility among individual bulls. While the reported incidence of sterility is generally low (less than 4%), subfertility, at a consistent level of 20% to 25%, is more common in breeding bulls.

Subfertility may be caused by low libido (drive), sperm quality/quantity, defects or physical factors affecting bull mobility or mating ability.

While a subfertile bull is capable of getting some cows pregnant, it will result in low pregnancy rates, an extended calving interval, reduced calf weaning weights and higher involuntary culling of cows for barrenness, unless the bull is operating within a herd with a very low cow:bull ratio.

Frequently, subfertile bulls go undetected and the suspicion of subfertility does not become apparent until towards the end of the breeding season or until cows are checked for pregnancy. Furthermore, there is no guarantee that a bull will retain his fertility from season to season or even within a season.

For the production of fertile spermatozoa, the temperature of the testes must be 2-6°C lower than core body temperature (normal rectal temperature ~ 38.5-39.5°C).

Increased testicular temperature, irrespective of the cause, reduces semen quality and is a common cause of infertility in bulls.

The duration of the decrease in semen quality, following a spell of high temperature, is related to its sever-



The aim of one project is to examine the main factors affecting reproductive efficiency of beef cow herds across Ireland



David Kenny at Teagasc Grange says you must never take a bull's fertility for granted.



Selection

Genetic gain for improved cow fertility through traditional selection is often slow due to the typical low heritability of the component traits.

Difficulties achieving accurate measurements, and the fact that some key traits may only be measured in mature females, also reduce the speed of progress. However, the incorporation of genomic information into breeding programmes has the potential to significantly increase the rate of genetic gain in biologically complex

but economically important traits, including fertility. The Beef Genomics Scheme – launched by the Department of Agriculture, Food and Marine in conjunction with ICBF – will put Ireland in prime position to implement a genomic selection programme for beef cattle, which should accelerate the rate of genetic gain for improved reproductive efficiency. Teagasc research has underpinned the initiation and continued development of this technology.



sociation (BCVA) recently introduced a certification protocol for evaluating bulls for breeding purposes, which involves four main steps:

- Physical examination,
- Semen examination,
- Assessment of mating ability (not generally performed) and
- Classification or overall prognosis.

Bulls failing to reach a certain threshold on any of the above will result in the animal being classified as “unsatisfactory”. Bulls passing the physical and semen examination and/or assessment of mating ability examinations are classified as “suitable for breeding.”

While this, or indeed any of the systems used, do not classify a bull as “fertile” or “infertile”, the objective is to reduce the risk of poor fertility performance in stock bulls.

Those classified as “satisfactory” will have reached minimum criteria for semen motility, semen morphology, scrotal circumference and no evidence of physical abnormalities have been found.

Bulls with serious semen or physical defects, or which fail to meet minimum criteria for scrotal circumference are classified as “unsatisfactory” for potential stock bulls.

A number of Irish veterinary practices are BCVA accredited and are offering this bull fertility assessment service to herds.

During the breeding season, it is important to check a bull for locomotion, evidence of injury or arthritic problems, and that he is physically capable of mating cows. The best check of a bull’s fertility is his ability to get cows pregnant. Therefore, it is advisable to record the identity of the first cows bred and to obtain confirmation of a bull’s fertility by ultrasonically scanning these cows for pregnancy 28 to 35 days after breeding.

This is particularly important for young bulls joining the herd. It is impossible to be precise regarding the

exact number of cows to assign to a bull. For yearling bulls, the general recommendation is 20 to 30 cows with up to 50 cows assigned to mature bulls of known high fertility.

Research

Teagasc Grange recently started a large-scale beef cow herd fertility research programme, funded by the Irish Department of Agriculture, Food and the Marine and involving University College Dublin, the Irish Cattle Breeding Federation, The Agri-Food and Biosciences Institute of Northern Ireland and the *Irish Farmers Journal*.

The aim of one project is to examine the main factors affecting reproductive efficiency of beef cow herds across Ireland.

Particular emphasis will be placed on the role of specific minerals, as well as the disease status of cows. This trial will run for over two years with the aim of recruiting at least 200 herds and up to 4,000 cows.

A second large project within this research programme is a large on-farm study to evaluate various oestrous synchronisation protocols with the aim of developing a strategy to enable the use of fixed-time AI, removing the considerable labour and management input associated with achieving high rates of heat detection.

Preliminary data from this project, which has been run across 30 participating herds across Ireland, has shown that pregnancy rates of up to 70% can be achieved following use of heat synchronisation and a single fixed time AI in suckler cows, calved six weeks or more.

As mentioned earlier, there is certainly a role for AI in all herds and, in particular, those wishing to breed their own replacement heifers from within the herd. Heifers should also be inseminated using AI, where possible, to proven easy-calving bulls to minimise calving difficulties.

ity and duration. Sperm production returns to normal within about six weeks of the end of the high temperature incident, but resumption of normal fertility may take somewhat longer.

Because of the serious implications of an infertile or subfertile bull on herd productivity, a bull breeding soundness evaluation (BBSE), or pre-breeding examination has been put forward by a number of groups to help identify such bulls before the onset of the breeding season.

The British Cattle Veterinary As-

Why calving date is so important

Paul Crosson and Mark McGee
Teagasc Animal & Grassland Research and Innovation Centre, Grange

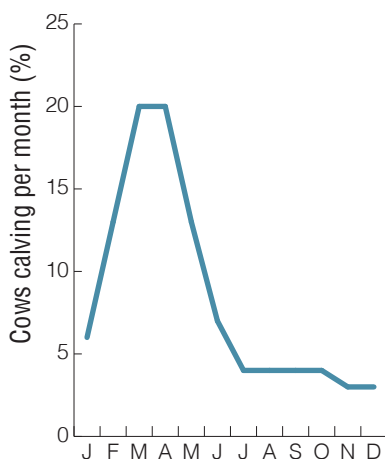
Feed and feed-related costs account for more than three-quarters of the variable costs in suckler beef production systems. Efficiently managed grazed grass is the cheapest feed available for cattle, so maximising its proportion in the annual feed budget is central to profitability. Of course, grass growth is seasonal, so there's always an indoor winter period (of varying length) during which grass silage is provided. Therefore, primary feed costs on most suckler farms relate to grass silage production and feeding. Because grass is so much cheaper than silage, a long grazing season with a corresponding short indoor winter feeding period is preferable. Keeping the winter feed costs as low as possible is also important.

While the length of the housing period is dictated by the weather and soil conditions, grassland management and grazing infrastructure also play a pivotal role. A further management factor that influences the length of the grazing season on many suckler farms is the calving date in the spring. Compact calving before turnout to pasture is an essential component of profitable grass-based suckler systems.

The mean (average) calving date should coincide with the start of the grass growing/grazing season. This means that the cow's rapidly increasing need for feed occurs when the availability of low cost but nutritious grass begins. Where the calving date is delayed until later in the spring (e.g. April and May calving), the opportunity to reduce feed costs via early turnout is lost. Furthermore, late spring calving means that the weight of calves at weaning will be lower at a fixed weaning date, a particular issue in calf-to-weanling systems.

National statistics indicate that, in

Figure 1
Monthly profile of calvings of beef cows in Ireland for 2013



2013, 20% of cows calved in April and a further 20% calved in May and June (Figure 1). This has implications for the cost of carrying the suckler cow on many farms.

