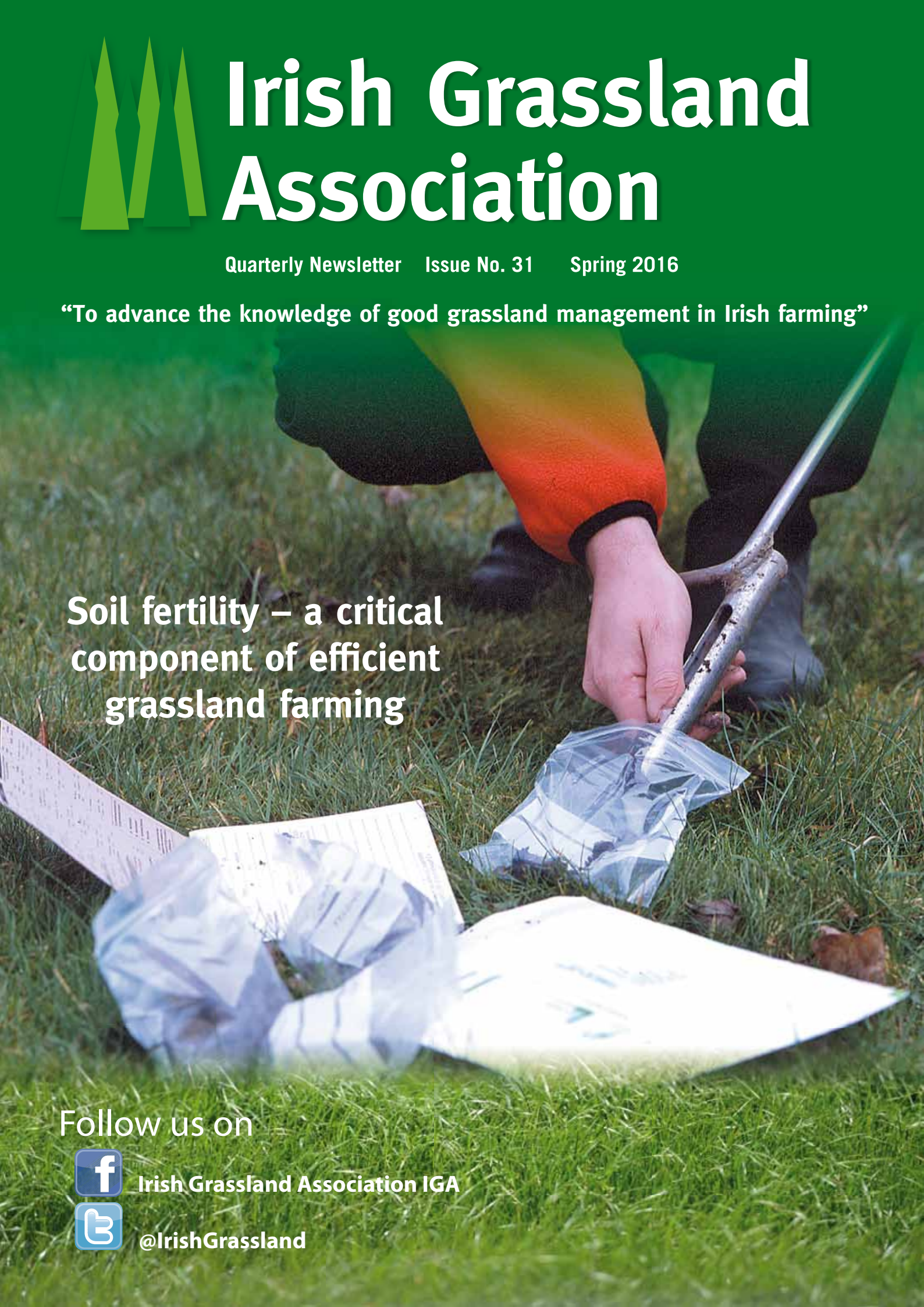
Irish Grassland Association

Quarterly Newsletter Issue No. 31 Spring 2016

"To advance the knowledge of good grassland management in Irish farming"



Soil fertility – a critical component of efficient grassland farming

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Contents

Irish Grassland Association President's Address

Dear Member,

Let me give you a quick taster of the latest edition of the Irish Grassland Association's Quarterly Newsletter. It is another full edition.

For starters we have a preview of our upcoming events. Our sheep conference takes place on Tuesday 26 April in Aughrim, Wicklow followed by a farm walk at John Pringle's (page 10). Our beef conference takes place on the following day, Wednesday 27 April in Limerick (page 9).

Both events are returning to the cornerstones of grassland farming; grass, breeding and money. Key industry stakeholders including The Irish Farmers' Journal, Teagasc and UCD will contribute to the events, along with contributions from farmers on their experience of using the latest technologies. There will be an international flare to both events with Welsh sheep farmer Neil Perkins addressing the sheep conference and another Welsh farmer, award winning Glasnant Morgan speaking at the beef conference.

Taking a look back at our most recent event we have a report on our dairy conference (page 6). The dairy conference was held on Tuesday 7 January in Limerick and was kindly sponsored by Yara. A capacity crowd was in attendance to hear the latest strategies to overcome price volatility. Key speakers at the event included leading dairy farmers and members of the dairy industry working in the areas of research, consultancy and agribusiness.

We have a jam-packed section on grass in this edition. Starting with soil fertility David Wall asks if soil fertility on your farm is hindering your grassland production targets (page 19). Jan Jensma asks if we can afford to take a P and K holiday in 2016 (page 22).

With the grazing season finally getting going after persistent inclement weather Darren Carty aims to get to grips with the grazing lingo for the season ahead (page 12). For those looking at reseeding this year David Cummins gives an overview of the recommended grass and clover varieties for 2016 (page 14). This is the second year that the DAFM Recommended List for Grass and White Clover includes the Teagasc Pasture Profit Index (PPI). Moorepark researchers give an overview of the PPI and how to use it to identify the most appropriate varieties for your farm (page 18).

Pat Donnellan and Tommy Moyles catch up with Denis O'Donovan in West Cork for a farmer focus article. His aim is to maximise profit on his 40 ha farm and when asked his thoughts on crossbreeding his response was "the bank doesn't care what colour cow I have, not one bit". Read more on his opinions on important issues facing his family farm (page 24). We have two new farmers to follow in 2016 in our "Year in our Wellies" series of article. Bryan Hynes gives us an update on his dairy farm and how the grazing plan is going this spring in spite of the variable weather conditions (page 26). Jonathan Hynes gives us a taste of his busy spring juggling lambing with studies at UCD (page 27)!

In our opinion section Robin Talbot gives his opinion on the beef industry in Ireland. He believes that given a level playing field efficient beef farmers in Ireland can compete with anybody (page 28).

In our technical focus section Moorepark researchers explain why compact calving is so important and how it can be achieved (page 30). We continue our health and safety series and Dr. Aoife Osborne outlines tips for a safer calving season (page 33).

I hope you enjoy this edition of our newsletter and I hope to see you soon at one of our upcoming events! Check out dates for your diary (page 35)!

Yours Sincerely,

Karen Dukelow

Karen Dukelow
Irish Grassland Association President 2015/'16

2016 IGA Dairy Conference Review – 'The Ability to Overcome Volatility'

Rosalyn Drew,
Drummonds Seeds
and IGA
Council Member

The annual IGA Dairy Conference took place on Thursday 7th January in the Radisson Blu Hotel, Limerick and was kindly sponsored by Yara. This years' conference theme focussed on strategies to overcome volatility. Key speakers at the event included leading dairy farmers and members of the dairy industry working in the areas of research, consultancy and agribusiness.

On the morning of the conference, a breakfast meeting took place with guest speaker Dr. Edmond Harty who addressed the topic 'The importance of innovative ability in times of volatility'. Dr. Harty is CEO of Dairymaster, one of the leading dairy innovation and technology companies in the world. The key message from Dr. Harty's presentation was that in order for a business to remain innovative in their product range they must constantly identify and stay in touch with what their customer needs. Using examples from Dairymaster's range of award winning products, Dr. Harty spoke about the increasing importance of technology in todays' world and the opportunities this creates in providing solutions to customer problems.

The main conference was divided into four sessions. The first session addressed grassland management, the second session discussed dry and early lactation nutritional management of cows in grass based dairy production systems. The third session had industry speakers consider various strategies in managing volatility. The final session discussed herd health risks when expanding and William Kingston gave a review of how his farm has progressed in 13 years and his plans for the future.

Dr. Michael O'Donovan from Teagasc Moorepark gave the first presentation of the conference. Michael discussed the importance of improving the focus on spring grass and the latest recommendations and guidelines for maximising the use of grass as supported by data from PastureBase Ireland participants. Speaking on the variation in grass DM production on Irish farms, Michael reported that high grass DM production can be achieved on dairy farms with good grazing and soil fertility management irrespective of location. It is the 'man in front of the cows that dictates grass performance'. Farms recording farm cover on PastureBase Ireland have grown between 12-15 t DM/ha/yr over the past three years. Michael then highlighted the following as factors influencing spring grass supply which are controlled by the farmer: Autumn closing date, closing cover, spring nitrogen application and spring grazing management. Winter grass growth and spring grass growth are also factors that the farmer can influence to a lesser degree. Michael found that farms finishing their first rotation before April 10th grew 20% more grass in spring 2015 compared to farms who finished the first rotation after this date. He believes that targets within the spring rotation planner need to be adhered to in order to utilise spring grass and ensure a high April growth.

Shane Crean, a Kerry man farming in Cork presented his experience of transition to a grass-based system of milk production and his plans for the grazing season ahead. Shane outlined his journey in arriving to his current farm in Cork, explaining how his experience as a Stephen Cullinane scholar in New Zealand showed him how he could have a low input, grass-based system that would also work in Doneraile. Shane set about addressing the areas of breeding policy, soil fertility and reseeding and grassland management. In looking to the future, Shane says the two biggest components that make his business successful and profitable are to utilise more grass per hectare by aiming to grow 18,500 kg DM/ha and increase his six week calving rate to over 85%. He will also be keeping a close eye on production costs while keeping a good work/life balance.

The second session saw Dr. Mary Herlihy of Teagasc Moorepark present her findings to date from her on-farm study of cows after calving. Mary's paper discussed the trends in body condition score and its impact on reproductive performance.

Reproductive performance has long been recognised as a major contributor to the overall profitability of any dairy system. Cows with a low body condition score at calving or between calving and breeding are more likely to have reduced submission and conception rates and this will have a negative impact on compact calving patterns. Marys' key messages for a successful breeding season in 2016 are as follows

- Maintain accurate records of calving difficulty, retained foetal membranes, endometritis, displaced abomasum and metabolic disorders early postpartum.
- Body Condition Score and nutritional management are critical.
- It is essential to identify and treat cows with uterine infection before planned start of mating.
- Complete pre-breeding oestrous detection to facilitate early identification of non-cycling cows.
- 10 days before mating starts, treat non-cycling cows calved over 30 days with a progesterone based timed AI protocol.

Dr. Finbar Mulligan of UCD presented his paper with the latest research and guidelines for the management and nutrition of the dry and transition cow in grass based systems. In complement to Dr. Herlihy's presentation, Finbar reiterated the most important aspect of dry cow nutrition is to ensure an appropriate body condition score (3.0 to 3.25) at calving. He also emphasised the importance of grass-silage analysis to ensure the appropriate energy, protein, mineral and trace element allowances can be provided.

The third session of the day saw an interesting line up of speakers from industry who presented their thoughts on market outlook and suitable business strategies that dairy farmers could adapt to remain financially viable in times of low milk prices. Noel Gowan of Grasstec identified the main drivers of profit as cost of production and grass utilisation. Using ideas from a UK discussion group, Noel illustrated various useful cost cutting measures that this group had decided to apply in the coming year to try reduce costs by 15%. He then explained the importance of grass utilisation as an indicator of profit on dairy farms. For every one tonne increase in DM utilised per ha, profit will increase by approximately Ð267/ha. Using a grass utilisation calculation, it shows that those farmers with relatively high stocking rates and high output/ha from low concentrate inputs are those who are driving high profits from their systems.

Tadhg Buckley of AIB then showed that since 2007 milk price volatility over any three month period has increased by 300%. While volatility is a relatively new phenomenon for Irish dairy farmers, it is set to be a fact of life in the future. Tadhg said that those farmers with strong financial awareness who have simple and stable farm systems are able to manage volatility better. He said that these farmers also have certain traits such as a strong information and feedback network in the form of discussion groups or otherwise, they have excellent people management skills which helps in dealing with banks etc and also hold the ability to make timely decisions.

FDC's Dave Sheane stressed that farmer attitude and outlook is critical in addressing volatility. Dave recommended that farmers develop a proactive approach based on a medium-term outlook, incorporating a five year rolling business plan, periodic market assessment, financial management and cashflow projections.

The final session was opened by Dr. Riona Sayers who presented twelve steps to minimising the herd health risk in an expanding dairy herd. Riona emphasised the importance of having an effective biosecurity plan in place that should include such measures as good purchasing strategy, quarantine procedures, good hygiene, stock proof fencing and vaccination protocols. She then highlighted the following strategies to prevent disease introduction.

- Establish disease status before introducing cattle.
- Buy all cattle from a single source if possible.
- Get test results, health history, vaccination status from the seller.
- Quarantine all newly purchased stock for at least 30 days.
- Clean and disinfect housing for new purchases.
- Vaccinate all new purchases over 6 months of age for leptospirosis and salmonellosis.
- Test bulls for BVD and IBR before purchase or while in quarantine.
- Test all purchased females for BVD and IBR antibody.
- Dose all purchased animals for parasites such as lungworm, gut-worm and liver fluke.
- Footbath all new cattle on arrival.
- Discuss an on-going testing strategy for infectious diseases with your vet.
- Continue to implement a vaccination strategy suitable for your farm.

