



Today's Farm

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



Fodder still an issue

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Mannheimia (*Pasteurella*)
haemolytica

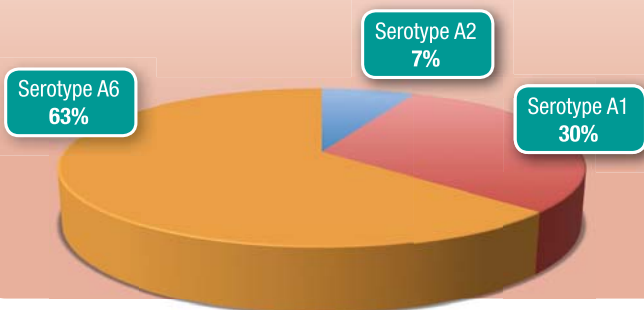
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Web: www.msd-animal-health.ie

**Mannheimia (Pasteurella) haemolytica* A1 and A6.

**From 3 weeks of age.

1. Timsit, E et al.: Transmission dynamics of *Mannheimia haemolytica* in newly-received beef bulls at fattening operations. Veterinary Microbiology 161 (2013) 295–304.



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COMMENT

Mark Moore
Editor,
Today's Farm

Are you suffering fodder fatigue?

All farmers know that fodder is short, not only on their farms but in the country as a whole. They may even be fed up reading about it. Some feel that with grass now at least trying to grow again, the manure is still some way from the fan. But there is no room for complacency and it's vital that farmers do everything they can to secure feed supplies for the coming winter.

So nearly every article in this edition touches on the issue. We cannot change market or weather conditions but if we pass on even a couple of tips to each reader we will hopefully have made a contribution to a very serious situation.

Céard ba chóir duit a dhéanamh le do chuid féir?

Tá fodar gann ach tá roinnt féir agat. Mar sin, céard ba chóir duit a dhéanamh? Na hainmhithe a chur ar féarach? É a bhurláil? Nó é a fhágáil go dtí an t-earrach? Deir na saineolaithe gur fearr ainmhithe a chur ar féarach air go dtí go mbainfear amach an clúdach barrmhaith don dúnadh. Is é an fear an bheatha is cost-éifeachtúla dá mbíonn ann san fhómhar, ach bíonn sé níos luachmhara fós san earrach. B'éigean duit diúltú don chathú filleadh ar pháirceanna dúnta; beidh tú buíoch as an bhféar san earrach. Má bhíonn an t-ádh leat an fómhar seo agus barrachas féir agat, déan sadh-las de. Is dócha go mbeidh an-éileamh go deo air.

FORESTRY
Plant trees to help reduce your stress levels, says Westmeath farmer

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Cover | Dairy farmer Lawrence McNamee is passionate about grass measuring and grazing but he also advocates building a silage reserve (and possibly extra pit capacity), when conditions allow next year, to give farmers peace of mind when we get years like 2013 or 2018.

Soil testing and fertiliser planning changes for 2018

Now is the ideal time to take soil samples and check soil fertility levels (lime, P and K).

Take soil samples every 2ha to 4ha to a depth of 10cm and take a minimum of 20 soil cores per sampling area. This will provide the basis for planning lime and fertiliser applications.

Changes to Nitrates Action Programme (Nitrates Directive)

• **Soil sampling:** Under Nitrates Regulations (SI 605, 2017) soil sampling area has reduced from 8ha to 5ha, soil samples are now required every four years. Soil sampling intensity has increased under the new NAP as it is an effective tool to ensure the efficient use of P applied as either manures or fertilisers and reduce the risk of nutrient loss to water. Check farm fertiliser plans and take additional soil samples where required.

• **Additional P on grassland farms:** The rates of chemical P for index 1 and 2 soils have increased to facilitate the buildup of low fertility soils to increase their productive

capacity. Higher P rates are available on grassland farms with the following criteria – a grassland stocking rate above 130 kg Org N/ha, soil test results for every 5ha and engage with an FAS advisor to complete a farm fertiliser plan. Update farm fertiliser plans to avail of additional chemical P to build soil fertility levels.

• **Autumn P for cereals:** As part of the recent changes to the Nitrates Directive winter cereals can now receive an application of chemical P up until 31 October provided that the P is either soil incorporated or placed at sowing time. An application of 20kg and 10kg P/ha is permitted to index 1 or 2 soils, respectively. The application of P in the autumn to winter cereals on low fertility soils is required to aid plant rooting and tillering over the winter. There are no restrictions on the application of potassium (K) during the growing season.

Remember, before applying additional P, correct soil pH to the optimum of pH 6.3 in grassland and pH 6.5 in cereals. Now is an ideal time on either



grassland or tillage farms to apply lime and correct soil pH cost effectively. Optimising soil pH will firstly release soil P and secondly increase the availability of applied P as either chemical or organic fertilisers.

• **Lime:** Over the coming weeks and months it will be optimum to spread lime. Only apply lime based on a recent soil test result (last three to five years). Lime is the one nutrient that offers a very good rate of

PastureBase Ireland launches new app

PastureBase Ireland (PBI) is an internet-based grassland management programme for all grassland farmers.

In operation since 2013, and with the ongoing merger with AgriNet Grass since 2017, it offers farmers grassland decision support and stores grassland data from dairy, beef and sheep farmers in a central national database.

Does PBI have an offline app? How and who should download it?

Earlier this summer PBI launched an offline app which is available to download from the app store and Google Play store. Search for "PBI Grass". All farmers currently using PBI should download the app right now. The app is free.

What can I record on the offline app?

The objective of the offline app is to

record grass covers, graze dates, fertiliser application and livestock number/intakes, as well as milk data quickly while undertaking the task in the paddock, independent of mobile coverage.

Why choose to develop an offline app?

Internet access is rarely available in fields so the app needed to be offline.

So what steps do you take once you have the app on your phone?

You need the most up-to-date information on the app before you can add new information offline. So, before you head out to the field download the most up-to-date farm covers from www.pbi.ie on to the app in your phone. You can then enter newly measured covers offline (no need for coverage and Wi-Fi in the

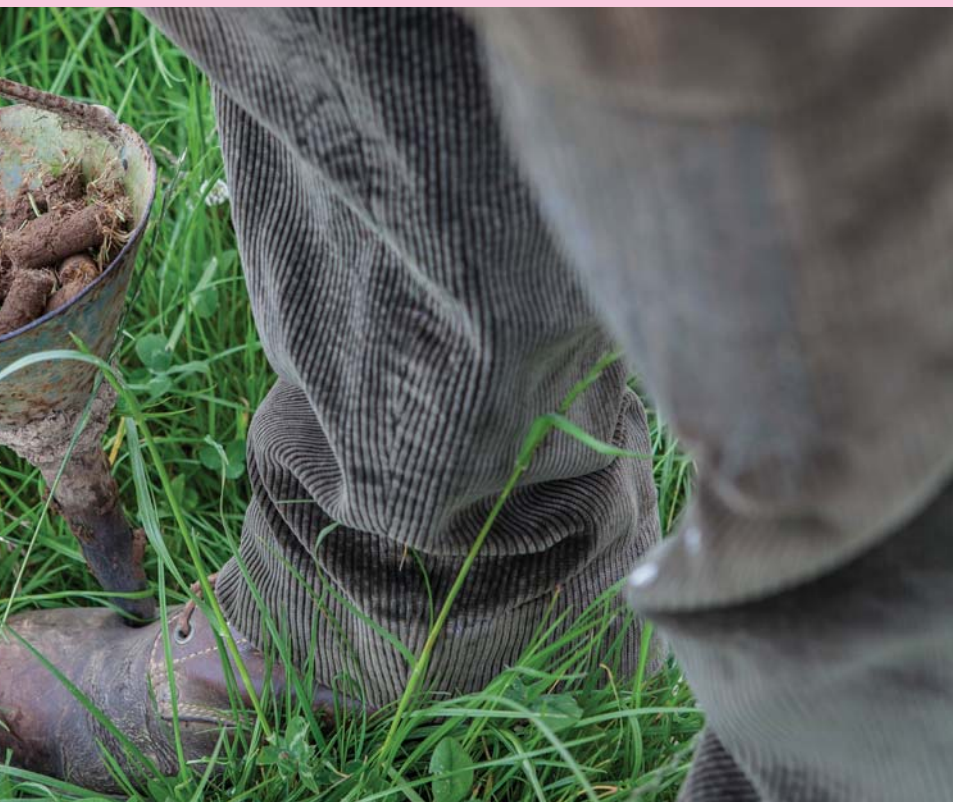
field) and when you have completed taking these new measurements you will need internet coverage or Wi-Fi again (at home probably) to upload the information to www.pbi.ie.

What does the future hold for the app?

The current app is basic but functional; however we are currently developing a daily grazing planner and hope to display an image of the grass wedge once a full farm cover is completed. These additions should help farmers even further in managing their grass.

PastureBase Ireland is available to all Teagasc clients.

If you wish to sign up or require more information please call our dedicated help centre 046-9200965 or email support@pbi.ie.



Teagasc at the Ploughing

Teagasc will again have a major presence at the National Ploughing Championships in September. The exceptionally dry weather means that fodder remains a key issue for many farmers. Our open-air arena beside the Teagasc marquee proved highly popular last year and we will use it again to address this crucial topic.

Teagasc researchers, specialists, advisors and nutritionists will address real examples by interviewing farmers about their situations and how they optimise their feed and fodder strategy this autumn, winter and next spring. As well as viewing live interviews on our outdoor screen farmers can have one-to-one discussions about individual fodder or financial issues with advisors at the event.

The Teagasc stand will not just be about fodder of course. It is a one-stop-shop for the full range of issues confronting farm families. So if you want to discuss education opportunities (Teagasc has several exciting new initiatives and partnerships in the pipeline); farm succession (we will have experts present); forestry; environment related issues; diversification; food; health and safety; horticulture; farm management as well as the main stream enterprises drystock, dairy or tillage there will be free advice available.

We are very close to the NPA headquarters and if you would like to come and work for Teagasc, our HR colleagues will tell you about careers with us.
• Block 3, Row 13, Stand 277.

return on investment. For example, every €1 spent on lime will return up to €7 extra grass production.

Extension for fertiliser and slurry spreading

An extension to the deadlines for spreading of chemical and organic fertilisers has been granted by the Minister for Agriculture due to the exceptional weather conditions in the spring and summer of 2018. The aim is

to boost grass growth in the autumn to try and alleviate the current shortage of winter feed. The closed periods for chemical fertilisers in 2018 is now 30 September and organic fertilisers 31 October. Ensure to comply with buffer zones for both chemical and organic fertilisers at time of application to protect water bodies.

– Mark Plunkett,
Johnstown Castle

Download the new PastureBase Offline App

Search for **PBI Grass** on iPhone & Android



Download on the
App Store



GET IT ON
Google Play



Enter Data Now
- Upload Later!



NATIONAL CROPS FORUM

- **11 September 2018:** 2pm.
- **Venue:** Killashee House Hotel, Naas, Co Kildare.

The National Crops Forum will examine new varieties available this year and the outlook for grain prices. The forum will discuss profitably integrating forage crops on a tillage farm, including livestock forage needs – opportunities for tillage farmers and red clover – a tillage crop option.

TRANSFERRING THE FAMILY FARM CLINICS

- 25 September: Ballygarry House Hotel, Tralee.
- 26 September: TBC.
- 27 September: Great National Hotel, Ballina.
- 3 October: Abbey Hotel, Roscommon.
- 4 October: Killeeshin Hotel, Portlaoise.

EQUINE

- Saturday, 29 September 2018: young breeders' training day – Kildalton College, Piltown, Co Kilkenny.



The National Crops Forum will take place on 11 September.



