TEAGASC

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Today's Farm

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

MEET US AT MOOREPARK ON 4 JULY

Teagasc Moorepark 17 Focus including:

teagasc

Agriculture and Food Development Authority

Often copied, never matched

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FRAGMENTATION

Cork farmer creates viable business from fragmented farm

>> 18

Jack Hallahan with Teagasc advisor Tim O'Donovan.

Today's farm is a bi-monthly publication produced in a joint venture between Teagasc and the Agricultural Trust, publishers of the *Irish Farmers Journal* and *The Irish Field*.

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Cover | Walsh Fellow Jessica Anna Werner is a researcher and PhD student at Teagasc Moorepark. Using these collars, she's able to track cow feeding and rumination time. To learn more about a vast range of topics related to dairy farming come to Teagasc Moorepark on 4 July.

COMMENT

Mark Moore
Editor,
Today's Farm

Moorepark 2017

One key theme of the Teagasc Moorepark open day on 4 July will be working with, and managing, people. This theme is not just for dairy farmers. In the past, many farms could support several family members who worked closely together. The Halpenny brothers featured in our article on potatoes are a good example.

Today, many farmers work alone on ever more intensive farm units. Partnerships or employing a staff member can help restore some work-life balance (see Tom Curran's article on pages 32 and 33).

This often requires new skills and knowledge, topics which will be addressed at Moorepark. So dairy farmers, those thinking about dairying, and farmers in many other enterprises will find something of value at the open day. See you there.

An Chloch Liath 2017

Is é an príomhthéama a bheidh ag lá oscailte na Cloiche Léithe ar an 4ú Iúil, a ritheann Teagasc faoi dhó sa bhliain, ná oibriú le daoine agus bainistíocht a dhéanamh orthu. Tá an téama seo chun tosaigh freisin san eagrán seo. San am atá thart, bhíodh go leor feirmeacha in ann slí bheatha a thabhairt do roinnt daoine sa chlann nuair a bhídís ag obair i dteannta a chéile. Is sampla maith iad na deartháireacha Halpenny ar rinneadh trácht orthu san alt a bhí againn ar phrátaí. Mar sin féin oibríonn go leor feirmeoirí astu féin sa lá atá inniu ann ar aonaid feirme atá ag éirí níos déine an t-am ar fad. Chabhródh compháirtíochtaí nó ball foirne a fhostú le cothromaíocht oibre/saoil a thabhairt ar ais (féach an t-alt le Tom Curran). Ach is minic go mbíonn gá le scileanna nua agus le topaicí eolais faoina choinne sin, agus tabharfar aghaidh orthu sin sa Chloch Liath.

Moorepark open day a date for the diary

- **Date:** 4 July 2017.
- **Event time:** 10am.
- **Venue:** Moorepark, Fermoy, Co Cork.

Resilient technologies

PRINCIPLES OF RESILIENT DAIRYING
- Key technical efficiency drivers.
- Sustainable production systems.
- Maintaining financial resilience.

PEOPLE FIRST
- Making dairy farming an attractive career.
- Managing larger herds more efficiently.
- Creating a work-life balance.

FEEDING THE MODERN COW AT PASTURE
- Understanding what the cow requires.
- Managing high-performing pastures.
- Growing 15t of grass DM.

THE PERFECT COW
- High EBI.
- 90% calving in six weeks.
- Crossbreeding – does it have a role?

GRAZING DEMO
- PastureBase Ireland.
- Pasture wedge.
- Increasing pasture utilisation.

Technology villages

GRASS10
- Pasture production and utilisation.
- Benefits of optimum soil fertility.
- Pasture profit index.

ADVANCING GENETIC GAIN
- Genomic technologies.
- Next Generation Herd.
- Sexed semen.

PROFITABLE SYSTEMS OF MILK PRODUCTION
- Key drivers of farm profitability.
- Financial planning.
- Increasing farm sustainability.

HEALTHY COW – HEALTHY MILK
- Reducing the use of antibiotics.
- Rearing healthy calves.
- New cleaning protocols for milking machines and bulk tanks.

INVESTING IN PEOPLE
- Succession planning – engaging the next generation.
- A year in the life of a dairy farmer.
- Planning your labour requirements.

DAIRY FARM INFRASTRUCTURE
- Layout of a dairy farm.
- Infrastructure for efficient grazing.
- Reducing time spent milking.

KEEPING YOURSELF SAFE ON THE FARM
- Making the farm a safe place to work.
- Working with machinery and animals.
- Increasing personal wellbeing.

Highlights

SPECIAL FORUM
- There will be two Q&A panel discussions facilitated by Sharon Ní Bheoláin from *RTÉ Six One News*. The first panel discussion will examine Brexit and Irish dairying, and will include

Upcoming events

Date	Event	Location
27 June	Teagasc/AHI Beef Health Event	Andy Boylan, Carrickmacross, Co Monaghan
29 June	Teagasc/AHI Beef Health Event	Walter Cleary, Kilmacow, Waterford
4 July	Teagasc National Dairy Open Day	Moorepark, Fermoy
5 July	Agri-Tech Symposium	Horse and Jockey, Thurles, Co Tipperary
6 July	Teagasc Green Acres Calf to Beef Walk	Christy Dowd, Co Roscommon
7 July:	Teagasc/AHI Beef Health Event	David & Peter Killwen, Labadish, Manorcunningham, Co Donegal
11 July	Teagasc/AHI Beef Health Event	John Pringle, Aughrim, Co Wicklow (see p23)
12 July	BETTER Sheep Event	Thomas O'Leary, Co Kerry
19 July	BETTER Sheep Event	John O'Connell, Co Leitrim
26 July	BETTER Sheep Event	Brian Nicholson, Co Kilkenny
13 Aug	Teagasc exhibits, Tullamore Show	Tullamore, Co Offaly
22 Aug	Energy in Agriculture 2017	Gurteen Agricultural College
31 Aug	Talking Timber - timber marketing event	Teagasc Ballyhaise College

Marion Beecher, Teagasc, speaking at the last Teagasc Moorepark open day in 2015.

panellists such as the Minister for Agriculture, Food and Marine Michael Creed TD, and other key stakeholders in the dairy industry. The second panel discussion will ask "How attractive is a career in dairy farming?".

LIVE DEMONSTRATIONS AND WORKSHOPS

• Demonstrations on grazing management, reseeding, farm infrastructure, body condition scoring and locomotion scoring, calf-rearing, high EBI genetics, and health and safety will take place throughout the day. There will be workshops on strategic management, milk quality, new entrants to dairy farming and labour management. A number of national and international experts have accepted invitations to participate in the workshops.

RESEARCH TO ADOPTION: EXTENSION METHODS

• A wide range of extension methodologies are employed to transfer research to dairy farmers. These include discussion groups, farm walks, seminars, newsletters and short courses on financial management, breeding and grassland. Information on how to avail of these programmes will be available on the day.

INDUSTRY PARTNERSHIP

• Industry experts from ICBF, AHI, DAFM, AgriAware, Ornua and UCD will be present on the day to discuss individual farmer queries.

Teagasc at Bloom

Teagasc, in association with Pieta House, won a gold medal for best medium show garden at Bloom in the Phoenix Park. This was followed with the Best in Category award for the garden and a third gold medal for the separate Teagasc education and advisory exhibition (number 28) in the floral pavilion. The Teagasc exhibit also came first in a "People's Choice" category voted for by members of the public.

Teagasc designers Laura Cassin, Louise Jones and Linda Murphy combined their talents to come up with the show garden design to reflect the Pieta House theme of darkness into light and enlisted the expert help of Teagasc landscape construction specialist Paddy Smith and horticultural staff and students from across the organisation to deliver the garden.

"We in Teagasc are delighted and proud to be able to increase awareness about the services offered by Pieta house through this garden. The fact that it has achieved gold will further highlight the Pieta House message it supports," according to Dermot Callaghan, head of the horticulture development department at Teagasc.

Speaking at Bloom, John Mulhern, principal of the Teagasc College of Amenity Horticulture at the National Botanic Gardens, said: "It is a huge endorsement of the talent that we have in Teagasc that our colleagues have been rewarded with winning displays at Ireland's premier horticultural and gardening show."

Teagasc designers Laura Cassin, Louise Jones and Linda Murphy combined their talents to come up with the show garden design to reflect the Pieta House theme of darkness into light.

Win a 200 EBI heifer calf

Naturally, Teagasc is present on Facebook. In connection with Moorepark '17 (which is featured extensively in this edition) we have created a Facebook page directly associated with the event. On this page, you can read about preparations for the big day and also research going on at Moorepark.

To add some fun, competitions are a feature of the page. In the ultimate competition, you will be able to enter to win a young heifer calf with an EBI score of 200. All you have to do is search for "Teagasc Moorepark" on Facebook or type in the link https://www.facebook.com/teagascmoorepark/. The competition, which will take place in the week before the open day, is open to all. To be eligible to win the calf, you must have a herd number.

To be eligible to win the calf, you must have a herd number.

Teagasc/UCD Michael Smurfit business strategy course in autumn

The Teagasc/UCD Michael Smurfit course in business strategy, which will take place this autumn has generated strong interest but a small number of places are still available. If you would like to participate (see also the May-June edition of *Today's Farm*) please contact mark.moore@teagasc.ie. Alternatively, call 087 4179131.

Large crowds in attendance at a previous Moorepark open day forum.

Moorepark open day forum 2017

The Moorepark open day forum will take place at 2pm in the open day marquee

This year, the Moorepark open day forum will be chaired by Sharon Ní Bheoláin from RTÉ and will include two separate panel discussions on key issues facing the Irish dairy industry.

Panel one: Brexit and Irish dairying

•**Panellists:** Minister for Agriculture, Food and the Marine, Michael Creed TD, Prof Colm McCarthy (UCD), Prof Gerry Boyle (Teagasc) and Kevin Lane (Ornua).

The UK is Ireland's largest market for food and drink, accounting for 41% of Irish food and drink exports, valued at €4.4bn in 2015 and has been a strong growth market in recent years. Between 2010 and 2015, Irish exports to the UK increased by €1bn largely driven by increased meat exports.

The UK accounts for around 54% of total Irish meat and livestock exports, 30% of dairy, 70% of prepared consumer foods and 30% of beverage exports. Irish dairy is the fastest-growing agri-food industry in the EU, delivering jobs and wealth to rural Ireland, growing by almost a quarter since the end of EU quotas in 2015.

Up to 65% of Ireland's cheddar cheese exports go to the UK, while large shipments of butter and infant formula are also exported to the market. Already, Brexit and the related significant sterling depreciation have resulted in a fall of 12% in UK cheddar imports. Industry experts have forecast a rise in regulatory and administrative costs in the event of a Brexit, while potential WTO tariffs may cost in excess of €130m per year.

The effect of Brexit on trade is likely to be substantial with the combination of potentially high-tariff barriers on food exports, resulting in a 40% reduction in dairy exports to the UK. In addition, increased complexity of trading and restrictions in transit through the UK would add to costs for Irish exporters.

The panel will provide views of what they believe to be the immediate and longer-term effects of Brexit for the Irish dairy sector and what the industry (Government/food processors/ farmers) can do to prepare for any adverse effects.

Panel two: how attractive is a career in dairy farming?

•**Panellists:** Padraig Walshe (dairy farmer and former IFA president), Billy Curtin (dairy farmer), Ann Moore (dairy farmer), Gillian O'Sullivan (dairy farmer) and David Kerr (dairy farmer).

Food Wise 2025 highlights the importance of people and career development on farms to build management capacity and attract, retain and develop more people to the industry in the future.

Despite its importance, anecdotal evidence suggests that many dairy farmers lack the people management skills to make this transition effectively and consequently, staffing on dairy farms can be problematic.

An estimated 6,000 people are needed to enter the Irish dairy industry at farm level over the next eight years to replace retiring farmers and meet the additional workload arising from expansion of the national herd. National cow numbers have already increased by over 300,000 cows since 2010 and are expected to grow by a further 250,000 to 1.6m by 2025.

Almost 50% of Ireland's dairy cows are now milked in herds of 100 cows or greater and will require hired help in addition to family labour. Dairy expansion and this requirement for people means there are now exciting career opportunities in Irish dairying. With improving national economic conditions, the dairy industry will have to work particularly hard to attract the next generation of young people into dairying.

Young people today have different work expectations to previous generations. To attract people to these careers, they must be rewarding and enjoyable and remunerate those employed to levels consistent with other trades within a recovering economy. To that end, ensuring that dairy farms are enjoyable places to work (e.g. via work rosters, efficient work practices and labour-efficient facilities, etc) must become just as important as technical efficiency.

The panel will discuss the challenges of achieving a satisfactory work-life balance as dairy farmers and what steps they have taken to streamline workload. The panel will also discuss the steps farmers can take to make dairy farming a more attractive career for young people.

Next Generation Herd shows benefits of crossbreeding

Frank Buckley
Teagasc Animal and Grassland Research & Innovation Programme

A huge amount of research has been conducted at Teagasc Moorepark, and internationally, evaluating the performance benefits from crossbreeding in the dairy herd. The results consistently demonstrate that high EBI crossbred dairy cattle outperform high-EBI purebred contemporaries, both within research studies and on commercial dairy farms.

The economic advantage is €100 to €150/cow per lactation in addition to that explained by EBI. This is a consequence of better fertility and longevity, as well as greater herd productivity compared with the average performance of the purebred parents.

The Jersey breed offers particular advantages for crossbreeding in Ireland due to many favourable characteristics: small size, moderate yield coupled with very high milk fat and protein content, high intake capacity, superior feed efficiency and compatibility with a pasture-based system.

These characteristics complement the higher-yielding Holstein Friesian breed. The genetic distance between the Holstein Friesian and Jersey results in a greater expression of hybrid vigour, compared with crosses of more closely related breeds.