The final speaker for the day was Cork dairy farmer William Kingston who is a past president of the IGA and hosted the IGA Dairy summer tour back in 2002. William reviewed the progress made on his farm since that time. Today the business is much bigger, he is still farming 120ha but now owns 80% of it, all the beef is gone and heifer rearing is contracted out. Over 360 cows (mostly Jersey crossbred) will calve down in spring 2016, while in 2002 he was milking 165 Holstein Friesian. His milk fat and protein have lifted from 3.62% and 3.33% respectively up to 4.65% and 3.9%. The lift in milk quality was worth about 7 c/litre. This highlights the value in breeding for composition, better fertility and good grassland management. William's key message to dairy farmers was to keep focused and stick to what you know – 'if you are in dairying stay at dairying – leave other farmers to look after beef'. He also advised young farmers to be patient particularly with challenges that farming brings. Write your plans down as when it is on paper you are more likely to stick to it better. He believes that if you hold tough, farm as well as you can on your own farm and the opportunities will come your way.

Award winning Welsh farmer featured at the 2016 IGA Beef Conference

Tommy Moyles
Beef Farmer and
(IGA Council Member)

The IGA are delighted to announce that award winning Welsh farmer Glasnant Morgan will be giving a keynote address at the 2016 beef conference in the Radisson Blu Hotel and Spa, Limerick on Wednesday April 27th. Farming 450 acres, Glasnant runs a herd of 50 autumn-calving sucklers and a flock of 850 ewes. Grazed grass is integral to the farming system. Glasnant farms to get the most from pasture to maximise self-sufficiency. In the spring 10% of the farm has grass seed stitched in with a grass harrow and hopper. According to Glasnant, "Our sole aim is to produce offspring so we graze the grass hard, that's the only way to keep on top of it." Glasnant is a mentor in the Welsh Government's Young Entrants Support Scheme, and was the National Farmers Union Wales Brecon County Chairmen for two years.

Continuing the theme of grassland management, the IGA beef conference will also feature Michael O'Leary and Michael O'Donovan (Teagasc, Moorepark) who will present the most recent findings from PastureBase Ireland. PastureBase is entering its third year and this paper will look at grass production on drystock farms in 2014 and 2015. The variation in annual DM production and seasonal DM production, especially during the critical spring period, will be presented. PastureBase is showing that very little grazing is occurring on beef farms in this spring period imposing higher feeding and slurry management costs. The first rotation on the majority of farms begins in late spring and as a consequence do not finish until May. Given that this is a critical time for setting up pastures for subsequent grazing rotations, poor spring utilisation has a detrimental effect on pasture quality later in the season. Are there opportunities to turn light stock out early? The number of grazing from each paddock and grass management targets for different times of the year will also be covered.

Given that the attention of farmers with spring-calving herds will be turning to the breeding season at the end of April, the beef conference will also feature the latest results from the large-scale DAFM-funded all-Ireland beef cow fertility research programme. An overview of the most recent findings will be presented by Mervyn Parr (Teagasc, Grange). This project is examining a range of factors affecting the fertility of beef cows and includes two large on-farm trials. The objective of the first trial is to develop a heat synchronisation protocol for beef cows to facilitate cost- and labour-effective use of AI and remove the need for heat detection. This has a very large potential to increase the use of AI on suckler herds and to reduce calving intervals thus, improving the compactness of calving on many herds. This trial is already showing very promising results which could have significant implications for the suckler sector. The second on-farm trial is examining the effect of infectious diseases and trace elements on suckler cow fertility. There is a widespread perception that these factors are having an important detrimental effect on cow fertility and so the results of this trial are of great interest. These studies represent the most comprehensive analysis of factors affecting suckler cow fertility and the results will have significant implications for management and policy decisions.

The IGA beef conference will also include a focus session on financial management. Cash flow is a major challenge on beef farms given the intermittent nature of cattle sales. Peter Young of the Irish farmers Journal will give a presentation on his initiative, Operation Cashflow. This is a program that follows six farmers who have committed to prepare a cashflow plan for 2016 and to share this information with other farmers. There are two dry stock farmers among the six participants farmers. The first farmer is a mixed sheep and beef farmer. He has 25 suckler cows and 150 ewes on 100 acres. His goals for the year are to remain full-time and ensure that the farm makes Ð20,000 to contribute to the household. The second farmer is a drystock farmer who rears calves to two-year-old stores and also buys weanling heifers to beef. He owns 120 acres and rents 50 acres. His goal is to improve his planning and finances. He wants to have a set plan for the farm and stick to it. The importance of cash flow management and the steps to developing your own cash flow statement will be outlined.

The 2016 Irish Grassland Association Beef conference will take place in the Radisson Blu Hotel and Spa, Limerick on Wednesday April 27th. The conference opens at 11.00am following registration from 10.30am, and IGA President, Karen Dukelow will close the conference at 4.00pm. The conference fee is €30 for IGA members (€60 for non-members) and includes attendance at the conference, tea/coffee on arrival and a hot lunch.

Sheep Conference Preview

Brian Nicholson
Sheep Farmer and
IGA Council Member

Utilising new technology and efficiency gains to drive flock productivity

This year's Irish Grassland Association Sheep Conference and Farm Walk heads to Wicklow. The event, taking place on Tuesday 26th April 2016. The conference opens at 11am following registration at 10.30am and includes a morning conference in Lawless' Hotel, Aughrim, Co Wicklow followed by an exciting afternoon farm walk with local farmer John Pringle.

John, his wife Linda, daughter Lucy (10) and twin sons Scott and William (5) farm a mixed sheep and suckler-to-beef enterprises on land described as relatively dry but vulnerable to late growth, rising to about 650 m above sea level at the highest points. The sheep enterprise includes a 255 mid-season lambing ewe flock along with 70 lambing yearling hoggets which begin to lamb after the first cycle of mature ewes at the end of March/start of April.

A main focal point of the farm walk surrounds setting up and managing the farm through the critical May and June period for grassland management. Huge gains have been made in this area in recent years with the farm focusing on improving performance and kilos of output from grazed grass. Many fields on the farm are large and in the past limited the opportunity to operate a rotational grazing system. In recent years large fields have been subdivided, both in a semi-permanent and temporary (four strands of electrified polywire) manner allowing a rotational and mixed grazing system to be operated.

Ewes are split into two groups of about 120 to 125 ewes and their lambs with each group run with a batch of 25 spring calving suckler cows and their calves. Yearling hoggets and their lambs are run with heifers which are finished at about 22 months of age. Male progeny are finished in an under 16 month bull beef system and therefore do not return to grass. Each group now has access to about seven paddocks and while John says a slow spring may still leave grass tight, especially when 50 acres are closed for first-cut silage, grass quality is easier to manage.

There are other factors contributing to the improvement in grassland productivity. There is a focus on feeding the soil with compound fertilisers used as the season progresses and low fertility/pH soils targeted for special attention and lime application. John says he finds spreading farm yard manure on higher more exposed fields is also delivering massively in boosting summer growth. A reseeding programme is in place and along with his local discussion group John is planning to experiment with some alternative forage crops such as plantain and chicory in 2016. Additionally, he is also hoping to work with his Teagasc B&T adviser Bob Sheriff and begin measuring and monitoring grassland performance on Teagasc's PastureBase Ireland.

Much more to see

There is much more to see in addition to grassland management. A new breeding policy incorporating Belclare and

New Zealand/Irish Suffolk genetics into the foundation ewe flock (mixture of Texel, Suffolk, Border and Blue Leicester) is contributing, along with better grassland management and addressing mineral issues, to an increase in flock output with this year's ewes scanning 1.91 lambs per ewe to the ram and a litter size of 1.98 for those in-lamb. Performance in the ewe lamb flock is also impressive with a litter size of 1.04 lambs after a three-week breeding season. The breeding policy will be discussed in detail on the day as will plans to introduce flock electronic tagging and flock performance recording.

Stimulating conference line-up

As mentioned above the conference takes place at 11am in Lawless' Hotel following registration at 10.30am. There are three excellent topics confirmed as outlined below.

Grass utilisation and the latest research from PastureBase Ireland: Teagasc have a number of new initiatives aimed at increasing productivity from grazed grass. This session will give an explanation of the new PastureBase Ireland recording system and give a flavour of the Teagasc grassland programme including a look into what grasses and clover varieties are performing for sheep farmers.

Mixed species grazing trials in UCD: The results stemming from Year 1 of the mixed species grazing trials in Lyons Research Farm look very positive. Tommy Boland will give an overview of performance to date and plans for the trial in year two and beyond.

Running 2,400 ewes, what works best for me!: Welsh sheep farmer and Nuffield Scholar Neil Perkins explains grassland management on his farm, the swards that are working best for him and the benefits possible from using EID tagging and performance recording.

Getting to grips with grazing lingo

Darren Carty,
Irish Farmers Journal
and IGA
Council Member

SECTION 2
GRASS FOCUS

Grassland management is an integral component of efficient livestock systems. Despite this, the number of farmers measuring and budgeting grass remains low across all livestock enterprises with dairy farmers most active, followed by beef and lastly sheep farmers.

As an industry, we often take it for granted or presume all farmers are up to speed with the meaning of commonly used grassland phrases. With the grazing season finally slowly getting going after persistent inclement weather, this article aims to go back to basics and give producers a refresher course on grassland terminology.

Grass dry matter: Grass dry matter or what is regularly shortened as DM is the content of grass excluding water. DM varies across the season and stage of grass growth with wet weather reducing the dry matter of grass while lush fresh grass generally has a lower DM content than grass with a higher percentage of stem. For example the grass DM following a period of continuous rain will average 14 to 15% rising to 20% to 21% after a week of sunshine and high temperatures.

Grass growth: This is a measure of the quantity of grass grown and is normally measured in kilograms of dry matter per hectare (kg DM/ha). Typical growth rates are 10 kg/ha to 15 kg/ha per day in early spring, rising to 30 kg/ha to 40 kg/ha per day in April and reaching a high of 70 kg/ha to over 100 kg/ha per day during peak growth in May and June.

Grass growth is usually calculated on a weekly basis and is established by measuring growth on fields or areas that have not been grazed in the previous week. The total dry matter yield is established and subtracted from the figure obtained in the previous week (or previous period) and divided by the number of days. For example Field 1 has an average farm cover of 700 kg DM/ha last week and is now measuring 960 kg DM/ha seven days later. This gives a growth rate of 260 kg / 7 days = 37 kg DM/day. A rising platemeter or "quadrant & shears method" (where grass is cut and weighed) are the two main methods used to measure grass yield. With experience, some farmers can 'eyeball' or estimate grass covers, often measuring in tandem to ensure they are accurately measuring.

Grass demand: This is the demand for grass from grazing livestock on a farm and is generally calculated on a per hectare basis. Typically on cattle farms it requires an estimate of the weight of animals with grass intake estimated at 2% of their live weight. For example, 20 store bullocks grazing 6 ha and weighing 550 kg have a gross weight of 11,000 kg or 1,833 kg live weight/ha. Therefore, in this example the group's grazing demand is 37 kg DM/ha. In other words, grass growth must be at least 37 kg DM/ha in order to meet this demand. Where grass growth is less than this, the quantity of grass on the farm at the end of each day will decline, i.e. average farm cover will decline; where grass growth is greater than demand, average farm cover will increase.

Pre grazing sward height or yield: Animal performance is maximised by grazing top quality grass (high dry matter digestibility) which is influenced over the course of a season by how the sward is managed and the varieties or species present in the sward. For cattle, for example, a pre-grazing grass height of 6cm to 6.5cm translates to each hectare containing in the region of 1,000 kg DM/ha to 1,200 kg DM/ha. A grass height of 8cm to 10cm is equivalent to a pre-grazing yield of 1,300 kg DM/ha to 1,600 kg DM/ha. This can vary hugely from sward to sward depending on the "thickness" (density) of the sward. Maintaining the pre-grazing yield at the target height for different classes of stock and at different stages in the season will make it easier to achieve the optimum post-grazing height.

Post-grazing sward height or yield: The post-grazing height or what is also often termed as the post-grazing residual is essentially the volume of material left after animals have grazed the sward. The aim at the start of the year is to graze the sward down to 3.5cm to 4cm or a residual of 0 to 50kg DM/ha. If paddocks are not grazed to the recommended height early in the season a butt of stem or dead material will accumulate and reduce animal performance in subsequent grazing's. The post grazing height often increases as the season progresses. Additionally, lambs and young cattle which are more sensitive to grass quality, can be moved on quicker with older cattle/ewes used to graze down paddocks. On lowly stocked farms topping to a height of 3.5cm to 4cm may be required later in the season to improve quality.

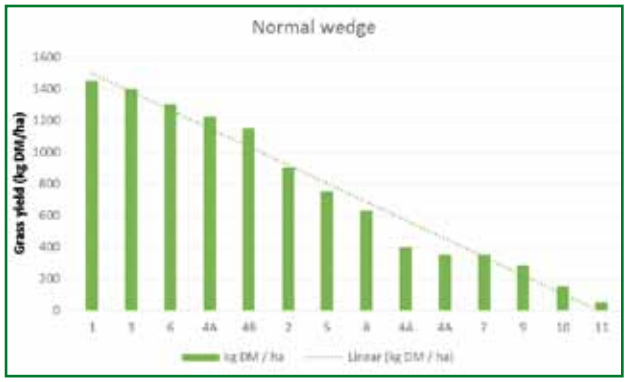
Rotation length: This is the recommended duration of days between grazings. It will be dictated by the grass growth rate which is in turn dictated by the stage of the season. Recommended rotation lengths range from 30 days plus in early spring to 18 to 21 days during the main grazing season and

peak grass growth. Taking out surplus paddocks as baled silage during the main grazing season will help maintain the ideal grazing rotation while reintroducing silage ground will help lengthen the rotation later in the year when the aim is to build a bank of grass for autumn grazing.