Schedule of College Open Days

Autumn 2018	
Date/Time	College
Thursday 4th October 2018 Open Day 2pm – 4.30pm Tours on-going	Botanic Gardens (Horticulture) Teagasc, College of Horticulture, National Botanic Gardens, Glasnevin, Dublin 9 Principal: John Mulhern Phone: 01 8040201 Email: botanic.college@teagasc.ie
Thursday 4th October 2018 Open Day 10.30am – 12.30pm Tours on-going	Gurteen (Agriculture) Gurteen College, Ballingarry, Roscrea, Co Tipperary Principal: Mike Pearson Phone: 067 21282 Email: info@gurteencollege.ie
Friday 5th October 2018 Open Day 10am – 1pm Tours on-going	Ballyhaise (Agriculture) Teagasc, Ballyhaise Agricultural College, Ballyhaise, Co Cavan Principal: John Kelly Phone: 049 4338108 Email: ballyhaise.college@teagasc.ie
Friday 5th October 2018 Open Day tours start at 10am & 11am	Kildalton (Agriculture & Horticulture) Teagasc, Kildalton Agricultural & Horticultural College, Piltown, Co Kilkenny Principal: Paul Hennessy Phone: 051 644400 Email: reception@kildaltoncollege.ie
Wednesday 10th October 2018 Open Day tours start at 9.30am, 10.30am & 11.30am	Mountbellew (Agriculture) Mountbellew Agricultural College, Mountbellew, Co Galway Principal: Tom Burke Phone: 0909 679205 Email: tvb@iol.ie
Thursday 11th October 2018 Open Day 10am – 2pm Tours on-going	Pallaskenry (Agriculture) Salesian Agricultural College, Pallaskenry, Co Limerick Principal: Derek O'Donoghue Phone: 061 393100 Email: info@pallaskenry.com
Friday 12th October 2018 Open Day tours start at 11am & 12 noon	Clonakilty (Agriculture) Teagasc, Clonakilty Agricultural College, Darrara, Clonakilty, Co Cork Principal: Keith Kennedy Phone: 023 8832500 Email: clonakilty.college@teagasc.ie

Spring 2019	
Date/Time	College
Thursday 28th February 2019 Open Day 10am – 2pm Tours on-going	Pallaskenry (Agriculture) Salesian Agricultural College, Pallaskenry, Co Limerick Principal: Derek O'Donoghue Phone: 061 393100 Email: info@pallaskenry.com
Friday 1st March 2019 Open Day tours start at 10am & 11am	Kildalton (Agriculture & Horticulture) Teagasc, Kildalton Agricultural & Horticultural College, Piltown, Co Kilkenny Principal: Paul Hennessy Phone: 051 644400 Email: reception@kildaltoncollege.ie
Wednesday 6th March 2019 Open Day tours start at 9.30am, 10.30am & 11.30am	Mountbellew (Agriculture) Mountbellew Agricultural College, Mountbellew, Co Galway Principal: Tom Burke Phone: 0909 679205 Email: tvb@iol.ie
Thursday 7th March 2019 Open Day 2pm – 4pm Tours on-going	Botanic Gardens (Horticulture) Teagasc, College of Horticulture, National Botanic Gardens, Glasnevin, Dublin 9 Principal: John Mulhern Phone: 01 8040201 Email: botanic.college@teagasc.ie
Friday 8th March 2019 Open Day 10am – 1pm Tours on-going	Ballyhaise (Agriculture) Teagasc, Ballyhaise Agricultural College, Ballyhaise, Co Cavan Principal: John Kelly Phone: 049 4338108 Email: ballyhaise.college@teagasc.ie
Friday 8th March 2019 Open Day tours start at 11am & 12 noon	Clonakilty (Agriculture) Teagasc, Clonakilty Agricultural College, Darrara, Clonakilty, Co Cork Principal: Keith Kennedy Phone: 023 8832500 Email: clonakilty.college@teagasc.ie
Wednesday 13th March 2019 Open Day 10.30am – 12.30pm Tours on-going	Gurteen (Agriculture) Gurteen College, Ballingarry, Roscrea, Co Tipperary Principal: Mike Pearson Phone: 067 21282 Email: info@gurteencollege.ie

For further information please contact the college of your choice or visit our website at www.teagasc.ie



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Setting up the farm for spring 2019

Careful paddock management is key to ensuring you make the most of your grass this autumn and next spring

Fergus Bogue
Teagasc Grass10

The decisions we make this autumn will have a huge impact on grass availability in spring 2019. With grass available, calved cows can be let out to feed on fresh grass and concentrates. No need for silage.

Every extra day at grass in the spring is worth €2 to €3 per animal/day. So for a herd of 100 animals, 10 extra days at grass next spring is worth €2,000 to €3,000. This benefit from grazing can be twice as great where fodder is scarce and expensive.

Autumn grazing management plays a huge role in how much grass you will have next spring. Every extra day at grass in the autumn is also valuable – worth €2/head/day, so we must try to keep grass in the diet of our animals for as long as possible, without affecting grass supply next spring.

So the objectives for farmers over the remainder of the grazing season are to:

- Keep grass in the diet of livestock for as long as possible.
- Close off paddocks in good time so they will have good quantities of grass next spring.

How to close the farm

To close off the farm, we generally use the 60:40 autumn planner. The target is to have 60% of the farm grazed and closed in early November and to graze the remaining 40% during November.

Farmers with heavy soils will have to start closing earlier (e.g. Teagasc

Ballyhaise starts closing paddocks on 25 September) and must close off most of the farm by 31 October. A dry farm should start closing in the first week of October. The target closing cover on farms should be at least 600kg DM/ha (preferably 650kg DM/ha). If you can achieve this, you have a good chance of starting next year with a substantial opening cover (depending on growth rates over the winter).

Example one: closing cover 650kg DM/ha on 15 November. Growth rate of 3kg DM/day over the winter period. Seventy-eight days from 15 November to 1 February:

Closing cover: 650kg DM/ha + (3kg DM/ha growth rate x 78 days) = 884kg DM/ha. Opening cover: 1 February.

Farmers should keep the following in mind when closing off the farm:

- Put a plan in place. For example, if you have 100 acres and you plan to have 60 acres closed by the first of November, you must graze and close 15 acres per week during the month of October. So you might graze and close 15 acres by 10 October, another 15 acres by 17 October, another 15 acres by 24 October and the final 15 acres by 31 October.

On heavy land you will be aiming to have 60% closed by the end of October. So the paddocks will be closed a week earlier i.e. starting on 3 October.

- Once a paddock is closed, do not re-graze it, as it will reduce grass supply for next spring. There may be a strong temptation to graze in late (November/December) if fodder is short. This approach will defeat the strategy of ensuring a supply of early spring grass. Spring grass is much more valuable than autumn grass.
- Dry paddocks with good grass covers close to the yard are especially precious in the spring. So make certain that these dry paddocks are grazed off and closed early so that they have grass on them next spring (it's frustrating in the spring to have grass on paddocks with heavy soil and possibly poor ground conditions.). Make sure these precious paddocks also have multiple access and water points

to further minimise possible damage in the spring.

- Farms with low grass supply: if you have a low grass supply on your farm this autumn, supplement to extend the grazing season and to keep at least some grazed grass in the diet of your animals for as long as possible. Do not graze the farm quickly and run out of grass, as it will result in an even earlier housing date.

Autumn grazing management:

The following are some grazing tips to maximise grass utilisation on our farms this autumn, while also keeping one eye on spring 2019:

- Extend the rotation in September and October: operate a rotation length of 35 days (30 days minimum). This means cattle return to the same paddock after 30 to 35 days. This will keep at least some grass in the diet of your animals.
- For the final round, which is likely to start in early October, extend the rotation to 45 days so animals will have gone through all the paddocks in 45 days (leaving the last one in mid-November.) If conditions deteriorate make every effort (by using strip grazing for example) to keep cows at grass.





Every extra day at grass in the spring is worth €2 to €3 per animal/day. So for a herd of 100 animals, 10 extra days at grass next spring is worth €2,000 to €3,000.

- Walk the farm weekly to monitor farm grass covers. Make sure to keep grass in the diet of animals for the remainder of the grazing season. Supplement levels will depend on growth rates and farm grass supply. To avoid running out of grass completely, reduce demand (by cutting stock numbers or increasing supplementation levels). Heavier animals can be housed and lighter animals left outside. If grass growth rates are low you may have to supplement. Supplement with concentrates to save your silage for the winter.
- If silage is to be included in the diet, animals can graze during the day and go in at night to avoid damage the ground.
- Remember demand is in your control, growth rates will be variable.
- It is crucial that we clean out paddocks well to stimulate growth over the winter and spring. So continue to graze paddocks down to 4cm throughout the autumn (grass should be 4cm when animals are leaving the paddock).
- If you don't graze to 4cm, dead material will lie dormant over the winter and inhibit growth.
- Good grazing infrastructure is crucial to maximising grass utilisation,

particularly in wet weather. Strip-grazing can help to minimise damage and ensure the correct amount of area/grass is allocated to stock through the autumn.

- Make sure to keep grass in the diet of animals for as long as possible,

while closing up to ensure sufficient grass supply on farms next spring. Extending the grazing season in autumn and spring will increase profits and make the most of scarce fodder.

Autumn grazing targets: farm cover, cover/LU and rotation length

Date	Cover/cow (Kg DM)	Average farm cover (Kg DM/ha)	Rotation length
STOCKING RATE OF 2.5 LU/HA			
Mid-September	400-450	1,000-1,100	35 days
1 October	400	1,000	40 days
1 November	60% of your grazing platform should be closed for spring at this stage		
Fully housed		550-600	
STOCKING RATE OF 3.0 LU/HA			
Mid-September	370	1,100	35 days
1 October	380	1,150	40 days
1 November	60% of your grazing platform should be closed for spring at this stage		
Fully housed		600-650	
STOCKING RATE OF 3.5 LU/HA			
Mid-September	340	1200	35 days
1 October	335	1175	40 days
1 November	70% of your grazing platform should be closed for Spring at this stage		
Fully housed		700-750	

Making late silage

It can pay to make bale or pit silage into October and beyond

Teagasc Grange

Grass is best-served fresh and grazing is the cheapest way to get good feed into animals cheaply. Extending grazing into the autumn when conditions and grass growth allow shortens the winter, reducing the number of days you are feeding indoors. So far, so obvious. But if you have surplus grass available (beyond what you need your closing covers to be) it can make sense to consider ensiling it as pit or baled silage.

Late autumn grass is usually very leafy with low fibre and high protein, particularly, if it is growing in paddocks that have been grazed down in the summer. It will be very lush and wet and ideally should be wilted before ensiling. This might be easier said than done of course. As we get further into September and October it will be hard enough to get the dew to lift off the grass let alone expect too much wilting from a weakening sun.

Bales or pit? It is possible to make both bales and pit silage in the autumn...if you only have a small amount of grass, bales are the obvious choice. Remember, however, that moisture content will inevitably be

quite high. Bales of silage could be as heavy as a tonne. Take this into account when planning to handle them.

Also be careful about effluent loss from bales or pit silage. You may need to include 'drainage' within the pit of silage to prevent moisture "pooling" within the pit or the silage "splitting".

Growth rates

Table 1 shows dry matter (DM) yields

for a perennial ryegrass and two old pasture swards average over a five-year period. The same fertiliser input and harvest dates were used for each sward type. All soils had satisfactory values for P, K and pH, and the stubble was bare at the start of each growth.

Two harvest schedules were used – one to harvest leafier grass and the other to take fewer harvests with heavier yields. Of course, 2018 has been far from a typical year. People might be taking second cuts which are far lighter than a second cut made in July. Nonetheless grass growth rates from now forward at around 50-60 kg grass DM/ha/day (moisture permitting) and silage can still be made.

Note, these are yields of grass, and values for silage DM consumed by livestock should be at least 75% of these values.

Harvester systems

Later cuts of silage can be equally successfully made with a precision-chop harvester, a pickup wagon or



Table 1: Yield (DM – dry matter) and digestibility (DMD%) of grass swards managed for silage production

Harvest date	Days from closing, or previous harvest	Yield (tonne grass DM/ha)	Growth rate (kg grass DM/ha/day)	DMD% (grass)	DMD% (change per week)
Schedule A					
22 May	49	5.42	111	75.5	-2.4
3 July	42	3.37	80	74.9	-1.1
14 August	42	2.08	49	74.2	-0.6
16 Oct	63	3.45	55	75.3	-0.3
Schedule B					
12 June	70	7.77	111	68.4	-2.4
14 August	63	4.73	75	70.6	-1.1
16 Oct.	63	3.71	59	75.0	-0.3

The main point of interest here is the October data.

Source: Teagasc Grange.

Options when short of silage

- Buy silage, but this can be a bad choice if available silage is over-priced and poor quality.
- Offer straw and concentrates.
- Buy alternative feeds.
- Extend the grazing season where possible.
- Sell stock.
- Restrict access to silage and make up the shortfall with concentrates (often the best option).

What about maize?

- At a concentrate price of €230/t good quality forage maize (30% DM, 25% to 30% starch) is worth €45/t.
- If the price of concentrates rises/falls by €20/t the value of forage maize increases/decreases by €4/5.



Bales of silage could be as heavy as a tonne in weight. Take this into account when planning to handle them.

CALCULATING SILAGE STOCKS ON THE FARM

First calculate the volume of silage in the pit. For example, a silage pit with measurements 28m long X 10m wide by 2.4m depth. Volume = 28 X 10 X 2.4 = 672m³.

Select the conversion to tonnes of fresh weight, depending on the dry matter of the silage.