Similarly, autumn-calving cows are typically more costly to maintain than spring-calvers. In the case of autumn-calving systems, it is sometimes argued that these costs are offset by higher valued weanlings (sold at a heavier weight and earlier in the weanling sale season). Recent research at Teagasc, Grange, examined the effect of calving date on suckler beef farms on feed costs and profitability.

Feed costs and profitability

To quantify the relative costs and economic returns of alternative calving dates for suckler systems, we compared five alternative spring-calving dates (January to May) and one autumn-calving date (September). We assumed that the grazing season started in early March and housing was in early-November. To examine if the production system had an effect on the optimal calving date, we

analysed both calf-to-weanling and calf-to-beef systems.

In the spring and autumn-calving calf-to-weanling systems, calves were sold on 31 October and 30 June, respectively. The price assumed was €2.37/kg for spring-born weanlings and €2.60/kg for autumn-born weanlings. In the calf-to-beef scenarios, steers and heifers were finished at 24 and 20 months of age, respectively. Base price was set at €3.80/kg carcass with the actual price received depending on carcass grade and the month of sale.

Suckler calf-to-weanling systems

Figure 2 shows that total farm feed costs increased as calving date in spring was delayed. May-calvers incurred 12% higher costs than January calvers. September-calving was the most costly overall, since autumn calvers required higher quality (and more expensive) silage and meal supplementation.

February-calving systems were the most profitable and provided the optimal balance between output (relatively early-born calves resulting in a





“

Because grass is so much cheaper than silage, a long grazing season with a short indoor winter feeding period is preferable. Keeping the winter feed costs as low as possible is also important

– Paul Crosson (pictured left)

Figure 2

Effect of calving date on feed costs (€/cow calving; blue bars) and net margin (€/cow calving; red line) for suckler calf-to-weanling systems

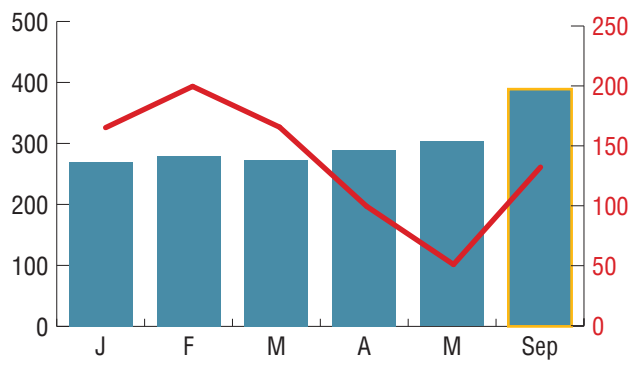
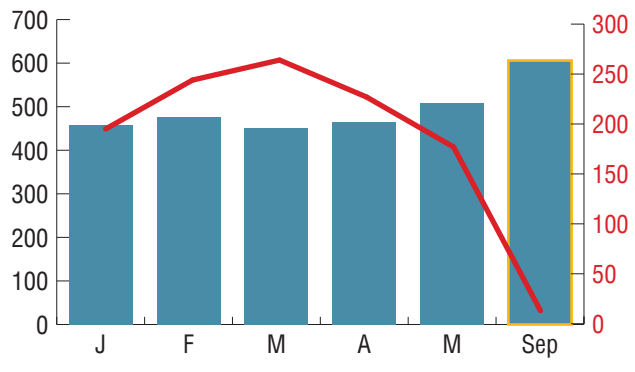


Figure 3

Effect of calving date on feed costs (€/cow calving; blue bars) and net margin (€/cow calving; red line) for suckler calf-to-weanling systems



heavy – 335kg – weanling) and cost efficiency (calving close to turnout date so that a high proportion of the total diet of the cow was grazed grass).

In contrast, May-calving was least profitable since output was low (later-born calf resulting in a younger, lighter – 285kg – weanling) and costs were greater (calving after the start of the grazing season so that a higher proportion of the total diet of the cow was grass silage).

January-calving was less profitable than February- or March-calving since cows were indoor for longer and required higher levels of relatively expensive meal supplementation. September-calving was found to be more profitable than April and May-calving (bearing in mind that the weanling price assumed was greater for September-calving than spring-calving systems) but less profitable than early spring-calving systems.

Suckler calf-to-beef systems

Figure 3 shows that total farm feed costs per cow calving for calf-to-beef systems were much greater than

the corresponding calf-to-weanling scenarios and ranged from €450 in the March-calving systems to €606 in the September-calving systems.

The total costs in this case were 28% greater for September calvers than March calvers. On average, calf-to-beef systems returned somewhat higher margins than calf-to-weanling systems at the prices and levels of performance assumed in this analysis. March-calving systems were most profitable for calf-to-beef systems.

In contrast to the calf-to-weanling system where earlier birth dates resulted in weanlings that were older and heavier at sale, increased output resulting from earlier calving was not captured in calf-to-beef systems since all cattle were slaughtered at the same age (24 months of age for steers and 20 months of age for heifers). Thus, calving at a date closer to turnout was financially optimal. Again, May-calving was the least profitable of the spring-calving systems. September-calving was found to be the least profitable of all systems with net returns only slightly greater than breakeven.

It is clear that the profitability of suckler beef cow production systems is influenced to a large extent by calving date. This is due to the combined effect of the changing feed requirements of the cow and the corresponding availability of low-cost, high-quality feed in the form of grazed grass.

Following calving, the feed requirements of the cow increase considerably and therefore, calving at a date close to the onset of the grazing season is best.

Calving too early (e.g. January) is less profitable as calved cows require higher quality (more expensive) grass silage and/or concentrate supplementation. Autumn-calving systems, in this analysis represented by cows calving in September, was only comparable in profitability with March/April calving systems in calf-to-weanling systems.

A key factor in this regard was the higher price received for older autumn-born weanlings. For calf-to-beef systems, autumn-calving was much less profitable owing to a lack of the same price premium.

sheep

Options for finishing hill lambs

Michael G Diskin, Noel Claffey & Frank Hynes
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The Scottish Blackface breed accounts for approximately 22% of the 2.5 million ewes in Ireland. The majority of these Blackface sheep are maintained on hills or marginal land that is not suited to other sheep breeds or other farm enterprises.

Profits from these hill sheep enterprises depend on prices obtained for lambs sold. A large proportion of these lambs become available for sale annually from August onwards. In recent years, prices for hill lambs and, in particular, light hill lambs have been disappointing. This paper briefly examines different options to improve the marketability and profitability. The main focus of this paper is on pure Scottish Blackface lambs with some minor references to crosses of the breed.

Hill lamb performance

There is much evidence that the performance of pure Scottish Blackface lambs, in terms of liveweight gain, feed intake and feed conversion efficiency, is lower than that of lowland lambs or from hill lamb crossed with lowland breeds.

However, general performance trends are similar with both lowland and hill lambs. Many hill lambs are sold to lowland finishers and reappear in the spring as hoggets.

Performance at grass

Post-weaning performance at grass depends on the quantity and quality of grass available. Results from Teagasc studies suggest that well-grown weaned hill lambs on well managed pasture can achieve approximately 115g/day or 0.8kg/week in early autumn, (August/early September) while in late autumn, (September/

October) this performance drops to 0.4kg/week. Growth rate of lambs on hill pastures will be 50% below these levels.