Crossbreeding research at Moorepark

From 2006 to 2010, a study including Jersey, Holstein Friesian and Jersey Holstein Friesian crossbred cows identified clear benefits from crossbreeding. The proportion of cows pregnant to first service (+21%), in-calf after six weeks breeding (+19%) and in-calf after 13 weeks breeding (+8%) was considerably higher for the Jersey × Holstein-Friesian compared with Holstein-Friesian (and pure Jersey cows).

The economic analyses [incorporating differences in cull cow and male calf value] showed that a herd of Jersey × Holstein-Friesian cows was 48% more profitable than a herd of either of the parent breeds. On a per-cow basis, the improved profit equated to over €180/cow per lactation.

More recently (2013 to 2016), crossbred cows have been incorporated into a comparative stocking rate study at Teagasc's Curtin's Research Farm. The EBI value of both the Holstein Friesian and crossbred cows was similar at approximately €130 (ICBF, May 2017).

The Jersey crossbred cows delivered an additional 70kg/ha annually. Economic analysis has not been completed but it is clear that there is a definite advantage in favour of the Jersey crossbred cows exists.

At Teagasc Clonakilty Agricultural College, the research being conducted is primarily concerned with evaluating the benefits of incorporating clover in the grazing sward but does include a comparison between Jersey × Holstein-Friesian and straight Holstein Friesians.

The EBI of both groups of cows is similar (€120 and €105). The Jersey crossbred cows are delivering more milk solids per cow per lactation (466kg v 455kg). They are 10% lighter (-51kg), had 15 percentage units higher pregnancy rate to first service, and five percentage units higher six-week in-calf rate. An economic analysis has indicated a €100/ha advantage to the Jersey crossbred cows.

Our most recent research, an analysis of 40 commercial dairy herds with data from 2010 to 2012, represents the first evaluation of crossbred and straight bred cattle within commercial high EBI dairy herds.

The results are in line with the research findings from Teagasc research herds: high EBI Jersey × Holstein Friesian cows produced 25kg more milk solids per cow per year than the mean of high EBI purebred Holstein Friesian and Jersey purebred equivalents. The crossbred cattle also achieved a 7.5-day shorter calving interval within these herds.

A similar piece of research conducted during development of the "culling" or "cow" index found that crossbred cows had a nine-day shorter calving interval, a 6% greater pregnancy rate in the first six weeks of the breeding season and a 3% greater survival rate to

Frank Buckley.

Pictured are cows in the Next Generation dairy herd.

the next lactation. Lifetime financial heterosis was estimated to be just under €550.

Jersey intake capacity

Jersey cows consume approximately 4% of their bodyweight in grass DM daily compared with 3.4% for the Holstein Friesian and 3.65% for the Jersey crossbred cows.

The implication of this is that Jersey and Jersey crossbred cows tend to produce higher yields of milk solids relative to their body weight. This facilitates the higher productivity per hectare achieved with the Jersey and Jersey crossbred cows in the studies outlined above.

Detailed anatomical investigations conducted on animals post-slaughter revealed the physiological mechanisms underpinning the differences in intake capacity observed, which tended to be more physical than metabolic in nature.

Next Generation Herd

In Ireland, the Holstein Friesian breeding programme continues to increase the rate of genetic gain (increasing EBI) due to our national breeding programme and the application of genomic technology. The rate of gain in Jersey genetics is lower, raising questions about the relevance of crossbreeding in Ireland.

A nucleus Jersey herd of elite Jersey cows has been established at Moorepark. This initiative has been driven by:

- The opportunity to exploit the Jersey breed, and its proven synergy with our intensive, seasonal, pasture-based production and dairy product portfolio.
- The extra performance and profit to be gained from capitalising on hybrid vigour in addition to genetic improvement via EBI.
- The absence of an Irish Jersey breeding programme, and consequent reliance on imported Jersey genetics.
- The long-term requirement to continually evaluate high-EBI Jersey genetics in Ireland.
- The requirement to generate high-EBI Jersey sires to complement our successful "black and white" selection programme.

The herd has been established with genetics sourced from different breeding programmes around the world (primarily New Zealand and Denmark). The herd comprises 100 lactating cows, and there are plans to expand the resource.

Ultimately, the success of this initiative will depend on the level of demand for Jersey genetics at commercial farm level. Irish dairy farmers must be willing to embrace the programme by progeny testing the best young test sires that will emerge. This is a vital step to further advance genetic progress within crossbred dairy herds.

Key messages

- Crossbreeding with Jersey has the potential to markedly increase milk solids output and herd productivity on Irish dairy farms.
- A Nucleus Jersey herd of elite Jersey genetics has been established at Teagasc Moorepark to evaluate/validate 'high EBI' Jersey genetics. This herd will also generate a supply of high EBI Jersey sires for the Irish dairy industry.

Moorepark focus

Taking a people-first

Paidi Kelly and Abigail Ryan
Teagasc Animal and Grassland Research & Innovation Programme

There will be a wide variety of people-focused topics featured at the Moorepark Open Day.

Key questions addressed will include:

- How can I make my farm more labour efficient and have a better work/life balance while still running a profitable farm business?
- How many cows can one person manage?
- How can I become a better employer, attracting and retaining good people?
- What is the best way to bring the next generation into the business?
- How do collaborative farming models work, and what are the benefits?
- Is it worth converting my farm to dairying?
- What kinds of career opportunities exist in Irish dairying for people without farms?

> "The infrastructure village will include a number of different boards on how farms can be set up to maximise labour efficiency

These topics will be dealt with in a variety of ways. The main board, which all visitors encounter, will feature aspects of the recently launched "People in Dairy" project report, which outlines the need for 6,000 people to enter Irish dairy farming by 2025.

Future expansion

The People in Dairy report outlines a framework for future expansion focused on making dairy farming an attractive career which can compete with other sectors.

A key aspect of this is making farms enjoyable places to work by improving labour efficiency and work practices. Ensuring that every person working on Irish dairy farms including owner-operators are taking on sustainable workloads is crucial for the sector and has become a big challenge with the recent surge in cow numbers across the country.

approach to dairying

As dairy herds grow in size, many farmers are becoming employers for the first time.

Attractions at the People Village

FORUM ONE: New entrants/ dairy conversions

The New Entrant Forum is bound to be of interest to anyone not currently in dairy farming. This is where you can hear first-hand from new entrant dairy farmers. They will describe and discuss the lessons they've learned from their own conversion experience.

Some of these farmers have been dairy farming for a number of years; some started in the last two years; others have just bought heifers and plan to start milking in 2018. Converting to dairying can require substantial investment and a new range of skills. During the forum, which will be run twice during the day, attendees can hear first-hand how these new entrants managed this process. They will discuss both what they got right and what they got wrong!

These farmers will be available to meet on a one-to-one basis in the private dairy conversion marquee throughout the day. Dr Roberta McDonald from Aurivo will chair both forums.

FORUM TWO: Labour management/ training the employer

Justine Deming, a PhD student in Moorepark, will outline her recent findings from a labour study on some of Ireland's most labour-efficient farmers. Dr Nollaig Heffernan who works as a consultant with businesses all over the world, including dairy farmers, about how to manage people will share her insights.

Many farmers have questions about how to recruit, manage and retain good people. Nollaig will outline the key aspects of successfully employing someone in your business. Both Nollaig and Justine will discuss potential solutions to managing the spring workload from a labour efficiency and people management point of view.

This forum will also run twice during the day and will be chaired by John McNamara, a Teagasc dairy advisor in west Cork. John is coordinating the Shinaugh Dairy Farm Project in Bandon, Co Cork. The times of the forums will be announced on the day.

The big labour wall

One of the major challenges farmers have encountered in recent years with expansion is managing the workload associated with larger herds. With half the cows in Ireland now milked in herds of more than 100 cows, labour efficiency is central to a successful farm business.

As part of the village, Teagasc dairy specialist Pat Clarke will answer questions about labour efficiency. Pat will outline a number of practical labour saving ideas which will be displayed on a 'labour-saving ideas wall'. This promises to be a lot of fun with a number of ideas for how time can be better spent, both inside and outside the farm gate.

Other key boards

Teagasc collaborative farming specialist Tom Curran will be in the village to discuss opportunities such as partnerships, share farming, leasing and contract-rearing. Researcher Dr Tomas Russell and specialist James McDonnell will also be on hand to discuss succession management within a farming business.

Teagasc beef advisor Tom Coll, who has a special discussion group of farmers who are contract-rearing heifers, will be there with one of the members to provide more insight on this topic. These three stands will be of interest to anyone considering collaborative farming models to grow their business. Alternatively, someone might be looking to "take a step back" by working with a farmer in a calf-rearing arrangement.

Dr Marion Beecher, who is coordinating the professional farm managers' course in Moorepark, will be present to discuss career options in dairying and training opportunities for the next-generation farmer.

Dr Niall O'Leary who recently joined Moorepark to work on the dairy precision project, will discuss his recent studies which have shown that farmer attributes and behaviour can predict farm profitability.

People focus in other villages

Farmers interested in learning more about strategic planning should make sure to visit Tom O'Dwyer and New Zealand consultant Lynaire Ryan in the profitable farm systems village. They will be running an interactive session on the importance of strategic planning and giving practical tips on how to start planning strategically in your own business.

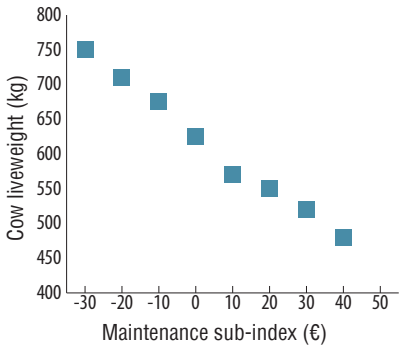
The infrastructure village will include a number of different boards on how farms can be set up to maximise labour efficiency. All of these ideas have been summarised in a booklet on efficient farm infrastructure, which will be available on the day. This booklet covers many aspects of how to improve labour efficiency with a particular focus on all aspects of the milking routine and paddock infrastructure.

Justine Deming says farmers should aim to finish earlier in the evenings.

EBI and its components reflect superior performance

Sinead McParland[1], George Ramsbottom[2], Andrew Cromie[3], John McCarthy[3], Kevin Downing[3] and Donagh Berry[1]
[1]Teagasc, Animal & Grassland Research and Innovation Centre, Moorepark, Fermoy, Co Cork
[2]Teagasc, Oak Park, Co Carlow
[3]Irish Cattle Breeding Federation, Bandon, Co Cork

Figure 1
Mean cow liveweight across different maintenance sub-index values



There are two strategies to validate breeding indexes and their component traits. One is to compare animals divergent for genetic merit within a controlled experiment, such as in the Next Generation Herd.

A second approach is to compare the performance of a large database of herds, or animals, differing in genetic merit.

The Next Generation Herd and the high-low cow fertility study have clearly documented the range of performance that can be achieved in animals divergent for EBI and fertility, respectively.

Evaluated here, using herd data, is the degree to which herd EBI and performance concur; also evaluated, using cow data, is the concordance between genetic merit for milk production and actual cow output. Finally, we look at the relationship between the maintenance sub-index and cow liveweight.

Key messages

- Each unit change in herd EBI translates to €1.946 profit per lactation in Holstein Friesian dairy cows, which is as expected.
- Animals with a higher maintenance sub-index (i.e., genetically lighter) are indeed lighter animals.
- Progeny from sires of higher genetic merit for milk production and composition do indeed produce more milk of greater composition.

EBI and profit

Access to Teagasc eProfit Monitor data provides a unique opportunity to validate if herd EBI translates into more profit per cow. A €1 difference in herd EBI is expected to translate to an extra €2 profit per cow.

Using data from more than 1,000 eProfit Monitor herds between 2008 and 2011, a €1 difference in herd EBI was associated with a €1.94 extra net profit per cow in spring calving Holstein Friesian herds.

The analysis was recently re-run using data from 2012 to 2016 in spring calving herds where EBI data were available on more than 70% of cows; at least 90% of the genetics of the herd had to be Holstein Friesian to remove any confounding of heterosis which is not captured in the EBI.

Based on these most recent years, a €1 change in herd EBI was associated with €1.96 net profit per cow; account was taken of the year, herd mean stocking rate and the level of concentrates fed per cow as well as using a standard A+B-C milk pricing system across the whole country.

This new and more recent-based analysis further supports the results from the Next Generation Herd that higher EBI equates to more profit.

Milk production

Research studies from Teagasc Moorepark have clearly shown that animals genetically divergent for calving interval subsequently have dramatically different fertility performance. However, no study has attempted to validate if genetic merit for milk production translates into a difference in milk production.

Data from more than 200,000 lactations on over 3,000 Irish dairy herds were collated over the years 2012 to 2014 (i.e. pre-quota) and the lactation yields and composition of each cow was compared to the respective genetic merit of the sire.

We expect a one-unit difference in sire genetic merit to translate into a one unit difference in cow performance in an unrestricted environment. The results of the analysis are in Table 1.

Access to Teagasc eProfit Monitor data provides a unique opportunity to validate if herd EBI translates into more profit per cow.

Table 1 shows that a one-unit increase in sire genetic merit for milk yield translates to just a 0.59kg increase in daughter milk yield across all parities; the associated increase was less in first parity animals.

The change in daughter performance for milk composition per respective change in sire genetic merit for milk composition was greater. These results are not unexpected.

Firstly, milk quota restricted the yields that could be achieved and thus the benefit of genetic improvement in milk production was not being fully realised on the average Irish farm.

This implies that there was (and probably still is) ample genetic merit for milk production in Irish dairy cows. The lower response in first-parity cows compared with older cows is simply an artefact of their respective stage of maturity.

Genetic evaluations are based on the national herd which is dominated by older cows. Mature cows yield 22% more than first-parity cows and so genetic improvement is more fully realised in older cows signifying the importance of survival in realising genetic gain.

This is substantiated by a lesser parity difference in milk composition.