For example if silage is 25% DM the conversion factor is 0.68. If the pit described above has 672m³ that equates to 457t of fresh weight.

baler systems, provided that the principles of good silage making are achieved in each case. Lighter yields of grass may be more economically harvested as bales, although bales made with moist leafy grass can readily weigh a tonne and thus be difficult to handle.

It is absolutely essential that any effluent released is collected and managed securely.

In some situations, it will be worth

Table 2:

Silage dry matter %	Conversion factor
18%	0.81
20%	0.77
25%	0.68
30%	0.60
35%	0.53

Table 3: Weight of silage bales

Grass silage	Weight
Chopped 25% DM	720kg
Chopped 30% DM	650kg
Unchopped 25% DM	660kg
Unchopped 30% DM	580kg

considering baling grass harvested in late autumn and then feeding these bales to livestock immediately after they are housed.

Wastage

More care than usual will need to be applied to covering and sealing late grass in silos (and bales) this year in order to minimise the amount of waste occurring. If 10cm packed grass rots on the top of a 2.5m high

clamp, that represents 4% of your feed that is unnecessarily lost.

If silage heats noticeably at the silo face or feed trough during feedout, that could readily represent a further 5% loss of feed. These losses are preventable by attention to detail when properly covering/sealing silos and when managing the silage face during feedout.

In some situations, it may be convenient to cleanly collect and feed silage effluent. Such effluent has an average feed value of 18 litres being equivalent to 1kg rolled barley grain.

Later cuts harvested into late September or October can be more difficult to preserve, especially if they have a high content of white clover. These tend to be very leafy, vegetative crops, with high moisture contents and buffering capacities. The cooler nights (heavy dew) and shorter days make successful wilting more difficult to achieve. If these crops have low sugar contents then they will require either an adequate wilt or treatment with an effective preservative – a sugar- or acid-based additive.

Straw bedding

what's the alternative?

Straw is expensive due to its potential as feed. Fortunately, there are viable alternatives, especially peat, slats and calf jackets for calves and rubber mats in calving pens

Tom Fallon

Teagasc specialist, Teagasc Animal and Grassland research & Innovation programme



Peat is a highly absorbent material which can be used to keep livestock warm, clean and dry with minimal labour. As bedding it is cost-effective, can last for months and can be spread on the land immediately after use.

It will add nutrients and condition your soil without depleting nitrogen levels the way straw and wood chips can do. Another advantage is that peat is acidic so it inhibits the growth of pathogens. Sphagnum moss, a component of peat, is a natural antiseptic.

Gurteen Agricultural College has

used peat for bedding dry cows and weanlings for a number of years. They have found a deep layer works best, 76cm (2.5ft) is placed in the back of the pen and it slopes down to 25cm (10in) near the slats where the animals feed. A double slat is used to prevent the peat spilling into the slatted tank.

When the top layer becomes wet, the whole lot is dug up, placed out into the yard, mixed and put back in. A total of 350m³ (14 silage trailer loads) was used in the winter of 2017/2018 to bed 50 dry cows and 140 weanlings for

five months. The experience of other farmers is that bedding with a 15cm layer is simpler; it can be topped up or cleaned out as required.

Calves can appear very dirty on peat moss and the top layer must be regularly cleaned off. Cleaning out used peat moss is more labour demanding than with straw. In the busy spring period, farmers can clean out a straw bedded calving pen with one grab of the loader.

Farmers have successfully used peat in a group calving facility. Bulk peat is more available in the midlands (depots for collection from Tullamore to Thurles to Clane and Kilcullen in Co Kildare) with an artic load (93m³ or 27t) costing €1,581, including VAT delivered to about 70km. Organic farmers are not allowed use peat in place of straw.

Suppliers: www.peatbed.com

Summary of bedding materials

	Absorbency (hold own weight in water)	Animal health	Disposal	Cost/tonne (including VAT where applicable)	Cost to bed a 200 kg suckler calf/week
Straw	2.5 times	Dust and mould spores	Rots and spreads easily	€167 (€25 per 150 kg bale)	€1.19 ¹
Woodchip	2.5 to 4	Ideally 20% moisture (but must be <30%)	Can be composted, spread directly or reused?	€56	€1.07 ²
Peat	10	No issues	No issues	€60	€0.87 ³

¹ Farm example where 42 August born calves from Limousin X Friesian dams are bedded on a four-bay by 6.7m lie-back (3m² per calf) and they can suckle and eat on slats, straw use is based on previous winter. The use of other bedding materials are an estimate.

² Woodchip: initially spreading a 10cm layer and topping up with 2.5cm each week for 15 weeks so there will be 48cm (1.5 feet) of bedding used over 16 weeks.

³ Peat: a 15cm layer will last nine weeks (six weeks is the general bedding interval but the weanlings here have 45% more space than the standard recommendation).

Calf-rearing

• Timber, plastic slats or concrete slats with a rubber mat and calf jackets.

Suppliers of plastic slats:

• JFC 1.2m x 0.9m x 120mm high at €105 each.

• Easyfix: 2m X 0.9m x 150mm high at €130 each (treated timber with rubber on top and bottom).

• Durapak: 1.51m X 0.7m X 89mm high at €105 each.



An advantage of peat bedding is that peat is acidic, which inhibits the growth of pathogens.

CASE STUDY

Replacing all straw with mats in calving area and rearing calves on slats

A 90 spring-calving dairy herd is currently using 80 round bales of straw for calving and calf rearing. The farmer rears 25 replacement heifer calves and sells 87 calves at four weeks of age. He has excellent facilities and plans to build an extra slurry tank this year so storing extra wash water will not be a problem.

Cost of conversion of calf house to plastic slats:

- Six calf pens 4.8 x 4.26m.
- Using 10 JFC calf slats per pen = €6,000.

Cost of rubber mats for calving area:

- Four calving pens 4.5 x 4.5m
- Using six Bama Mayo mats/pen = €1,152.
- Forty calf jackets x €35 each = €1,400.
- Total cost: €8,552

This cost excludes labour and the extension of washdown facilities to the calving area.

Return if no straw purchased: 80 bales x €25 = €2,000/8,552 x 100 = 23%. Buying the straw this year and feeding ad-lib with concentrates to 90 dry cows will save 95t of silage or 20 days' feed for these animals. Restricting straw intake will extend this feed by about three days.

A high standard of management is needed for all alternatives to straw bedding.

No endorsement of the products or product suppliers in this article is intended nor is any criticism implied of person(s) or companies or their products that are not mentioned.

Other suppliers include: Irish Recycled Products, Birr, Murray's Recycled Plastic, Co Mayo and O'Donnell Engineering, Emly, Co Tipperary.

These prices exclude VAT but this can be reclaimed on slats and mats. It is important that the fall in the floor is adequate to drain away urine to avoid problems with ammonia gas. Good ventilation and regular cleaning are critical with this system. Calves reared on slats are also more prone to draughts.

Timber slats made from hardwood may also be constructed (20mm to 28mm gaps and 22mm to 50mm ribs, See Department of Agriculture Specification S124).

See <http://www.comfortslatmat.com/products/product-range>

Calf jackets

Calf jackets can be used to keep calves warm for the first three weeks of life. The cost is approximately €35 per jacket. This is not expensive compared to using one round bale of straw to rear a calf. Each jacket could rear about three calves per year. It is essential to separate the calf from its faeces and urine so slats are the preferred housing option.

For calves under eight weeks of age Teagasc recommends straw bedding, other materials may not provide ad-

equat warmth and it will be harder to disinfect pens.

The use of calf jackets on outdoor-reared calves has been trialled in Grange for the first six weeks of life – there was no advantage in terms of calf performance and ectoparasites proved more troublesome. Calf jackets must be washable.

Calving facility

Using rubber mats on the floor. The mat must be soft and provide sufficient grip, especially for a calf that is learning to stand. The facility to wash out and collect the waste from the calving area is important.

A number of companies make mats specifically for this purpose: Bama mat from Mayo Mats, Kraiburg (main agent Condon Engineering), etc. Four mats in a calving pen will cost approximately €200. This option will be attractive on a cost basis versus straw.

Some farmers use a roofed holding yard or empty silage pit for calving. They may consider using pre-cast cubicles with an appropriate mat in this type of group calving area. The area adjacent to these cubicles would also be matted. The cubicles will reduce the area to be washed clean.

It may be possible to use plastic cubicles without the precast bed to achieve the same objective.

Less viable options

Miscanthus

Miscanthus makes for excellent, clean, dust free bedding. Unfortunately it is not generally available and, like straw, it is also not available to import.

Paper

Paper commands a price of €160/t for recycling and is rarely available for bedding.

Woodchip

Outdoor woodchip pads as standalone entities have gone out of favour. Initially, cheap recycled timber was used. The use of recycled or treated timber on woodchip pads is now illegal. Logs have trebled in price since 2007 increasing the cost of woodchip. There were also problems with drainage on parts of the pad where there was heavy animal traffic.

Extra pit proved prudent

Tommy Doherty
Dairy advisor, Teagasc Donegal

Donegal farmer Lawrence McNamee added a fourth silage pit after a tough winter in 2013

"My light bulb moment came when I was looking back at a number of old aerial photographs of our farm commissioned by my predecessors," says Donegal dairy farmer Lawrence McNamee reflecting on the last major fodder shortage in 2013.

"Overhead photographs were normally taken around mid-May and there it was, consistently, half a pit of silage still in reserve. By contrast, on St Patrick's Day 2013 we had hit the back wall of our third silage pit.

"Prior to 2013, we had been pushing the stock numbers and pushing the boundaries. This had gone beyond my comfort zone, something had to change. That spring I made a promise to myself that sailing this close to the wind was not for me. We decided to build a fourth silage pit and secured another parcel of land dedicated to silage production."

Needless to say, the extra pit has alleviated a lot of pressure in Lawrence's yard. With four separate pits, Lawrence is able to rotate his feeding so that the reserve is not getting older every year. Taking on the extra silage ground and building a reserve in the pit means there is a backup plan for extreme weather conditions.

"Lawrence assessed his situation in 2013; he hit the back wall of the pit

and had to resort to feeding whatever was available at the asking price. The steps of building a fourth pit and taking on surplus silage ground were sound decisions," says Tommy Doherty, Lawrence's Teagasc advisor. "After the longest winter in my memory we still had 50t of silage left over," says Lawrence, with relief rather than any sense of satisfaction in his tone.

"Winter 2017/18 highlighted more than ever the importance of feed budgeting and sufficient silage production on farms, particularly those of us battling the elements in the northwest and along the western seaboard. Milking cows in Donegal on heavy and sometimes very variable soils with high rainfall, is a long way and a lot different from some of the highly favoured parts of Munster. The importance of having a good silage



reserve cannot be underestimated."

Though quotas were still in place in 2013, farmers in Donegal were able to get hold of quota at an affordable price. Lawrence reflects with hindsight that he may have been expanding too fast.

"We were heavily stocked which meant we weren't able to do things we wanted to do, such as reseeding paddocks. It was a vicious circle, we needed more grass dry matter but couldn't spare a paddock for a couple of months to establish a new, more productive, sward.

"Of course we were only making as much silage as we needed. We had none spare."

Since 2013, when he reduced stock numbers Lawrence has been systematically building up the productive capacity of the farm, not only by reseeding (he now reseeds at least 10% each year), but also by investing in infrastructure such as roads and drainage. Needless to say, he has steadily enhanced his herd genetics. He plans vigorously for winter feed.

A feed budget is essential on the farm even if you have some reserve capacity. It is paramount to know what winter feed is required on the farm in order to maintain stock comfortably, build a reserve or assess a surplus/deficit. It is also essential to know the growth potential of the

GRANT AID

There may be opportunities for farmers to gain grant aid for new silage pits under TAMS II. "If farmers contact their local advisor in the next couple of months, they may be able to plan a project and submit an application to add a pit in time for next year's silage season," says Tommy Doherty.

"For many farmers things may look dark at the moment but things will improve and adding some silage capacity, particularly if you can get it grant-aided might be a prudent step."



Tommy Doherty and Lawrence McNamee in front of the four individual silage pits on the farm.

“

We need to produce and graze as much grass as we can but in recent years we've learned that it's prudent to have a decent reserve of silage

farm. Assess grass growth by grass measuring and have the ability to identify surplus paddocks which can contribute to building reserves.

Passenger animals on the farm must be identified. Winter fodder is precious and it is essential that it is fed to our most important groups of stock. Non-productive stock, particularly cull cows, should be offloaded as they are adding to the feeding requirements unnecessarily. Where farms are running into great deficit, perhaps contracting rearing heifers off the farm could be an option to free up fodder for the milking cows.

With all these options considered, Lawrence credits a lot of the knowledge to past generations, and feels there is a lot to be learned from the years gone by.