Furthermore, if the weaned lambs are very light, less than 25kg, at this time of year performance will be depressed further.

Options for dealing with hill lambs

A number of options are discussed in terms of their advantages, disadvantages and expected lamb performance:

Option 1: Sell at weaning

Advantages:

- Extra grass made available for ewe lambs and breeding ewes.
- Savings on flock health costs.
- Improved cashflow.

Disadvantages:

- Poor prices for light lambs.
- Limited markets.
- Lamb potential not exploited by primary producer

Option 2: Graze and sell in late October

Requires excellent quality grass and grassland management

Advantages:

- Heavier lambs.
- Greater sale options.
- Possibly higher prices.

Disadvantages:

- Less grass for ewe lambs and breeding ewes.
- Additional flock health costs.
- Cashflow.

Expected lamb performance:

- August to mid-Sept: 115g/day or 0.8kg/week.
- Mid-Sept to end of October: 60g/day or 0.4kg/week.
- Total liveweight gain: After 12 weeks = 7.2kg.

Option 3: Graze and supplement meal feeding at pasture and sell late October

Requires excellent quality grass and grassland management, plus meal feeding (300g/lamb/day) by trough.



Advantages:

- Heavier lambs.
- Greater sale options.
- Possibly higher prices.

Disadvantages:

- Less grass for ewe lambs and breeding ewes.
- Additional flock health costs.
- Cost of concentrates (€6.30/lamb).
- Cashflow.

Expected lamb performance:

- August to mid-Sept: 155g/day or 1.1kg/week.
 - Mid-Sept to end of October: 100g/day or 0.7kg/week.
 - 6kg to 9kg concentrates required for 1kg liveweight gain.
 - Total gain after 12 weeks = 11kg.
- The direct cost of the meal consumed per lamb will vary from €6.30/lamb (€250/t) to €8.82 (€350/t). The key question is, will the market at the end of October pay for the additional 4kg of liveweight?

Option 4: Finish lambs on all-meal diet after weaning

This requires housing the lambs and finishing them on an all meal diet.

Advantages:

- Extra grass for ewe lambs and breeding ewes.
- Heavier lambs.

Markets

Traditionally, Ireland has been relying on the Mediterranean markets including Portugal, Spain and Italy to take the lambs from the hill flocks. In the past, these markets required carcasses from 10kg and upwards, with preferences for carcasses from 12kg to 15kg. While hill lambs meet these weight requirements, demands from these markets have declined in recent years. There has been a 54% decline in the level of exports to the three Mediterranean countries, and an 87% decline in the combined Portuguese and Spanish markets.



Scottish Blackface lambs in Waterford spend much of their lives on the hill but come down to 'green' land to be fattened.

- French lamb prices.
- Disadvantages:*
- Cost of meal.
- Large quantity of meal required.
- A long finishing period for light lambs .
- Additional flock health costs.
- Facilities.
- Cashflow.

Expected lamb performance:

- Average daily gain: 200g/lamb/day
- Feed conversion efficiency: 6.5kg to 7kg meal – 1kg liveweight gain.
- Market suitability: At least 90% of the lambs should reach French market specification.

The profitability of this depends on the following factors:

- The market price or valuation for lambs at weaning.
- Meal prices: These can be variable depending on location, quantities, ration composition and whether it can be purchased in bulk or bags. A high quality balanced ration suitable for feeding to finishing male lambs must be used.
- Lamb mortality: Ideally, this must be kept below 4%. Starting off with healthy lambs followed with good husbandry is essential.
- Sale price of finished lamb: Starting the intensive feeding of lambs in August or September will result in a high proportion of lambs being

finished in November or December, probably before there is a worthwhile increase in factory lamb prices.

Option 5: Graze for a period followed by finishing on all-meal diet

With this option, the lambs are grazed until late October or even longer when kept at a low stocking rate. During this period, lambs would be expected to gain about 7kg to 10 kg if grazed on good quality grass. At the end of the grazing period, lambs would be housed and finished on an all meal diet. This is, in fact, the system that is followed by many lowland farmers. Store hill lambs are purchased in the autumn and grazed on grass until December.

Advantages:

- Heavier lambs at the start of meal feeding period.
- Reduced meal requirement
- French lamb prices
- Higher prices in January to March.
- Reduced finishing period.

Disadvantages:

- Less grass for ewe lambs and breeding flock.
- Additional flock health costs
- Facilities.
- Cashflow.

» Continued on next page

» From page 25

Expected lamb performance:

- Grazing: 12 weeks grazing = 7.2kg liveweight gain.
- Indoors: Average performance = 200g/day.
- Feed conversion efficiency: 6.5kg to 7kg of meal = 1kg of liveweight gain.
- Market suitability: 90% of the lambs should reach French market specification.

The finishing of lambs is dependent on the action discussed under Option 4. With this option, cheaper liveweight gain is achieved from grazed grass and the quantities of meal required are less. By starting the finishing period later, there is a greater probability of lambs being sold in January.

Performance of hill and crossbred lambs at Athenry 2013-14

The performance of hill and crossbred lambs at Athenry 2013-2014 is summarised in Table 1. Lambs were kept indoors for the duration of the feeding period and fed a ration comprising 70% cereals; 15% protein and a UFL of 1.00. The total lamb mortality was 3%.

The effect of a change in meal price is most significant when feeding lighter lambs and aiming to bring them to "French" weights, reflecting

the fact that they require larger meal inputs. Increasing the factory lamb price has a consistent effect across the different lamb weight ranges. The effect of increased lamb mortality is greatest with heavier lambs reflecting the increased value of a heavier lamb at the start of the feeding period.

Conclusions

A decline in demand for light hill lambs in recent years has led to poor prices being paid for these lambs. However, through careful management, value can be added to these lambs.

Every effort should be made, through planned grassland management to maximise weaning weight. There are then a number of options open to deal with these well-grown weaned hill lambs. They can be sold directly for slaughter for the limited light carcass market. They can be sold as stores for further feeding by the purchaser, or they can be successfully fattened by the producer on a high concentrate diet to achieve the French type carcass of greater than 15kg. The latter requires excellent sheep husbandry to minimise lamb loss and maximise lamb performance. It's vital to be able to obtain a quality ration at a competitive price. The ration must be formulated for intensive feeding of lamb.

Table 1: Performance of hill and crossbred lambs, Athenry 2013-14

	Scottish Blackface		Texel x Scottish Blackface	
	Light	Medium	Light	Medium
Starting weight (kg)	24.8	29.1	24.9	29.9
Days on diet	73	61	65	60
Slaughter weight (kg)	39.0	40.4	41.9	43.1
Total meal intake (kg)	89.4	72.6	82.2	77.6
Daily intake (kg)	1.24	1.19	1.26	1.3
Average daily gain (g/day)	206	197	277	230
Feed conversion efficacy (FCE)				
Liveweight gain (kg)	6.39	6.80	4.61	5.73
Feed conversion efficacy				
Kg meal/carcass gain (kg)	12.01	11.82	12.198	12.084
Carcass weight (kg)	17.10	17.60	17.41	19.26
Carcass conformation				
% 'U'	0%		20%	
% 'R'	80%		80%	
% 'O'	20%		0%	
KO%	43.81	43.63	41.60	44.60
% carcass > 15kg (French)	96		100	

Effect of varying meal prices, factory lamb price and mortality on margin/lamb is presented in Table 2.