Table 1: Mean increase (standard error) in performance per cow per one unit respective increase in sire genetic merit

	Milk (kg)	Fat (kg)	Protein (kg)	Fat (%)	Protein (%)
Average	0.59(0.01)	0.61(0.01)	0.48(0.01)	0.79(0.01)	0.73(0.01)
Parity 1	0.48(0.01)	0.45(0.01)	0.39(0.01)	0.73(0.01)	0.66(0.01)
Parity 2	0.67(0.01)	0.73(0.01)	0.56(0.01)	0.84(0.01)	0.80(0.01)
Parity 3	0.87(0.02)	0.98(0.02)	0.73(0.02)	0.89(0.01)	0.88(0.01)

Maintenance

The maintenance sub-index within the EBI is calculated from the carcase weight of slaughtered cull cows multiplied by an economic value of -€1.65.

A question that is often asked is: how do differences in maintenance sub-index translate to differences in cow liveweight? To answer this, 22,705 liveweight records from cows sold singly in livestock marts in 2016 were used.

Adjustments were made for the herd the cow originated from, as well as the parity of the cow, days since last calving, and the calendar month of the year.

The mean liveweight of cows within €10 brackets of maintenance sub-index is presented in Figure 1. Each €10 increase in cow maintenance sub-index was associated with 41.6kg lighter cow liveweight.

Similarly, each unit increase in cull cow weight genetic merit was associated with a 3.4 kg increase in liveweight. Assuming a kill-out of 45%, one would expect the latter value to be 2.2 kg.

Sexed semen: grow your dairy herd and increase beef output

Craig Murphy
Animal and Grassland Research and Innovation Centre,Teagasc, Moorepark, Fermoy, Co Cork

Global demand for milk and meat protein will necessitate greater numbers of dairy cows and more efficient beef production from the dairy herd. Sexed semen may be a useful technology to rapidly increase dairy heifer calf inventory, while also facilitating increased output of crossbred beef calves.

With conventional semen, roughly 50% of the calves born are male, but >99% of male dairy calves are a low-value byproduct of using dairy semen for AI. A large Irish field trial in 2013 indicated that sexed semen resulted in conception rates that were approximately 87% of the conception rates achieved with conventional semen.

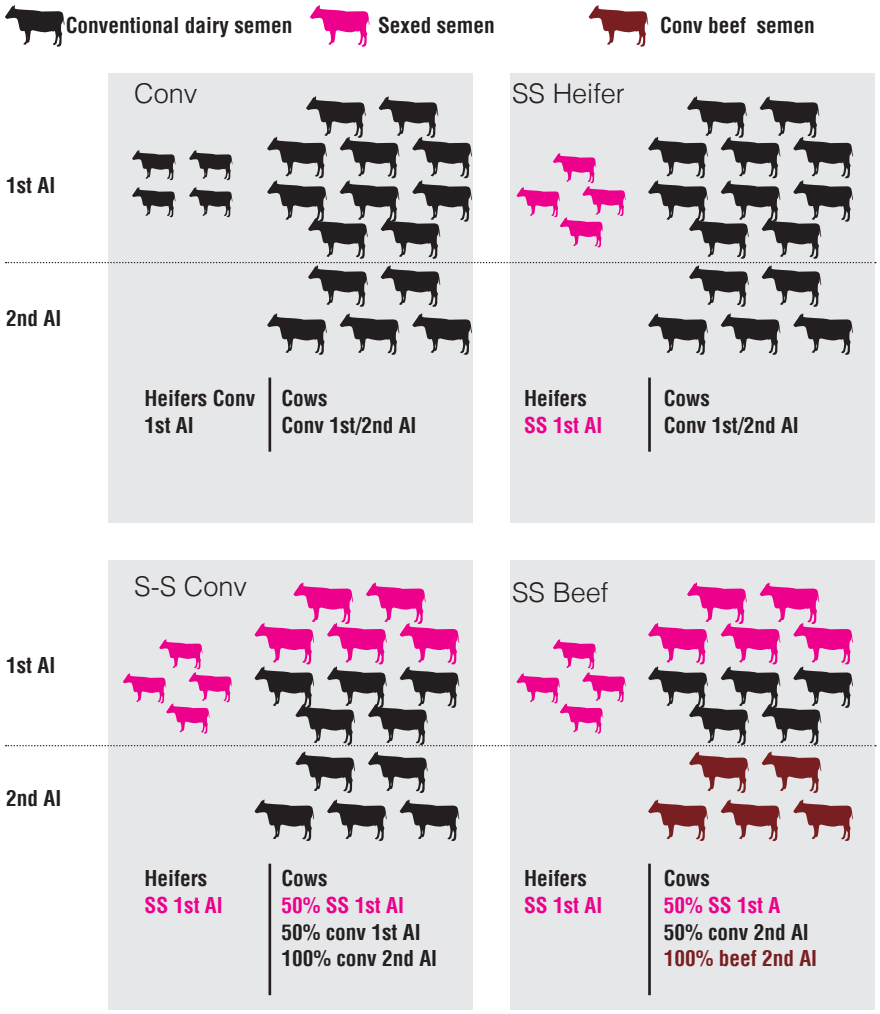
A study in New Zealand reported that fresh sexed semen could achieve conception rates that were approximately 94% of the conception rates achieved with sexed semen. In the near future, it is likely that sexed semen will be capable of achieving conception rates that are similar to conventional semen.

Simulation study

A simulation model was developed to determine the effects of sexed semen use in heifers and lactating cows on replacement heifer numbers and rate of herd expansion in a seasonal dairy production system. Four AI protocols were established according to the type of semen used:

1. Conventional frozen-thawed semen (CONV).
2. Sexed semen in heifers and conventional semen used in cows (SS-HEIFER).
3. Sexed semen in heifers and a targeted group of cows (body condition score ≥ 3 and calved ≥ 63 days), with conventional semen used in the remainder of cows (SS-CONV).
4. Sexed semen in heifers and a targeted group of cows, with conventional semen in the remainder of cows for the first AI and conventional beef semen used for the second AI (SS-BEEF).

Figure 1
Schematic outline of the different sexed semen usage scenarios investigated at varying levels of sexed semen conception rate relative to conventional semen.



Conclusions

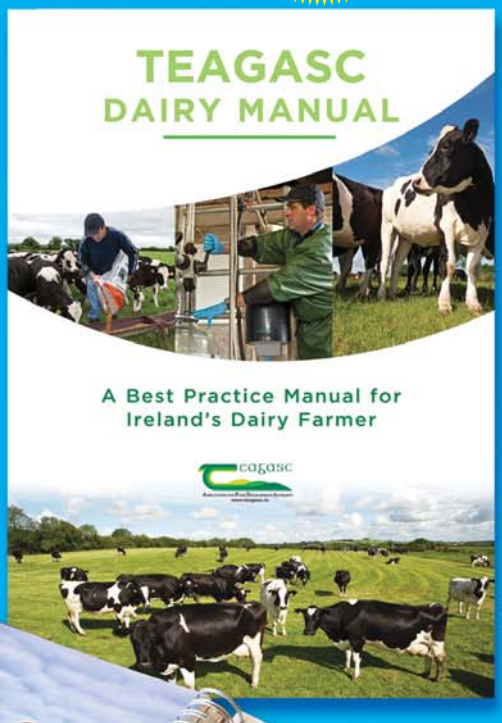
The study examined a variety of strategies for sexed semen use when expanding from 100 to 300 lactating cows. Using sexed semen generally facilitated faster herd expansion and increased discounted net profit compared to CONV.

The quickest expansion strategy, SS-CONV, resulted in negative cash flows with high fertility sexed semen (100 and 94% SS-CR) during the period of most rapid expansion and at all SS-CR when milk price was low, placing the viability of the farm business at risk.

Combining sexed semen use with conventional beef semen provides alternative strategies for expanding farmers, which have the potential to generate additional income. Further work is required to validate the findings from this simulation model.

TEAGASC DAIRY MANUAL

REVISED AND UPDATED FOR 2017

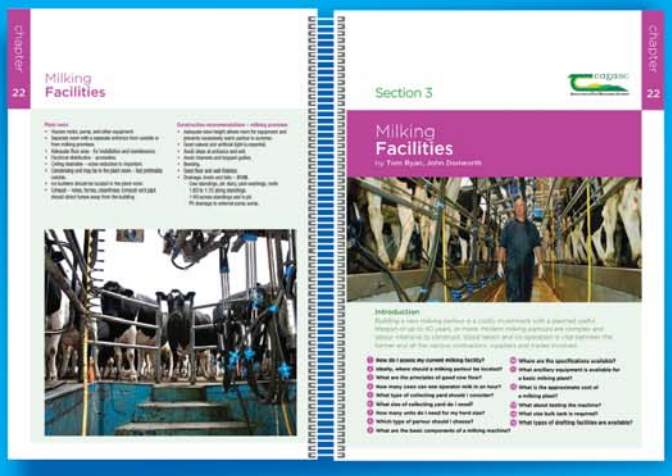


A comprehensive source of practical advice for any dairy business.

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

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

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



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

The Teagasc Dairy Manual is available from your local Teagasc office **(clients €25, non-clients €50)**. Alternatively contact **Therese Dempsey (059 9183422)** who will send you a copy by post **(p&p €7.50 extra)**

Dairy products from grass are simply better

A pasture-based diet improves nutritional the composition and quality of milk, butter and cheddar cheese

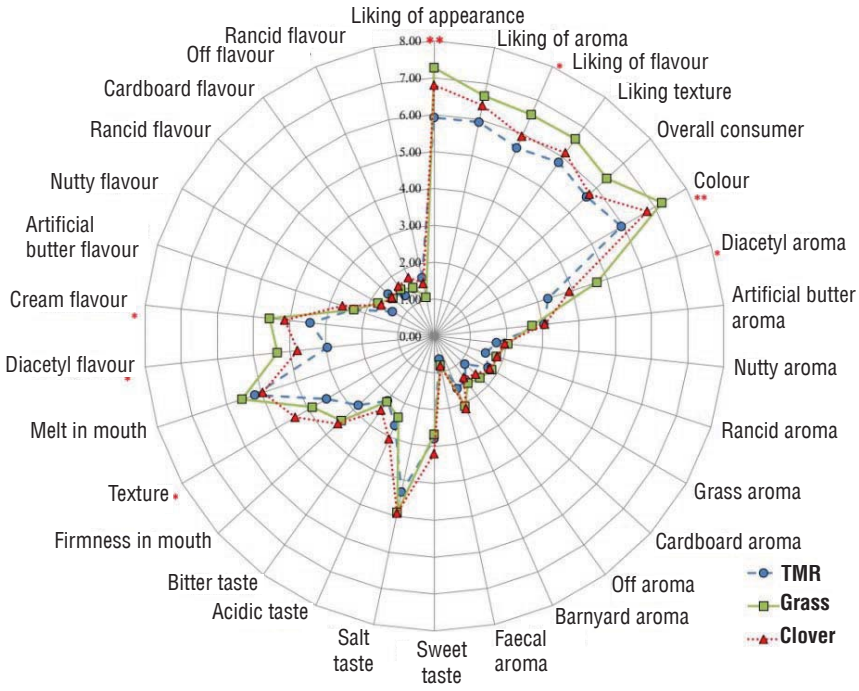
Tom O'Callaghan, Deirdre Hennessy, Stephen McAuliffe, Diarmuid Sheehan, Kieran Kilcawley, Pat Dillon, Paul Ross and Catherine Stanton
Teagasc, Food Research Centre, Moorepark, Fermoy, Co Cork; Teagasc, Animal and Grassland Research Centre, Moorepark, Fermoy, Co Cork

Only 10% of global milk production originates from pasture-based systems of production similar to traditional Irish systems. The use of a high-input confinement total mixed ration (TMR) feeding system is widely used in the US, parts of Europe and the southern hemisphere.

The TMR diet typically includes a formulated mix of forages, grains, by-products, minerals and vitamins, and is designed to enable the cow to achieve high dry matter intake and high milk yield. By its nature, however, a TMR system is an expensive and high-input enterprise, requiring specialised machinery and housing.

While TMR feeding results in increased milk yield, it does not necessarily improve the nutritional composition of the milk. Profiling Milk from Grass is a Teagasc-funded, multidisciplinary, collaborative project between the Teagasc Food Research Centre, the Teagasc Animal and Grassland Research and Innovation Centre and the APC Microbiome Institute. Key aims of the project are to compare the compositional, functional, and processing characteristics of milk and dairy products derived from a pasture-based feeding system of perennial ryegrass; a perennial ryegrass/white clover mixed sward; and a TMR-feeding system.

Figure 1: Sensory analysis of sweet cream mid-lactation butter produced from cows on TMR, GRS and CLV feeding systems. Sensory panellists were required to score each butter on a scale from 0 to 10 in terms of preference or intensity of attribute; 0 (none) to 10 (extreme). Points shown are the average results of a 26-person sensory panel for butter produced from each feeding system



Experimental design

Fifty-four spring-calving Holstein Friesian cows were allocated to three groups at the Moorepark dairy unit. Three feeding systems were compared over a full lactation:

- **Treatment one** was housed indoors and fed a TMR diet.
- **Treatment two** was maintained outdoors on perennial ryegrass pasture only (GRS).
- **Treatment three** was maintained outdoors on a perennial ryegrass/white clover pasture (CLV).

Cows on the TMR diet were offered, on a dry matter basis (DM), 7.15kg of grass silage, 7.15kg of maize silage and 8.3kg of concentrates daily. Cows on the pasture-based systems were offered about 18 kg DM/day (>4cm). The CLV sward contained approximately 20 % white clover. In order to obtain a representative sample of milk, the cows in each of the three feeding systems were milked separately into designated 5,000-litre refrigerated tanks.

The evening milk was stored at 4°C

Cows on the TMR diet were offered, on a dry matter basis (DM), 7.15kg of grass silage, 7.15kg of maize silage and 8.3kg of concentrates daily.

overnight, the morning milk was then added and the milk was agitated before collection. Bulk milk samples were collected after the morning milking weekly throughout lactation and stored at 4°C until analysis. Bulk milk samples were also collected to produce mid-lactation sweet cream butter and mid-late lactation cheddar cheese.