"The previous generation weren't always wrong," Lawrence says. "We need to produce and graze as much grass as we can but in recent years we've learned that it's prudent to have a decent reserve of silage. Those who are struggling to get through at the moment may feel there is no light at the end of the tunnel but they will get through. I'd certainly advise anyone to think about building a reserve once they have the chance to do so. You really only have to do it once and it certainly reduces stress when you have a long winter!"

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Feeding tips when forage is short

If you have counted up what you have and you know you are short of fodder start “spinning it out” at housing and don’t delay. You can substitute silage with other fodder and concentrates if you achieve the minimum fibre for animal health

Joe Patton
Teagasc Animal and Grassland
Research & Innovation Programme

Individual situations will vary depending on what feed you have available, animals in the yard, feeding facilities, and options for purchased feed, etc. So while this Q and A aims to cover the majority of situations; for tailored advice contact your local Teagasc advisor.

Q What does an animal need to eat in the winter?

A Feed requirements are described in terms of UFL (energy), PDI (protein) and NDF (fibre). The values in Table 2 are useful to build and compare diets. A key point is that diets made up of different ingredients will deliver similar performance if the same UFL, PDI and NDF values are met. So you can choose feeds based on availability and price per unit of feed value.

Q How do I make best use of limited fodder supplies?

A For spring-calving dairy herds, the primary demand for silage will be for dry cows in late pregnancy. Depending on turnout date and calving pattern, milking cows in early lactation may need high-quality silage.

Tables 4 and 5 outline some example diets for herds with silage deficits of 30% to 40%.

Q If I feed more concentrates, will cows automatically eat less silage?

A Replacing silage with concentrates is a viable option to fill moderate gaps (forage deficit of circa 25%) where forage costs are high (e.g. straw prices exceed €25 per 4x4 bale for feeding)

When animals are fed supplements with silage, there is usually a decline in forage intake compared to feeding the same silage ad-lib as the sole feed. In practise, the reduction in voluntary silage intake is relatively small, i.e. the animal mostly eats the supplement as well as silage.

In the case of dry dairy cows eating 10-12kg DM of moderate quality silage plus 3-4kg meal, there will likely

be a substitution rate of less than 0.2kg silage per kilo of meal offered.

Where silage intake is not restricted, the forage-sparing effect of meal-feeding is less than 5% of total winter forage requirement. Furthermore, cows can gain body condition potentially resulting in more metabolic health problems at calving.

Restricting access to silage and balancing with the correct level of meal can return forage savings of 25-30%, while meeting targets for body condition score at calving. So restricting daily silage allowance must form part of the feeding plan.

Q In practice, how should I feed a restricted level of silage plus meal to dry cows?

A A 3-4kg concentrate feeding rate can be used to reduce daily silage feeding by 20-25%. For example, where 12 silage blocks per day would usually be fed ad-lib to dry cows, this would be reduced to around nine silage blocks per day to the same cow numbers, with meal to balance.

• Test pit silage and bales to establish dry matter, DMD and protein content.

Table 1: Effect of supplementing dry cows, with or without silage restriction, on silage budgets and cow body condition score over a 10-week dry period

	Silage ad-lib	Silage plus 3.5kg meal	Restricted silage plus 3.5kg meal
Silage dry matter intake	12-13	11.4	8.0
Concentrate kg as fed	0	3.5	3.5
Total energy (UFL) intake	9.1	11.9	9.3
Total protein (PDI g) intake	790	1075	865
Net UFL balance (10wk dry period)	107	298	120
BCS at calving (2.75 at dry off)	3.25	> 4.0	3.25
Silage saved kg DM per cow	-	38	252
Total fresh silage (bales per 100 cows)	-	17	115

*70 DMD grass silage at 12% CP

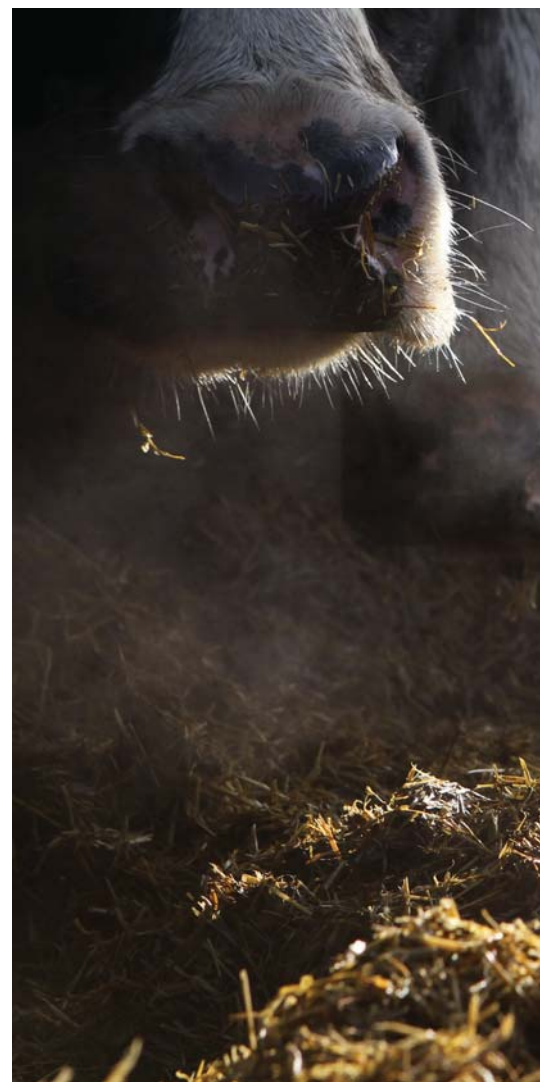


Table 2: Total daily intake targets for different classes of dairy stock

Energy	UFL	Notes
Cows		
Maintenance	5.5 to 6.0 approx	Depending on weight
Pregnancy	Add 0.8, 1.6 and 2.4 UFL/day in seventh, eighth and ninth month of gestation	
Milk	0.43 per kg milk	Depending on fat %
Weight gain (1kg)	4.5	50kg = 1 BCS unit
Weight loss (1kg)	3.5	Restrict deficit to max 0.5kg (1.7 UFL) per day
Yearling heifers		
Target gain 0.5kg /day	4.1	250kg FR type heifers
Target gain 0.8kg /day	4.7	
Protein	PDI	Notes
Cows		
Maintenance	420 to 460	Depending on weight
Pregnancy	Add 70, 140, and 210g/day in seventh, eighth and ninth month of gestation	
Milk	48 to 52g per kg milk	Depending on protein %
Fibre (minimum)	NDF	
Dry cows	45-55%	Too low fibre may result in excess BCS gain
Milking cows	Min 32-36%	75% from forage.
Youngstock	36 to 40%	Too low risk acidosis
		Heifers will eat 0.75 to max 1.0% of lwt as NDF

Aim to balance PDIN/PDIE values and PDI/UFL ratio

Table 3: Guideline daily total feed intake requirements for dairy stock

	DM intake	UFL	PDI	Fibre	NDF
Dry in-calf cows					
Thin at dry off (2.5)	11-12	8.5 to 9	660		
On target at dry-off (2.75+)	10-12	7.5	640	45-55	
In-calf heifers	9-10	7.5	640		
Milking cows					
Late lactation (15 litres)	14-16	13.0	1,220	38-40	
Early lactation indoors (29 litres)	19-21	18.5	1,890	32-34	
Yearling heifers					
Target gain 0.5kg /day	6.0	4.1	420	36-40	
Target gain 0.8kg /day		4.7	460		

Table 4: Example dry cow diets to meet requirements¹ using hay, straw and limited silage (8-10 week dry period)

	Straw	Hay	Lo-Silage
Grass silage 68 ² DMD	6.0 kg DM	6.0 kg DM	3.5 kg DM
	kg as fed		
Barley straw	3.0	-	3.0
Hay	-	3.5	-
Barley/gluten mix	2.5	1.5	2.0
Hulls/pulp/PKE	-	-	2.5
Soya bean meal	0.75	0.5	0.75
	Total diet ³		
UFL	8.7	8.8	8.7
PDI	840	850	860
Extra ⁴ cost per day €	€0.62	€0.54	€0.61

¹Assuming 0.25 BCS units gain required, daily energy intake 8.7 UFL and adequate PDI (650-800g)

²For higher silage quality (70-72 DMD), reduce barley/gluten mix by 0.5kg per cow per day

³Optimal diet cost will depend on price and availability of feeds and so will vary between farms

⁴Compared to 11kg silage at €0.165 per kg DM, based on straw at €0.205 per kg, hay at €0.18 per kg

⁵Supplement all diets with high-quality dry cow minerals

Table 5: Milking cow diets to meet requirements¹ using limited silage (60% of grass silage available)

	Straw, pulp + brewers	Indoor diet ² Maize/whole crop	Fodder beet + straw	Grass Early spring
	kg DM			
Grass silage 703 DMD	7.5	7.5	7.5	6.0
Spring grass	-	-	-	6.0
Maize/whole crop	-	3.5	-	-
	kg as fed			
Hi Energy 18 parlour nut	8.0	7.5	7.5	5.0 4
Soya bean meal	-	0.5	0.5	-
Fodder Beet	-	-	9.0	-
Beet pulp (hulls)	2.5	2.0	2.5	2.5
Brewer's grains	8.0	-	-	-
Straw	1.5	-	1.5	-
	Total diet			
UFL	18.5	18.5	18.8	18.3
PDI	1890	1905	1890	1840

¹Assuming 29 litres of milk per day, balanced for NDF to exceed 34% with adequate NDF from forage

²Optimal diet will depend on price and availability of feeds and so will vary between farms

³Adjust parlour concentrate depending on silage quality

⁴Ration crude protein can be reduced to 14-16% when grass is included in the diet



When animals are fed supplements with silage, there is usually a decline in forage intake compared to feeding the same silage ad-lib as the sole feed.

Do this before the start of winter feeding and again in early January.

- Weigh a sample of silage blocks/bales once per month. Use this information in conjunction with DM test results to estimate and adjust daily silage allowances.

- Offer fresh silage daily, keeping to a fixed schedule, if possible.

- Where feeds are handled/fed separately, feed out silage to dry cows in the evening. This will be eaten by early next morning. Offer 3-4kg meal per cow as a mid-morning feed.

Provide a token amount of straw or hay (if available) along the barrier after meal feeding (a half round straw bale or one-third hay bale for 100 cows). This is not required from a feed fibre point of view, but will help satisfy cows with higher intake capacity until evening silage feeding.

- Allow 700mm barrier space per cow (seven cows per standard bay) when feeding restricted silage to minimise bullying.

» Continued on next page

» From page 17

Q What can I do if I have a forage deficit greater than 25%?

A You will need to buy silage or if not available good quality straw or hay to meet fibre requirements. Some practical guidelines on straw and hay feeding:

- Dry dairy cows can be fed up to 4kg straw per day plus meal to balance energy and protein, replacing up to 70% of daily silage requirement.
- High-straw diets will deliver similar performance to all-silage diets for dry cows, provided that total UFL and PDI levels are balanced correctly (Table 1).

- Chopping the straw will reduce feed sorting and wastage, particularly for milking cows on mixed diets. Optimal chop length is 30mm to 50mm. If chopping is not feasible, feed "long form" to dry cows with bales rolled out along the feed barrier.

- Where more than 2.5kg of straw is included in dry cow diets, have soya bean meal in the diet to guarantee adequate protein for late stage foetal growth and improved colostrum quality.

- Straw tends to have relatively low macro-mineral content, particularly K (potassium). This can help prevent milk fever in dry cows. However, some sources (e.g. oat straw) may have high K values, so feed the correct mineral and check the diet's mineral profile if in doubt.

- Yearling heifers will eat 1% of their liveweight as fibre. Including 1kg straw plus concentrate can replace approximately 40% of their daily silage requirement. Balance for energy and protein.

- Where silage is limited for milking cows, including 1kg of chopped straw helps to meet their minimum fibre requirement of 32% NDF (25% from forage).

- Grass hay will do the same job as straw but has higher UFL/PDI and lower fibre value. A rule of thumb is that 1kg of good-quality hay is equivalent to 0.5kg straw plus 0.4kg of a maize gluten/barley mix. Products such as alfalfa hay have similar UFL but higher protein compared to grass hay. Particle lengths of more than 30mm is required for fibre function.

Q Concentrate ingredients – which to choose?

A Value is determined by UFL and PDI content (Table 6). As said earlier, rations with differing ingredients will perform quite similarly if the total energy and protein values are equal.