Table 2: Effect of varying meal prices, factory lamb price and mortality on margin per lamb

	Lamb starting weight (kg)		
	25	30	35
€20 increase in meal price	€-2.31	€-1.55	€-1.05
20 cent increase in lamb factory price	€3.70	€3.70	€3.70
1 Percentage point increase in lamb mortality	€0.42-0.52	€0.50-0.65	€0.65-0.80



Waterford farmers finishing lambs for niche markets



James Walsh farms in the Comeragh mountains near Lemybrian, Co Waterford. James has 380 purebred Scottish Blackface (Perth strain) ewes and farms a one-eighth share of the 1,600 acres of commonage on the rugged hills, as well as rented and owned 'greenland'.

"The Comeragh mountains are as rugged an environment as any in the country but the Scottish Blackface can do well there," says James who credits local Teagasc adviser Paddy O'Brien with encouraging the hill farmers to fatten their lambs. "Up until about eight years ago, we sold lambs as stores or milk lambs directly off the ewes for wicked bad money. At least now they come to something."

According to Paddy, the secret to boosting the production from the hills was to match the number of ewes to the capacity of the farmer's mountain and greenland assets. "In the past, the hill farmers were only getting about 0.5 lambs per ewe sent to the ram; now they are at about 1.0," says Paddy. "They are producing more lambs with fewer ewes. Management of hoggets is also better and they are more likely to have adequate body condition when they go to the ram."

"There was a belief that Scottish Blackface sheep wouldn't eat concentrates but that's gone. They'd take the hand off you," says Paddy, smiling.

James Walsh's ewes lamb in April. The lambs are weaned in August and will be fattened on lowland paddocks with access to lamb fattener nuts in meal feeders until finished from about the end of October onwards. Hoggets are needed as replacements and James sells some ewe or ram lambs

for breeding. The lambs fattened are nearly all males. "It's important to have the lambs started on creep feeding before they are weaned," says James.

"The lambs will eat about €20 worth of concentrates and my target is to get lambs to 42kg liveweight. Many lambs will end up on Continental tables.

Depending on when it falls, the Islamic festival of Ramadan can provide a useful boost in demand. All lambs will be well gone before the new crop arrives."

James is a member of the Waterford Hill Sheep Group as is his neighbour, Willie Drohan, who has added value to his hill lamb production by developing the Comeragh Mountain Lamb brand. "We sell Scottish Blackface wether lambs who have grazed on the hills and are fattened on lowland until they have reached about 45 kg liveweight," says Willie, who supplies top-end restaurants and artisan food shops in Dublin and Waterford via a specialist distributor.

Killing about 20 lambs a week, for nine months of the year (no lambs are ready in May/June/July), Willie says he would like to increase his output of this premium product. "There's a huge amount of work involved in the marketing etc," points out Willie, who is in regular contact with the world of celebrity chefs.

The Comeraghs constantly challenge sheep to survive and farmers to make a living. Farmers such as James, Willie and others in the area have met the challenge by focusing on quality – be it in breeding stock, targeting niche overseas markets for lamb, or serving customers at home with an elite product, a great story behind it.

– Mark Moore

James Walsh (left) breeder and lamb producer says the Scottish Blackface is perfectly suited to the sometimes harsh conditions on the Comeragh mountains.

RIGHT: Lambs will consume just under €20/head worth of concentrates in the finishing phase, according to James.



Green means beans

Beans are only one of the possibilities when extra greening is needed

Ciaran Collins
B&T adviser
& **Tim O'Donovan**
Teagasc Crops, Environment
and Land Use Programme

In January 2015, the Single Farm Payment will be replaced by two distinct payments: the Basic Payment Scheme (approximately 70% of the total payment) and greening (approximately 30% of the total payment). Both of these schemes are mandatory to ensure full payment. The Department of Agriculture, Food & the Marine (DAFM) will shortly write to all farmers who declared greater than 10ha of arable land on their Single Farm Payment (SFP) form in 2014, informing them of their greening situation.

In November, DAFM will also send the same farmers maps of their farms (as per 2014 SFP) with the relevant Ecological Focus Area (EFA) features outlined. It is important that all farmers examine these documents carefully and consult with their advisers about their own situation. In recognition of the fact that farmers may come under greening rules due to cropping changes, it is important that **all** farmers who intend to grow arable crops in 2015 consult with their local Teagasc adviser to assess their individual situation.

Robert Coughlan is a tillage farmer and agricultural contractor based near Mitchelstown in north Cork. He farms 94ha of land with his son, Robert, of which 64ha is arable. Robert has developed great expertise in growing maize over the years and now maize is the main crop on the farm. Robert had 51ha of maize in 2014, along with 13ha of spring barley with the remainder consisting of 30ha of permanent pasture.

The introduction of the greening payment as part of the new basic payment scheme (BPS) has meant that Robert has had to reassess his options



DAFM estimates that around 10,000 Single Farm Payment applicants will have to comply with the greening rules





Ciaran Collins and Robert Coughlan study a maize crop for silage.

Crop diversification calculation

Your tillage crop area*	(a)	_____ ha
Your temporary grassland area + arable fallow	(b)	_____ ha
Total arable area	(a + b) = (c)	_____ ha
If "C" is 10ha to 30ha	Two crop types needed	
Largest crop area must be less than	(C x .75) =	_____ ha
If "C" is over 30ha	Three crop types needed	
Largest crop area must be less than	(C x .75) =	_____ ha
Total two largest crop areas must be less than	(C x .95) =	_____ ha

EFA calculation

If "C" is over 15ha,	5% EFA needed	_____ ha
Ha EFA you require	(C x .05) =	_____ ha

*All areas are worked on the reference area of the land parcel

for 2015. Robert must comply with the crop diversification and ecological focus areas (EFAs) to make sure that he receives the 30% of his payment that is subject to greening.

Robert would like to maximise his maize acreage as there is an increasing demand from expanding dairy farmers in the area but Robert will be restricted as a result of not being allowed to have more than 75% of his arable land devoted to any one crop. Based on his 2014 SPS application, Robert would be in breach of the greening regulations for 2015 as he had 80% maize, (maximum allow under greening is 75%) and 20% spring barley.

"I'd encourage farmers to examine their applications carefully," says Robert. "One of the parcels on my 2014 application was pre-printed as 'grass year four' on the form but should have been permanent pasture as the parcel did not grow an arable crop in the previous five years."

Winter barley has been a popular choice for many farmers in the area to increase their crop diversification. Most already grow spring barley and are familiar with its agronomy. Autumn sowing helps to ease the workload for the spring and means an earlier start to the harvest. Another reason for the increasing popularity of winter barley is the increasing difficulty farmers are having controlling septoria in wheat and the associated costs and risks.

The spring beans area is also likely to increase substantially in 2015 as a result of the new greening measures. Beans offer many benefits in the new regime:

- They can make up part, or all, of a farmer's EFA requirement.
- They are an additional crop.
- They are eligible for the €250/ha top-up.
- They constitute an excellent break crop.