Effects of feeding system on raw milk composition

The GRS feeding system produced milk with higher concentrations of fat (4.65% v 4.39%) and protein (3.65% v 3.38%) compared with the TMR system. Moreover, the GRS feeding system produced milk with better quality protein with increased true protein concentrations compared with the TMR system (3.46% v 3.19%).

Effects of feeding system on sweet cream butter

This study evaluated the effects of the cow feeding system on the characteristics, quality and consumer perception of butter. Feeding system resulted in significant differences in fatty acid composition. These differences contributed to significant differences in textural, thermal, sensory and volatile properties of the butter produced. Pasture-derived (GRS and CLV) milk produced butter with improved nutritional characteristics.

Sensory panellist data revealed that GRS-derived butter achieved significantly higher scores for several attributes including "liking" of appearance, flavour and colour (Figure 1).

Effects of feeding system on cheddar cheese

The nutritional composition of cheddar cheese was improved on the pasture-based feeding systems (GRS or CLV). Pasture-derived cheddar cheese was shown to have significantly higher omega-3 fatty acid content, while TMR cheese had significantly higher omega-6 fatty acid content. The consumption of CLA has been proposed to have several potential health benefits.

Conclusions

The results of the current study demonstrated the superior nutritional quality of milk produced from pasture-based systems compared with TMR systems of milk production in terms of fatty acid and macronutrient composition. Additionally, higher scores for a combination of appearance, flavour and colour were recorded for butter and cheddar cheese manufactured using milk derived from pasture-based systems compared with a TMR system. The study also highlighted the possibility of using milk fatty acid profiling to distinguish milk and different dairy products derived from a pasture versus a TMR-based diet.

Key messages

- A study was conducted to compare milk derived from cows fed different diets based on grazed grass, grazed grass plus clover or an indoor TMR.
- Milk from pasture-based systems had higher fat and protein content and improved protein quality compared with milk from the TMR system
- The fatty acid composition of milk from the pasture-based systems was nutritionally superior, and resulted in butter and cheddar cheese with more favourable thrombogenicity (a measure of processability) scores.
- Sensory analysis revealed a consumer preference for the dairy products derived from the pasture-based system compared with the TMR-based system. The preference was based on a combination of appearance, flavour and colour.
- The study highlighted the possibility of using milk fatty acid profiling to distinguish between milk derived from a pasture diet and milk derived from TMR-based diet.

Cork farmer creates viable business from fragmented farm

Tim O'Donovan
Dairy Advisor, Clonakilty, Cork West

Like all farmers, Jack Hallahan of Commons, Crookstown, Co Cork, is always looking for ways to cut costs, expand his enterprise and in essence, make farming life a little easier.

Farming along with his wife Fidelma, who is a secondary school teacher and his young daughters Rachel and Clodagh, the family farm is focused on generating a steady income for the household.

The herd has grown from a modest 50-cow herd during the early 2000s to a 100-cow, spring-calving herd today. With the herd increasing, Jack was finding it increasingly difficult to manage as he had land parcels distributed over a large area. In the past, Jack's owned milk platform was only 15ha.

He also had 22ha which were rented from nearby farmers. This land was used to feed the milking cows during the spring and autumn.

In order to access this rented land, the cows had to cross a number of public roads.

This led to health and safety issues requiring extra supervision and time, leading to an unsustainable farming system.

However, 2015/16 was a turning point for Jack's farming career when a neighbouring farmer opted to take a step back from farming and leased a block of land (20ha) to Jack, adjacent to his existing milking block. This allowed Jack to gain access, through the new land, to the rented land he was already farming, which in some cases halved the walking time for cows.

Being able to access grazing land without the need to walk cows on a public road was a major changing point in the day-to-day management of the farm leading to better efficiency and profitability.

Key farm statistics

- 100 spring-calving cows, 20 replacements heifers and 30 beef animals sold at 16 to 18 months.
- Fed 600kg of concentrates in 2016, aim to reduce it to 400kg in 2017.
- Herd production: 430kg MS – 4.42% fat, 3.52% protein.
- Herd EBI: €73
- One-man operation along with part-time help from Darragh, a young neighbour.
- Cost of reclaiming and setting up the new farm €600 per acre – includes roadways, reseeding, fencing and water toughs.
- Jack did most of the work on the new farm himself – contractor hired for digging, ploughing and sowing.
- Sell beef stock in early autumn to allow grass build up for the milking cows to extend the days at grass.
- Six weeks' AI and seven weeks of beef bulls.
- Jack is a member of the Bandon Grazers discussion group.

Setting the foundations

The first thing that Jack sought to achieve was to establish an effective roadway for cow movement which could be easily maintained, upgraded and extended. The design and construction of farm roadways has a major effect on grazing management, cow flow, walking speed, labour efficiency and herd health.

Luckily, Jack was able to source hardcore material on the farm which was used as the foundation for the roadways. This was laid down on top of the topsoil which greatly reduced the cost of constructing the roadways.

A digger was hired for a number of days, while Jack used his own tractor and trailer. At least 25cm to 30cm of hardcore material was laid down to construct the roadways, which were three to four metres in width to cater for his 100 cows.

Once the roadways where completed, the next job was to start reseeding the new 20ha leased land.

> Paddock entrances are positioned for cows to access grazing and machinery to enter

With this land being close to the milking parlour, Jack said: "It was well worth the cost of reseeding the entire 20ha as it was going to be the main grazing block for the next number of years."

With the late spring of 2016, arable

Rachel, Jack and Clodagh Hallahan.

whole crop silage was planted in approximately 8ha which boosted his winter-feed requirements. The rest of the land was sown to high PPI index grass seeds with varieties including, Abergain, Aberchoice and Drumbo.

Once roadways and reseeding were completed, Jack fenced the land into easily workable paddocks with two to three metre-wide entrances per paddock. Each paddock has access to a water trough and entrances are carefully positioned for cows to access grazing and machinery to enter.

Jack Hallahan
Commons,
Crookstown, Co Cork

- **2017:** Farming 57ha – 15ha owned, 42ha rented.
- **2015:** Farming 45ha and in 2014 was farming 37ha.
- All grassland.

Making the most of the new land

With the new land in place, the next goal was to realise its potential. Jack is undecided as to how many cows he can manage in the future. With a young family being central to the couple's life, and the fact that they are still caring for Jack's mother, the daily routine can vary a lot.

For the coming year, the farm's aim is to milk 100 cows, rear 20 replacement heifers and carry 30 beef calves reared to between 16 and 18 months. The focus of these beef animals is to sell them as beef stores in August/ September, which will allow the buildup of a grass reservoir for the dairy herd to extend the grazing season.

With the herd increasing from a six-week calving rate of 68% in 2015 to an impressive 78% this year, Jack is confident that the herd performance can be increased further from last year's 430kg milk solids per cow.

TOP TIPS

- Have a good work-life balance.
- Sign a good contract for the leased land in which both parties are happy.
- Have timely payments of creditors to ensure prompt service when required in the future.
- Farm the rented land as if it's your own – having a long lease agreement allows money to be spent on building up soil fertility and improving the grazing infrastructure.
- Keep trying to improve the business to make it more productive – grass grown, EBI, milk production.
- Spend money on things that will give a good return on investment, eg grass reseeding and roadways.
- Breed a robust cow that produces high quantities of solids.
- Have replacement stock of excellent quality.

Pioneering once-a-day milking

Brian Hilliard
Teagasc Dungarvan

Mark Trimble
Teagasc Portlaoise

There is growing interest right across the country in switching to milking cows once a day (OAD) for their entire lactation. It is not an entirely new concept. Many farmers practised the "strategic" use of OAD when the milk quota system was in place. OAD for the entire lactation has been practised in New Zealand since the 1950s and also in France for many years.

The first piece of advice Brian gives to those who contact him about going OAD, is that "if you are not doing a good job with twice a day (TAD), then don't go near OAD." Good management is as important with OAD milking but at least you have a little more time for management.

The transition

The switch requires two to three years' planning in most cases. Poorly performing cows, cows with high SCC, cows with bad udders, etc, should be culled. The first year on OAD will see the biggest hit to yield – approximately 25% in volume and about 20% in milk solids. Friesian cows and heifers/first-calvers are the hardest hit.

Consider milking your cows for a two-month period on OAD before changing over to OAD full-time. This will identify cows unsuitable for OAD that should be culled/replaced.

Breed or buy the right type of cow before you start and minimise the number of first lactation animals so as to minimise the hit for the first year on OAD & have SCC under control. Carrying an extra 10% of cows is a tactic to compensate for the drop in yield.

After about five to six years of OAD milking, yields should stabilise at about 6% to 10% lower than TAD as cows that do not perform well on OAD will have been culled. Over time, replacements from the better OAD cows will be entering the herd.

New Zealand research data on OAD shows that Holstein Friesian-Jersey cross cows seem to adapt better as they have less volume but a higher fat and protein % – less stress on the udder.

Having said that, I know of one member in the group with a Holstein-Friesian herd who delivered 417kg MS/cow last year (ICBF – Co-op report).

> Consider milking your cows for a two-month period on OAD before changing over to OAD full-time

Profit

I have looked at the Teagasc eProfit Monitor figures for some members and for the better operators who are milking OAD for a number of years, their profits are just as good and better than many at TAD milking. How can this be?

There are a number of factors that will compensate for the drop in yield (which lessens over the years). Milk price will be up to 5c/l higher due to the higher fat and protein percentage and there will be a reduction in costs due to:

- Lower veterinary bills, cows are healthier, better body condition and lameness is practically eliminated.
- Better body condition, fertility/conception rates – less straws used.
- More compact calving – more days milking.
- Better longevity/lower replacement rate – fewer first-calvers (higher yields with more mature cows).
- More time to manage and look after animals better, calf-rearing, grassland management, etc.
- Lower electricity charges/detergents, etc.

Research

In New Zealand, 5% of dairy herds are now full-time OAD and the number is growing. A total of 54% of herds make meaningful use of OAD, between milking first-calvers OAD, milking OAD in the spring, when there is a feed shortage and those in full-time OAD. Also, much research has been done in New Zealand (and France) on OAD milking.

ABOVE: After about five to six years of OAD milking, yields should stabilise at about 6% to 10% lower than TAD.

In 2005, Waterford discussion group members visited a research station in Brittany trialling high yielding Holsteins on OAD. In 2006 we visited New Zealand where we met researchers/advisors who had done a lot of work on OAD and visited a 700 cow OAD herd in the South Island that was making more profit after switching from TAD to OAD.

Teagasc, Moorepark are hoping to set up a new research programme on OAD milking.

Why milk OAD?

There are a number of reasons or a combination of reasons why people have gone over or are thinking of changing over to OAD. These are:

- Shortage of labour.
- Lifestyle – less stress, more time off, more time with family/ children growing up.
- Off-farm job.
- Cows having to walk long distances/steep land/fragmented farms.
- Cows having to cross busy roads (where underpass not possible).
- Succession of a son or daughter to stay milking is made more attractive.
- Milking OAD can make it more feasible for someone who does not have a successor to stay milking rather than retire.
- Where a second herd can be established on an outside farm, milk them OAD with the home herd milked TAD or OAD.
- Anyone doing a reasonable job at OAD will definitely not return to TAD milking.

- Brian Hilliard will be manning a stand at the Moorepark open day.

Continued on next page

OAD farmer profile
Michael John Delaney

Michael John Delaney, a member of the POADII Discussion Group, milks 100 cows at Ballykealy, Durrow, Co Laois. He started milking his cows OAD in 2013 due to the fragmented nature of his farm. Mark Trimble, Teagasc, Kilkenny, is his advisor.

At the time, he farmed 38.5ha in five blocks. With just 2.8ha at the yard, and the other four blocks only accessible by public road, the cows were on the road almost all the time. This was becoming more of an issue due to the extra labour required to move the cows along the road, (1km to the furthest block), as well as the inconvenience to other road users in the locality.

Michael says this came to a head in 2012. "Something had to change or it was a case of getting out of cows." He decided that milking OAD was the best solution and so, in 2013, the herd was milked OAD for the first time. He has the cows in the yard for milking at 7.30am each day so as to avoid school buses on the road. It takes him two hours and 40 minutes to milk in his 10-unit parlour, an hour longer than morning milking under TAD.

In year one, the herd took the expected hit with a drop in milk volume of 28% and a drop in yield of milk solids of 23%, as can be seen in Table 1.

After the initial drop, the herd recovered well in 2014 and 2015, with yields being only 4% lower than the last year milking TAD. The poor spring of 2016 hit production in that year. The cows had to be housed for two weeks in April due to a shortage of grass; they peaked at only 17 litres while indoors and never fully recovered from this. This year, the cows peaked at 21 litres so this should result in a recovery of some of the gains that were made.

Michael knew from the start that his herd would not be best suited to OAD milking and so, in 2013, he made a change to his breeding policy and switched from using exclusively British Friesian bulls to New Zealand Friesians.

Michael John Delaney milks 100 cows in Co Laois.

Table 1: Herd output comparison

	2012 TAD	2013 OAD	2014 OAD	2015 OAD	2016 OAD
Farm size (ha)	38.5	38.5	38.5	38.5	45.5
Herd size (number of cows)	87	88	92	95	102
Stocking rate (LU/ha)	2.85	2.87	2.92	3.06	2.78
Yield (litres/cow)	4,880	3,491	4,278	4,304	3,917
Fat %	4.02	4.33	4.44	4.41	4.40
Protein %	3.43	3.67	3.68	3.69	3.72
Yield (kg MS/cow)	375	288	358	359	328

Research in New Zealand has shown that this type of cow is better suited to the OAD system. Considering the gains in output in 2014 and 2015 were achieved by the same type of cow that he milked TAD, Michael expects that with the introduction of the new genetics to the herd in 2016, this will improve the progress of the herd in the OAD system.

Good fertility

Michael says that keeping cows in calf was always a problem on the farm despite good fertility in the herd. He puts this down to the amount of walking on the road the cows had to do and the energy it required.