Farm cover: A farm cover is the total quantity of grass (→4cm) on the farm for grazing. It is calculated by measuring/estimating the yield of grass in each field/paddock and then calculating cumulatively across the entire farm. This will give you the **average farm cover** figure. In dairying, it is often conveyed as farm cover per cow or livestock unit across the grazing platform to get an idea of grass yield present per animal.

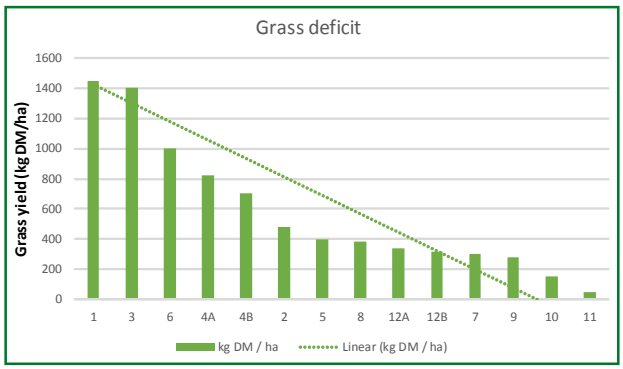
Days ahead. This is another measure of the yield of grass on a grazing block. It can be used to identify if there is a grass surplus or deficit coming down the line for a group of stock and allow decisions to be made with confidence. During the main growing season, it is advised to have about 10 days to 14 days grazing ahead. Days ahead is the number of days grass would last if grass stopped growing at that point in time.

Grass wedge: A grass wedge is a graphical representation of the quantity of grass present on each paddock on the grazing block and if it is sufficient to meet grass demand. A line is drawn from the ideal pre-grazing height back down to the ideal post-grazing height. See on right hand side graphs examples of a normal wedge, a surplus wedge and a deficit wedge.



Grass surplus: As it denotes, a grass surplus occurs when the quantity of grass grown exceeds demand from grazing animals. It is most likely to occur during the peak growing season. Surplus grass can be removed as round bale silage which will also contribute to maintaining sward quality. The aim is to act fast and avoid a delay in harvesting so that the area can be quickly brought back into the grazing rotation. Also, be careful to avoid removing excessive grass, especially if growth rates are slowing.

Grass deficit: It is important to identify grass deficits coming down the line so that corrective decisions can be taken. Options include applying chemical fertiliser, slowing down the grazing rotation and reducing demand by supplementing animals (concentrate or high-quality silage) or in very difficult situations re-grazing a percentage of silage ground (as long as the pre-grazing yield is not excessive).



Spring rotation planner: This is a tool used to manage grazing in spring and allocate grass to stock. It requires an estimate of when your farm is generally in a position to grow enough grass to meet your herd's or flock's demand which is often known as magic day. The other date required is when you aim to turn out cattle to pasture. The overall objective is to ensure enough grass is grazed early enough in the season to allow sufficient re-growth for grazing in the second rotation while at the same time ensuring grass does not run out. It requires regular walking of the farm and letting priority stock out in a planned manner. On a dry farm 40% of the farm is grazed in the first five weeks with 60% grazed in the final three weeks in anticipation of higher grass growth rates. On a wetter farm this switches to 40% grazed in three weeks and 60% in four weeks.

Feedback welcomed.

If there are any areas of grassland you would like to see featured in upcoming newsletters, please e-mail secretary@irishgrassland.com.

Grass and White Clover Recommended List Varieties 2016

David Cummins,
Crop Evaluation & Certification Division, Department of Agriculture, Food and the Marine & IGA Council Member

Perennial Ryegrass (PRG), Italian Ryegrass and White Clover account for nearly all of the agricultural grass/clover seed sold in Ireland. Of these, Perennial Ryegrass is by far the most important. Other species of grass and clover are not commonly used. Crop Evaluation and Certification Division of the Department of Agriculture, Food and the Marine (DAFM) are responsible for evaluating new varieties of grass and clover in Ireland. To market an agricultural crop variety in the EU, it must be registered in the National Catalogue of at least one EU Member State and the seed must be certified. These catalogues must be drawn up in accordance with uniform rules so that the varieties accepted will be distinct, stable and sufficiently uniform (DUS) and that they will be of satisfactory value for cultivation and use (VCU).

Each year DAFM test over 100 varieties of grass and clover for VCU in replicated trials at five locations throughout the country. All new candidate varieties are tested against existing commercial Recommended List varieties over a minimum of two sowing years, with each sowing harvested for two years, giving a total of four harvest years. Trials are grown on good quality soils in a manner conducive to selection of varieties most suited to good commercial farming practices. Crop Evaluation and Certification Division of DAFM published the Grass and White Clover Recommended List of Varieties for 2016 in February. There are four new varieties of Perennial Ryegrass and one new small-leafed White Clover.

New varieties of Perennial Ryegrass on the 2016 Recommended List

*Variety Name	Group & Ploidy	Heading Date	Breeder
Nifty	Inter Diploid	27th May	DLF
Kerry	Late Diploid	1st June	Teagasc
Alfonso	Late Tetraploid	4th June	DSV
Xenon	Late Tetraploid	11th June	DLF

*Listed in order of Maturity, Ploidy and Heading Date

New variety of White Clover on the 2016 Recommended List

Variety Name	Leaf Size	Clover %	Breeder
Aberace	Small	33%	IBERS

The List is now available for free download from the 'Publications' section on the Department's website: http://www.agriculture.gov.ie/publications/2016/

Outclassed grass varieties removed from the List are the Intermediate diploid Rodrigo, Intermediate tetraploids Giant and Trend, the Late diploid Mezquita and the Late tetraploid Abercraigs.

General Purpose and Simulated Grazing Data

Perennial ryegrass (Early, Intermediate and Late heading groups), Italian ryegrass and Hybrid ryegrass trials are sown in May/August and establish during the remainder of that year. (In recent years, all the sowings were carried out in the May period). The trials are then assessed over the following two-year period under two different systems; a 6 cut system and an 8 to 10 cut system, using a trial-plot harvesting machine. Individual trials remain on one system for the two-year period. The 6 cut system is also referred to as the General Purpose/2-Cut Silage system and involves one spring grazing cut, followed by two silage cuts and then three grazing cuts. Results from the 2003 to 2013 sowings of this trial are presented in the Main Tables of the 2016 Recommended List.

The 8 – 10 cut system is referred to as the Simulated Grazing (frequent cutting) system and involves that number of cuts taken at periods corresponding to normal commercial rotational grazing practice. This system was introduced by DAFM in its 2010 sowings. Its purpose is to provide variety performance data suitable for situations where grass is grazed throughout the growing season. Results from the 2010 to 2013 sowings of this trial are presented in the Main Tables of the Recommended List. Where a variety has data from only 2 harvest years, the results are provisional and this is indicated by brackets ( ) on the Tables. The dependability of this information will increase in coming years as the data for more varieties will be based on four or more harvest years.

Farmers should give preference to recommended varieties unless there is strong evidence that some other variety is more suited to their conditions. Using Recommended List varieties to reseed old and degraded pasture, in conjunction with appropriate soil pH and fertility will:

- Increase grass dry matter output per hectare,
- Improve response to fertiliser, especially Nitrogen,
- Extend the grazing season in spring and autumn,
- Improve animal performance, and
- Increase profits.

This is the second year that the DAFM Recommended List for Grass and White Clover includes the Teagasc Pasture Profit Index (PPI). The Teagasc PPI economic values are based on variety performance data from the DAFM Recommended List 2016, relating to the Simulated Grazing protocol and data for silage cuts. Teagasc is responsible for economic values attributed to varieties. See companion article in this newsletter page 18.

DAFM 2016 Recommended Intermediate, Late and White Clover varieties are presented in the following tables. For a complete list of Recommended List varieties please refer to the Department's website: http://www.agriculture.gov.ie/publications/2016/

Recommended Intermediate Diploid & Tetraploid Perennial Ryegrass Varieties 2016

Variety Name	Heading Date	General Purpose (2-Cut Silage)						Simulated Grazing					*DMD %	*WSC %
		Total Rel. Yield GP	Ground Cover 1-9	Spring Growth	1st Cut Silage	2nd Cut Silage	Autumn Growth	Total Rel. Yield SG	Ground Cover 1-9	Spring Growth	Summer Growth	Autumn Growth		
Control Mean (t DM/ha)		**14.7**	**6.4**	**1.1**	**4.7**	**3.9**	**3.2**	**10.7**	**6.2**	**1.3**	**7.1**	**2.3**	**83.3**	**21.8**
Solomon	21-May	**99**	6.6	116	104	94	93	**97**	6.8	106	97	92	98.4	90
Boyne	22-May	**103**	6.9	112	110	100	97	**97**	6.8	99	97	93	97.6	90
Rosetta	24-May	**100**	6.7	114	103	90	99	**99**	6.8	116	96	97	99.1	93
Nifty	27-May	**99**	6.7	97	104	92	101	**105**	6.8	110	105	103	99.3	100
Abermagic	31-May	**100**	6.8	88	97	100	106	**105**	6.6	96	105	109	100.7	112
Magician (T)	22-May	**99**	6.0	107	105	98	94	**97**	5.9	99	98	94	99.5	92
Carraig (T)	24-May	**101**	6.6	113	107	96	96	**98**	6.3	95	100	93	99.1	93
Seagoe (T)	28-May	**(102)**	6.1	101	109	100	95	**(99)**	(6.2)	(90)	(102)	(95)	100.1	98
Dunluce (T)	30-May	**101**	5.9	91	95	112	101	**100**	5.8	89	102	101	100.6	102

Data based on the mean of Diploid & Tetraploid Control varieties.
*DMD and WSC controls data is shown as g/100g on this Table and have been taken from both the GP and SG Trials.
Ground Cover values for Simulated Grazing are derived from Year 2 values in the 2016 Recommended List Appendices.
Intermediate Diploid and Tetraploid PRG variety descriptions can be found in the 2016 Recommended List publication.

Recommended Late Diploid Perennial Ryegrass Varieties 2016

Variety Name	Heading Date	General Purpose (2-Cut Silage)						Simulated Grazing					*DMD %	*WSC %
		Total Rel. Yield GP	Ground Cover 1-9	Spring Growth	1st Cut Silage	2nd Cut Silage	Autumn Growth	Total Rel. Yield SG	Ground Cover 1-9	Spring Growth	Summer Growth	Autumn Growth		
Control Mean (t DM/ha)		**14.0**	**6.6**	**1.0**	**4.5**	**3.9**	**3.0**	**10.2**	**6.5**	**1.1**	**7.0**	**2.1**	**82.9**	**21.4**
Kerry	01-Jun	**104**	6.4	123	95	107	105	**103**	6.4	106	103	104	99.6	106
Glenveagh	02-Jun	**99**	7.4	88	100	99	99	**101**	7.5	102	101	99	99.2	95
Majestic	02-Jun	**99**	7.2	104	97	96	101	**(102)**	(7.3)	(108)	(100)	(105)	98.9	94
Stefani	02-Jun	**98**	7.0	107	101	98	94	**(98)**	(7.0)	(98)	(98)	(97)	99.5	94
Piccadilly	03-Jun	**100**	7.1	103	107	94	97	**(99)**	(7.2)	(101)	(99)	(96)	98.7	90
Tyrella	04-Jun	**97**	6.7	114	100	91	93	**96**	6.7	109	94	94	99.7	101
Glenroyal	05-Jun	**100**	7.2	95	95	106	101	**103**	7.3	103	103	104	99.7	98
Clanrye	06-Jun	**100**	7.1	97	96	112	95	**(102)**	(7.6)	(106)	(103)	(95)	99.3	93
Drumbo	07-Jun	**98**	6.7	102	91	102	94	**100**	6.7	101	99	101	100.9	107
Aberchoice	09-Jun	**102**	6.6	95	93	111	105	**105**	6.5	100	106	106	101.6	119

Data based on the mean of Diploid & Tetraploid Control varieties.
*DMD and WSC controls data is shown as g/100g on this Table and have been taken from both the GP and SG Trials.
Ground Cover values for Simulated Grazing are derived from Year 2 values in the 2016 Recommended List Appendices.
Late Diploid PRG variety descriptions can be found in the 2016 Recommended List publication.