Although beans can sometimes produce variable yields depending on the season, the area grown in Cork is likely to increase as there are willing buyers for the crop in the area in addi-

tion to the aforementioned benefits.

Although Robert doesn't need an additional break crop, this is the option he thinks he will take as he has grown beans in the past and is comfortable with the agronomy. Growing beans also gives Robert some leeway for the EFAs, especially in the first year and it is the safest option for him. Winter crops don't suit his system as he will generally be busy harvesting maize when they should be sown.

Greening requirements

The rules attached to greening are divided into three areas: crop diversification, EFA and permanent grassland.

Crop diversification

The aim of this measure is to encourage crop diversity. The main elements of the measure are:

- At between 10ha and 30ha of arable land, a farmer is obliged to grow at least two crops, and any one crop cannot exceed 75% of the arable land.
- With over 30ha of arable land, the farmer is obliged to grow at least three crops, of which the main crop shall not cover more than 75% of the arable land. The two main crops together must not cover more than 95% of the arable land. Permanent grassland does not count as a crop for the three crop rules. However, temporary grassland can be counted as a crop and therefore comes into the calculation if greening is required.
- A farmer is exempt from crop diversification if they declare less than 10 hectares of arable land.

Ecological focus areas (EFA)

This measure is to promote certain habitats on farms. EFAs need to be equivalent to at least 5% of the total arable land declared. There are conversion factors assigned to the different qualifying EFAs. The exact rules and definitions governing the qualifying EFA areas are still under discussion between the Department of Agriculture and the EU.

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» Continued on next page



Robert Coughlan Jr, Ciaran Collins and Robert Coughlan Sr discuss the implications of greening.

» From page 29

Areas eligible are: hedges (1m length=10m²), drains (1m length=6m²), fallow (1m²=1m²), cover crops (1m²=0.3m²), protein crops (1m²=0.7m²), buffer strips (1m length=9m²), short rotation coppice (1m²=1m²), SPS eligible forestry (1m²=1m²).

Permanent grassland

There are no restrictions on ploughing permanent grassland, except in areas of natural habitats. Ploughing grassland will be monitored at national level. Essentially, Ireland would have to convert more than 5% of its grassland area into arable crops for individual farmers to be affected and controlled.

Am I exempt from greening?

DAFM estimates that approximately 10,000 Single Farm Payment applicants will have to comply with the greening rules. The remaining 120,000 applicants will be exempt from greening requirements under these following main exemptions:

- Where 75% of the eligible land is in grassland and the tillage area is not greater than 30ha.
- Certified organic farmers.
- Arable area less than 10ha.

Important definitions for calculating your greening requirements

- Grassland: Permanent grassland + temporary grassland.
- Permanent grassland: Grassland and declared as grassland on preceding five or more SFP applications. E.g. arable in 2009, grassland in 2010, 2011, 2012, 2013 and 2014 = permanent pasture in 2015
- Temporary grassland: Grassland and declared as arable on any of the previous five SFP applications. E.g. arable in 2010, grassland in 2011, 2012, 2013 and 2014 = temporary grassland in 2015.
- Tillage: All tillage crops (wheat, barley, rape, beans, beet, potatoes, maize etc, as per SFP).
- Arable: All tillage crops and temporary grassland and fallow (arable).
- Fallow (arable): Must have been in tillage in one of the previous five years and in fallow from 1 January to 30 June of the year of declaration.

Assessing your farm for greening

- Is your farm 100% grassland?
- Is your farm greater than 75% grassland AND less than 30ha tillage?
- Is your entire farm certified organic?
- Do you have less than 10ha arable land?

If you answered **yes** to any of the above, you are exempt from greening.

Your farm: Are you exempt from greening?

Permanent grassland	30 ha	
Temporary grassland	0 ha	Grassland: 31.91%

Arable area used for:

Tillage crops	64 ha
Temporary grassland	0 ha
Forage crops	0 ha
Fallow	0 ha
Total eligible hectares	94 ha

Greening required:

You need at least three crops in your arable area	
The largest crop should not be more than	48 ha
The two largest crops should not be more than	60.8 ha



Two excellent presentations on the Basic Payment Scheme and the Greening rules by Bernie Brennan and Paud Evans, DAFM are available online at: <http://www.teagasc.ie/publications>

Grower-funded break crop research at Oak Park

Dermot Forristal
Teagasc Crops Environment and
Land Use Programme, Oak Park

The 2012 Tillage Sector Development Plan, which was prepared by industry members of the Teagasc tillage commodity group, identified the need to develop break crops to give growers greater crop choices, better rotations, and improved yields of cereal crops. Increased production of break crops, such as oilseed rape and legumes, would also reduce the need to import feed protein.

The plan highlighted both research and market shortcomings, but also recognised the challenges involved in making progress. Within the last year, two Teagasc Oak Park research projects dealing with break crops were initiated. The projects are:

- **CROPQUEST:** A desk-study dealing with break crops and alternative crop options for growers which is funded by the Department of Agriculture, Food and the Marine.
- **Break crop agronomy:** A field-based research project aimed at improving the agronomy of break crops. The project is jointly funded by

Figure 1

Winter wheat (break: +12% yield, +1.1t/ha)

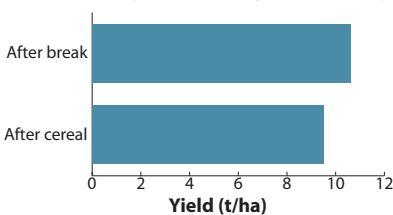
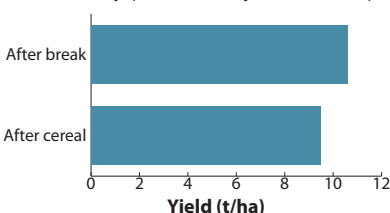


Figure 2

Winter barley (break: +9% yield, +0.7t/ha)



Break crops can result in improved yields in subsequent crops as shown by this analysis of nine years' data from the Knockbeg systems trial.



While soya will continue to be the dominant protein source, native protein production can progress.

Teagasc and growers through the IFA grain levy.

These projects, together with an existing project dealing with crop establishment systems for oilseed rape, show how Teagasc's research programme has changed to address current and future needs.

CROPQUEST

The CROPQUEST desk study combines a review of the benefits of break crops (including economics), with assembly of information on the individual break crops. It will help growers, industry and researchers to identify the most suitable break crops to develop; and it should highlight the key research and development needs for these crops.

A secondary aim of this study, which UCD also contributes to, is the identification of possible high-value crop or crop product market opportunities in the food or non-food areas. The study has quantified the benefits of rotation, which are quite variable, in modern crop production systems, making the economic advantage of rotations similarly volatile. The need for more consistent performance from break crops is clear.

Break crop agronomy

Earlier in 2014, a five-year field research programme on break crop agronomy started. John Carroll and Faisal Zahoor are the contract researchers involved in this work. While this project will include work on oilseed rape and sugar beet, the

primary focus is on protein crops, such as beans. There is an urgent need to address Europe's huge protein deficit and with the new protein support scheme in place for the 2015 cropping year, the initiation of this research is timely.

The 2014 field research programme consisted of trials examining: seed rate; the role (if any) of early nitrogen and disease control on spring beans. There was also a small winter bean variety trial carried out in collaboration with Goldcrop. Bean yields in 2014 were exceptionally good, particularly when you consider the relatively late sowing date of the spring crop.