In 2012, conception rate to first service was 33%, this rose to 73% in 2017. Michael had an empty rate of 20% in 2012 and this has dropped to 5% in 2016. Also, first to third calvers were carried over if not in calf to keep numbers up, an added cost to the system.

The reduction in empty rate and in lameness (a reduction of 75% in hoof-paring) has given Michael much more control of what to cull for instead of having to cull empty cows and for lameness.

Michael joined the POADII Group in 2016 and has found it a great help. Even though they only meet four times a year, the fortnightly group report and the Whatsapp group are invaluable to measure progress and get queries answered quickly.

He expects to produce 400kg/MS/cow in the next few years as the New Zealand Friesians become more established in the herd.

National Discussion Group

In 2015, a discussion group was established for farmers who had been milking OAD for a number of years and for those who were planning to do so. The group is facilitated by Brian Hilliard, Teagasc, Dungarvan. With the help of his dairy advisor colleagues throughout the country, we identified clients who were milking OAD.

Now we have a group consisting of 36 members, 32 of whom are milking OAD full-time.

Geographically, they are located from Sligo to Wexford and from Wicklow to Cork. Herd size ranges from 50 to 250 cows.

From their ICBF-Co-op reports, 12 of the members (40% of group) delivered over 300kg MS/cow in 2016, the average of those 12 being 360kg/cow. The Glanbia average for herds milked TAD in 2016 is 372kg MS/cow.

The members decided to name the group Pioneering Once A Day [milking] in Ireland (POADII).The group provides great mutual support and information/backup for the members.

Every two weeks during the main production months, each member sends in current data figures to chair Gillian O'Sullivan who then emails a group report to those who respond.

The group have had four meetings this year, the first one indoors in the Teagasc office, Thurles, in January. Our last meeting was on the farm of Michael John Delaney in Laois.

We have two more farm meetings planned, one in July in Mayo and the final one in October in Limerick.

Teagasc/AHI beef health events

Aidan Murray
Beef specialist, Teagasc Animal and Grassland Research & Innovation programme

Teagasc and Animal Health Ireland (AHI) have again teamed up with Meat Industry Ireland and the meat factories to deliver five animal health events targeting beef farmers. All will take place on farms with the first on 22 June and the final one taking place on 11 July. The theme this year is: ''Prevention is Better than Cure''.

As farmers and food producers, we are being continually reminded about issues around food safety, traceability and sustainability. Proper animal health management is central in achieving all of these objectives and how we approach health management is changing.

In terms of sustainability and the whole area of antimicrobial resistance (AMR) some countries are looking at the amount of antibiotic used per kilo of beef produced. So we need to rethink our approach to things like routine dosing and disease prevention. Farmers and vets will need to work even more closely towards a more proactive prevention strategy with a greater emphasis on herd health planning.

Each event will have a mix of expert speakers from AHI, Teagasc and vets to cover four themes.

- **Faecal sampling and parasite control:** What can faecal sampling tell us about parasite levels in our herds. What can it detect? How often should we sample? How do we interpret the results? How will the results influence our dosing regime? Are there any differences emerging between bucket reared calves and suckled calves?
- **Proactive herd health management:** The host farmer and their vet will discuss the on-farm herd health plan and preventative measures including vaccination policy. The objective of this stand is to demonstrate what practical steps the host farm is taking to keep stock health while reducing the reliance on antibiotics.
- **Beef healthcheck programme results:** One year into the programme, the results have been collated nationally and regionally. Regional liver-fluke, liver abscesses and pneumonia results will be discussed. There will also be a practical demonstration on identifying health problems in slaughtered cattle.
- ***Neospora Caninum:*** An abortion threat – it has been estimated that approximately 9% of all bovine abortions in Ireland are as a result of neospora. Find out what the clinical signs are, how it can be diagnosed and what steps you can take to prevent or remove infected animals from the herd. The case of one farmer who has been through the experience will be discussed.

Farmers and vets need to work even more closely towards a more proactive prevention strategy with a greater emphasis on herd health planning.

The events will be beneficial to both suckler farmers and to non-breeding finishers.

With regard to animal health we are moving towards the old adage where ''Prevention is Better than Cure''. All events start at 11am and run until approximately 1pm.

•See events, page 6, for upcoming dates and locations.

Securing your

Although winter feeding is a distant thought, some careful planning and preparation now will help prevent problems arising later

Brian Garry
Nutritionist, Teagasc, Animal and Grassland Research & Innovation Programme

There are a number of questions to ask yourself. Is there enough silage in storage? Is silage of adequate quality to meet the nutritional requirements of stock? Is there a contingency reserve in case there is a lack of grass next spring?

Silage requirements

Silage accounts for a significant proportion of a pasture-based dairy herd's annual feed budget. This ranges from approximately 20% for extended grazing systems to more than 30% for highly stocked grazing platforms and/or heavy soil farms. Following the expansion of many herds, silage supplies must be increased to meet the extra demand.

This increased silage requirement is often a hidden cost, particularly where grass utilisation per hectare has not increased. Incorporating silage-making decisions into the grazing management of the whole farm will help to meet this requirement.

On dairy farms, silage requirements can be separated into high-quality silage and standard quality silage. High-quality silage (74 DMD) should be targeted at lactating cows and weanling replacement heifers. Standard silage (68 DMD) should be fed to dry cows and stock bulls.

In spring-calving herds, a dairy cow will consume 1.5t DM of 68 DMD silage over a 140 day winter. An additional 400kg DM 74+ DMD silage should be available for feeding cows that are still milking. This is very important where stocking rates have increased and grass supplies are under greater pressure during periods of poor growth.

Weanling replacement heifers should also have access to high quality silage. At least 850kg DM silage should be allowed for each replacement heifer for a 140-day winter. For example, a 100-cow herd with 25 replacement heifers has a requirement for 300 high-quality bales.

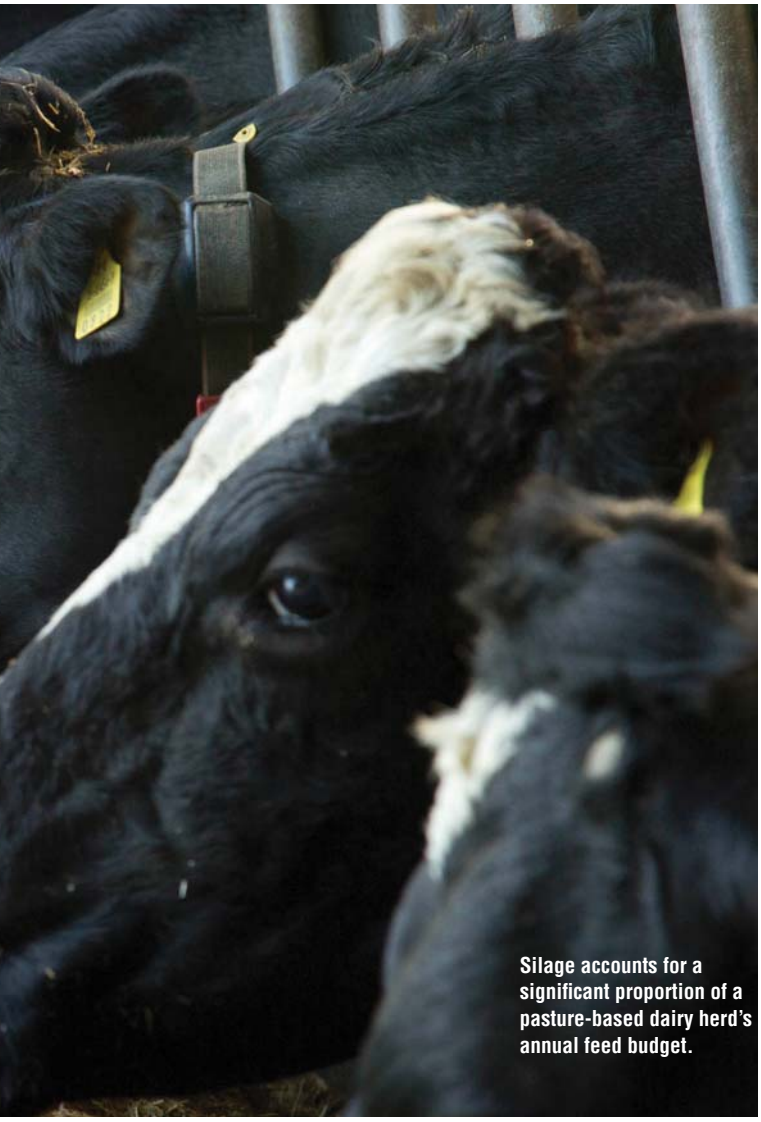
A spring-calving dairy cow that will be dry over the winter needs 7.5 bales or 1,500kg DM of silage for a 140-day winter. On heavily stocked farms or farms on heavy soils, an additional bale of high-quality silage may be required as silage makes up a greater proportion of the milking cow's diet.

On suckler farms, a similar approach can be followed, with autumn calvers, growing and finishing stock, having access to 72+ DMD silage while dry cows can be offered restricted access to 68 DMD silage. Each finishing steer, for example, will require 1,000kg DM silage for a 120 day finishing period. Feed budgets should allow 1,100kg DM for each dry suckler cow on farm. A complete fodder budget can be completed using Table 2 and Table 3.

Silage quality

Analysis of silage quality reports from Teagasc clients in 2016 has highlighted differences between regions of the country (Table 1). The counties along the Atlantic coast, particularly in the northwest had, on average, lower DMD silage than farmers located inland and in the south east of the

silage supply



Silage accounts for a significant proportion of a pasture-based dairy herd's annual feed budget.

Table 1: Mean grass silage quality parameters from Teagasc clients in 2016

	DMD	CP	PDI	UFL
West	66	11	63	0.74
Southwest	67	11	66	0.74
Southeast	70	13	74	0.79
Northeast	67	11	66	0.75
Midlands	68	12	69	0.76
Northwest	64	10	59	0.71

Table 2: Quantity of silage required on farm

Animal Type	No of stock to be kept over winter (A)	No of months (B)	Pit silage needed/ animal /month (C)	Total silage requirement
A×B×C				
Dairy cow			1.6	
Suckler cow			1.4	
0-1 year old			0.7	
1-2 year old			1.3	
2+ year old			1.3	
Ewes			0.15	
Total tonnes needed				X=

Table 3: Silage in stock/ to be harvested

Pit silage in yard[1]	A	
Pit silage to be harvested (area in acres × 7t/ac)	B	
Total pit (A+B)	C	
Bales	D	
Bales converted to tonnes (D × 0.9)	E	
Total silage tonnes (E+C)	F	
[1]Pit silage tonnes = (length × width× settled height)÷1.35		

country. In addition, there was a large range in DMD across all regions with silage quality in a spectrum from 55 DMD up to 80 DMD.

The average quality of silage was 67 DMD. This silage has an energy value of 0.74 UFL which is lower than grazed grass (0.85-1.05 UFL kg DM). High quality silage can have a UFL value in excess of 0.80 UFL kg DM, which can help meet performance targets with minimal supplementary feeding.

A similar trend was also found for crude protein. Average silage crude protein concentration for 2016 was 11%. This would equate to a PDI (protein that is digestible in the small intestine) of 66g/kg DM. The PDI system accounts for the quantity of protein that is available to the animal as not all of the protein in a feedstuff is utilisable by the animal.

Typically, young stock need 13% to 15% crude protein in the diet, lactating cows require 14% to 17% crude protein, depending on yield, and finishing cattle require 11% to 12% crude protein. Silage crude protein can be improved by ensuring that sufficient quantities of nitrogen fertiliser are applied and by harvesting leafier grass before stem and seed head develops with a shorter regrowth interval.

Silage analysis

Having your silage quality analysed is vital and early analysis can help guide decisions regarding the type and specification of additional feedstuffs to be purchased. The benefits of silage analysis are clear.

Feeding rates can be formulated to reach a target body weight and body condition score, which can result in cost saving through reduced feeding and/or improved performance of livestock. Once grass has been ensiled for six weeks silage analysis can be carried out. Early analysis of silage quality and stock checking, allows for alternative strategies to be put in place before the winter.

Further information on making high-quality silage can be found at https://www.teagasc.ie/media/website/publications/2016/Teagasc-Quality-Grass-Silage-Guide.pdf

An excellent spring at the Newford Farm

Karen Dukelow
Cattle Specialist, Teagasc,
Animal and Grassland Research
& Innovation Programme

In 2015, Teagasc, Dawn Meats and the *Irish Farmers Journal*, supported by McDonald's, established a standalone suckler herd at Athenry, Co Galway, to demonstrate best practice in sustainable suckler beef production. Located in Newford, the unit is run on a fully commercial basis. Its purpose is to demonstrate the potential of a large suckler beef farm (100-cow herd) to generate a viable family farm income.

The farm is laid out in four divisions. The main block of land is dry, good-quality grassland comprising about 26.13 ha. This area is used for grazing suckler cows and calves. The other blocks are used to grow silage and graze yearling cattle.

The herd

Cow type at Newford differs from the norm, comprising mainly of first-cross Aberdeen Angus, with a small percentage of Hereford-cross-Friesian cows. The cow type has strong maternal traits and is an efficient converter of grass to milk, resulting in good daily liveweight gains in the calf crop. The average replacement index of the cows is €101 with heifers averaging €96. Herd targets are:

- First calving at 24 months.
- 365-day calving interval.
- 10- to 12-week calving spread.
- 80% cows calved within eight weeks.
- Weaning a calf greater than 50% their own body weight.
- Calf mortality to 28 days less than 2%.

Calving season 2017

I recently caught up with Matthew Murphy and Michael Fagan to see how the spring has gone on the farm. Calving has gone exceptionally well. All cows had a body condition score completed on 10 January and were grouped and managed accordingly. The average BCS of the herd was 3.05.