Recommended Late Tetraploid Perennial Ryegrass Varieties 2016

Variety Name	Heading Date	General Purpose (2-Cut Silage)						Simulated Grazing					*DMD %	*WSC %
		Total Rel. Yield GP	Ground Cover 1-9	Spring Growth	1st Cut Silage	2nd Cut Silage	Autumn Growth	Total Rel. Yield SG	Ground Cover 1-9	Spring Growth	Summer Growth	Autumn Growth		
Control Mean (t DM/ha)		**14.0**	**6.6**	**1.0**	**4.5**	**3.9**	**3.0**	**10.2**	**6.5**	**1.1**	**7.0**	**2.1**	**82.9**	**21.4**
Astonenergy (T)	02-Jun	**101**	5.6	91	102	98	102	**101**	5.7	91	101	104	102.0	114
Delphin (T)	02-Jun	**103**	5.9	107	105	102	101	**101**	5.5	97	103	99	100.3	100
Alfonso (T)	04-Jun	**98**	6.2	101	100	95	98	**101**	6.3	94	102	103	101.4	111
Abergain (T)	05-Jun	**107**	6.2	121	105	106	106	**105**	6.1	108	104	104	102.0	115
Aspect (T)	06-Jun	**(102)**	(6.7)	(103)	(96)	(107)	(102)	**(102)**	(6.7)	(101)	(103)	(98)	101.2	105
Navan (T)	06-Jun	**102**	6.2	91	95	108	107	**102**	6.2	93	102	108	100.7	105
Kintyre (T)	07-Jun	**104**	6.1	102	96	110	108	**103**	6.4	102	101	111	100.9	106
Twymax (T)	07-Jun	**101**	6.4	95	98	110	98	**(99)**	(6.1)	(81)	(104)	(94)	100.8	103
Aberplentiful (T)	09-Jun	**104**	6.3	98	97	110	108	**108**	6.1	111	107	107	100.9	104
Solas (T)	10-Jun	**105**	6.4	100	94	114	108	**(106)**	(6.4)	(106)	(104)	(113)	101.1	104
Xenon (T)	11-Jun	**102**	6.8	93	92	118	100	**102**	6.8	99	102	102	101.1	108

Data based on the mean of Diploid & Tetraploid Control varieties.
*DMD and WSC controls data is shown as g/100g on this Table and have been taken from both the GP and SG Trials.
Ground Cover values for Simulated Grazing are derived from Year 2 values in the 2016 Recommended List Appendices.
Late Tetraploid PRG variety descriptions can be found in the 2016 Recommended List publication.

Recommended White Clover Varieties 2016

Variety Name	Total Yield	Leaf Size*	Clover %	Year 1st Listed	Breeder	Origin
Control Mean: (t DM/ha)	9.8					
Barblanca	**105**	Large (0.78)	50	2009	Barenbrug	NL
Alice	**99**	Large (0.76)	50	1995	IBERS	UK
Chieftain	**98**	Medium (0.68)	47	2005	Teagasc	IRL
Buddy	**100**	Medium (0.63)	45	2015	Teagasc	IRL
Avoca	**103**	Medium (0.61)	47	1995	Teagasc	IRL
Iona	**94**	Medium (0.59)	44	2014	Teagasc	IRL
Aberherald	**98**	Medium (0.55)	45	2003	IBERS	UK
Crusader	**95**	Medium (0.54)	42	2009	Barenbrug	NL
Aberace	**99**	Small (0.38)	33	2016	IBERS	UK

In the table above varieties are listed in order of decreasing leaf size.
*Values in brackets indicate leaf size compared to the variety Aran
(i.e. Aran = 1.00), based on data from UK D.U.S. tests.
Control varieties are shown in the Appendices of the 2016 Recommended List publication

An overview of the Pasture Profit Index (PPI) 2016

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The PPI is a total merit economic index which ranks varieties on the economic value to a grassland farm. It was developed to assist grassland farmers to identify the most appropriate variety(s) for their farms. The PPI comprises of 6-sub-indices: spring, mid-season and autumn grass DM production, grass quality (April to July, inclusive), 1st and 2nd cut silage DM production and persistency. The performance of a variety for each trait is calculated by determining the difference between the performance of each variety and the base value for that trait.

The economic value of an extra kg of grass DM in spring and autumn is higher than mid-season because it supports an extended grazing season. The relative emphasis on each trait is as follows: grass DM yield (31%), grass quality (20%), silage yield (15%) and sward persistency (34%). The performance values included in the PPI are based on data collected from the DAFM grass evaluation trials. Varieties are evaluated over a minimum of two separate sowings, with each sowing harvested over two consecutive years after the sowing year. The two harvested years include a 6 cut system involving one spring grazing cut, followed by two silage cuts and then three grazing cuts; as well as an 8 – 10 cut system corresponding to normal commercial rotational grazing practice.

The PPI index values ranges from €210 to €61/ha per year for the 30 cultivars where the data was assigned to. The sub-indices present the opportunity to select varieties for specific purposes. For example, if selecting a cultivar for intensive grazing, the emphasis would be placed on seasonal DM yield and quality with less importance placed on the silage performance. If selecting a variety specifically for silage production, then greater emphasis would be placed on the performance of that cultivar within the silage sub-index.

Teagasc Pasture Profit Index (PPI) 2016

Variety Details			Pasture Profit Index Sub-indices (€ per ha per year)						Total
			Dry Matter Production			Quality	Silage	Persistency	€/ha/year
Variety	Ploidy	Heading date	Spring	Summer	Autumn				
AberMagic	D	May 31	47	50	63	36	14	0	210
AberGain	T	June 5	38	44	32	65	25	-5	199
Nifty	D	May 27	77	50	49	-6	20	0	190
AberPlentiful	T	June 9	44	51	38	30	14	0	177
Solas*	T	June 10	34	45	51	31	14	0	175
Dunluce	T	May 30	32	42	43	39	23	-5	174
AberChoice	D	June 9	23	47	36	64	8	-5	173
Rosetta	D	May 24	92	25	33	2	16	0	168
Seagoe*	T	May 28	33	41	29	20	37	0	160
Kintyre	T	June 7	28	35	47	33	13	0	156
Astonenergy	T	June 2	7	37	31	61	11	0	147
Xenon	T	June 11	22	39	26	46	14	0	147
Magician	T	May 22	53	30	26	7	26	-5	137
Alfonso	T	June 4	13	38	27	51	4	0	133
Aspect*	T	June 6	25	41	17	37	9	0	129
Carraig	T	May 24	46	37	23	-11	30	0	125
Navan	T	June 6	10	39	40	26	9	0	124
Solomon	D	May 21	69	29	22	-23	21	0	118
Kerry	D	June 1	34	40	32	0	7	0	113
Delphin	T	June 2	17	40	19	16	20	0	112
Glenroyal	D	June 5	29	40	31	2	7	0	109
Drumbo	D	June 7	26	30	24	44	-5	-11	108
Boyne	D	May 22	54	29	24	-39	39	0	107
Clanrye*	D	June 6	34	42	10	-10	15	0	91
Twymax*	T	June 7	-13	44	7	35	16	0	89
Majestic*	D	June 2	39	32	33	-16	-1	0	87
Glenveagh	D	June 2	27	35	20	-10	8	0	80
Stefani*	D	June 2	21	27	16	-2	8	0	70
Tyrella	D	June 4	40	18	8	3	-1	-5	63
Piccadilly*	D	June 3	26	31	12	-23	15	0	61

Varieties marked with an asterisk (*) have only one sowing year data available (two harvest years data), therefore this is provisional data.

Soil fertility – meeting grassland production targets?

David Wall
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Only approximately 10% of grassland soils in 2015 were in the optimum soil fertility range in terms of soil pH and P and K (source Teagasc). This means that 90% of the soils analysed were outside the range of what is desirable on the farm from both agronomic and environmental perspectives.

Productive soils are the foundation of any successful grassland farm system. The increasing demand for high grass growth rates and crop yields represents an increasing demand on soil fertility levels. The ability of soils to maintain a continuous season long supply of nutrients in the appropriate quantities for grass growth is a key determining factor of how productive a field or farm can be. Therefore, the management of soil fertility levels should be a primary objective on grassland farms.

Fertilizers account for a significant proportion of direct production costs on grassland farms, but spending on fertilizer inputs represents good value for money when used correctly. However, fertilizer application rates that undersupply or oversupply nutrients, or are not in balance with other soil fertility factors (e.g. soil pH) will yield lower returns on investment. With fertilizers becoming more expensive, it is vital that fertilizer is managed as efficiently as possible with maximum return in farm produce.

Soil analysis results

A review of soil samples taken on farms and analysed through Teagasc indicates a large diversity in soil fertility levels on farms. The results of samples analysed in 2015 over all grassland farm systems is shown in Figure 1. The results indicate that a relatively small proportion (only approximately 25%) of the soil analysed are in the optimum soil fertility range of Index 3 for both P and K. Looking at soil fertility trends there is increasing trend in the proportion of grassland soils with low fertility (Index 1 and 2) for P and K in recent years.

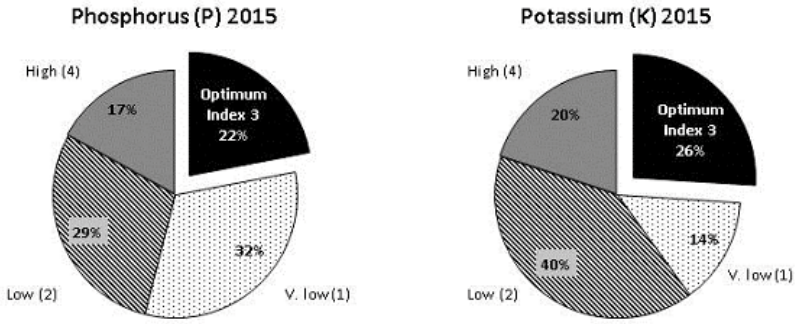


Figure 1. Proportions of grassland soil samples analysed through Teagasc in 2015 (n= c. 28,000) with very low (Index 1), low (Index 2), optimum (Index 3) and high (Index 4) soil fertility levels for P and K. (Source: Teagasc).

These results indicate how important it is to have soil analysis results for a farm. In many cases, advice for Index 3 soils is assumed where soil test results are not available. These results highlight the danger of this strategy, and show that where standard Index 3 advice based on average offtake is given in the absence of a soil test result, the advice is likely to be incorrect in 75% of cases.

Another important message in these results is that there is a need to consider each nutrient separately. A soil that is low in P is not necessarily low in K, and vice versa. A lot of the commentary on nutrient management and fertilizers focus on P, while neglecting to consider other nutrients as being equally critical. In many cases, this may mean a requirement for more diversity in the mix of NPK fertilizer blends available, or a move at farm level to greater adoption of straight P or K products or zero P and zero K blends.

Soil fertility management

Managing soil fertility is about focussing on the key aspects of soil and nutrient applications, and setting targets for the farm. Aiming to have as much of the farm as possible at optimum soil fertility levels to maximise grass production when required requires an understanding of the soil Index system and what the different indexes mean for fertilizer application. Understanding how much nutrients are being removed from different fields is also important.

Soil sampling

The first step in soil fertility management is soil sampling. Have soil samples taken for the whole farm. Unless you know what is already in the soil, it is impossible to know how much fertilizer it needs. Therefore, by taking soil analysis and putting the results into practice, the fertilizer programme can be tailored to the needs of the soil and the production system. Repeating soil analysis over time is also critical to monitor the effectiveness of the fertilizer strategy.

Soil pH and lime

The second critical step is optimising soil pH and should be the first thing to get right where soil test results indicate that lime is required. Lime should be applied as recommended on the soil test report to increase soil pH to target pH of 6.3 for grassland (note; keep pH ≤ 6.2 on high molybdenum soils or supplement animals with Cu). Acid soils will result in reduced release of the major nutrients from soil, and poorer response to fertilizers. Apply lime as a priority in line with the lime advice.

Soil Index system

To simplify nutrient advice, the soil Index system was developed to allow soils to be categorised for each nutrient tested based on the soil test result. The Index system used in Ireland places soils into one of four categories for each nutrient. The range in soil test results corresponding to each Index varies with each nutrient. The Index ranges for phosphorus (P), potassium (K) and magnesium (Mg) are shown in (Table 1). The nutrients P and K usually receive most attention in Ireland. The advice for soils low in Mg is to use a lime source that contains Mg (e.g. magnesium or dolomitic lime)

Table 1. The soil Index system used in Ireland for grassland P, K and Mg

Soil Index	Response to fertilizers	P (mgL^{-1}) Grassland	K ($mg\ L^{-1}$) Grassland	Mg ($mg\ L^{-1}$) Grassland
1	Definite	0 – 3.0	0 – 50	0 – 25
2	Likely	3.1 – 5.0	51 – 100	26 – 50
3	Unlikely/tenuous	5.0 – 8.0	101 – 150	51 – 100
4	None	>8.0	>150	> 100

The P and K advice is based around maintaining soils at Index 3. This is the soil Index where the soil has sufficient nutrients to meet the nutrient uptake demands of the grass or silage crop. For P, which can cause issues with water quality, Index 1, 2 and 3 are also considered to be lower risk for losses to water. The objective of the fertilizer strategy should therefore be to move as many soils into Index 3 as possible, and maintain them in Index 3 after that.

Advice for P and K in Index 3 is to apply annually to maintain soil reserves. This is the main reason why one may not see a response to P and K applied annually if the soil reserves are sufficiently high. However, reducing or skipping P or K applications will mean that the nutrients will have to be replaced at some stage if soil fertility is to be maintained. With restrictions in P fertilizer use based on annual farm allowances, it may not be possible to apply extra in subsequent years.

Index 1 and 2 soils are very responsive to applied P and K. These soils have a higher P and K requirement as the P and K applied should be sufficient to build up soil reserves to the optimum soil Index in addition to replacing the P and K removed in product (i.e., meat, milk, live weight, silage etc). The aim should be to build soil fertility levels from Index 1 and 2 up to Index 3 over a number of years. The total quantity of an individual nutrient required to build up soil fertility levels will depend on a number of factors such as soil type, annual nutrient application rate, and the amount of nutrient removed. Building soil fertility usually takes a number of years, so application of build up rates in addition to maintenance rates should continue for a number of years after the soil sample is taken.

Soils at Index 4 are very fertile soils and soil reserves will supply sufficient P or K to meet crop nutrient requirements throughout the growing season. Where grass is grown on Index 4 soils, it is recommended to omit P for a number of years and then re-sample to monitor changes over time. For K it is recommended to omit K applications for one year and then revert back to Index 3 advice in subsequent years. These fields offer an opportunity to reduce fertilizer costs and to target other areas of the farm that would benefit from organic manure applications. The speed of P and K decline on Index 4 soils will depend on the soil type, the level of P or K in the soil, and the removals on an annual basis. Regular soil testing is essential to monitor changes.