Experienced bean producers are well aware of the seasonal variation in bean performance, and the current research, which will expand in 2015, aims to identify the key factors which influence this variability. As the rate of genetic improvement in beans and other legumes will determine the future rate of progress in the crop, we have also linked with the University of Reading to develop a bean breeding programme. Future work is likely to include crop establishment systems and disease control.

While soya will continue to be the dominant protein source, native protein production can progress. It requires commitment, however, at national and EU level.

The position of soya in world protein markets follows huge investment in breeding and development of that crop.

Budget analysis

Financial management specialist **Kevin Connolly**, Teagasc Rural Economy & Development Programme, summarises the main measures in Budget 2015

Income tax rates, bands and credits

The top rate of income tax has been reduced from 41% to 40%, while the standard tax rate remains at 20% (Table 1). There was no change in the tax credits for 2015 (Table 2).

Tax credits are applied as a straight deduction from an individual's income tax as calculated by applying the two tax rates and using the bands outlined above.

Age exemption limits

There are income thresholds set for people aged 65 years and above, meaning they can earn income and pay no income tax. These thresholds remain unchanged:

- Single: €18,000
- Married: €36,000

PRSI

Farmers pay the self-employed rate of PRSI known as Class S PRSI. This is applied to all income and there is only one rate so no bands apply.

The Class S rate remains unchanged at 4%. Reckonable income for the purposes of PRSI is profit after capital allowances but before reliefs and deductions

Universal social charge

The new lower exemption threshold above which income becomes liable to the universal social charge (USC) is €12,012 (increased from €10,036). So, where an individual earns below this amount, no USC applies. Where the income exceeds €12,012 in 2015, then the rates listed in Table 3 apply.

The maximum USC rate paid is 3.5%, for individuals who are either above 70 years or who hold a medical card and whose aggregate income (not including Department of Social protection payments) is €60,000, or less.

Self-employed individuals with annual income exceeding €100,000 are subject to a 3% additional surcharge – an effective 11% rate of USC

The USC is payable on gross income after relief for certain trading losses and capital allowances, but before relief for pension contributions.

The marginal rate of tax for employed self-employed individuals (under 70 years) with a maximum income below €70,000 is shown in Table 4.

Income averaging

The averaging period used in the income averaging calculation is to be increased from three to five years.

Election for income averaging on the farming trade income only will also be available to farmers or spouse/civil partner who supplement their farming income with income from an on-farm diversification trade or profession. Previously, farmers or their spouse/civil partner could not avail of averaging if they had income from a trade or profession other than farming. PAYE income earned off the farm does not rule a farmer out from electing for income averaging as has been the case previously.

Land lease income exemption

There have been a number of changes to the exemption of income from the leasing of farm land which will come into effect from 1 January 2015

- Eligible lessor's no longer need to be a minimum of 40 years of age to get the relief.
- A non-connected company will now be regarded as an eligible lessee for this income exemption. Previously, where land was leased to a company the lessor could not get the exemption on the lease income.
- Farm entitlements will continue to be eligible for this exemption, if leased with land.

Value added tax (VAT)

The standard rate of VAT remains at 23%. The 13.5% rate also remains unchanged.

» Continued on page 34




Table 1: Standard income tax rate bands

	At 20% rate		At 40%*
	Existing 2014	Proposed for 2015	
Single/widowed	€32,800	€33,800	Balance
Married one income	€41,800	€42,800	Balance
Married two incomes – max	€65,600	€67,600	Balance
One parent/widowed parent	€36,800	€37,800	Balance

*The 40% rate applies for the 2015 tax year – was 41% for 2014

Table 2: Selected tax credits

	2014	2015
Personal tax credits		
- Single	1,650	1,650
- Married	3,300	3,300
Single person child carer tax credit	1,650	1,650
PAYE credit	1,650	
Home carer tax credit	810	810
Dependent relative tax credit	70	70
Age credit		
- Single	245	245
- Married	490	490

Table 3: Universal social charge income bands

2014 USC		2015 USC	
Income bands	Rates	Income bands	Rates
€0 - €10,036	2%	€0 - €12,012	1.5%
€10,037 - €16,016	4%	€12,013 - €17,576	3.5%
> €16,016	7%	€17,577 - €70,044	7%
		€70,045 - €100,000	8%
		> €100k (self-employed only)	11%

Table 4: Marginal rate of tax for employed and self-employed

	Self-employed	Employed
Income tax	40%	40%
PRSI	4%	4%
Universal social charge	7%	7%
Total	51%	51%

Table 5: Land lease income exemption

2014		2015	
Term of lease	Maximum tax free lease income/year	Term of lease	Maximum tax free lease income/year
5 – 7 years	€12,000	5 – 7 years	€18,000
7 – 10 years	€15,000	7 – 10 years	€22,500
> 10 years	€20,000	10 – 15 years	€30,000
	Not applicable	>15 years	€40,000

Table 6: Stamp duty rates

Non-residential rates		Residential rates	
Consideration	Rate	Consideration	Rate
Entire consideration	2%	Up to €1,000,000	1%
		Over €1,000,000	2%

Table 7: Capital acquisitions tax

Group	2015 threshold
Son/daughter, minor child of deceased child	€225,000
Lineal ancestor/descendent, brother, sister, niece, nephew	€30,150
Any other person	€15,075

Table 8: Selected social welfare rates

	From Jan 2015	2014
State pension (contributory)	€230.30	€230.30
State pension (non-contributory)	€219	€219
Jobseeker's allowance (aged 26 +)	€188	€188
Farm Assist	€188	€188

» From page 32

The 9% reduced rate for tourism related services is to be maintained. The flat-rate farmer rate is to increase from 5% to 5.2% from 1 January 2015.

Stamp duty

Rates remain unchanged as shown in Table 6.

Consanguinity relief for stamp duty

This relief, which gives a 50% deduction on the rate applying to transfers between related persons (i.e. blood relations including lineal descendant, parent, grandparent, step parent, husband or wife, brother or sister of a parent or brother or sister, or lineal descendant of a parent, husband or wife or brother or sister and foster children), on non-residential property.

This relief reduces the rate that applies on transfers of non-residential property from 2% to 1%.

It is to be extended for a further three years until the end of 2017 but the relief will only apply where:

- The transferor is 65 years or under. This upper age limit and any other transferor conditions will be clarified in upcoming drafts of the Finance Bill.
- The transferee must also be an active farmer (see definition below).

This relief was previously abolished in Budget 2011 for transfers of residential property.

Stamp duty on agricultural leases

From 1 January 2015, agricultural leases between five and 35 years in duration and where the land is used by active farmers will be exempt from stamp duty. Previously, stamp duty on leases of agricultural land was levied at the rate of 1% of the annual lease amount charged.

Capital acquisitions tax (CAT)

The rate of CAT is unchanged at 33%. There was also no change made to the CAT thresholds (Table 7, page 33).

Capital acquisitions tax – agricultural relief

Changes are being introduced to target CAT agricultural relief to active farmers. From 1 January 2015, and subject to other conditions, the relief will be available only in respect of agricultural property gifted to or inherited by active farmers and to individuals who are not active farmers but who lease out the property on a long-term basis (a minimum of six years) for agricultural use to such farmers. This “active farmer” qualifying condition will be in addition to the normal farmer test (the 80% asset test) that has applied up to now.