Table 1: Newford BCS 10 January 2017

Lactation	BCS
Second lactation cows	2.39
Third lactation cows	2.91
Fourth lactation cows	3.29
Replacement in-calf heifers	3.02

Table 2: Newford cow numbers

	2015	2016	2017
Cows	74	81	85
Heifers	24	15	22
Total	98	96	107

Table 3: Calving score for the Newford Herd

Calving Score	Number of calvings	
1	71	Normal calving
2	24	Some assistance
3	7	Considerable difficulty
4	3	Vet assistance

The herd achieved an 11-week calving spread (2 February to 22 April). Some 107 cows had scanned in-calf and 105 cows calved down with 108 live calves (included four sets of twins and one mortality). This is a herd performance of 1.04 calves/cow calved or 0.96 calves/cow bred.

Calving difficulty was low for the calving season with 90% of the herd having a calving score between one and two and calf weight averaging 43.5kg (bull calves weighed 46kg with heifers averaging 40kg). Calves are doing well and were weighed on 9 May. Bull calves weighed 136kg (average daily gain of 1.22kg/day) and heifers weighed 119kg (average daily gain of 1.14kg/day).

The breeding season has been in full swing since 24 April. Tail-painting and two teaser bulls are being used as heat detection aids. Cows are checked on a regular basis and any cows detected in heat are artificially inseminated at 12am.

As all replacement heifers are purchased and contract reared the terminal index is used to select AI sires. FSZ (Charolais), ZGM (Limousin) and LM4050 (Limousin) were selected for use on the cows with THZ (Limousin) selected for the replacement heifers. The following criteria were used to select bulls:

- Five-star terminal index.
- <7% calving difficulty for mature cows.
- <6% calving difficulty for first and second calvers.
- >30kg predicted carcase weight for mature cows.
- >25kg predicted carcass weight for first and second calvers.
- Reliability of >80%.
- Cost of less than €15/straw.

At the time of writing all cows had cycled, except one, since breeding commenced. This first time calver received estrumate to get her to cycle. The two stock bulls (SI and LM) will be turned out on 3 June for four

The main block of land is dry, good-quality grassland comprising about 26.13 ha. This area is used for grazing suckler cows and calves.

weeks to mop up. One bull will be placed with each group of cows. The 26 replacement heifers have been bred to AI on the contract-rearing farm with no repeats so far.

Grazing 2017

Teagasc eProfit Monitor results for 2016 showed that straw costs were high on the farm.

A number of measures have been put in place in order to reduce the number of straws used, not least of which has been the spring grassland management.

The autumn planner was used to close paddocks in rotation ensuring a high opening cover. Grass measuring and recording on PastureBase Ireland commenced for 2017 in January – average farm cover was 924kg DM/ha.

Weanlings were moved from straw bedding to slats as space became available (as cattle were slaughtered) and meal feeding of the 89 weanlings ceased at the end of January in anticipation of getting them out to grass from mid-February onwards. They were turned out to grass on Monday 13 February.

Due to very wet weather, the yearlings were rehoused for three weeks. A total of 43 yearling heifers returned to grass on 14 March at 369kg. Forty-six yearling steers returned to grass on 15 March at 388kg.

The yearling heifers and steers have gained 1.02kg/day since turnout weighing 429kg on 11 May and 452kg on 16 May, respectively. Seventy-one cows and calves went out to grass on 13 March with the remaining cows being turned out as they calved. Seventy per cent of the home farm had been grazed off (18.74ha) by 22 March and the second rotation started on the home farm on 5 April with 100% of the home farm having been grazed off during the first rotation. A total of 26ha of first-cut silage was made in May along with 114 surplus round bales.

SUMMARY

The excellent spring performance means the Newford Herd is on an excellent footing to achieve improved profitability of the 100-cow herd. Key targets in the five-year plan are:

- **Improved profitability:** Increase gross margin from €495/ha in 2015 to €1,170/ha in 2020. This is more than double the €532/ha average for suckler farms.
- **Reduce variable costs:** As a percentage of total output from 74% in 2015 to 45% in 2020.
- **Ambitious weight gain:** Increase carcase weights of heifers from 280kg in 2015 to 330kg in 2020, and from 295kg to 365kg for steers.
- **Maximise grazing:** Target over 200 days on grass based on a high stocking rate of 2.7 livestock units per hectare.

Gains from grass can put profit in your pocket

Reseeded pasture grew eight times the grass of old swards in Roscommon

James Kelly
Teagasc Business & Technology Drystock Advisor, Roscommon

On many drystock farms, a shortage of grass is often a problem in spring and autumn, particularly where stocking rates are relatively high. On the other hand, drystock farmers frequently underestimate their farm's potential to grow grass, leading to lower stocking rates.

A viable option to increase the amount of grass grown on a farm is reseeding. Perennial ryegrass is a high-quality feed and offers major advantages:

- Extra grass production, particularly in the spring and autumn.
- Higher quality grass.
- Reduction in concentrate feed requirement.
- Improved response to fertiliser.
- Increased grass utilisation.
- Increased stocking rate capacity.

National data reports that just 2% of Ireland's land area is reseeded annually. Figure 1 (source: Teagasc) shows just how much more productive reseeded swards are.

The swards with 100% perennial ryegrass grew 2.7t DM/ha more than the 15% perennial ryegrass sward. Most of the difference in grass production between the two swards occurs in the spring period, up to mid-May. This is the key period of grass demand for sheep enterprises and is the reason why all sheep farmers should consider reseeding. Put simply, it can reduce and concentrate costs.

BETTER sheep farmer John Curley reseeds regularly on his farm in Four Roads, Co Roscommon. Since joining the BETTER farm programme, John has significantly reduced his concentrate meal usage through increased grass growth and utilisation. Outlined below are the key steps John has taken in grassland management since joining the BETTER farm programme.

Soil fertility

Soil sampling is carried out on the farm every three to four years. Lime is spread according to paddock demand with a target pH of 6.2 to 6.5. A nutrient management plan is in place to maintain soil P and K levels at Index 3. These actions create the conditions for optimal grass growth.

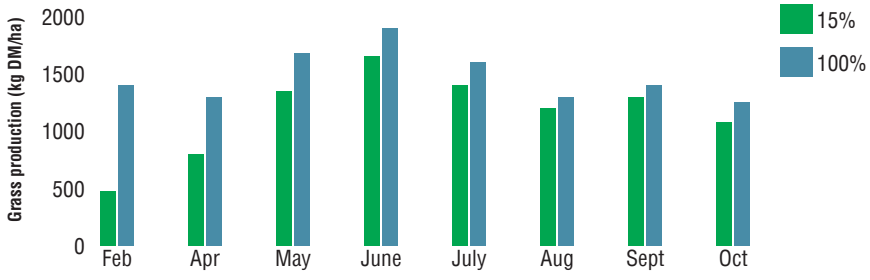
Increased number of paddocks

The number of grazing divisions on the farm has been raised from eight to 21. This has allowed better utilisation of grass on farm and has increased the quality of the grass available. Additional paddocks have improved the quality of silage on the farm because covers, which are too strong for grazing, are harvested. Temporary fencing is used throughout the grazing season to further enhance utilsation/quality.

Grass measuring

John measures grass weekly and inputs his data on the PastureBase Ireland system. Weekly grass meas-

Figure 1
Grass production per month (February to October) in a sward containing 15% perennial ryegrass and 100% perennial ryegrass



A ryegrass dominant sward. On the last reseed (inset), John used a seed mixture of Abergain (4kg), Aberchoice (4kg), Drumbo (4kg) and 1.5kg of a clover variety called Iona.

urement and budgeting is critical to management decisions. This will identify grass deficits or surpluses as well as identifying poorly performing paddocks; allowing them to be selected for reseeded. A highlight of the data collected on PastureBase for this farm has been its ability to show how reseeded swards have outperformed old, permanent pasture, swards.

Annual reports generated by PastureBase Ireland show a huge contrast in terms of output per hectare from old permanent pasture swards and periennial ryegrass dominated swards.

Reseeding

Having recognised the benefits of reseeding as a method of boosting both the quantity and quality of grass grown, a reseeding plan is in place on this farm. "The reseeded swards are more responsive to fertiliser," says John. "They are really valuable in the spring when the flock's need for high-quality feed is at its highest."

On the last reseed, John used a seed mixture of Abergain (4kg), Aberchoice (4kg), Drumbo (4kg) and 1.5kg of a clover variety called Iona.

To maintain a perennial ryegrass dominant sward, good grassland management skills are essential. Also important is adequate fertiliser application to prevent weed takeover. John spreads 60 to 70 units N/ha on grazing ground and 90 units N/ha on silage ground.

BETTER sheep farmer John Curley.

Key messages

- Reseeded swards have the ability to improve the quantity and quality of grass growth on a farm especially in the spring and autumn.
- PastureBase Ireland allows paddocks to be identified for reseeding, show the improvements in grass growth, and help improve grass utilisation through more informed grassland management decision-making.
- A nutrient management plan is a must on all drystock farms to maintain optimal soil pH and soil P and K levels for grass growth.

Worm treatment failure on Irish sheep farms

Barbara Good[1] and Orla Keane[2]
[1] Teagasc, Animal & Grassland Research and Innovation Centre, Athenry, Co Galway, and [2]Dunsany, Co Meath

Grazing sheep are naturally exposed to parasitic roundworms that live in the gut and infection can result in chronic disease, ill-thrift and occasionally death. Worm control depends on effective worming products and grazing management. However, an unavoidable result of continuous use of wormers is the development of drug resistant worms. These are worms that can survive a dose of the wormer that would normally kill them.

Left unchecked, worms developing resistance to wormers will lead to one of the biggest challenges facing sheep producers. Treating lambs with products that do not give the desired control is a waste of time and money. It also results in poor performance as the sheep end up carrying a heavy worm burden despite having been treated and you thinking parasites are now covered.

Until 2009, farmers had three "families" of broad spectrum wormers available for treating gut roundworms. These were benzimidazole (white group), levamisole (yellow group), and macrocyclic lactones (clear group e.g. ivermectin, moxidectin, doramectin). After over 25 years, two new families of wormers were launched on the Irish market; in 2010 Novartis Animal Health launched Zolvix which belongs to a new family of wormers called the AADs (orange group).

In 2012, Zoetis launched a new product called Startect which is a dual active compound combining derquantel which belongs to a new family of drugs, Spiroindoles (purple group), with abamectin (clear group anthelmintic).

These two new families of wormers are prescription-only medicines and if used judiciously afford new opportunities for Irish flock owners to prolong the lifespan of the older families. Research shows that there is wide-scale wormer failure, which has proven to be due to resistance to wormers (anthelmintics) on Irish sheep farms

STAP drench test task

Between 2013 and 2015, the Department of Agriculture, Food and the Marine (DAFM) administered the Sheep Technology Adoption Programme (STAP), with the aim of increasing profitability by encouraging the adoption of best management practices.

One of the options available to STAP participants was to test the efficacy of the anthelmintic treatment (benzimadazole (white group), levamisole (yellow group) or macrocyclic lactone (clear group)).

This was done by means of a drench test which is a modification of the faecal egg count reduction test. Individual faecal samples were collected from the same group of lambs before, and at a defined time after, anthelmintic treatment.

The number of eggs present pre- and post- treatment was subsequently determined in the lab from pooled faecal samples.

An impressive number of drench tests (4,211) were taken by farmers during the three years of the STAP programme. Information on the anthelmintic product used was available for 3,771 of these tests; anthelmintics from the benzimidazole group (white drench) were the most popular products (Figure 1).

The efficacy of treatment against gut roundworms known as other trichostrongyles (which excludes Nematodirus species) that cause the main problems midseason could be established for 1,446 drench tests and 49% of these tests were considered ineffective (i.e. a reduction of faecal egg count (FEC) ≤ 95%).

There was a significant difference among the drug groups in efficacy and Figure 2 provides a summary of the efficacy of each drug group. This pattern is in line with a pilot drench test study carried out on a small number of Teagasc clients' flocks in 2012 (Figure 3).

Drench failure does not necessar-

Table 1: Timeframe for testing the flock post-drenching with wormers from different groups

Wormer group	Number of days post-treatment to resample sheep	
1	Benzimidazole (white group)	10-14 days
2	Levamisole (yellow group)	5-7 days
3	Macrocyclic lactones (clear group)	14-16 days

The Sheep Technology Adoption Programme aimed to increase profitability by encouraging the adoption of best management practices.

Figure 1
Choice of wormer used by farmers for STAP drench test task

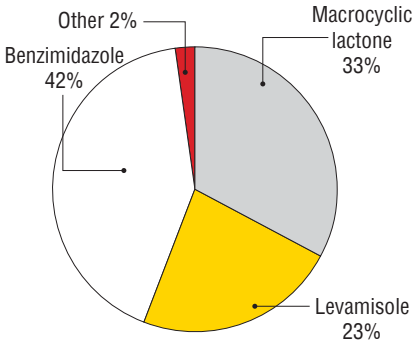


Figure 2
Drench failure observed in STAP participant's flocks 2013-2015

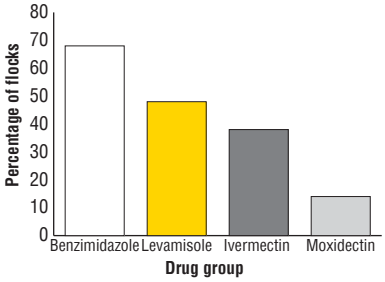
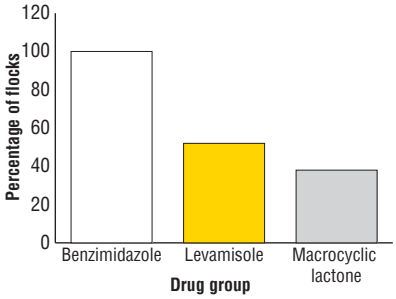


Figure 3
Drench failure observed in Teagasc client's flocks in 2012



ily mean that the worms are resistant. Drench failure could be due to a myriad of other reasons relating to sub-optimal treatment such as use of a faulty dosing gun or administration of the incorrect dose rate.