Replacing offtake

Knowing how much nutrients are leaving the farm in produce is the key step to knowing how much fertilizer needs to be applied. In a grassland system, the offtake will depend on the farm system (e.g. dairy will be different to drystock) and the stocking rate. In some cases, such as with P in concentrate feeds fed to grazing animals, inputs into the farm can help offset the nutrient removal. Therefore in order to devise an appropriate and effective fertiliser programme for a farm, field or paddock you need to determine the P and K offtake for your system,

Offtakes in grassland systems

Nutrient offtakes are normally calculated on the basis of whole farm nutrient balancers that estimate the net nutrient removal counting in the P and K removed in milk or meat. Inputs are also included; most notably the P contained in concentrate feeds. The standard P and K offtakes from dairy, grazing and drystock are shown in Table 2.

Table 2. Typical soil fertility maintenance P and K advice (kg ha^{-1}) in grazing systems on Index 3 soils. (Rates shown for P should be reduced by 5 kg ha^{-1} for every 1 t ha^{-1} of concentrate feed used).

		Stocking Rate (kg ha^{-1} organic N)					
		<85	86-130	131-170	171-210	211-250	>250
Dairy	**P**	11	16	21	26	29	31
	K	20	25	30	35	40	45
Drystock	**P**	4	7	10	13	16	19
	K	5	10	15	20	25	30

It should be noted that the rates shown for P should be reduced where concentrate feeds are used on the farm. The simplest way of adjusting for concentrate feeds is to calculate the tonnes of concentrates used on the farm per hectare using the following equation:

$$\textit{Pin Concentrate feed (kg ha}^{-1}\textit{)} = \frac{\textit{Total concentrate feed used (tonnes) x5(kgt}^{-1}\textit{ of P)}}{\textit{Total grassland area (ha)}}$$

This equation assumes an average P content in concentrate feeds of 5 kg t^{-1}. However, many straight or compound feeds may differ from this default value. True P contents of individual feeds should be used where they are known. In many cases, it can happen that the P in the concentrate feed will balance the full P offtake, hence the P fertilizer advice can be reduced to 0 kg ha^{-1} in these cases.

Offtakes in grass silage

The P and K offtakes of a grass silage field can be estimated from the dry matter (DM) yield of silage removed. The standard P and K advice for silage in Ireland assumes a crop yield of 5 t ha^{-1} of DM, and a P and K offtake of 20 kg ha^{-1} of P, and 125 kg ha^{-1} of K. However, the P and K offtake of any grass silage crop can be estimated based on the DM yield and by assuming P offtake of 4 kg t^{-1} of DM, and K offtake of 25 kg t^{-1} of DM.

Converting offtake to a fertilizer recommendation

Generating a fertilizer programme requires combining the offtake and the soil test result. Linking the soil test result to the offtake of the crop allows the nutrient application rate to be adjusted for additional requirements for build-up if in Index 1 or 2, and for reduced application rates in high fertility Index 4 soils. When the required application rate, corrected for soil Index, has been calculated, the decision remains as to how to supply these nutrients.

Slurry and manures

One option is to use an organic manure to supply all or part of the nutrients required. Grassland and mixed farms will have organic manures available on the farm. Other farms may have the option of importing organic fertilizers. Either way, organic fertilizers can be a very cost effective source of nutrients, particularly where low fertility soils require additional nutrients for soil build up over and above the maintenance rates. Use slurry on the farm as efficiently as possible, and top up with fertilizer as required. Aim to apply slurry and manures to fields that have high P and K requirements. Apply in cool and moist weather conditions (e.g. spring or prior to closing for silage) to maximise N recovery. Using low emission slurry spreading methods such as trailing shoe or bandspreading has been shown to further increase the efficiency of slurry N for grass production.

The right fertilizer product

The final step in the fertilizer recommendation is to select a fertilizer product (or mix of products) that supply the required application rates in the correct balance. Standard products may not suit all situations, so mixes of NP and/or straight K products may help to provide sufficient scope to meet a balanced nutrient supply where there is large variability between the P and K application rates required in different fields. The fertilizer selection should also complement any organic fertilizers that are applied to the grass or silage crop. Soil pH, lime, Sulphur (S) and Mg are also critical to an overall balanced approach to soil fertility, as are trace elements, particularly in tillage crops. A significant proportion of Irish soils will show a response to applied S. There is no reliable soil test for S, but responses are most likely on light textured soils with lower organic matter content. Where soils are responsive to S, on grazed grass apply 20 kg ha^{-1} S per year and on grass silage 20 kg ha^{-1} S per cut.

GAP (Nitrates) cross compliance

The formulation of fertilizer programmes for individual fields based on nutrient offtakes and soil test results being recommended needs to be cross-checked against the total N and P allowance on the farm in compliance with the GAP (Nitrates) Regulations. Adjustments to the fertilizer programme may be required to comply with the regulations. However, it is also important to highlight that it is only N and P that are controlled by the regulations. The farmer has freedom of choice in how to manage other nutrients such as lime, K and S. Therefore, there is no reason under to neglect these other nutrients in the soil which are required by the crop.

Conclusions

Managing soil fertility on farms is a critical factor for a productive and profitable farm. Given the diversity of soil fertility levels in Irish soils, it is essential to know how fertile the soils on your farm are by soil testing. Fertilizer programmes should then be tailored to the soil test results and the offtake by silage or livestock systems on the farm. Balanced fertilizer inputs based on this information is the key to maintaining soil fertility over time and maximising the most cost effective feed source on the farm which is grass.

Taking a P & K holiday or reducing fertiliser inputs in 2016

Jan Jansma
Yara and
IGA council member

Fertiliser is one of the biggest expenses incurred on livestock farms and is frequently looked at as an option to reduce costs on farm. Margins in all enterprises are likely to be squeezed even harder in 2016 than they were in 2015 meaning farmers might be tempted into taking a P & K holiday or using less fertiliser on grassland to reduce costs. Farmers tempted to do this need to ask themselves – what impact will this decisions have on their farming enterprise, both in the short term and long term?

My thoughts are that the best way of reducing costs on a grassland farm is to maximise the yield and quality of the cheapest form of feed you can get – GRASS.

It stands to reason that high yields of good quality grass will help maximize on farm profitability and agronomically there is a lot that the grower can do to maximize these. **Proper Plant Nutrition** is fundamental to achieving maximum yield and quality.

Maintenance of an optimum soil pH ensures nutrients are readily available and maximizes grassland growth. Figure No1 shows the influence of soil pH on nutrient availability and why maintaining a pH of 6.3 is vital in ensuring full availability of all nutrients. Even a slight decrease in pH will have a detrimental effect on availability on available nutrients, especially P.

To maximise yield and subsequently reduce on-farm costs, a robust nutrient management plan that makes best use of manure and slurry needs to be drawn up and adhered to. Target fields with suboptimal indexes with manure, slurry and fertiliser to bring all soil indexes on the farm up to the target index of 3. Fields at index 3 will still need maintenance applications of P & K.

All grassland farmers should be looking for the maximum yield of high quality grass to feed their stock. To achieve this, plants need a balanced supply of nutrients as they all have specific roles to play in achieving this. An absence or reduced availability of any nutrient by taking a P&K holiday or reducing the amount of fertiliser spread in a season will restrict the growth processes and will in turn reduce subsequent yield and or quality.

I have listed below the major plant nutrients and their function in maintaining yield and quality of grass. By understanding their function it should be less likely that their availability will be restricted.

Nitrogen (N) provides the highest DM yield responses in grassland. It fuels grass growth and – provided it is not in excess – boosts animal uptake.

Nitrogen is the key element essential for photosynthesis and strong productive growth leading to high dry matter yields of good quality grass. Nitrogen, while delivering high yields, boosts the energy and protein content of grass. Not surprisingly, grass is highly responsive to nitrogen. Depending on N rate and growing conditions average response to inorganic nitrogen is between 12-24kg DM/kg N. At 2016 prices for concentrates and nitrogen fertilizers, farmers meet the economic optimum if the last kg of nitrogen applied contributes to an additional production of 8-9 kg DM. Timing of application and rate

are critical. If nitrogen is applied when the plant has little demand, losses are high and utilization is poor.

Best practice is to apply fertilizer 1-2 days after grazing or cutting to ensure nitrogen is converted in the grass. Each day's delay in applying nitrogen reduces subsequent yield.

Phosphorus (P) plays a major role in the energy supply in plants. It is also required for root development and good grass establishment, and is particularly important for spring regrowth. Even though phosphorus demand is small compared to that of nitrogen, its availability is essential. Responses to phosphorus can be found even on soils where the P levels are thought to be sufficient, this is due to the fact that phosphorus is very immobile in the soil. Typically only around 16% of the grazing surface will have been covered by dung after two years of intensive grazing, so unless slurry is applied, phosphorus remains a key component of the fertilizer programme.

Potassium (K) is required in periods of rapid growth, for example, after grazing or after silage. Potassium – like nitrogen – is a key input for high grass yields. It increases individual leaf area and the leaf to stem ratio. Regular, annual applications are required to maintain soil potassium levels and to maintain yields. Soil indices are soon compromised and, even on soils with a reasonable reserve, yields decline, unless slurry or fertilisers are applied. Grass management (i.e. grazing or cutting) will affect the rate required; demand is greatest under regimes where grass is removed. Poor supply of potassium results in higher susceptibility to stresses like drought, frost etc. Similar levels of potassium in intensive production systems are removed compared to nitrogen over the season. An adequate supply of potassium is also essential for maximizing yield responses from applied nitrogen.

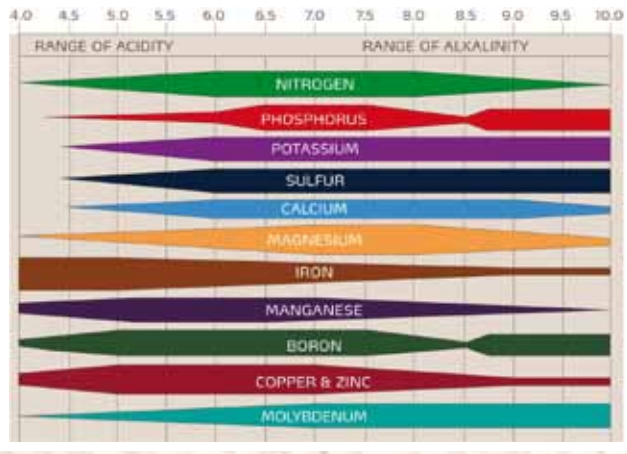
Sulphur (S) is increasingly important in most situations for plant protein production and helping to improve plant growth and development. With good sulphur supply it helps boost DM yield production and nitrogen use efficiency is improved. Sulphur boosts protein and energy content of grasses, increasing sugar content, and digestibility.

Sulphur is subject to leaching especially on sandy soils. On light soils under grass, 12-30 kg S/ha can be leached in a year. Therefore, the amount that is potentially lost from the soil through leaching is likely to be significantly higher than the amount gained through atmospheric deposition.

While slurry and manure can contribute some sulphur, levels are very low. For example a 40 m^3/ha (3,500 gallon/acre) application of dairy slurry may only supply 1-3 kg S/ha of available sulphate. As a result, fertilizer S is a key input for productive grassland. S removal is about 2 kg/t DM, therefore grassland requires 15-30 kg S/ha and year depending on productivity levels. Grass digestibility is also better when adequate sulphur has been taken up by the grass.

Speak to any grassland farmer consistently achieving high yields of quality grass and they will tell you that cutting fertiliser costs isn't a viable way to reducing on farm costs or managing costs in a volatile market. Soil indexes can be depleted very quickly leading to a significant reduction in yield. Increasing soil indexes is a much slower and very expensive process. All the nutrients that have been taken out need to be replaced and doing that within the regulations will take a significant amount of time.

Given the effect that plant nutrients have on the yield and quality of grass, the impact of reducing or eliminating any of these on farm incomes should not be underestimated. It would be "penny wise and pound foolish" to reduce fertiliser costs by having a P&K holiday or reduce application rates and then have to write out a cheque later in the year for supplementary feed when there isn't enough grass



Farmer Focus:
Denis O'Donovan, Ballyvoreen, Rosscarbery, Co.Cork

By Tommy Moyles
Beef Farmer and IGA Council Member
& Pat Donnellan
ICBF and IGA Council Member

Background

Denis O'Donovan milks 140 cows on a 40 hectare milking platform between Glandore and Rosscarbery, Co.Cork. His wife Colette rears the calves with the help of their son Eoghan and his father is still a huge help about the farm. Denis's father bought the farm in the 1970's and began reclaiming it. His main aim is to make more money from a limited base, using Jersey cross-breds.

Average Herd Performance Stats			
Total hectares farmed	64ha (30 owned)	**Kg Milk solids/cow**	414kgs
Milking Platform	40ha stocked at 3.5 cows/ha	**Kg Milk solids/ha**	1449kgs
Total farm stocking rate	3 LU/ha	**Fat**	4.85%
Herd EBI	€181	**Protein**	3.89%
2014 Heifers EBI	€210	**SCC**	162
2015 Heifers EBI	€218	**TBC**	19
6 week calving rate	86%	**Meal fed**	330kgs/cow

We caught up with Denis recently to get his thoughts on some of the main challenges that he faces as a dairy farmer in Ireland in 2016, starting with the most important issue – '**Grass**';

Grass;*'You've got to match peak calving to peak grass, that's where I see it going. I am looking very much at what they are doing in Clonakilty Ag College at the moment. They are running a grazing experiment investigating the impact of grazing swards differing in grass ploidy and clover content and they will also have a genotype component investigating three breeds of dairy cow in grass-based systems of production. It's a remarkable story achieving remarkable figures and if they can crack the bloat issue then they are home and dry. More milk solids and less fertiliser, however the worry is if you strike a cold spring you could run into an issue with clover content. I'm glad they're extending out the PPI (Pasture Profit Index). Its all a work in progress and all of the information is going back into one database.*

In terms of grass varieties you would have your preferences. 'Abermagic' and 'Abergain' are nice grasses and cows like them. Cows don't particularly like 'Tyrella'. For 'Kintyre', cows need to be in there in 16 or 17day rotations in summer or else the grass gets ahead of them. In terms of silage, I have a bank of silage built up and its over 70 DMD'.