Where forage is in short supply, include high-fibre ingredients to reduce the risk of digestive upsets. These

Table 6: Value of concentrate ingredients relative to barley (€210/t) and soya bean meal (€360/t)

	Value €/t	UFL	PDI	Comment
Barley	210	1.16	103	
Soya bean meal	360	1.18	269	
Maize meal	230	1.22	120	Useful in high-performance diets
Maize gluten	217	1.04	125	Moderate energy and protein
Distillers	245	1.16	135	
Rapeseed meal	240	1.05	150	
Citrus pulp	200	1.14	91	Not a fibre source, low in P, high energy
Beet pulp	210	1.14	110	Hi fibre and energy, excellent fodder stretcher
Hulls	200	1.02	107	Excellent fibre source, moderate energy
Palm kernel	210	0.94	131	Very hi-fibre, fodder stretcher, poor palatability
Oats	185	1.03	84	Moderate energy ingredient
Wheat	215	1.16	106	High energy feed, acidosis risk
Molasses	135	1.0	68	75% DM product, cereal replacement, no fibre

Table 7: Value of common other feeds relative to barley (€210/t) and soya bean meal (€360/t)

	Value €/t	UFL	PDI	Max ¹ kg as fed	Comment
Brewers	58	0.90	181	8-10 (2kg DM)	Good fibre levels
Fodder beet	45	1.12	88	8-10 (2kg MD)	High energy, low protein, low fibre
Potatoes	51	1.20	103	6-8 (2kg DM)	To replace cereals, no fibre value
Maize silage	55	0.80	68	-	Assuming 30% DM
Barley straw	87	0.44	40	3-4kg	4x4 bales have feed value of €14
Good hay	130	0.68	70	-	4x4 bales have feed value of €34

¹To dairy cows in a limited silage situation

ingredients tend to be lower in energy than cereals but have good NDF profiles. Where deficits are 25% or less, products such as cereals, gluten and distillers can be used to fill a 3-4kg intake gap.

The feed values of forages and wet feeds are shown in Table 7. You may need to buy some forage to meet minimum fibre needs. However, if extra fibre is not required and forage costs are much higher than the values in the table, concentrate options may offer best value to fill deficits.

Q Are other fodder stretcher feeds available?

A There are numerous products being marketed as fodder stretcher feeds. Some will represent value, others may have limited use. The key questions when valuing these feeds are:

- What is the dry matter content?

Feeds must always be valued on a dry matter basis

- What is the energy and protein content? This can be difficult to find out.
- What is the NDF value? Remember, feeds with NDF content less than 30% of DM, and/or particle size of <30mm, have limited, to no, value as fibre sources.

By-product feeds from the food industry, such as bread, confectionery etc, can carry a high risk of acidosis due to their high sugar content. These can replace concentrates but not forage. Consult your Teagasc advisor/nutritionist before purchasing and feeding any novel feeds, particularly where fodder is in short supply.

Q If I switch her to a more concentrate-based diet, will her performance suffer?

A If she has similar total energy and protein intake, and the diet has enough fibre, then performance should be approximately the same.

Q Does the cow's feed requirement change over the winter?

A Naturally as the cow's pregnancy progresses, her requirements grow, but the balance of protein, energy and fibre needed does not change over the winter.

The dry cow group will have the biggest total demand (tonnes) for silage but moderate DMD material should be fine. The best-quality silage should be kept for cows in early lactation, i.e. when they have started milking. Of course, grazed grass is even better than silage.



Key messages

- Most dairy herds are facing a significant winter feeding challenge.
- Market options are limited so early action to stretch forage will be vital.
- A range of feeding solutions can be used to meet herd requirements.
- Finally, consider reducing demand (i.e. early culling) where forage deficits exceed 50%.

Fodder budgeting for sheep farms

If you are short, you still have time to take action

Michael Gottstein

Teagasc Animal and Grassland Research & Innovation programme

Grow as much grass as you possibly can so that you can extend the grazing season (weather permitting). Continue to spread chemical nitrogen in September to build up grass covers. The earlier that fertiliser is applied, the greater the response will be. That said, when alternative forage sources are expensive then spreading fertiliser even at lower response rates is likely to prove economical.

Best response rates will be achieved on recently reseeded ground and on fields that had late cuts of silage taken off them. The start of the closed period for the spreading of chemical nitrogen and phosphorous has been pushed back from 15 until 30 September. The closed period for spreading slurry has also been deferred and will start on 31 October instead of 15 October.

Make late silage

On farms where grass growth rates have recovered, and surpluses are building, take the opportunity to take out surpluses as baled silage. Weather permitting, try to get a wilt (24 to 48-hour) as late-cut grass tends to be low in dry matter. It goes without saying that with day length shortening you will not get the same speed of drying as in midsummer.

Plan for winter

• **Fodder budget:** do your winter fodder budget to see exactly how you are fixed. One-hundred ewes will require about 23 bales of silage/hay per month. Rams and dry hoggets will eat approximately the same so don't forget to include this in your calculations. Where ewes are housed for three months they will consume about two-thirds of a round bale of silage/hay each.

• **All-concentrate diets:** it is possible to feed ewes on all-concentrate



Do your winter fodder budget to see exactly how you are fixed.

diets with limited access to roughage. On this type of diet, the ewes will consume approximately 100kg of concentrates over a 12-week period and the equivalent of 10% of a bale of silage/hay.

“Where ewes are housed for three months they will consume about two-thirds of a round bale of silage/hay each

• **Bedding:** depending on how wet the silage is, you will need between half and two-thirds of a round bale of straw per ewe on concrete-floored sheds. At current straw prices and

with lack of supply, alternatives such as woodchip, miscanthus or peat may be options to consider. The economics of these depends largely on transport costs. If you are considering alternative bedding options, but still want straw for lambing pens, then you will need about four to five round bales of straw per 100 ewes in the flock.

Plan for spring 2019

Start to plan your autumn rotation now so that you are grazing your fields/paddocks in the order in which you intend to close them for the winter. Grass will need 120 days rest over the winter so aim to start closing your first fields/paddocks two to three weeks after ram turn-out. Grass is three times more valuable in the spring than in the winter so don't be tempted to eat your spring grass during the winter.

sheep

Nature and farming in balance in west Cork

Michael Connolly
Teagasc drystock advisor

There was gold in the hills of west Cork during World War II. It was growing on the backs of sheep when, in the days pre-plastic, wool was used in a wide range of industrial applications and could command a price of £7 a stone, equivalent to about €350 today.

"That's about €175 from each sheep," says Denis O'Riordan who farms 270ha in Curramore, Borlin and 8.4ha in Glanycarney at the Coosane gap near Kealkill in west Cork. Denis and his wife Esther keep 320 hill ewes and six suckler cows.



Denis and Esther O'Riordan.

"There were farms bought on the back of the wool price in those days," says Denis's uncle Donal O'Connor, with a wistful smile." Denis took over the farm in Curramore from Donal after completing a certificate in agriculture around 15 years ago.

"Margins are a lot tighter now," says Denis who has been in the Teagasc hill sheep BETTER farm programme for three years. "You need to get all the advice you can to make a margin, but it can be done."

Nutrient management planning

When Denis joined the BETTER farm programme, the farm was soil tested with at least one soil sample taken for every 5ha of fertilisable land. A nutrient management plan was drawn up and lime and fertiliser were spread where required.

This plan is followed carefully to ensure compliance with GLAS, which generates €5,000 per annum. There are SAC measures for the rare and precious blanket peat uplands of Derryclogher Bog and low-input permanent pasture on the lower slopes of the hills. Apart from the lowland fields, the majority of the farm has grown better than ever this year as the heat suits the upland slopes where there is wet and dry heath, peat and upland grassland.

Income enhancement

The couple married last year and Esther, who is a Glengarriff native from a farming background, works as a public health nurse locally. They are expecting their first child later in the autumn to carry on the farming tradition.

To maximise income, they participate in the Sheep Welfare Scheme which pays €10 per ewe to supplement ewes with minerals for 60 days after

mating and lambs before weaning. A long-acting liquid mineral drench, Stockline, is used, which is supplied by Terence O'Shea, Glengarriff, a local agent. Department of Agriculture inspectors are satisfied with this product on sheep welfare inspections.

Usage rates and times have to be recorded on record sheets and receipts and empty containers retained with batch numbers for inspection purposes.

"Myself and my brother Donal, who farms our late father Michael's home, farm in Coosane are members of the local Knowledge Transfer discussion group Beanntraí where Michael (Connolly) is the Teagasc facilitator," says Denis.

"Meetings are completed for year two of the programme with all mem-





Denis O'Riordan and Teagasc advisor Michael Connolly. Denis has increased output on his west Cork farm by breeding more yearling ewes and using pregnancy scanning as a management tool to ensure that there is enough fodder for next winter. He also budgets for a 20% fodder reserve.

bers attending five group meetings and possibly two public events and three group meetings or one public event and four group meeting to be eligible for a payment of €750 per annum as a primary group or €375 per annum as a secondary group.

"As part of the requirements, the 18 members have completed health and safety, breeding, financial and grassland plans."

Denis has often hosted group meetings on his farm and as a BETTER farmer, he is seen as a leader in the discussion group.

BETTER farm walk

Teagasc will hold a BETTER farm KT DAFM approved farm walk on the O'Riordan farm on **Thursday 13 September**.

This will showcase what Denis has achieved under the BETTER farm programme. For example, he has bred more hogget ewes to boost output. Around 30 were mated in autumn 2017. He scans pregnant ewes to plan his spring feeding regime.

In autumn 2017, 316 ewes were mated. The scan results were one triplet, 60 couples, 222 singles and 33 dry. A total of 300 lambs were counted at shearing recently, so there were some losses in the tough winter and spring just gone by. "Scanning is a very useful management tool," says Denis. "It can be awkward if sheep are still on the hill in January when it should be done. But it is very valuable because ewes having couples can be separated to get extra feeding and dry ewes identified in time to spare feeding."

Frank Campion from the Teagasc BETTER hill sheep farm programme has been a regular caller to Denis to record data such as seven-week lamb weights and general management and this will be discussed at the walk in September.

"The rain is falling heavier now so maybe we can avert a fodder crisis for next winter by spreading fertiliser and growing as much silage as we can this autumn," concludes Denis, who is an expert farmer. "We'll survive for another year."

While young farm families like the O'Riordans continue to have a passion to farm them, in balance with nature, there will be life in these beautiful surroundings, even when income prospects from the land are not always golden.

Grass key to success

Despite a difficult season grass remains central to farmer Joe Farrell's success

Karen Dukelow

Cattle Specialist, Teagasc Animal and Grassland Research & Innovation Programme

Joe Farrell is one of 10 farmers who participated in phase one of the Teagasc Green Acres Calf to Beef Programme. He worked closely with programme advisor Gordon Peppard and local Teagasc advisor, Christy Watson. The project showed that, with technical efficiency, it is possible to attain a net margin per hectare (excluding premia) of more than €500 per hectare €200/acre on beef farms.

"The farm was traditionally split equally between the tillage and the calf to beef enterprises," says Joe, but with the poor prices for grain over the last few years we reduced the tillage area and increased cattle numbers."

Before joining the Teagasc Green Acres Calf to Beef Programme, Joe was purchasing 75 Angus/Hereford heifer and 15 Friesian bull calves from dairy herds in March/April. The 15 Friesians were slaughtered in June of the following year at 16 months of

Table 1: Example costings for dividing 14ac paddock into subdivisions

Paddock costings	
Item	Cost
Wire	€35
Handles/insulators	€30
Stakes	€125
Pigtails	€60
Water troughs and piping	€310
Total cost	€560
Cost/acre	€40

age and the heifers at 22 to 24 months from December to March.

"We bought in calves at two to three weeks of age," says Joe. "Following a rearing phase for the first 10 weeks, they went to grass for their first grazing season receiving 1kg of concentrate. They were generally housed in mid to late November and fed silage and concentrates."

The Friesian bulls were built up to ad-lib feeding and slaughtered out of the shed in June. Following a second year at grass, the heifers were housed full time on straw and built up to 5kg of concentrates for finishing.

Heifers were slaughtered from December to March out of the shed as they became fit.

Increasing output

"The plan over the course of the Teagasc Green Acres programme was to increase output on the farm and sell more kilos of beef per hectare by utilising more grass," says Joe. "In order to do this, I decided to make a



few adjustments to how we do things. We put a grassland plan in place so we could make better use of grazed grass. This involved introducing a paddock system, grass measuring, maintaining soil fertility levels, getting cattle out earlier and also introducing a reseeding programme."

The numbers of calves reared on the farm has increased to 140 over the last three years and an additional 30 to 40 weanlings are also bought in, in the autumn. Due to the high cost of the Angus heifer calf and the lighter carcass at slaughter, Joe has decided to buy in more Friesian bull calves, which will be castrated and slaughtered as steers at 24 months, out of the shed.