Unnecessary drenching

More than a quarter of STAP participants (who complied with the drench test instructions) had pre-treatment faecal egg counts below 200 eggs per gramme. In sheep, this indicates a low level of gut parasitism and highlights that many farmers were treating unnecessarily.

The results highlight the merit of using worm egg counts to help inform the correct timing of treatment. So not only are worm egg counts useful in establishing treatment/drench performance, they are useful in guiding when, and who, to treat.

Drench test

So, if like many producers, you are using a wormer that belongs to the three older families, it is important to check that it is still working on your farm. The simplest approach and a good post treatment practice is to determine whether any worms survive after drenching, i.e a drench check.

This involves getting faecal samples from at least 10 lambs at specific times (Table 1) post-treatment and sending them to the lab where they will they will determine the number of eggs per gramme of faeces (faecal egg count). Should there be eggs present, a more detailed look is warranted to determine the reduction in egg count post treatment.

This requires taking samples pre and post treatment (like in the STAP drench task) to calculate the reduction in the number of eggs observed post treatment. Samples should be taken from at least 10 lambs that have not been treated in at least six weeks (longer if you have treated with a long-acting wormer).

The length of time that should elapse between drenching and taking the post-treatment dung sample depends on the type of wormer that is used (Table 1). All products must be given in accordance with the manufacturer's recommendations.

Conclusion

Drench tests offer an impartial and cost effective method to test the efficacy of your wormer. Multiple drug resistance is a serious threat. We encourage producers to test the efficacy of the wormer on their flock and, in line with best treatment practices, to use worm egg counts to inform decisions on treatment for worms.

Partnership improves work-life balance

Tom Curran
Farm Structures Specialist,
Teagasc Rural Economy and
Development Programme

The Treacy and Fitzgerald families are dairy farming in a Department of Agriculture Food and the Marine-registered farm partnership near Littleton in Co Tipperary. Work began to set up the partnership in 2015 and the business structure began in earnest on 1 January 2016. The motivation was to deliver an income and a better work/life for both families.

Sean Treacy's Teagasc discussion group, facilitated by local advisor Sandra Hayes, were on an annual trip during which they visited a farm partnership in Co Louth. "The benefits from how the two farmers were working were clear and that sowed a seed in my head about a partnership," says Sean, who subsequently came to Teagasc to find out more about a partnership and how it could work for him.

Sean and his wife Lorraine have two children. At that time they were dairy farming on a fragmented farm, milking 70 cows, rearing replacements for the dairy herd and also rearing pedigree Friesian bulls for sale. With Sean working alone except for casual labour, the sheer volume of work meant that family life began to suffer.

Kieran and Angela Fitzgerald also have two children. Kieran had worked in the mining industry for 15 years. With the mine closing, Kieran was looking for a new opportunity. Prior to the mine, Kieran had worked as a farm manager (he is a Farm Apprenticeship Board graduate).

Sean mentioned the idea of working together on the farm in a partnership to Kieran who is married to a cousin of his and had worked on the farm as a hobby for years. Sean had considered offering Kieran a job as an employee but he wanted to work for himself and had some capital available to invest in the business.

Getting started

Sean and Kieran started the process by discussing the partnership with their wives and families. They then created a business plan; working out the financial figures to show that this partnership can deliver for both families. The 57-acre milking platform was carrying 70 cows and followers.

In 2015, two options to expand the scale of farm arose. Option one was to purchase 24 acres that had come up for sale near the grazing block. The second opportunity was to lease a 60ac farm two miles away for the long term. Sean and Kieran decided to lease the 60-acre block on a 10-year lease rather than buy the very expensive smaller block.

Putting the plan into practice

The leased land created the room to expand using a zero-grazing system. This outside block enables the business to carry a higher stocking rate on the milking platform and the leased land is used for silage, young stock and zero grazing grass for the milking cows.

"The new block was more than we needed," says Sean. "But when the opportunity came up, we took it." The land reduced the stocking rate on the farm to approximately 160kg of organic nitrogen hectare. It was all reseeded in 2015 and is producing good-quality grass for grazing, cutting and silage. The additional land created a need to make more silage in 2016 as the stocking rate had not increased sufficiently to utilise the extra grass through zero grazing and grazing with young stock.

The dairy herd is growing from within rather than through buying additional stock. This allows both men time to adjust to working together. "We are building cow numbers gradually; when the herd gets to 140, the numbers of young stock will be reduced." All calves were carried through last year and bulls were sold

Kieran Fitzgerald and Sean Treacy.

in November and December. The current herd EBI is €70 with a high-fertility sub index and good genetic potential for milk solids in the form of fat and protein. The 2017 calves have an EBI of €131 and maiden heifers are currently at €106. This shows that the cow type is right for the grass-based system.

With 45 heifers calved down in 2017, the herd has already increased to 96 cows from the 70 milked in 2016. The aim is to supply one million litres of milk from these cows. In 2016, the herd supplied 6,300 litres per cow (506kg of milk solids) while including 46% heifers. As the herd matures, output of milk solids will improve.

Labour and work organisation

"We sit down every morning and have the tea and discuss the day," says Kieran. "It's about communication; we both go and do jobs – he knows what I'm doing and I know what he is doing. Two jobs are done in the same timeframe and if we overlap or work on a job together, that is also done."

Decision-making is shared between Sean and Kieran. The morning chat over breakfast is very important to tease things out and make decisions. Sean says: "No hasty decisions are made." They sat down and created plan for the partnership. This was followed up with putting financial figures around the plan.

Sean says that the past two springs have been great with Kieran working with him. "In general we have every second night off. We both have access to the calving camera and if a second person is needed for a difficult calving, they can be called upon. "You don't feel it as bad when you are up during the night knowing that you can get a night's sleep the following night."

Lack of sleep is not good for your health. You have no time for family as they never see you when you are working alone. "I'm married to a dairy farmer and he does actually exist," says Lorraine.

Work-life balance

Lorraine says one the great benefits is that "we can book a family holiday months in advance, whereas we could never do that before".

There are health and safety benefits too. Lorraine says: "The benefits for your health and your family life are huge. We see a massive improvement." Research by Teagasc has shown that the nature of partnership with more labour available on a daily basis reduces work stress and creates an environment of social interaction.

Dealing with differences of opinion

"We are both fairly easy-going and don't let it come to arguments. If something is to be said, it will be said and dealt with," says Sean. They are open and honest with each other and the daily communication and sense of common purpose is a huge help in that regard.

"When something is in your head, it gets bigger and bigger, so you're better off to say it out. Get it off your chest, right or wrong and sort it out," says Sean.

Sean and Kieran say that working together has created support for each other in their work. "If something's going wrong you have someone to sound off, what do you do? What do you think?"

"If it was up to yourself you'd be so far into something. You would wonder are you doing the right thing or the wrong thing," Kieran says.

"A good partnership beats working on your own," concludes Sean.

Louth potato growers have it in the bag

These potato growers have found their niche

Shane Kennedy
Teagasc tillage advisor, Drogheda

Volatile prices, smaller margins, tighter specifications and rising costs are increasing the pressure on potato growers. Supermarkets, who sell three-quarters of all potatoes consumed here, are supplied by a small number of very large growers with the scale to cover the huge investment in machinery, production and storage. However, there are still a small number of farmers who are running more traditional mixed farming operations while also successfully growing and marketing potatoes.

Nicholas and Martin Halpenny, who farm near Stabannon, Co Louth, operate a good example of a family business which is serving local consumers. Through careful agronomy, they have established a reputation for Rooster potatoes with both a good appearance and high eating quality.

Towards the end of May, the brothers are to be found quietly working together, changing over to row-crop tyres as they prepare to spray winter wheat, winter and spring oats. Winter barley has already received its final spray. "We sow late compared to growers further south but we find that it suits us in terms of yield and quality," says Nicholas.

With the potatoes in the ground, the brothers are on top of things with some cattle nearly ready to sell and the silage not due to be cut for another week or 10 days. One of the brothers is never far from the packing shed where they wash, dry and grade their stored crop. If they get an unexpected order, they will fill it. But they don't sell potatoes in bulk boxes.

"We found the box-trade to be uncertain and volatile," says Nicholas. "So we gradually built up a network of small retailers and distributors in our area who buy directly from us." This strategy has been so successful that every potato leaves the yard in a 5kg or 10kg bag.

Soil and fertility are key

Nicholas is a great believer in getting the basics right. "Our land and ground we rent is generally clay-loam and we really appreciate the value of soil testing as we need both pH and soil fertility to be right."

Some potash (K) deficiencies on tillage land were addressed this year by switching to a 10-7-25 fertiliser compound. Nicholas never operates a rotation of less than five years for potatoes. The fertiliser choice of 12 bags of 7-6-17 also helps him to achieve the optimum dry-matter levels for eating quality but also for storage.

All of his potato seed is certified. "We place great emphasis on good-quality, virus-free seed to provide the early vigour and skin finish required for a packing sample," says Nicholas. The brothers operate one ambient and one refrigerated store, allowing them to provide an excellent sample of ware potatoes year round.

Machinery

"We like to keep costs as low as possible, without threatening quality," says Nicholas. The brothers carry out all potato-planting operations themselves. They have tillage farmers' fascination with machinery and the ingenuity to solve almost any mechanical problem in-house.

An interesting example of this is visible at planting time where Nicholas and Martin use a small elevator, which the loose seed potatoes are tipped into from an old grain trailer recently refurbished for the purpose. This eliminates the need for a telehandler and perhaps an additional labour unit in the field. It also allows for the safe and efficient transfer of seed into the planter.

Their machinery costs are relatively low and Nicholas jokes that this is because they have decided not to overly invest in this area in recent years

Shane Kennedy and Nicholas Halpenny.

QUALITY

"The Halpennys have established a reputation for the appearance and eating quality of their potatoes," says Shane Kennedy. "That comes down to the ground they use to grow the potatoes, the fertiliser and pest management regimes, and in particular the handling and storage of the potatoes."

because they may not be around for much longer!

More likely, it's testament to the brothers' skill in the farm workshop, repairing and maintaining equipment and the ''getting the basics right'' philosophy, which permeates their approach.

The brothers, consciously or unconsciously, close the loop on their farming enterprise as much as possible and the traditional mixed farming operation tends to lend a hand in this. They use the potatoes that don't make the grade for fattening cattle along with various cereals grains that they grow and roll themselves.

Farmyard manure

The farmyard manure that these cattle produce is then stored indoors for as long as possible to preserve its nutrient status and is then spread on the land to improve soil fertility and reduce fertiliser costs. All of the land they farm is within a 2km radius of their yard.

The fact that Nicholas and Martin never have any problem renting good, fresh potato ground is testament to their reputation and good neighbourly qualities – they can be relied upon for tending to the stock of neighbouring farmers when they are on holiday.

It is also a truly family affair whereby Nicholas can draw on his children and extended family for help during busy periods as most of them also live within a few kilometres of the farmyard. His wife Anne looks after the paperwork.

EU visionaries like to talk about optimum food production models. This is where high-quality locally grown and consumed food is produced at a competitive cost and where waste streams are integrated back into a production system which is both economically and environmentally sustainable. It sounds very like what the Halpennys have been doing for years.

> In total just 9,000ha of potatoes are now grown annually in Ireland. It is an area which is declining as consumption and the pressure of imports takes its toll on Irish growers

Satisfying hearts and minds

Farm woodlands are making a growing contribution to Padraig Corcoran's quest for environmental, social and economic farm sustainability

Noel Kennedy
Teagasc Forestry Development Officer, Roscommon

"This was my playground when I was a child," muses Roscommon farmer Padraig Corcoran as we approach his 12 acres of 200-year-old broadleaf woodland which is the beating heart of Mount Plunkett Nature Reserve. Adjoining the canal which links Lecarrow village, just north of Athlone, with nearby Lough Ree, the woodland and associated wetlands are the jewels in the crown of Padraig's farm which he has been managing for the past 20 years. With an infectious enthusiasm, Padraig has established the nature reserve and has the protection of nature and wildlife at the heart of everything he does.

Satisfying hearts – farming conservation

Apart from the woodland, Padraig's farm would be considered small and extensive – he farms 81 acres – 16 rented – carrying sheep and store cattle – a typical Roscommon farm. But his impeccable environmental and conservation credentials are reflected in his long-term involvement in agri-environment schemes, from REPs right up to GLAS – planting hedges and trees, putting up nesting boxes, developing species-rich wetland and creating plots of wild bird cover.

On a breezy sunny morning the woodland is in full leaf – mature ash, oak, beech, sycamore and, remarkably, elm look down on hazel, holly and spindle. In brighter gaps, a new generation of younger trees grows. A handful of ewes and lambs meander through, grazing on the nutritious herb layer in the shelter of the trees. There is a cacophony of birdsong.

Woodland restoration

It wasn't always this idyllic. "Before I bought it in 2005, the woodland, right down to the canal, had been completely abandoned for more than 25 years," says Padraig. "It was a mess and when I got the chance I jumped at the opportunity to buy it and begin to restore it."

For Padraig, restoring means managing both woodland and wetlands in the traditional style of farming – high nature value farming in today's terminology. Because the area is in the Lough Ree Special Area of Conservation, this involves consultation with the National Parks & Wildlife Service (NPWS) and other agencies to sensitively manage the multiple services provided by the woodland.

To support the sustainable development of the woodland, Padraig recently got approval for funding under the Native Woodland Conservation Scheme. Administered by the Forest Service, DAFM, the scheme prioritises sites of high ecological significance where native woodland restoration will deliver benefits regarding the protection of watercourses and aquatic habitats.

Padraig is passionate and proud

Padraig Corcoran farms 12 acres of 200-year-old broadleaf woodland which is the beating heart of Mount Plunkett Nature Reserve in Co Roscommon.