Wood chip & Cubicles

'Our cows are wintered on a wood chip pad. This was built in 2008 but I am now considering converting this to topless cubicles. Competition from businesses using wood chip boilers has seen wood chip become expensive. One slight disadvantage of the topless cubicles is that the extra water collected waters down the P and K levels of the slurry. Slurry is spread using an irrigator on wheels and the rest is done with an umbilical cord system.'

'Land next to the milking platform is near impossible to get. in the past we used to draw in whole crop and we were stocked at near to four cows/ha but found there was no money in this in a poor milk price year.'

Crossbreeding

'For me, Crossbreeding=Fertility. We're consistently in single % figures for females not in calf in after 11 weeks of breeding. So we sell surplus heifers to both the UK and Irish markets. Is there money out of it? It's questionable but it gives us options having heifers on the ground, they're there to cash in and they don't cost any extra than my own. The bank manager doesn't care what colour cow I have, not one bit. As long as they get their repayments at the end of the month, colour of the cow is irrelevant.

On the other side of it I can see why guys wouldn't cross-breed, those who have built up pedigree herds, I can see why you wouldn't cross those cows.

The other thing is the mart, if you're someone who enjoys going to the mart you have no business cross breeding. We sell our calves privately. Its small money I wouldn't have a big value on them but the way I always look at it is if I can get one or two more cows in this herd that will go in calf that means I sell one or two heifers more that will pay for a lot of bull calves and 5 or 6c/l extra.' **Health**

Denis O'Donovan (above) and heifers being outwintered (right)

'I like the work animal health Ireland are doing. I think with more farmer participation they'd solve a lot of problems but farmers are slow on the ground to back them. IBR, is it going to be another disaster like BVD?

In terms of preventing widespread health problems here we run replacements on an outside farm where there are wintering facilities. The calves go down as they're being weaned and stay there for the first winter. It's like contract rearing but it's an enclosed block.'

AI & EBI

DIY AI is done straight after milking every morning. This is done for practicality and convenience reasons as the cows often have to cross roads to reach certain parts of the milking platform.

With a herd EBI of €181 – Denis's herd is well inside the top 5% of herds nationally and is fast heading for the top 1% club.

'My big worry is the Jersey population in Ireland probably is't big enough. I think ICBF may be letting us down slightly that they haven't issued a Jersey cow index.

They have held back the cow index, why I don't know. The Friesian population is pulling away in EBI and those of us who are cross breeding are at a cross roads. Do we follow the trend and go high EBI Friesian or do we continue crossing?. Its disappointing when you have a high EBI herd not to drive it on but I don't think we can afford to. I think we have to criss cross.'

'I think we have no business bringing in those Danish Jerseys. They'll add nothing to it. I know why they brought them in but the Danish system is an indoor confined system and is in no way related to what we're doing here. They should have brought in all New Zealand jersey embryos and it should have been done years ago.'

'Time will show the cross-breds to be more profitable especially as milk price fluctuates up and down. Farmers using crossbreds will be able to ride out the bad years a lot easier than those who aren't. We were consistently 5c/l over the co-op average in 2015. When cow numbers go up you have to go to the easy care cow. A lot of farmers don't realise it yet. You can't afford to have problem cows then, you haven't the time to give to them like perhaps you would in a 50 to 60 cow herd.'

Milk Price

'In terms of marketing our product I think that we are being sold short. Friesland Campina offer a bonus to farmers who get cows out for 100 days and we have ours out for over 300 days and see no benefit. They can get rid of product alright but we need more than just getting rid of the product, we need to target the top markets.'

Discussion Groups

'I'm involved in two discussion groups, one since 1997. Those guys are like my best friends. I've had my career with them. I'd have no issue picking up the phone and bouncing ideas off these guys - how do you put a value on that? I'd put being in a discussion group right up there. The advantage of being in a discussion group is you see the problems other fellas have and prevention is better than cure. Taking constructive criticism and giving it. From a social point of view they're great as well. I place a huge value on my fellow members as much as the facilitators.'

A Year in my Wellies

BRYAN HYNES, CLARIN FARM, CLARINBRIDGE, CO GALWAY

Introduction: Bryan Hynes started farming in a partnership arrangement in Clarin Farm in May 2013. Cow numbers have been increased gradually in advance of the abolition of milk quotas with 150 to 160 cows grazing in 2016 at a stocking rate on the milking grazing platform of about 3.5 cows/ha.

Land type can be described as dry, free draining soils with limestone rock lying not far beneath the surface. This gives an opportunity for grazing early and late in the year but does present the risk of paddocks burning up and growth slowing significantly in a dry summer. A high percentage of the farm has been reseeded in the last two to three years in line with the herd expanding.

Variable weather making spring management difficult

This spring has been challenging to say the least. Every time it dries and you think we may be finally getting a dry spell, it rains again and ground conditions are back to square one. Thankfully we are farming on dry ground so we have not been affected as badly as others. We have focused on trying to take any half chance we get to get cows out and have practised a mixture of on/off grazing, getting cows out permanently when possible and bringing back indoors and supplementing during very heavy rainfall.

While tough, we have got away with it up to now and met our target of having 40% of the farm grazed by 1st March. We had 50% grazed by 7th March but not 50% of the grass available. This is as we changed our spring grazing plan to try and contend with weather and still keep on track with our spring rotation planner. We have some heavy covers of 2,000 kg DM/ha and we skipped these to stay on target and also optimise grass utilisation, and instead grazed medium covers of 1,000 kg DM/ha to 1,500 kg DM/ha first. Clean-out has been mainly good with no real damage done.

We are hoping for more settled weather to graze the heavier covers and will operate 12 hour grazing's to improve utilisation. These covers really need to be cleaned off and if anything some have gone back with the difficult weather over the last few months. Grass growth has been poor during February with growth across all areas only averaging about 4 kg DM/ha. An average figure does not show a clear picture and paddocks grazed have much more life with a cover of 300kg DM/ha back on those grazed first. These paddocks received 30 to 40 units of Urea (rates vary depending on the field) and we are also going with slurry where possible.

Grass demand is rising with 90 cows, or just over 60% of the herd, calved between 9 February and 8 March. Our target is to have about 90% calved within six weeks. Tightening the calving spread from a year-round liquid milk production system has been a big focal point since 2012. Milking any cows that calve after St Patrick's Day once-a-day has worked well in pulling late calvers back four to five weeks on average and we will continue with this approach.

Our aim is to calve to grass and breeding will begin on 3 May. Cow type is British Friesian in the background with a mixture of Holstein, Jersey and kiwi Friesian used in a crossbreeding breeding programme. The ideal for us is a cow with some Holstein genetics to drive yield and 25% Jersey genetics to boost milk solids and fertility and add a bit of hardiness to cows.

There is no shortage of tasks in the coming week with calving continuing, calves to be dehorned, yearling heifers to be bolused and most importantly getting the farm set-up to maximise grass growth. Milk price remains under pressure and our focus will be to try and limit any unnecessary costs and drive production from grass.

At a busy time of the year it's important to take time out and meeting with our discussion group, Galway Grazers, is a great way of seeing what other farmers are up to. The group includes Noel O'Toole and Henry Walsh who held last year's IGA dairy summer tour. Groups are a great way of learning and adopting new practices and are a huge help and support for new entrants.

A Year in my Wellies

JONATHAN HIGGINS, LEEKFIELD, SKREEN, CO SLIGO

Introduction: Philip Higgins and his son Jonathan hosted an Irish Grassland Association farm walk in August 2014. The event was very well received by farmers, with over 300 delegates attending the day. A notable feature of the day was Jonathan's discussion on establishing a pedigree Texel flock with the attendance welcoming a well-needed injection of youth into the sheep sector.

Two years on, Jonathan has expanded his own pedigree Texel flock, the Avondale Flock, and is juggling management of the flock with a busy spring schedule studying Animal Science in University College Dublin School of Agriculture and Food Science.

Gearing up for a busy spring period

At the time of writing, you could say it is the calm before the storm with lambing in the main flock of 310 ewes due to kick off on Friday 11 March and the pedigrees just finishing up. But before I head back home from college in UCD and get stuck into lambing over the Easter break I am doing a few days lambing experience in Lyons Research Farm. While I will get my fair share of lambing at home it will be good to see what's happening in UCD in terms of research and trial work and also hopefully pick up a few tips. I am on a rota to lamb in Lyons from Friday 11 March to Monday 14 March. At that stage we will be just getting into the thick of lambing at home.

The pedigree ewes lambed well but conditions have been very tough with weather very variable and ground pretty wet. Ewes and lambs have been going to grass by day and in by night - they still haven't spent a night outdoors. There are a few ram lambs I am very happy with that were sired by two stock rams, Avondale warrior and Avondale veron. Hopefully they will keep up this performance and be suitable for showing later in the year.

I am a member of the Sheep Ireland LambPlus programme and will soon be collecting 40-day weights. This contributes to the animal's Eurostar evaluation. Naming of rams has also required plenty of thought; each year a letter is assigned that must be used as the first letter of each name. This year is 'Y' so there has been plenty of thinking!

Hopefully by the time lambing starts we will have got a dry spell to help ground conditions. Grass growth has been good on the paddocks closed early and if weather improves we should be fixed ok for grass. It will also give a chance to get fertiliser out which will help to put us in a better position. Also allowing the pedigrees to remain outdoors gives us more space for new born lambs.

We have had a busy few months at home as we were also converting a slatted shed used in the past for wintering cattle to house sheep. This is nearly finished and it is giving us great scope to get all sheep housed for the winter (310 ewes, 90 ewe lambs and 30 pedigree ewes). We are also getting ready for lambing and setting up individual lambing pens. The ewe and ewe lamb flock scanned well with about 205 twins, 50 triplets and 55 singles in the mature ewes with ewe lambs split roughly half and half with twins and singles. Lambing is tight and with these numbers having enough lambing pens is important.

We had 20 rams on straw for the last two months. 16 of these were ram lambs including 12 Texel's that will be sold as hogget in 2016 and two Charolais and two Suffolk rams lambs that were purchased last autumn. They have benefitted from housing and have recovered well after breeding. These will be let out to create extra space for lambing and supplemented with forage outdoors until grass growth kicks in.

Second year of college has been more interesting. There is still lots of tough science material but there is a better balance with agricultural topics such as nutrition and production systems. The course is enjoyable and most students have a lot in common so there is also a good social aspect to it.

A perspective on beef farming in Ireland

Robin Talbot,
beef farmer,
Ballacolla, Co. Laois

2015 was heralded as a dawn of a new era in the dairy sector with the abolition of milk quotas. Partly because of the changes in the dairy sector and partly because of changes in the marketplace, the beef sector is also in a state of flux.

I am the fifth generation of the Talbots to farm in Ballacolla, Co Laois. Up to the early 1980s, we had a range of enterprises, including a spring lambing ewe flock, tillage including sugar beet and buying store cattle to finish as beef. It was pretty typical of the time, except for the scale. The farm is 230ha which has been built up gradually by each generation. The soil type ranges from top quality tillage land down to some marginal summer grazing.

When it became obvious that our beef system was struggling to leave a margin, we decided to try suckling. We started by purchasing 25 heifers of non-descript breeds in local marts and ran a Hereford bull with them. I quickly realised that I loved working with the cows and I had always known that I didn't enjoy spending long spells in the marts. So we soon built up a spring-calving herd. This peaked at around 180 cows in the early 1990s.

The workload of lambing 400 ewes and calving 180 cows at the same time was not sustainable so, after much thought, we took the decision to get rid of the sheep and concentrate on the cows. Doing this meant we were able to convert the sheep sheds for cattle, which meant we could calve indoors rather than outdoors. Also, around this time, we were conscious of calving the spring herd in a set period of time. So, rather than culling off the late-calving cows, we started the nucleus of an autumn-calving herd. This was followed by a period of growth in cow numbers, which peaked at about 260, between autumn- and spring-calving. This was always a beef farm and, at this time, all the stock were taken through to beef.

At different times in the intervening period, we either took everything through to beef or sold the best of the bull weanlings for the export trade. We have always finished the heifers. In the first few years of the suckler herd, we castrated the males and finished them as steers. But, for more than 20 years, we have left them entire.

We found that calving cows in August/September was a lot easier than February/March so, over a period of time, we only brought replacements into the autumn herd so as the spring herd was decreasing the autumn herd was increasing. We ended up with 220 autumn calving cows and it has remained at that level for the last good few years. Over that period, we developed a preference for a Limousin cross cow. We found Limousins to be good cows to calve and to go back in calf again, all the while doing a good job rearing their offspring.

We have been crossing these cows with Belgian Blue bulls for a long number of years. This gave us the option of either taking them through to beef them or exporting them. We now, again, finish all our stock to beef. That's due to the introduction of the Quality Payment Scheme i.e. the grid. While it didn't meet with universal approval from all beef farmers, in our case, it has been very positive. It is the first time in a long time that, by increasing the quality of the stock we produce, we are also increasing the price paid per kg.