"This allows me to reduce the cost of purchasing calves while also having a heavier carcass to sell," says Joe. "I buy calves as early as possible in February/March so that a strong calf will go to grass in the first season. This allows more of the heifers to be slaughtered off grass before the



Original 10 paddocks and current 32 grazing divisions.



Karen Dukelow with Padraig and Joe Farrell.

Figure 1
Location of Teagasc Green Acres programme farms



second winter. So I need less housing.

"With the extra calves to be reared, we needed a comprehensive animal health plan and we worked with our local vet, focusing on a good vaccination programme, to curtail disease."

Grass is key

When Joe first heard about the programme, he saw it as an opportunity to improve the financial return on his farm, "I knew I could get more from grass. The biggest change since joining the programme is that I have been growing and using more grass on my farm (production is obviously down this year but it would be much worse with our old system). I went from 10 paddocks to 32 grazing divisions and effectively doubled my stocking numbers.

"Some fields still have room for improvement in terms of soil fertility and I'm working on these. I walk my paddocks and complete a grass cover on Saturday or Sunday evening. Some weeks I'd prefer to watch a match

on television, but most of the time once I'm out I enjoy the walk. It only takes about an hour and I know I am walking the farm for myself and the benefits it delivers to me."

When I met Joe in mid-July at the height of the drought, I asked him how he is set for the winter. He has ensiled some winter wheat as whole crop, so he now has half of his feed requirements for the winter.

"The disadvantage of ensiling the winter wheat is that I don't have income coming from the wheat and I will have less straw. However, I will put in leafy turnip which will save on feed and straw. I hope to graze this in January. I will have cattle hardy enough to be grazing grass on Valentine's Day, all going well," says Joe.

"I will also look at ad-lib finishing of the steers as this will save me 4t of silage/head. At least with half of my winter fodder in place, I will have options this winter."

I also asked Joe whether he will consider reducing stocking rate consider-

ing the difficult weather conditions of this past year. "I am not looking at reducing stocking rates as I know I need the output to drive profit on my farm," says Joe. "My system will still be based around growing and utilising grass. I will of course have to adapt and change to ensure I have enough fodder.

"I have flexibility with my winter wheat as I can ensile or sell in a good year. I grew maize before but found I was missing grass at the shoulders of the year. I think we can learn from this year and build silage reserves in good years.

"Simple things like having one inch piping to troughs would help get enough water to troughs in a drought. I find that big troughs do not work for small calves.

"I enjoy rearing cattle and seeing them thrive. I get a real sense of achievement if I can get cattle finished a month earlier."

» Continued on next page

Financial performance

During the course of the programme Joe increased his gross margin from €500/ha to €1,600/ha.

The average gross margin of the 10 participants improved from €500/ha to €1,100/ha.

Gordon Peppard summarises the 10 key steps to making this improvement:

1 Have a plan: when you buy your calves, you need to have a plan as to when these animals are going to be slaughtered. If not, you will fall between two stools, with implications for housing facilities, slurry storage, not enough silage, mixed age groups creating issues for dosing, feeding concentrates for finishing and cashflow.

Talk to your processor, know their requirements and ensure that all your animals meet these market specifications to earn bonuses, quality assurance payments, etc, and attain numbers that you can supply at different times of the year to command the best price possible.

2 Producing high beef output: simply put, this is the number of kilos of beef produced per hectare. It results from a combination of a high stocking rate and excellent performance by each animal.

As a target, 1,250kg/ha should be produced. This can be achieved from a stocking rate of two and a half live-stock units per hectare and a performance of 500kg per livestock unit.

Decide on a production system and stocking rate to suit your land type and housing facilities. In calf-to-beef systems, these targets are very achievable and even higher levels can be reached.

3 Careful calf selection: source a good-quality calf. Buying an earlier born calf (before 17 March) will help to increase output as these calves are generally from the cows with better fertility and performance. Also, these calves will be weaned and at grass for longer in the first grazing season.

4 Excellent calf rearing: feeding high levels of milk replacer, up to 750g per day, increases growth rates to weaning. Ensure good hygiene at feeding and in the calf pen. Consistency is key in relation to feeding the calf. Feed at the same time, rate and temperature each day to avoid stressing the young animal.



Slurry should be targeted at low-index fields.

5 Appropriate calf-rearing facilities: provide calves with a clean, warm, dry, well ventilated bed. Have a one-in-20 slope on the floor from back to front and a channel to remove seepage to an outside tank.

Use plenty of straw (see article on alternatives) to ensure that the calf is kept warm at all times. Pens should provide 2.2m² (24ft²) per calf. Ensure that there is no draught at calf level.

There should be an outlet (5-6m² per 100 calves) which needs to be covered to prevent rain entering and wetting the calf bed. The inlet should be two-to four-times the size of the outlet to deliver good ventilation which will remove bugs, respiration, moisture, smells and reduce the risk of disease.

6 Animal health plan: creating a health plan in conjunction with your vet is essential. With calves coming from multiple sources, a vaccination programme is criti-



You should decide on a production system and stocking rate to suit your land type and housing facilities

“ Weigh animals regularly to ensure that performance is not compromised at any stage from purchase to slaughter

8 Grassland management: maximising weight gain from grass is essential. A paddock system, if you don't have one, will definitely increase your supply of quality leafy grass. The goal is to have at least 240 days' grazing. To achieve this target, animals need to be out early in the spring. This requires excellent management in the autumn, with paddocks closed up early to ensure a supply of grass in the spring.

Good management of the grazing programme in the spring to ensure you set the farm up for maximum productivity over the summer is critical to success.

9 Produce high-quality silage: in a calf-to-beef system all animals are priority. Therefore, producing high-quality silage to help all animals meet the target average daily gain of 0.6kg+ over the winter is critical.

All silage produced should be greater than 70% DMD to help reduce the level of concentrates required to meet daily gains. The difference per head between a 62% and 72% DMD silage for 100 weanlings over a 140-day winter can be €70, a total of €7,000.

10 Weigh cattle regularly: to ensure that performance is not compromised at any stage from purchase to slaughter it is essential that animals are weighed periodically throughout the year. Animals must be weighed at turn out, mid-season and at housing.

Poorly performing animals should be detected and remedial action taken. Animals for finishing can be grouped together, thereby increasing efficiencies as only the stock close to target weights are fed.



cal. The top performers vaccinate for pneumonia and IBR, using the two-shot Bovipast RSP programme for pneumonia and the Bovilis IBR marker Live intranasally for IBR. Booster pneumonia and IBR are then given at the correct stages throughout the lifetime of the animal.

A strategic dosing regime needs to be planned to control, worms, fluke, lice etc. throughout the grazing season and during housing.

7 Correct soil fertility: to grow the large quantities of high-quality grass soil needed fertility must be at its optimum. If necessary, correct the lime status of the soil first and then bring P and K levels to index 3.

Slurry and farmyard manure should be targeted at low-index fields and the others with compound fertilisers.

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Potassium (K)ey in

Martin Bourke
Teagasc tillage advisor

**Mark Plunkett,
Patrick Forrestal**
Teagasc Crops, Environment and land
Use Programme

Potassium plays many roles in the cereal plant: boosting straw strength; enabling more efficient uptake of nitrogen and other nutrients; helping the plant resist certain diseases such as powdery mildew.

In a dry year such as 2018, it also has a huge role to play in water regulation in the plant. Water regulation in cells is a big part of the plant's drought resistance strategy. Adequate amounts of K in the soil and sufficient K applied to the growing crop are crucial if we aim to give the plant every chance to realise its yield potential under the drought conditions such as those we endured this season.

For many years, the primary research focus been on the efficient use of nitrogen and phosphorus on farms. However, in the last three years in Wicklow, Teagasc has been conducting trials on potassium too. This year, another trial is being carried out in spring barley to further explore the relationship between K and grain yield, grain quality and straw quality.

Trial site

The trial is on the tillage farm of Clinton Brownrigg, just outside Rathdrum, Co Wicklow. Clinton farms 60ha, primarily spring barley, with some winter barley, maize and grass. The site chosen for the trial is a field that was in grass for the last seven years.

A number of cuts for silage were taken each year from this field which led to a gradual decline in the soil K level. A recent soil test confirmed that the soil K level was low at 47 mg/L (Index 1). The soil type is a light shingly shale soil, which is prone to drought.

Knowledge transfer and on-farm trials

For the past few years, Teagasc has carried out some very important on-farm trials on tillage farms in Wicklow. In 2017, a K trial on spring barley near Arklow generated some much needed information that can greatly help the tillage industry.

Yield responses of up to 4.5t/ha



were recorded showing the potential yield losses that can occur when soil K fertility is neglected.

Tillage KT groups from the south-east region all visited the trial site and were greatly impressed with the findings. The trial site hosted a num-



Host farmer Clinton Brownrigg.

ber of events for the local trade and industry representatives.

Potassium plays a major role in maintaining the water content and hence the turgor (rigidity) of each plant cell. A large concentration of potassium in the cell sap (i.e. the liquid inside the cell) creates conditions that cause water to move into the cell (osmosis) through the porous cell wall.

Turgid cells maintain the leaf's vigour so that photosynthesis can proceed efficiently.

Potassium helps to ensure that the salt concentration within the cell sap is correctly maintained, helping the plant to combat the adverse effects of drought.

times of drought

A trial was carried out in spring barley this year to further explore the relationship between K and grain yield, grain quality and straw quality.



Martin Brennan, Teagasc Oakpark, cutting the spring barley K trial in Rathdrum.



Dr Patrick Forrestal, Johnstown Castle, assessing the level of straw brackling in the K trial.

Other potassium functions

If a soil has inadequate levels of K, other nutrients such as nitrogen will not be taken up by the plant as efficiently. In a spring barley scenario, the excess nitrogen not taken up by the plant remains in the soil after harvest as nitrate, and risks being lost.

In 2015 in a spring barley trial in Oak Park, Mark Plunkett Teagasc soil nutrition specialist, observed that plots which received no K fertiliser developed high levels of powdery mildew disease. This site had a low soil K level (index 1). Similar findings were observed in a winter barley trial in Wicklow in 2016. This reinforces considerable previous research that suggests potassium boosts the plant's

immunity against disease.

Applied potassium also helps to reduce straw brackling in barley at harvest time where the soil K level is low. Straw brackling occurs when the straw breaks or kinks along the stem as the straw dries out and becomes more brittle approaching harvest. This was observed in 2016 and 2017 in the Teagasc K trials.

Results from the 2017 spring barley K trial

There was a very large yield response to K fertiliser in 2017. The site had extremely low levels of soil K (26 mg/L). Applying just 40kg K/ha lifted the untreated yield by 4.5t/ha. But the yield kept rising as K applied was

increased by another 40kg/ha.

As levels of K fertiliser applied increased, the percentage of brackling reduced considerably.

The 2018 spring barley K trial

While 2018 plot yield results are not available yet, it is expected that a significant yield response to the application of K fertiliser will be observed again this year.

As the initial soil K level was slightly higher than in 2017, the yield responses may not be of the same magnitude. Brackling differences were not as pronounced in the 2018 trial, however the zero K plots could still be visually observed as having more straw brackling.

Fewer fragments,

Don't miss these tax reduction measures available for farm restructuring

James McDonnell
Financial Specialist, Teagasc Rural Economy Development Programme

Figures from the Central Statistics Office show the average number of separate land parcels per farm in Ireland has increased from 3.1 in 2000 to 3.8 in 2010. So farm fragmentation is actually on the increase. In 2010, 80,000 farms (well over half the total) had three or more separate land parcels.

Fragmentation adds to farm costs and reduces operational efficiency: extra labour, travel time, stock movement and inspection, extra machinery and facilities and crossing roadways.

Over the last number of years, the Irish Government has introduced schemes to assist farmers to consolidate their holdings. These schemes offer a reduction in either stamp duty or capital gains tax (CGT). In the budget for 2018, stamp duty and CGT reliefs were combined into one scheme. This has recently been enacted.

For farmers who qualify for this scheme, the potential tax savings for restructuring a farm are huge.

Farm restructuring

The Food Wise 2025 report set a strong challenge for the industry; land fragmentation is one impediment to achieving the targets. With any land transactions in Ireland a tax return must be completed. The tax cost of selling land is punitive and must be paid even if the money is reinvested in land.