Forestry Programme 2014-2020

- Afforestation scheme: the planting of forests is supported by a range of afforestation grants and annual premiums. Forest options include commercial conifers, native woodlands, agro-forestry and forests for fuelwood. Annual premiums are paid for 15 years and typically range €501 to €635/ha. New forests may also be eligible for Basic Payment.
- Native Woodland Conservation Scheme: Focusing on the restoration of native woodlands with a range of ecological benefits this scheme offers a Native Woodland Conservation Grant up to €5,000/ha and an annual premium of €350/ha to private owners for seven years.
- For the first time, the promotion of forestry to farmers is now the subject of a national Teagasc campaign. For more information on afforestation, Native Woodland Conservation and a host of forestry topics, see www.teagasc.ie/forestry.

of what he has achieved but he is anxious to send the message to policy-makers that more joined-up thinking is required between farming and the environment to ensure that production is sustainable – economically, socially and environmentally.

Perhaps the real strength of Mount Plunkett is in the education it offers and its demonstration of what can be done. Since 2006, Padraig has hosted numerous visits and courses involving agencies ranging from Teagasc to Birdwatch Ireland and the NPWS, to the annual Roscommon Lamb Festival. Padraig particularly welcomes local schoolchildren whom he describes as "open and enthusiastic sponges for knowledge, information and ideas."

Satisfying minds – production forestry

But, for Padraig, farming is also about being a pragmatist. His is not a big farm and, by 2012, he began to appreciate the reality of modern farming – ever longer hours and declining returns, making ends meet is difficult even with an off-farm job. With the future of his young family to consider, he saw that in order to continue to sustainably manage the land, an alternative secure source of income would be necessary.

As Padraig saw it, the environmental focus in farming was only going to get stronger with a particular emphasis on the protection of water quality and reducing the carbon footprint. He set about seeking an alternative farm enterprise with an environmental profile to complement his own farming system.

Forestry ticked all the right boxes as an enterprise, offering these environmental benefits and more, coupled with guaranteed annual premiums and retention of the Basic Payment.

Having sourced land – marginal for farming but highly productive for forestry – Padraig planted his first farm forest – 8.8ha of Sitka spruce, Japanese larch and broadleaves in 2012. Every year since then he has been planting an additional 6ha to 8ha and is planning a further 4ha in the back-end of the year.

He has engaged a local Roscommon forestry company to do most of his planting but in 2015 he planted 3ha himself and, not surprisingly, is following its progress with particular interest. "To get the best from forestry, owners need to be in touch with what's going on," says Padraig. "Planting a few trees or doing a bit of grass cleaning is great experience and is good for the owner and the trees."

In the same spirit of openness evident in Mount Plunkett, earlier this year Padraig hosted a Teagasc walk where forest owners learnt about the management of young plantations.

Padraig is delighted with the growth in his young plantations and their unashamedly strong focus on the production of commercial softwood. "Today's plantations match strong environmental measures with really fast tree growth," he comments. "The trees are carbon-neutral and a renewable resource – I see them as complementing the woodland conservation work in Mount Plunkett and helping to sustain the way we, as a family, want to see the farm develop."

Formative pruning of trees

Eileen Woodbyrne
Lecturer, Teagasc College at the National Botanic Gardens

Removing one of these co-dominant stems is easy at this young stage.

This union is well on the way to failing.

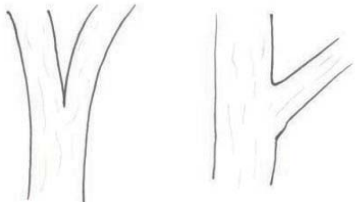
The outcome when co-dominant stems fail in a mature tree.

Formative pruning starts in the nursery and continues through the tree's early years in its ultimate location. Formative pruning helps the tree to establish a good, attractive, branch structure as it grows. Branch structure can contribute to tree health too. If crossing branches are allowed to develop, they can rub against each other causing bark wounds that allow disease-causing organisms to get into the wood.

Perhaps most importantly, formative pruning can correct problems in a young tree that have the potential, if not corrected, to lead to tree failure later on. Co-dominant stems are a good example. Sometimes called twin leaders (although there can be more than two), co-dominant stems exist where stems of similar diameter arise from the same point on a tree.

This gives rise to a tight, V-shaped fork which is structurally weaker than where a single subordinate branch arises from a main stem. When this weak union fails, it can leave a large tear-out wound that exposes wood to decay-causing organisms. The shape and appearance of the tree is usually badly affected.

Figure 1

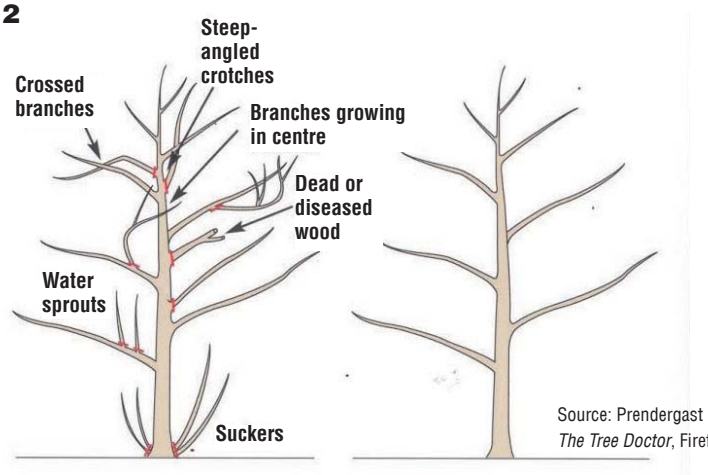


A potentially weak V-shaped union between two co-dominant stems.

A stronger branch union between a main stem and a subordinate branch.

When a tree is young, co-dominant stems can be corrected by choosing one leader and removing the other(s). If done early enough with a secateurs or a lopper, there will only be a small wound which the tree can seal quickly.

Figure 2



Source: Prendergast D & E, *The Tree Doctor*, Firefly 2003

How to prune a young tree

- If the tree has co-dominant stems, choose one to remain as the leader and remove the others.
- Remove dead or diseased wood.
- If two branches are crossing or rubbing, remove one.
- Remove suckers (shoots arising from the root system or from below the graft union in a grafted tree).
- Remove badly placed or crowded branches, and branches that are growing back in towards the centre of the tree.
- If you want a standard tree, you will have to remove some lower branches, but phase this process over a few years. The presence of low branches helps a young tree to develop a strong stem so don't remove them all at once.

When to prune?

If you buy a young tree from a nursery or garden centre, it should not need pruning – this should have been done in the nursery. Remember that if the tree has been field grown and lifted for sale as a bareroot or rootballed plant, it will inevitably have left some of its root system behind in the nursery. Its priority at this stage is to put on root growth in its new home and it won't want to put energy into responding to wounds. So, aside from removing or cutting back branches that have been damaged in transit, we should not be routinely pruning trees at planting time.

There is no ideal time to prune trees. When we prune we are inflicting wounds and the tree would prefer if we didn't do that. Many people prune in winter because with deciduous trees it's easier to see the branch structure. However, the tree is dormant then, and it is unable to mobilise its chemical defence system or to begin to seal the wounds.

In midsummer, the tree is actively growing and has built up enough stored energy to be able to respond to possible damage. With cherry trees in particular, it is better to prune in summer as they are less likely to become infected with silver leaf disease at that time of year.

The only caveat here is that we shouldn't prune any tree when it is stressed, so if there has been a drought spell, postpone the pruning operation.

In conclusion, judicious pruning while your tree is young will reward you and your descendants with a more attractive, healthier and potentially longer-lived tree.

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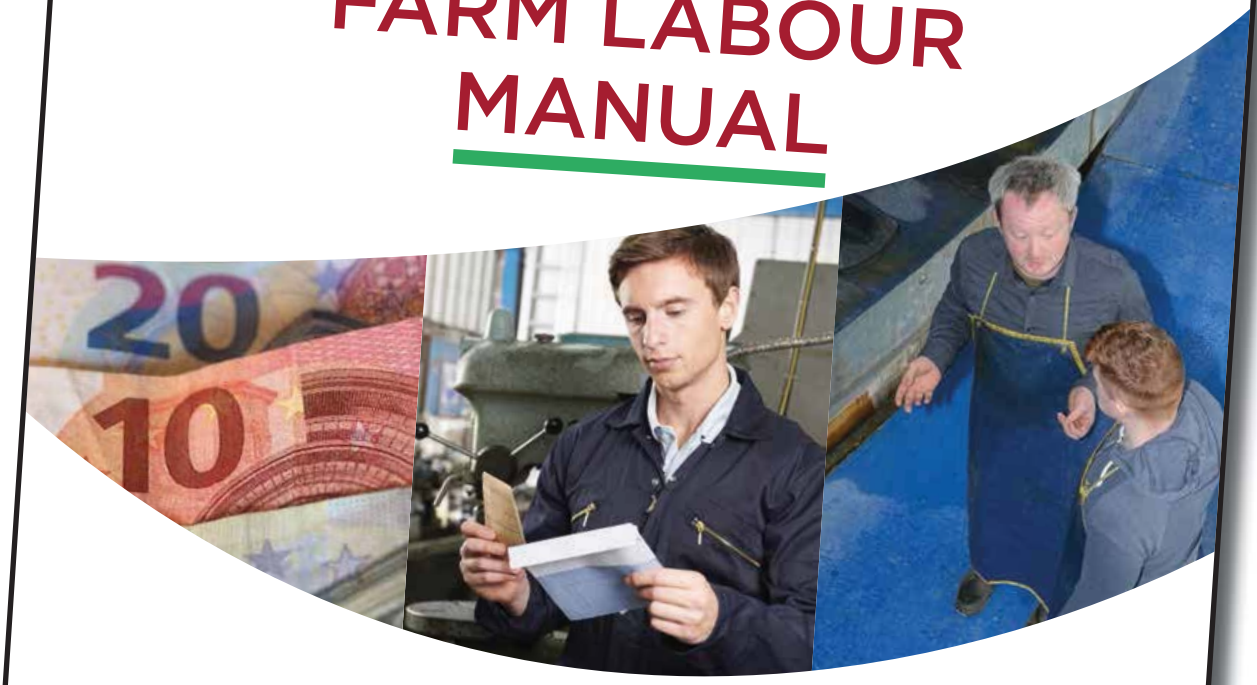

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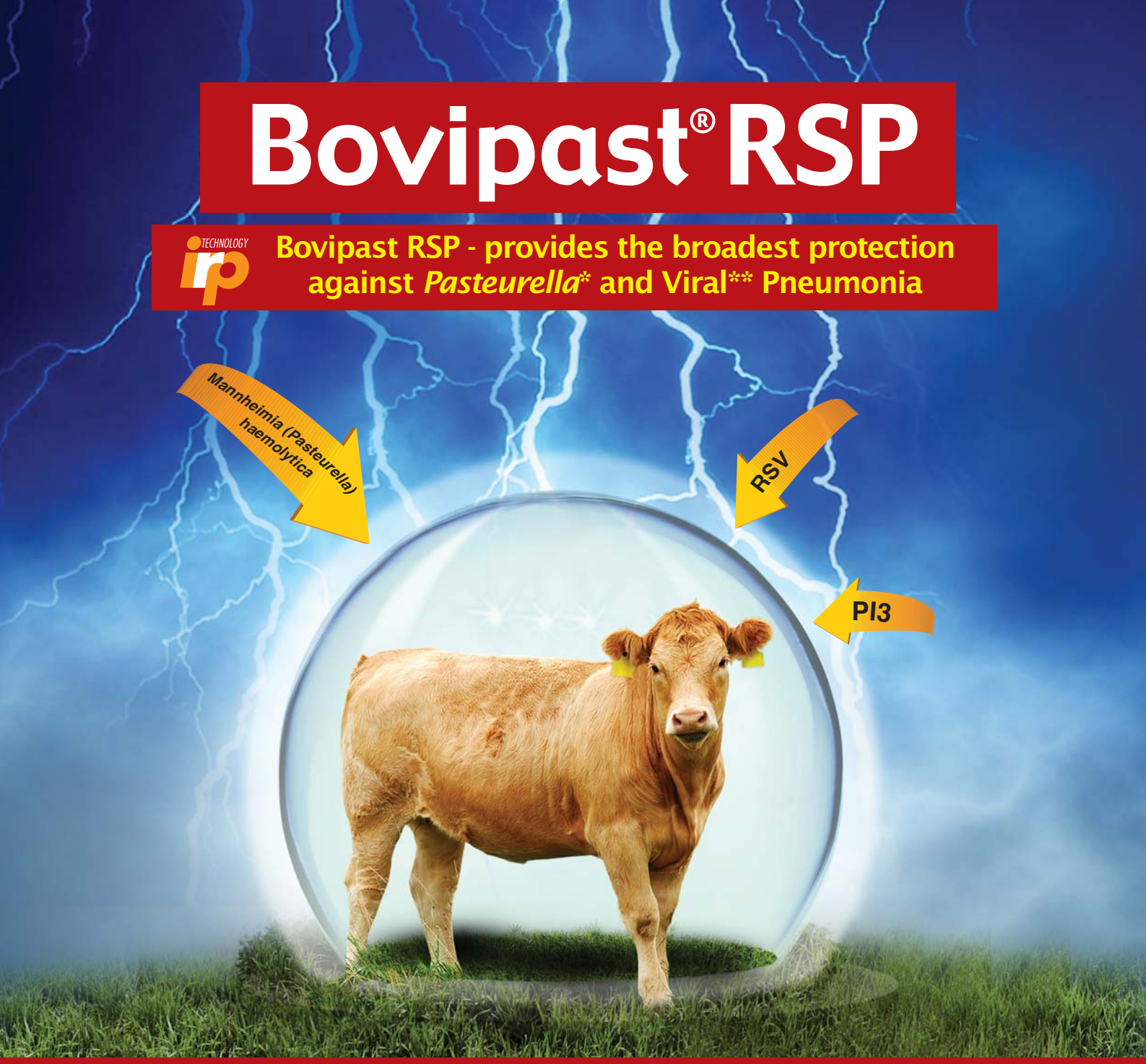

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