A bonus equivalent to 25% of the Christmas week payment will be paid to social welfare recipients

Definition of an active farmer

Our understanding of the term “active farmer” post-budget is as follows (it may be changed in the Finance Bill*). This definition is based on meeting one of the following criteria:

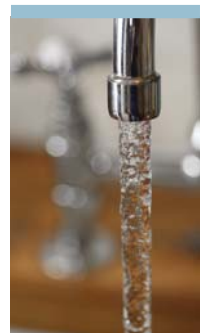
- Holding of a recognised agricultural qualifications (expected to be in line with young farmer stamp duty exemption qualifications or equivalent as certified by Teagasc, **OR**
- Is an individual who spends not less than 50% of that individual’s working time farming,
- For CAT agricultural relief purposes, a person who leases out the land to a farmer on a long-term lease (duration to be confirmed in the Finance Bill – but may be a minimum of six years as there is a minimum six-year holding period for land received by gift-inheritance on which agricultural relief is claimed) may also be deemed to be eligible for the relief.

Capital gains tax (CGT)

The rate of CGT is unchanged at 33%.

Capital gains tax retirement relief

CGT retirement relief on disposals (to a person other than a child of



Water charges

Tax relief at 20% will be provided on water charges, up to a maximum of €500 per annum – equivalent to a relief of €100.

BUDGET 2015: Specific agricultural measures

- Agri-environmental measures: Funding of €150m to fund REPS, AEOS and GLAS.
- Beef Genomics Scheme: Funding of €52m.
- A proposed payment of €100 per animal for the first 10 animals: The remaining animals are eligible for an €80/head payment in participating herds. Subject to approval as part of RDP.
- Beef data programme: Continued for 2015 with a funding allocation of €9m.
- Beef Quality Assurance Scheme: Funding of €6m targeted at assisting farmer participation in the scheme.
- Sheep Technology Adoption Programme – funding of €4m. Sheep Grassland Scheme payment of €15m to be included as part of BPS payments in 2015.
- Farm safety scheme: Funding of €12m. Will open subject to EU approval. Grants at rate of 40% up to a maximum ceiling of €20,000.
- Targeted Agriculture Measures (TAMS): Funding of €34m.
- Grassland

- sheep scheme: Funding of €15m.
- Forestry: Funding of €110m.
- Horticulture sector funding: €4.2m to support capital investment in horticulture provided. Funding of €3m for a Food & Horticulture Promotion Fund.
- CEDRA: Funding of €1m for the support of innovative and small-scale pilot initiatives as part of a Rural Innovation and Development Fund.

Note: The Finance Bill published in late October is the first stage in the implementation of the measures announced in the budget. The bill will be debated and will undergo a series of amendments before being finally signed into law as the Finance Act 2015.

**Minister for Finance
Michael Noonan at
the announcement of
Budget 2015.**



the transferor) of land that has been rented under a conacre arrangement.

Under this provision, land that is let under a conacre arrangement which is either disposed of before 31 December 2016, or is leased out prior to 31 December 2016 for a minimum of five years and which is then subsequently disposed of, where the disposal is to a person other than a child of the transferor, will, subject to meeting the other qualifying conditions of the relief, qualify for CGT retirement relief.

Previously land rented out under conacre arrangements did not qualify for retirement relief where the land was disposed of to someone other than a child. Where the disposal was to a child, land let under conacre arrangements for a total period of less than 15 years could qualify for the relief provided the 55 year minimum age condition and the 10-year usage rule were met.

CGT retirement relief on disposals to all categories of previously leased land

The maximum period that land could be leased out and still qualify for CGT retirement relief is being increased from 15 years to 25 years. Previously,

where land was leased out for up to a maximum of 15 years then retirement relief could still be availed of provided the other main conditions of the relief were complied with.

CGT farm restructuring relief

To enable farm restructuring, relief from CGT has been available (subject to conditions) where land disposed of by either sale or exchange has been reinvested into other land. This relief has been available for the period from 1 January 2013 to 31 December 2015.

The deadline for the completion of the first restructuring transaction is being extended to 31 December 2016. Both restructuring transactions must still be completed within a 24-month period. Also, a disposal of a complete farm and its replacement with other land will now qualify subject to meeting the current restructuring criteria in relation to a reduction in the fragmentation of the farm and an improvement in the operation and viability of the consolidated farm.

CGT relief – newly purchased property

This relief was introduced in Budget 2012 and catered for properties

bought between 6 December 2011 and 31 December 2014. Under the conditions of this relief, where a property is purchased and held for more than seven years then any capital gain that accrues in that seven-year period will not be subject to CGT on its disposal.

Social welfare changes

Child benefit rates increase from €130 in 2014 to €135 per child per month in 2015. These new rates come into effect from 1 January 2015. There is a stated intention to increase child benefit by a further €5 in January 2016 "if circumstances allow".

Farm Assist

The payment rate for Farm Assist will remain unchanged as per Table 8.

Selected social welfare rates

There were no changes to any of the social insurance and social assistance payments including those listed in Table 8. A Christmas bonus equivalent to 25% of the holiday week payment will be paid to social welfare recipients.

*All information is correct as going to press. Minor changes may be made in the Finance Bill.

Countdown to planting

Noel Kennedy
Teagasc Forestry Development
Department, Crops Environment
& Land Use Programme

Another planting season is fast approaching and it is time to examine how new forests are established. Achieving a high standard at planting stage is the perfect start for small trees and a major step to growing a healthy and productive forest enterprise.

Operational planning

Planting grant approval from Forest Service and the DAFM encompasses all the operational activities for planting a new forest. All planting operations, which adhere to Forest Service standards, are drawn up by a registered forester engaged by the owner, and approved by the Forest Service in accordance with grant scheme guidelines. Any deviations from the proposed operations must be agreed in advance with Forest Service.

The main planting operations are:

- Ground preparation.
- Fencing.
- Planting.
- Fertilizer application.

Ground preparation

Ground preparation and drainage are vital for successful forest establishment. Their main function is to provide an ideal planting environment and encourage strong tree growth.

Soil type is the most important factor when deciding the method of ground preparation.

An inappropriate choice of ground preparation and unnecessary drainage can have cost implications at planting and reduce the efficiency of future harvesting operations. The most common ground preparation options are:

Mechanical mounding

Particularly effective on poorly draining heavy mineral and peat sites, mechanical mounding is the most popular form of ground preparation. It involves an excavator digging drains at regular intervals and heaping the soil in mounds. The trees are

Table 1: Tree spacing and stocking – afforestation grant (since Jan 2011)

Species	Trees required /hectare	Plant spacing (metres)
Lodgepole pine (pure)	3,100	1.8 x 1.8
All other conifers	2,500	2.0 x 2.0
Alder	2,500	2.0 x 2.0
Sycamore, other broadleaves	3,300	2.0 x 1.5
Oak, beech pure	3,300	2.0 x 1.5
Oak, beech with nurse mix	3,300	2.0 x 1.5

then planted into the mounds, which provides an elevated and vegetation free planting zone.