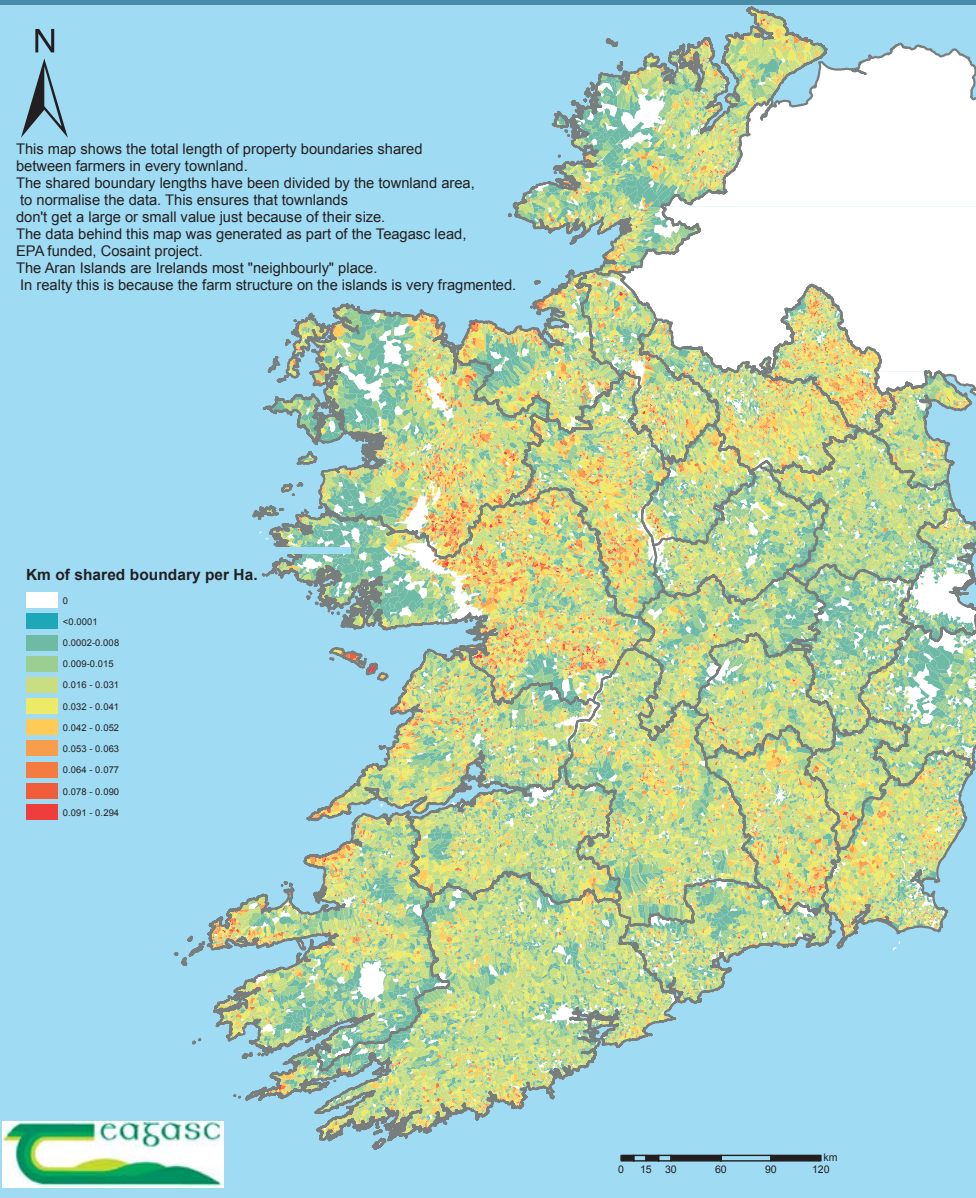
There are two relevant taxes when buying or selling land:

- Stamp duty on land purchased (currently 6%).
- CGT on land disposed of during one's lifetime (currently 33%).

Restructuring your farm may not be as easy as swapping a field with your neighbour. A transaction could

FRAGMENTED FARMSCAPES

Total length (km) of shared farm boundaries per hectare by townland



involve 10 fields with five parties. This kind of transaction is difficult to organise, and a broker or intermediary could be used to help ensure that the transaction is completed.

It is the individual's responsibility to familiarise him or herself with the amount of tax payable and any relief available for given transactions. Seek taxation and legal advice before

entering into any transaction.

The reliefs, if fully availed of, by a qualifying applicant reduce the CGT liability to zero. The stamp duty rate for a qualifying transaction is reduced from 6% to 1%.

Capital gains tax

When a farmer "disposes of" farmland during his lifetime, by sale,

fitter farms

POTENTIAL SAVINGS ON CGT AND STAMP DUTY

Example

- John sold a parcel A which is five miles away (10ha) for €260,000 with disposal costs of €6,000, giving a net disposal value of €254,000.
- John purchases parcel B across the road from his farmyard (12ha for €270,000). Both parcels are qualifying land.
- Parcel A was acquired in February 1982 for a cost (including expenses) of €30,500.
- This acquisition cost is adjusted upwards for inflation (indexation relief) using the CGT multiplier $€30,500 \times 2.678 = €81,679$.
- Capital gain: $€254,000 - €81,679 = €172,321$.
- Deduct annual CGT allowance: €1,270.
- CGT saving = $€172,321 - €1,270 = €171,051$
@ 33% tax = €56,447 tax due.
- He now qualifies for restructuring relief (less distance between land parcels) and obtains a farm restructuring certificate from Teagasc.
- The value of land sale exceeds the purchase all proceeds were invested.
- The CGT saving in this case is €56,447.
- John must also pay stamp duty on the sale. The relief reduces this to 1%. $€270,000 @ 1\% = €2,700$. The saving here is a further €13,500.

gift or exchange to another person, CGT rules apply. CGT on the lands disposed of can be substantial if the land is in your ownership for a significant time period.

Farmers over 55 years old may be eligible for CGT retirement relief if they satisfy a number of conditions. Check the CGT calculations with your accountant before disposing of land.

Indexation relief (adjusting the value of the lands for inflation) may also apply for land owned prior to 1 January 2003.

Stamp duty

Stamp duty is a tax that is paid on specific documents or instruments, where property is transferred or leased. It is also paid on bank cards. For the purposes of land transactions, the current rate is 6%. This relief reduces the rate to 1% for qualifying applicants. Young trained farmer relief is also available, but you must meet specific criteria to avail of this relief.

What is farm restructuring for the purposes of CGT relief and stamp duty?

The interaction of the sale and purchase together of qualifying land must result in:

- Where a parcel of land is sold by an individual farmer (or, where sold by more than one individual jointly, at least one of the individuals is a farmer).
- Where a parcel of land is purchased by the same individual farmer (or where purchased by more than one individual jointly, at least one of the individuals is the same farmer).
- Where the sale and purchase occur within 24 months of each other and must be between specific dates.
- The interaction of the sale and purchase together result in an overall reduction in the distance between parcels comprised in the farm, including land that has been leased for at least two years with a minimum of five years to run.
- This leads to a reduction in the fragmentation of the farm and an improvement in the operation and viability of the consolidated farm.

Note that the sale of an existing farm and the replacement of it by the purchase of another farm is not farm restructuring for the purposes of this relief.

What is a parcel of land for the purposes of the relief?

A parcel of land means an entire field or group of fields.

Land sold and purchased as part of a Farm Restructuring must comply with the following conditions:

- The land must be in the State.
- The land must be agricultural land as defined in Section 604B TCA. As the definition of agricultural land does not include afforested land, peat land, or habitable dwellings, the value of these should be deducted by the individual claiming relief when the relevant chargeable gain is being calculated.

Note: land sales under compulsory purchase orders will not qualify.

When applying for farm restructuring relief to the revenue commissioners, the farmer must sign a declaration that it is his/her intention for a period of five years from the date of execution of the deed of transfer:

- To spend not less than 50% of his/her normal working time farming.
- To farm the lands purchased.
- To retain ownership of the lands.

Farm restructuring certificate

The farm restructuring certificate (FRC) is a certificate issued by Teagasc to the farmer restructuring his/her farm where the sale and purchase transactions meet the restructuring conditions.

If the restructuring conditions are not met, Teagasc will give reasons why it cannot issue an FRC and there is scope to appeal.

The farmer applies to Teagasc, filling out the FR1.2 application and supplying supporting documentation for existing lands owned and farmed and the sale and purchase transactions. Documentation required includes legal documentation, maps of the lands, LPIS numbers under the Single Payment System, etc.

Farmers who are purchasing/selling land parcels to restructure their farms may be eligible for valuable tax relief under the Farm Restructuring Relief Scheme. If you are planning to restructure your farm, the first transaction must be completed by the 31 December 2019.

Contact

Contact your local Teagasc office or www.revenue.ie for copies of the scheme documents.

Map courtesy of Stuart Green, Teagasc.



Potential tax savings for restructuring a farm are huge

farm management

Today's farm

Give every euro a job

By planning how to spend your available funds, you will feel more in control and your stress levels over mounting bills and lack of cash will drop

Kevin Connolly
Financial Management Specialist,
Teagasc Rural Economy Development
Programme

Many farm businesses are showing the scars of a difficult year. Bare paddocks, low winter forage stocks, reduced crop yields together with well-depleted cash reserves and higher than usual short-term debt for the time of year. Cashflow will be a challenge for all farms over the next six months.

The best approach is to get an overview of what your cash commitments are now, and over the next six months. Then you can devise a plan which will help you steer through choppy waters in coming months.

First, establish what your cash commitments are in the short, medium and long term. The short term might be those you must pay within the next month, then those payable before the end of December, followed by those due before the next major cash income date in 2019 (e.g. the first milk cheque or first sale of other farm produce).

Make a commitment, now, to open every bill or statement promptly and record it under one of these categories. Never leave letters unopened or debt demands undealt with.

The need to list down absolutely all known demands for cash and fit these into distinct "due by" time periods is vital if you are to start putting shape on the farm's cash obligations in the months ahead.

You can then make decisions as to what gets paid, how much to pay and when. As each debt is paid mark it down by ticking it off, dating it or if it gives you more satisfaction draw a line through it.

Establishing the order in which to pay competing claims for cash can be difficult. The main areas to prioritise using either cash or credit are:

- Meeting operating expenses to ensure that production will not be compromised.
- Securing the key operating inputs of the farm for the short to medium term, including adequate supplies of feed, fertilisers, sprays for the remaining part of the current production cycle and the start of the next cycle at least until the next big sales income comes on stream.
- Meeting priority personal living expenses, family education needs, etc.
- Meeting your tax liability in Octo-

ber/November – talk to your accountant as soon as possible to get your 2017 accounts finalised so that your tax bill can be calculated, as well as any planned private pension contributions.

- Meeting debt repayments including bank and merchant debt as well as money owed to family, neighbours, contractors, landowners (for rented or leased land), etc.

Cash demands

Don't forget cash demands for which there is no formal bill, reminder letter or statement issued. Many farm-to-farm sales of feed have taken place and there may be cash owed to fellow farmers. In many cases, there will be no obvious pressure to settle these bills but that does not mean that they should be ignored in favour of other creditors shouting loudly. These farmer creditors may themselves be facing mounting bills due to drought and other issues.

You may fear that writing down your debts runs the risk of the list overwhelming you. On the other hand, you will have great satisfaction in drawing a line through bills as you work your way through them.

A monthly spending plan should be built on good information, or best estimates, as to what the priority demands for cash are, month by month. The "must-be-paid" category should obviously take priority – these are bills that are outstanding in the long term, are possibly incurring interest and penalty charges, or you (this is you taking control) have decided that they must be paid this month.

The next category is "pay if cash available" – as the name suggests you have some discretion here as to whether they need to be paid. Always ensure that you keep a buffer of either free cash or available credit that you can call on if an unforeseen cash demand occurs. This might be a broken water pump or an engine failing. Stuff happens. Knowing you have a reserve can greatly reduce your stress levels when something unexpected happens.

With fodder in short supply, those who can stump up immediate payment will get priority. This is why you need to prioritise getting your financial situation under control so that you have the flexibility and confidence to make deals for feed and pay cash to secure them.

» Continued on next page



Always remember that farming goes in cycles and that while the year just gone has been tough, there will be better times ahead

farm management

The income side

Monitoring spending is only half of the cashflow management equation. The other side is identifying sources and timing of cash income and how to increase them. Continuing to get the basics right in order to keep the output from the farm as near to normal as possible should be the main concern.

Identify what cash income is due to come in over the next six months. Income sources include the Basic Payment and other Department of Agriculture, Food and the Marine-administered direct payments, as well as the obvious money from farm sales.

Removing non-productive stock and focusing spending on those enterprises that give you the greatest return is the order of the day. While it is understandable that most of your energy and focus will be on the current crisis, try also to think longer term and the next production cycle.

Decisions made today may well have impacts in the future and compromising cashflow in next year's production cycle will not do the business any favours.