We have always endeavoured to go after the best available markets. We once sold heifers of a certain spec for the Superquinn chain of supermarkets. This was a big thing at the time and was the first occasion we heard mention of traceability, as the direct link between the farmer and the consumer. Originally there were about 20 suppliers in the scheme and, as has now become the norm, a brief biography of the supplying farmer was displayed at the point of sale. Another scheme we were involved in was the Keenan/Kepak (KK) Club which basically wanted pink meat with white fat for the Italian market. This was quite easily achieved by adding straw and limiting the amount of grass silage in the diet.

Following the 1992 BSE crisis, it became illegal to sell steak on the bone unless the animal was under 12 months of age and so, for a time, we supplied under 12 month beef, which was processed at the local factory. It was quite easy to get the heifers to the required level of fat cover but proved more challenging with the bulls. One thing all those markets had in common is that they paid a bonus for supplying the stock at the correct spec.

The future

Efficiencies are always improving and one of the key areas on any livestock farm is the amount of grass per ha that we can grow, which ultimately affects the amount of stock we can carry. But the economics will always win out, insofar as if it doesn't work for ten animals then it won't for 100 i.e. if you grow 10 ac of cereals and it loses money, growing 100 acres in the same manner is still going to lose money.

At the moment, we are finishing our bulls under 16 months and our heifers at 20 months. I think that system dovetails pretty snugly with an autumn-calving herd, from the point of view that, when the calves go out in the spring, they are the best equipped stock to utilise good quality grass. They will get a long grazing season and then you just bring them into the shed for a short quick finish.

But the worry for this system is all this talk about implementing the 380 kg weight limit. Why I say this is, regardless of what weight the finished carcase is, the cost of keeping the suckler cow for the year is still the same so the simple economics are that, if we have to sell a lighter carcase, we have to get paid more per kg.

Away from the whole area of economics these are exciting times in the beef industry at the moment, with the advent of genomics. Although we are not in the Beef Data and Genomics Programme (BDGP) because we were unwilling to commit to maintaining the required cow numbers for six years, I still believe that, if the industry is to move forward, we have to follow the science.

One of the major weaknesses in the beef production line is that there is no direct contact between the producer and the consumer. I firmly believe there is, and will continue to be, a demand for suckler beef, that ticks all the boxes in terms of telling the kind of story that appeals to consumers as well as in terms of welfare, traceability environmentally friendly production. We need to get to the stage where the industry and ultimately the consumer puts a value on that type of beef.

How do we go about that? Are producer groups the answer? I'd like to think they are a step in the right direction. Unfortunately we do not have a good track record of farmers pulling together as a collective, except in a reactive manner.

Our wholesome way of farming and food production cannot compete with large scale factory farming. My big worry is that beef farming might get sacrificed in the TTIP trade talks and that beef produced on a family farm would end up competing with beef produced on large feedlots on another continent. I don't believe that this is what consumers want and ultimately, no matter what we do, political decisions can have huge implications for family farming. It would be ironic if one of our strengths were to become one of our weaknesses. The rural economy of this country back in the 40s and 50s was built on an export trade of cattle. Now the fact that we export the beef from nine out of every ten animals that we produce seems to put us in a more vulnerable position.

Beef production from the dairy herd looks set to continue to rise for some time to come and there is plenty of evidence to suggest that a kill of 30,000 head per week is when the market seems to be in balance. Fall below that for a few weeks and prices will lift, go above it and prices tend to drop.

But I feel ultimately that we have to be positive about food production. We know the world population is increasing annually, people will always want food. The level of efficiency that you see around the country on a lot of farms means that, on a level playing pitch and given half a chance, we can compete with anybody.

Let's hope we get that chance.

Why is compact calving important in dairy herds and how can you achieve it?

Mary M. Herlihy, Eber Rojas Canadas, Jonathon Kenneally, Stephen T. Butler *Animal & Bioscience Research Department, Teagasc, Animal & Grassland Research and Innovation Centre, Moorepark, Fermoy, Co. Cork.*

Why is six week calving rate important?

In seasonal calving systems, the critical fertility key performance indicator is six week calving rate. The most profitable 10% of Irish dairy operations achieve the industry target six week calving rate of 90%. Every 1% increase in six week calving rate is worth Đ8.22 per cow in dairy herds. The breakdown of this figure is illustrated in Figure 1. Calving date captures the synchrony between feed demand and grass supply, and this accounts for more than half of the additional revenue.

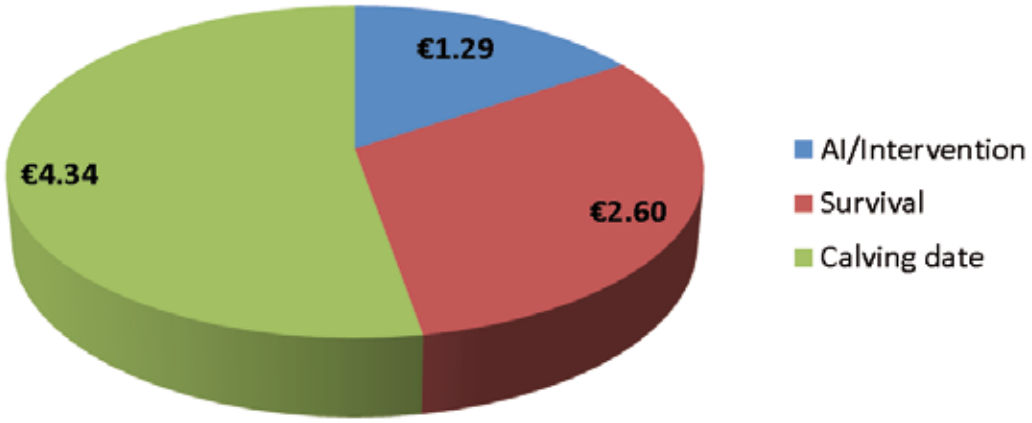


Figure 1. Breakdown of the additional revenue per cow associated with a 1% increase in six week calving rate. (Source: Shalloo et al., 2014)

The national average six week calving rate of 58% (ICBF, 2015). Increasing this figure to the industry target of 90% is worth an additional €263/cow/year, or €26,300 in a 100 cow herd. Clearly, a concentrated calving pattern is a key driver of profitability in a dairy herd. Achieving a compact calving pattern in spring is entirely dependent on achieving a high pregnancy rate within a short period following the planned start of mating. The objective of this article is to highlight the key factors that are important to achieve a high six week calving rate. Long term and short term strategies are discussed.

How to achieve a high six week calving rate

Breed cows with a high fertility sub-index

A study at Moorepark compared cows with similar genetic merit for milk production, but either good (Fert+) or poor (Fert-) genetic merit for fertility traits were assembled. These animals had similar proportions of Holstein genetics, and similar body weight, milk yield and milk composition. Fertility performance, however, was markedly poorer in the Fert- cows compared with the Fert+ cows. This is a brief summary of the main findings.

BCS and metabolic status

Fert+ cows maintained greater BCS during lactation and had reduced BCS loss after calving compared with Fert- cows. Maintenance of greater BCS in Fert+ cows is facilitated by greater dry matter intake during early lactation. Hence, selecting for EBI fertility sub-index improves the herd average BCS. Insulin-like growth factor-1 (IGF1) is an important metabolic hormone, and circulating concentrations of IGF1 are a good indicator of bioenergetic status. Circulating IGF1 concentrations are greater in Fert+ cows throughout lactation.

Uterine health

We examined uterine health in Fert+ and Fert- cows by assessing vaginal mucus scores weekly after calving and also by examining uterine cytology at three and six weeks postpartum. Both the vaginal mucus scores and uterine cytology results indicated greater incidence of clinical and sub-clinical endometritis in the Fert- cows.

Circulating progesterone
Circulating progesterone (P4) concentrations were 34% greater in Fert+ cows between day 5 and 13 after oestrus. Greater circulating P4 concentration accelerates the development of the early embryo, and hence increases the likelihood of subsequent pregnancy establishment.

Oestrous behaviour
Oestrus intensity and duration were greater in Fert+ cows compared with Fert- cows. In addition a greater proportion of Fert- cows had more silent heats (14% vs. 2%) and a greater proportion of Fert- cows displayed signs of oestrus, but subsequently failed to ovulate (22% vs. 0%).

Managing herd Body Condition Score

Body condition score (BCS) is expressed on a scale from 1 (emaciated) to 5 (extremely obese) with increments of 0.25. After calving, lactating dairy cows experience a rapid increase in milk yield, a slow rise in dry matter intake, and increased mobilisation of adipose tissue. Both BCS and BCS change can be used as an indirect measure of the energy status of an animal during the early postpartum period. Results from the Farm Fertility Study clearly demonstrated that cows in poor BCS at calving (←3.0) or cows that experience excessive BCS loss (→ 0.5 BCS) between calving and breeding are less likely to ovulate before the planned start of mating, have reduced submission rates to AI, reduced conception rates, and increased likelihood of pregnancy loss.

The key timepoints to assess BCS are indicated in Figure 2. After calving, lactation is the number one priority, and available nutrients are preferentially partitioned to the mammary gland. Therefore, if a cow is thin at calving, she will remain thin throughout early lactation and the breeding season. If a high proportion of the herd are below target BCS at the planned start of breeding, high submission rates will not be achieved. Cow management should focus on ensuring all cows are at the appropriate BCS at calving, and minimising BCS loss after calving.

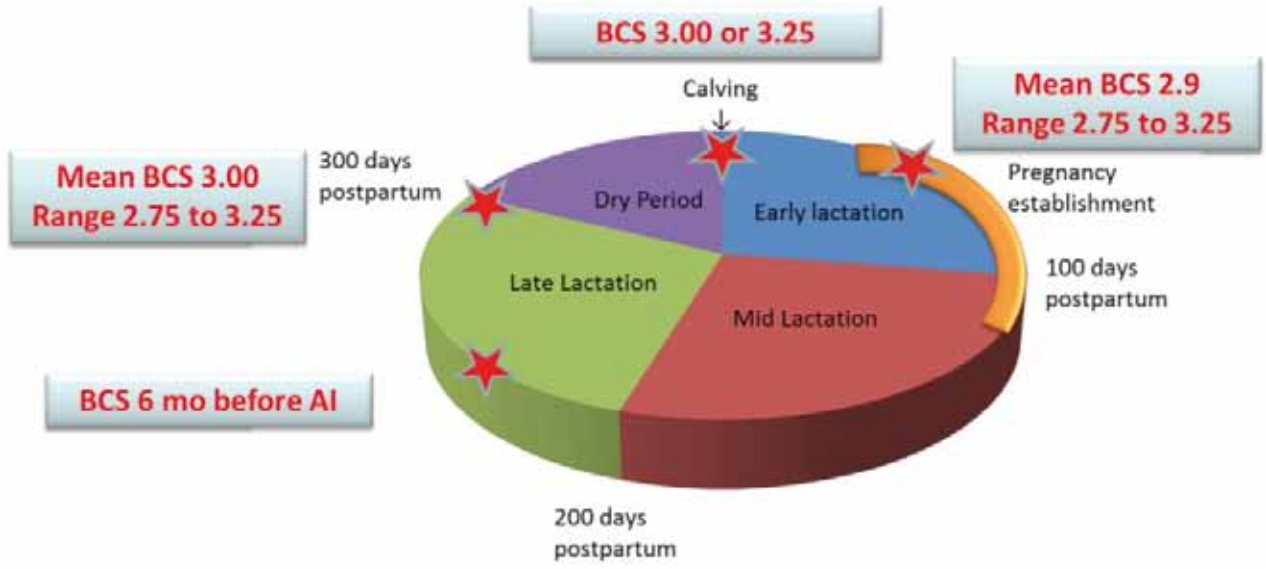


Figure 2. Key periods to assess BCS are indicated by ★. Herd average BCS targets for various stages of the gestation-lactation cycle are as follows (range in parenthesis): 1) Pre-calving: 3.00 or 3.25; Start of breeding: 2.90 (2.75-3.25); Drying off: 3.00 (2.75-3.25).

Interventions for non-cycling cows

Non-cycling cows should be treated with a timed AI program that begins 10 days before the mating start date so that the first AI occurs on the first day of the breeding season (Figure 3). A second round may be considered for later calving cows (i.e., start the protocol on day 11 of the breeding season with AI on day 21). Timed AI guarantees that treated cows will have 100% submission rate, and for cows that fail to conceive, the time of second AI will be advanced. Moorepark studies indicate that the timed AI protocol indicated in Figure 3 results in shorter intervals from calving to first service and from mating start date to conception.

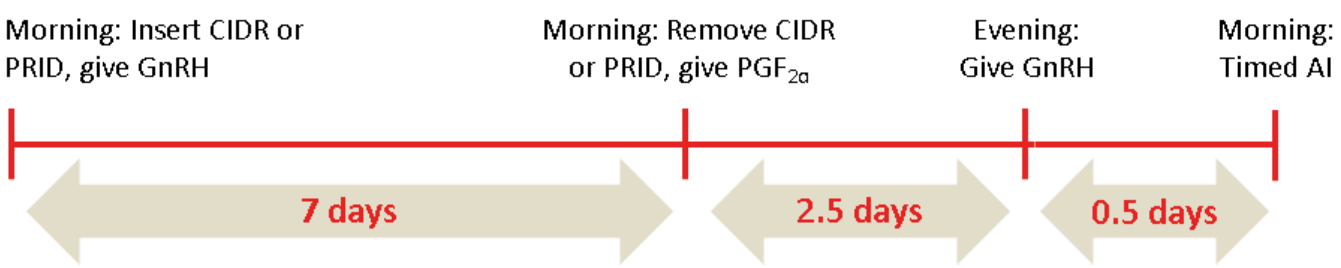


Figure 3. A 10 day progesterone-based timed AI program for use on lactating dairy cows. This program is suitable for cows that are at least 30 days calved.