Ripping

Ripping is primarily used on more fertile mineral soils sites where drainage is impeded by a compacted layer such as an iron pan or cultivation pan, beneath the surface. A bull-dozer or large tractor pulls a tine behind it to a depth of 45cm, shattering the pan layer. The trees are planted approximately 10cm from the centre of the rip channel.

Planting machine

Only suitable for good soils that do not need cultivation and/or drainage. The trees are mechanically planted into a trench opened by a tractor mounted plough.

Tree spacing

Each tree species must be planted at a prescribed spacing/stocking density per hectare. The layout and spacing of ground preparation is controlled by the required stocking density (Table 1).

Vegetation clearance

On some sites, woody vegetation/light scrub may need to be cleared as part of ground preparation. In some cases, scrub may be retained for environmental protection. All hedges are retained for biodiversity and habitat potential.

REMEMBER

When a new plantation is being planned, it is important that consideration is given to how the site will be harvested in the years to come. The choice of ground preparation and location of drains and other site infrastructure can have a major impact on future harvesting operations. At plantation design stage and without compromising early plantation development, where possible, the general site layout and development should encourage plantation establishment and also facilitate and optimise the effectiveness of future harvesting operations.



The main planting operations are ground preparation, fencing, planting and fertilizer application

 **Forestry Programme**

The Draft Forestry Programme 2014-2020,

which was recently published by DAFM, includes a range of planting schemes supported by attractive grants and annual premia. Proposed schemes include Afforestation, Native Woodland Establishment Scheme, Forestry for Fibre, Agroforestry and NeighbourWood. The programme is expected to be operational by the start of 2015. For more information on the Draft Programme 2014-2020, please see: http://www.teagasc.ie/forestry/media/hayes_draft_forestryprogramme_2014.asp



MAIN PICTURE: Mechanical mounding is particularly effective on poorly draining heavy mineral and peat sites.

LEFT: Careful planting provides the best conditions for successful establishment.

Fire protection

Fire can cause serious damage to young forests, especially in areas adjoining bog. Firebreaks are constructed along vulnerable boundaries to reduce this risk. This involves the removal of all vegetation along a corridor at least 6m wide. To remain effective, they should be well maintained and checked at least once a year.

Fencing

All grant-aided plantations must be stockproof and the erection of a stock proof fence may be required. The type of fence must reflect the risk from neighbouring livestock and other animals, such as stock fence, sheep-proof fence and rabbit fence.

All fencing materials, including posts and wire, must meet standards required by the Forest Service. Where there is a serious risk of deer damage to broadleaf trees, additional funding may be available for the erection of a deer proof fence.

Planting

Plant quality

Trees should only be bought from a recognised forest nursery and should be ordered, where possible, well in advance of planting. The trees should have a strong fibrous root and a straight stem and meet the size specifications as described in the afforestation grant approval.

Plant handling

Good plant handling is as important as plant quality. The bags of trees should be handled carefully and, ideally, the trees should be planted immediately. If stored, the bags should be kept upright in a shaded place, or shed, and planted as soon as possible.

Planting technique

Trees must be planted with care to provide the best conditions for successful establishment. The most common planting technique for conifers is slit planting with broadleaves planted using the angle notch method. On well drained mineral sites or environmentally-sensitive sites, trees are commonly pit planted.

The principles of good planting are:

- Ensure the tree is planted upright.
- Plant tree to correct depth (root collar).
- Carefully place roots into the soil by hand.
- Cover roots with soil and firm well.

Planting machine

This system may be used for the mechanical planting of both conifers and broadleaves and generally results in high survival rates and good subsequent growth.

Planting season

The planting season normally runs from November to May when trees are dormant and can be safely planted as barerooted trees. The planting season

can be extended, with caution, by using plants from cold storage.

Fertilizer application

On some new planting sites, an application of fertilizer is necessary to support early tree growth.

Phosphorus is the most commonly applied fertilizer on newly planted trees, usually in the form of ground rock phosphate. Fertilizer must be applied between April and August. This is to maximise fertilizer uptake and minimise the risk of environmental damage.

Get involved

Most farmers contract out the planting works to registered foresters and companies but, remember, it is your forest that is being planted and it is in your interest to know what's going on. So, go walkabout and ask plenty of questions – it is your forest, your grant, your prerogative and most important a part of your farming future.

Getting it right

Good quality site preparation and planting are exactly what small trees need. However, effective maintenance over the next four years is the next key stage to a bright future for young plantations on the road to becoming a productive and valuable timber crop.

For further information and downloads on a range of forest establishment and management topics, please see www.teagasc.ie/forestry

Learning at your own pace

Colm Doran,
Innovation Support Walsh Fellow,
Teagasc College at the National
Botanic Gardens

Teagasc's first major leap into internet-linked education happened in 2005 with the establishment of the Teagasc eCollege. As a result, students could undertake a 'distance learning' option to obtain an agricultural qualification.

In 2008, Teagasc adopted Moodle, an open source learning platform, for the eCollege as its web-based learning platform. Since then, Moodle has been used as an aid to deliver the distance learning Certificate in Agriculture awards and has also been rolled out to the agricultural and horticultural colleges to assist in the delivery of their courses.

My own work in the Botanic Gardens as an Innovation Support Walsh Fellow involves looking into how Moodle can be used as a resource to provide distance training models in horticulture. PhD student Donna Deegan, based in Teagasc Kildalton College, is carrying out similar research in agriculture.

Through technology and distance learning, students can choose to learn at a self-directed pace, in their own time, and in any location with internet access. The current generation approaching higher education has grown up using computers from a young age, so there should be no problems in adapting to online learning for students in the future.

For teaching institutions, the creation of digital materials for learning can greatly free up educators' time. It also allows for simple comparison and collaboration on teaching materials and methods with members of other institutes.

Personally, I have been looking into a distance training option for a pesticide application module. The relevance of such research is especially important with the Sustainable Use of Pesticides Directive to be implemented in November 2015, requiring all professional users of pesticides to have a minimum training requirement. This will include tillage farmers, agricultural contractors, professional landscapers, fruit and vegetable growers and any



Colm Doran aims to develop a distance learning module in pesticide application.



Moodle can be used as a resource to provide distance training models in horticulture

person who uses pesticides in their day-to-day work environment. With an estimated 30,000 pesticide users in the country, this represents a huge challenge in getting such a number trained and certified.

It is hoped that my study will look at options that can be taken to provide a distance or blended learning option for this course, while also applying lessons from this case study across horticultural education and, indeed, agricultural education.

Technology can provide wonderful opportunities to break down some of the barriers that exist in agricultural and horticultural education. Research has consistently shown that using technology to teach students matches, and can outweigh, traditional education.

Practical skills

Through Donna's research, the potential for the use of technology in practical skills teaching was shown through the use of recorded demonstrations. So, why not apply similar methods to teach skills such as plant identification, plant propagation or pesticide application?

Moodle is a great medium for communication and sharing materials that is freely available and ready to use all across Teagasc. The hardware and software required to incorporate technology into education doesn't come at high costs these days and you don't have to be a rocket scientist to use them.

Without doubt, with the right vision and the right strategy, technology and education in Teagasc can be a great combination.



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*Mannheimia haemolytica
#GfK sales data September 2014
§ All Ireland Animal Disease Surveillance Report 2012