Interventions for cows with clinical endometritis

From a practical perspective, the presence of clinical endometritis can be determined at one month before mating start date using a Metricheck device, which is specifically designed for vaginal mucus scoring (Figure 4). Intrauterine infusion of Metricure (cefaparin antibiotic) is an effective treatment for all cows with clinical endometritis that are at least 14 days calved. Prostaglandin $F_{2\alpha}$ is an effective treatment for cows with endometritis that are known to be cycling.

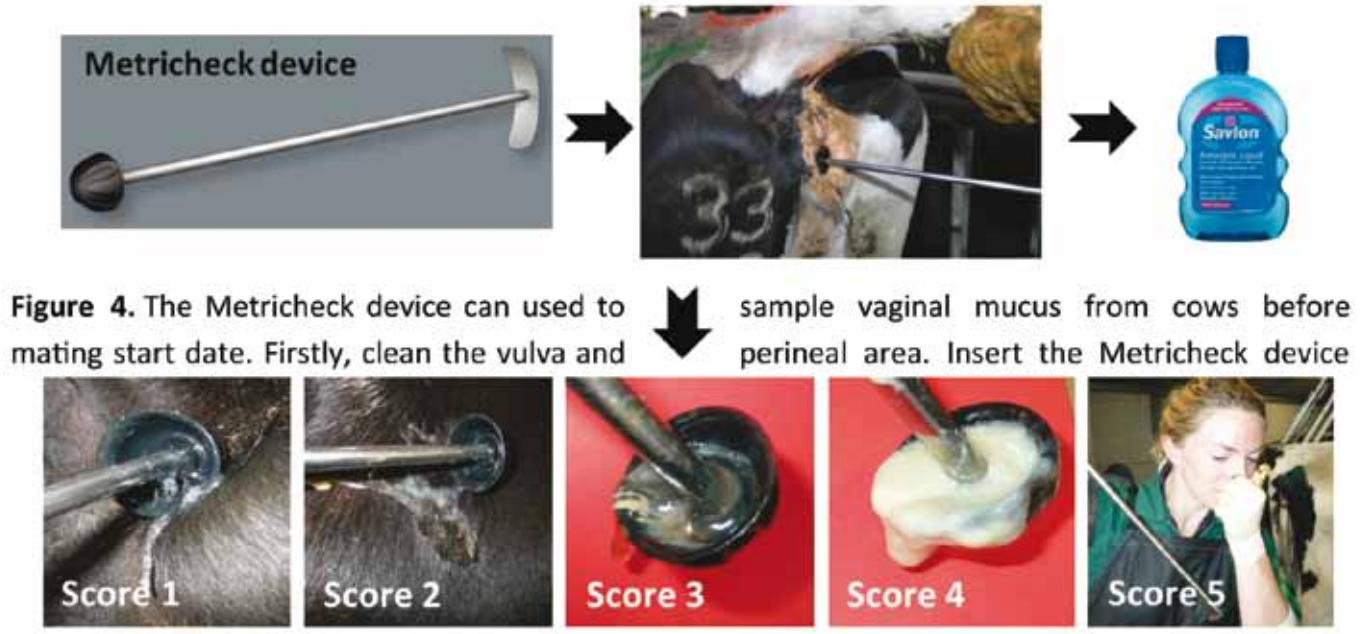


Figure 4. The Metricheck device can used to sample vaginal mucus from cows before mating start date. Firstly, clean the vulva and perineal area. Insert the Metricheck device into the vagina and advance it gently towards the anterior of the vagina, adjacent to the cervix. The Metricheck device should be retracted caudally to collect a sample of mucus from the floor of the vagina. Material within or adherent to the rubber cup should be scored as follows: 1 = clear and translucent mucus; 2 = mucus containing flecks of white or off-white pus; 3 = ← 50% white or off-white mucopurulent material; 4 = ↗ 50% white or off-white mucopurulent material; or 5 = ↗ 50% white or off-white mucopurulent material with fetid discharge. It is essential to sanitize the Metricheck device between cows.

Conclusions

The six week calving rate is a key driver of herd profitability. In the long term, improving the herd EBI fertility sub-index will contribute to improved fertility performance. In the short term, improving herd BCS management and timely use of appropriate interventions will result in faster pregnancy establishment after the breeding season begins, and consequently generate a more compact calving pattern. Both long term and short term strategies should be pursued.

Avoid becoming a statistic around calving time

Dr. Aoife Osborne, *FBD Lecturer in Farm Health & Safety, Agriculture and Food Science Centre, University College Dublin.*

Every year farmers and family members are killed or injured by cattle. In 2015, 22% of farm fatalities and 33% of all recorded farm accidents were livestock related. Attacks by recently calved cows have increased in recent years this accident cause has now surpassed bull attacks as the number one cause of livestock related deaths. This calls for particular vigilance while attending cows at calving time.

Calving can be an anxious time but advanced planning and preparation can reduce the stress levels of both farmers and animals and ensure a safer calving experience for all. Here are some suggestions on how to avoid accidents and injuries around calving time:

Calving facilities

Early preparation of calving facilities are essential. For calving indoors, the calving area should provide adequate space, be tidy and well-bedded with clean dry straw. Good lighting is vital for safety and efficiency in dealing with the birth. Calving cameras are a good way to check animals from a safe distance. Ensure all tripping hazards such as twines, rocks or pieces of timber are removed.

Well-designed calving pens and gates minimise the direct physical contact between the cow/heifer and the farmer. The facility should provide the farmer with easy access to both sides of the animal. Other desirable features would include areas to perform Caesarean sections and for the suckling of new born calves.

Cows and calving:

Cows and heifers are far more unpredictable during stressful periods such as calving and weaning. Suckler cows which are handled less frequently generally pose a greater risk, however, all cows with new born calves should be treated with caution. Continually aggressive cows should be culled. Aggressive behaviour can have a strong heritable component and it is good practice to have a breed improvement strategy in place with docility evaluation being placed as top priority.

Cows generally become very agitated directly after calving and it is recommended to leave the cow and calf alone for 20 to 30 minutes to bond. This will allow the cow to calm down. Never turn your back on cows with new born calves. She may perceive you as a threat and attack. Work practices such as taking a new born calf from a cow, hand milking, navel dipping and stomach tubing pose a risk of injury. Also be aware of zoonotic infections which can be contracted by farmers and vets around calving. Always wear arm length gloves and washable protective clothing and boots.

When handling cattle it is recommended to:

1. Keep a fully charged mobile phone in your pocket so you can call for help, if needed.
2. Have emergency numbers easily accessible on your mobile.
3. Think about what you will do if attacked or injured.
4. Assess the job before you start and get help if needed.
5. Ensure someone else knows where you are and when you expect to return.
6. Keep a First Aid kit handy in your vehicle or sheds, with supplies of plasters, bandages and disinfectant to treat minor cuts and grazes.
8. Keep feed reserves readily available in case temporary staff need to tend to your cattle if you are unable to do so for any reason.

Care of calves

Only intervene if necessary. After birth if you need to check or handle the calf, first safely put the cow back in the calving gate before you approach the calf. Horned cattle are a risk that is best controlled by

disbudding calves at a young age and it is recommended that this is done by three weeks of age. The main methods of disbudding calves are by cauterisation (heat) or by applying a caustic paste. Both of these methods have the capacity to create 'burns' to the operator so remember to take extra care during this procedure. Castration is a very important safety factor on all farms. Unless the farm is specifically raising bulls for breeding or beef then bull calves should be castrated. It should be done as early as possible.

Avoiding back injuries

Often it becomes necessary to lift a new born calf. This results in many back injuries to farmers. The key is to lift using your legs and to keep your back as straight as possible. To lift, squat down bedside the calf, pull it in close with one arm around the front and the other around the hind legs. Then straighten your knees to lift it. Hold it firmly and don't let it struggle loose. If you are moving it any distance tie the legs and put it in a barrow or trailer. Of course, consider cow attacks if the cow is in the same pen. Another important tool to have when calving is a calving jack. If properly used calving jacks can reduce the risk of back injuries. Mechanical lifting aids such as a pulley system in the calving pen can also prevent back injury.

Fatigue

Long hours, regular night work and broken sleep increases the risk of accidents during this busy time of the year. The risk of injury increases significantly when tired. Therefore, calving is a high risk time for all farmers. If you become very tired then you need to recognise that help is often needed to avoid the risk of injury.

Children

Never allow children become involved with cows during or after calving. Children as a group are at much greater risk compared to adults as they receive more severe injuries and lack the required skills and experience to recognise risk situations. Young children under seven years should never be allowed near livestock. Children over seven years need to be accompanied by an adult if approaching any livestock in sheds/fields, especially if cows with calves at foot are present.

Training and risk assessment

Continuing professional education in agriculture is important to update your knowledge and skills related to your professional life. Fatality and accident statistics relating to livestock suggest that farmers' knowledge of correct cattle handling is incomplete. Formal training courses in safe cattle handling are provided to clients and non-clients by organisations such as Teagasc (www.teagasc.ie) and the FRS Network (www.frstraining.com).

At the beginning of each year it is important to review your Farm Safety Risk Assessment document. Identifying hazards and taking remedial action, combined with adopting safe behaviour, are the proven ways of cutting farm accident risk. Teagasc plan to increase the number of half –day risk assessment training courses throughout the country during the spring and booking can be made at any Teagasc office.

Note: The document 'Guidance on the Safe Handling of Cattle on Farms' was used to inform this passage this can be viewed in its entirety on www.hsa.ie.

DATES FOR YOUR DIARY 2016

Beef Conference
Wednesday 27th April
Radisson Hotel Limerick

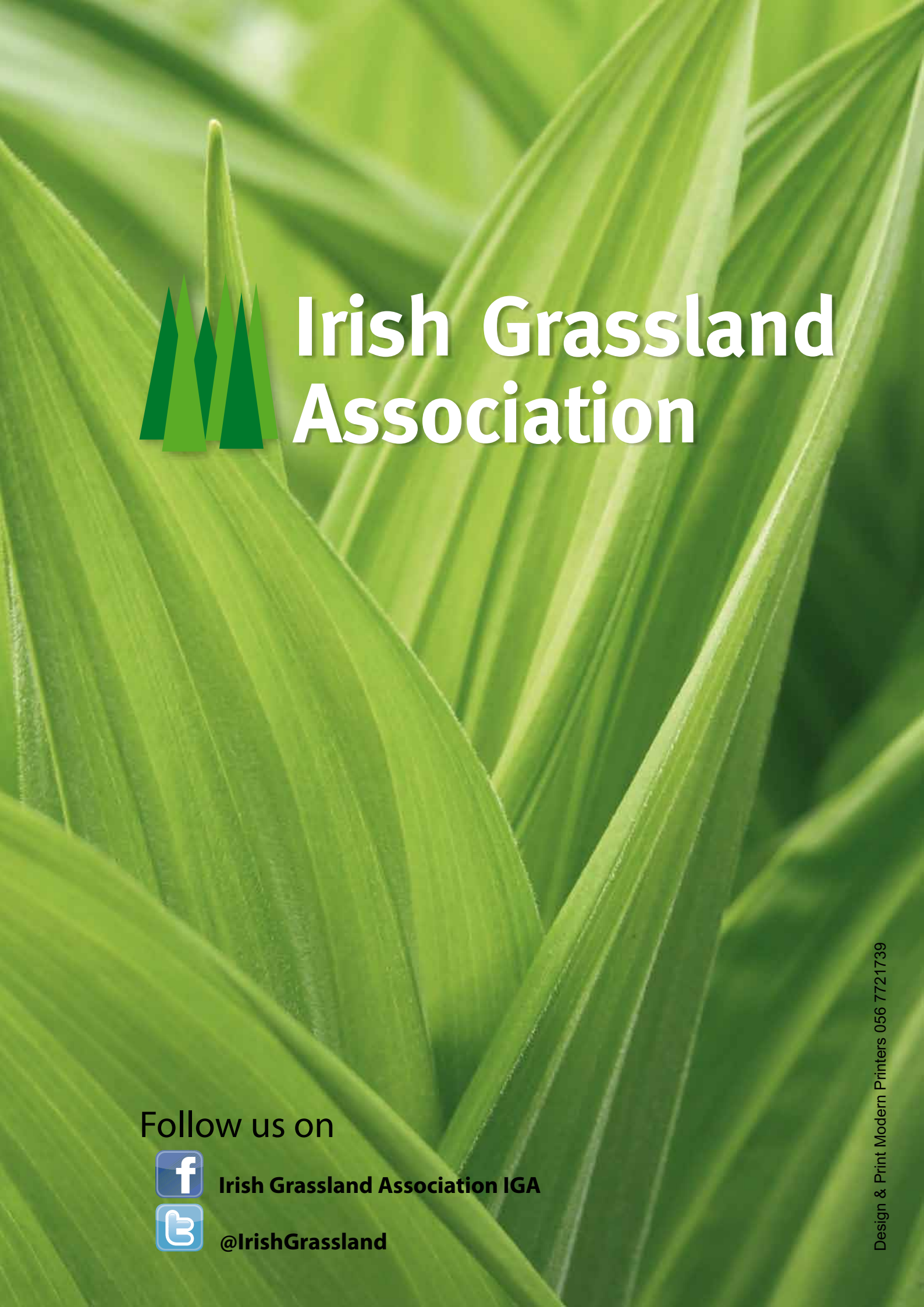
Irish Grassland Association
Dairy Summer Tour
20th July 2016

Sponsored by AIB

Sheep Conference and Farm Walk
Tuesday 26th April
Lawless Hotel Aughrim Co. Wicklow

Sponsored by FBD Trust

Student Conference
Monday 10th October
Kildalton Agricultural College



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