The role of credit

Practical use of credit to meet the required spending demands makes sense provided it is properly managed and structured with a clear programme for repayment.

Securing bank debt such as overdraft, stocking loans or term loans will inevitably involve a financial risk assessment and repayment capacity calculation. Repayment terms will be expected to be honoured. This line of credit will likely be a feature of most farm businesses' sources of callable funds to meet spending demands.

Sensible use of merchant credit can help smooth out spending and managing periods where purchases must be made, but cash is tight at the time of purchase. However, merchant debt that gets out of control or is not managed by the farmer can cause problems down the line.

For the farmer who is benefiting from merchant credit it is important that the terms of the credit arrangement such as days' credit, interest rates charged and upper credit limits are clearly understood. Merchants will not continue to extend credit where there is no attempt to clear some of the outstanding amount.



Figure 1: A few columns drawn on some notepaper to categorise cash demands and updated monthly will greatly help you to track and prioritise your spending. Start a new page at the beginning of each month and transfer any outstanding amounts from last month onto the new page before you add new entries.

Amount €	Owed For/ To Who?	Interest Y/N?	Due This Month	Due By Year End	Due By March/April	Date Paid
€3,700	Land Loan	5.1%	€3,700			23/08
€7,400	Land Loan	5.1%			€7,400	
€5,900	Revenue			€5,900		
€2,000	Farm Store		€2,000			15/08
€3,195	Farm Store			€3,195		
€4,250	Contractor			€4,250		
€2,200	Dev Oil		€2,200			
€2,400	College Digs			€2,400		
€960	Vet			€960		

Farmers equally should be aware that where they have built up a good relationship with a supplier and are long-term users of their products then jeopardising that relationship by abusing credit terms is not a sensible strategy.

Looking at the expected flow of income over the next month, two months and extending out to six months can give useful pointers as to how to time major paydowns of built up rolling credit from merchants, stocking loans or the overdraft.

This will give you breathing space to call on these credit facilities if needed again in the future. Having a clear picture of the expected monthly farming cash income and available credit facilities allows you to create a plan for using it.

Think in terms of allocating these available funds rather than spending them.

Give every euro a job

The spending capacity that you have available over the next six months, and which you have some control over, consists of the farm cash receipts outlined above and the remaining scope for drawdown left on your short-term credit sources. These include the farm overdraft, stocking loan or merchant credit.

There are considerable benefits in planning how you will use this potential rather than making spending decisions ad hoc. To take control, you should in effect give every euro a job.

This means identifying:

- Funds currently available and how much is due to come in.

- Spending demands over the next six months – include all debt repayment demands as well as expected cash purchases.

- Identifying the non-discretionary and discretionary spends – those that must be paid and those that can be delayed.

- Building in some leeway to cover unexpected outgoings. This may take the form of an easily accessible cash fund.

- Plan your spending: what will get paid, when will it be paid and how much will be paid.

At the end of your monthly allocation process, every euro of cash income and available credit should be either used to cover other current expenses, meet debt repayments or reduce credit balances. If cash is left over, it should be allocated to your backup fund or as available funds for next month's allocation.

Teagasc has a number of useful worksheets to help you monitor cashflow. See the Teagasc.ie webpage dedicated to cashflow management here: goo.gl/dV3e3W (type this into your internet browser to access the webpage).

By planning how you will spend your available funds, you will feel more in control and your stress levels over mounting bills and lack of cash will drop. Working to a plan can give you a sense of calm. You are the one making the decisions as to how your available funds are used rather than reacting to whoever is shouting the loudest. Always remember that farming goes in cycles and that while the year just gone has been tough, there will be better times ahead.

- Teagasc financial specialists will be present on the Teagasc stand at the National Ploughing Championships.



Making more from ammonia

We'll have to reduce emissions of this greenhouse gas, but the news is not all bad

Gary Lanigan
Teagasc Crops Environment and Land Use Programme

Ammonia is well known to farmers in terms of reducing the efficiency of urea fertilisers or the N replacement value of slurry. What is probably less well known is that it is an air pollutant and Ireland has targets under the National Emissions Ceilings Directive to reduce ammonia by 1% from 2020 to 2030 and 5% from 2030 onwards. Furthermore, unlike for greenhouse gases (GHG) and nitrates, agriculture is virtually the only source of ammonia, so reductions have to come from our sector.

So where does the problem lie? Emissions arise principally from dairy and beef housing and storage (50%) and spreading manure on land (31%). Manure emissions from pig and poultry systems comprise the bulk of the remaining emissions, followed by emissions resulting from the use of urea as fertiliser.

This ammonia can pollute water courses and sensitive habitats such as

fens and peatlands. Also, it can give rise to nitrous oxide, a greenhouse gas, and it can also contribute to respiratory disease. Ireland is in breach of the directive, with over 116,000t of ammonia emitted in 2016 and it looks likely we will remain so for a period of time.

Therefore, while it will be challenging to reduce emissions, especially in the context of increased output, the sector urgently needs to reduce emissions. Reducing ammonia isn't only about achieving targets. Lost ammonia represents a significant economic loss to the sector; almost 100,000t of N that could be contributing to grass and crop growth.

How can we reduce ammonia emissions? Increased N use efficiency on farm will go some of the way, as will reducing crude protein content in bovine and pig diets. However, the options with the most impact are early season spreading of slurry, switching from splashplate application of slurry to bandspreading or trailing shoe, and changing from straight urea to a protected urea fertiliser.

Bandspreading or trailing shoe application of slurry can reduce ammonia losses, improving N fertiliser efficiency of slurry by 20% to 40%. Early slurry application will save 30% in terms of ammonia N loss. Estimates are that these measures could reduce ammonia loss by 23,000t and improve farm N efficiency.

While there is a greater cost to protected urea, it has been shown to virtually eliminate ammonia loss

with a resulting better efficiency than straight urea.

Protected urea also has less greenhouse gas emissions associated with it than calcium ammonium nitrate, which means that the N rate does not have to be reduced.

Further down the line, there will be the option of slurry additives to reduce ammonia and methane and covering external storage units.

“While it will be challenging to reduce emissions, especially in the context of increased output, the sector urgently needs to reduce them

But it's not all doom and gloom. Farmers have been improving the fertiliser replacement value of slurry by applying substantially more during the early season.

There has also been a large level of interest in low emission slurry spreading, with almost 2,000 applications under TAMS II. In addition, all derogation farms are using trailing shoe when applying slurry after June. So, farmers are contributing to ammonia reductions.

While more will need to be done, reducing ammonia is a real win-win ... it means less pollution, greater efficiency and lower input costs.

Diversification opportunities

Prospects for on-farm renewable energy projects will be boosted by two new initiatives: the Support Scheme for Renewable Heat and the Renewable Electricity Support Scheme

Barry Caslin

Teagasc Crops Environment and Land Use Programme

Globally, there is a clear commitment to decarbonise economies and energy systems, and those countries that don't make the transition risk being left behind. There are a lot of complex issues, such as how we actually balance increasing renewable energy generation and changing demand, so the electricity grid maintains a constant supply.

However, there is a lot of innovation going on which will generate great opportunities. We need to fully exploit the opportunities which on-farm energy generation and battery charging could do to provide transport, heat and electricity options for rural people so we are no longer tied to the costs of fossil fuels.

Greater scope for anaerobic digestion

The removal of carbon dioxide from energy streams is commonly referred to as decarbonisation. There have been dramatic falls globally in the cost of technologies such as photo voltaic (PV) solar, onshore and offshore wind. New battery storage technology will help decarbonise Ireland's electricity supply and will generate interest in renewable energy production on-farm.

Ireland has a major challenge in decarbonising our heat supply. Large amounts of low carbon gas will be required to displace fossil fuel natural gas. This will offer opportunities for farmers to produce biomethane through anaerobic digestion (biogas) from slurry and grass together with other carbon sources such as food wastes.

Farmers have an obvious interest here in the supply of agricultural

feedstock's for the growing bio-based economy. Biomethane will require SSRH support in order for it to become viable as there is a high capital outlay.

Support Scheme for Renewable Heat

The Minister for Communications Climate Action and Environment Denis Naughten has committed to the introduction of a scheme to reduce Ireland's reliance on imported fossil fuels and cut greenhouse gas emissions. The minister will introduce a scheme called the Support Scheme for Renewable Heat (SSRH), which will encourage the installation of equipment such as biomass boilers and ground source heat pumps in commercial properties. This could have a real benefit for rural businesses.

The tariff will be paid for 15 years from joining the scheme, providing that claimants demonstrate a use for the heat produced.

Many farms have a ready supply of

wood coppice, chip or straw that can be used in biomass boilers, and others may be able to use ground-source heat, although this tends to require larger areas of land. There could also be scope for individuals or groups to supply heat to local communities through district heating networks.

Renewable Electricity Support Scheme

Minister Naughten has secured cabinet approval for a new Renewable Electricity Support Scheme (RESS). The new scheme will incentivise the introduction of sufficient renewable electricity generation to meet national and EU-wide renewable energy and decarbonisation targets to 2030.

RESS will consist of a number of key elements under headings including: community participation; increasing technology diversity; delivering on renewable targets for 2020 and 2030; and renewable electricity auctions. On Tuesday 31 July, a



at Energy Now Expo 2018



At the Energy in Agriculture 2018 event in Gurteen College, were Minister of Communications, Climate Action and Environment Denis Naughten TD with Sean Ganley, sales and marketing director of C & F Green Energy Athenry, Co Galway – standing in front of the nacelle of a 25kW wind turbine.



Key messages

- SSRH will be available for all commercial applications – with no lower limit.
- The budget for the scheme is €18m per year for 15 years. The €18m budget is for biomass alone.
- It is planned that the online portal for applications will be open in September. This will allow people to become familiar with the requirements.

Future of renewables

A lot of supermarkets and buyers are looking to supply-chain efficiencies and certainly some milk buyers are expecting farmers to install renewables. Milk producers and niche vegetable growers in particular are being told they need to have good green energy credentials. Poultry farmers who wish to heat their sheds for young broilers face an array of choice in terms of the technology available.

New opportunities will emerge in the renewables sector for farmers and landowners because they have the very thing that most renewable energy projects require – land. They may develop a project themselves or rent out the land and receive rental income. Renewable technologies are becoming more established so investors are increasingly confident to invest.

Energy Now Expo 2018

Teagasc and IFA are pleased to support the Energy Now Expo 2018. The conference and major exhibition of renewable technology providers takes place at The Hub, Cillín Hill, Co. Kilkenny on 24 and 25 October. The event brings together farmers, landowners and other rural business owners to engage with industry experts on the latest renewable energy opportunities available, together with the best practices in energy generation and efficiency.

Farmers will be able to engage with industry experts on the latest renewable energy opportunities, as well as the best practices in energy generation and efficiency.

For further information see www.energynowexpo-ireland.com

pilot scheme was launched aimed at domestic rooftop solar PV and battery storage.

The pilot provides grant support to encourage homes to generate some of their own renewable electricity. DCCAE say that a typical three-bed, semi-detached house would need to spend about €1,800 on a solar PV panel system and would save approximately €220 per year on their electricity bills.

Battery storage

Historically, one of the major drawbacks of renewable energy such as solar PV and wind has been variability. The wind does not always blow and the sun does not always shine when you need the electricity. Battery technology could help overcome these peaks and troughs.

It also opens up a range of future diversification opportunities, such as the prospect of hosting charging stations for electric vehicles (EVs) on farm. Developments in lithium

ion batteries have reduced the size and cost of the technology leading to more feasible “behind the meter” domestic storage and commercial scale systems, which support existing grid infrastructure for wind and solar farms. Farmers will be at the forefront of these developments.

Low-emission vehicles

Ireland will ban the sale of new petrol and diesel cars by 2040. The future will therefore see an explosion of interest in battery-powered cars. The interest will follow for electric trucks and tractors.

The first electric tractors may be on sale as early as 2019, competing with biomethane-powered machinery for farm self-sufficiency although challenging for the rural energy infrastructure in terms of charging needs. Large vehicles may function like mobile storage batteries, earning income through so-called “vehicle-to-grid” services potentially allowing access to ultra-low cost charging.

Plant trees to help

Forestry can complement farm enterprises and provide many benefits including better work-life balance

Liam Kelly
Teagasc forestry advisor

Psychoanalysts report that looking at trees and greenery generally is good for your health. Integrating trees into your mix of farm enterprises can also enhance your well-being. Westmeath farmer Gerard Deegan says planting part of his Mullingar farm has fitted in neatly with his farm enterprises and reduced his day-to-day stress.

"Since planting trees, I feel my workload is more manageable and I can now fully appreciate and enjoy what my farm has to offer," says Gerard. "For the first time in my life, I feel that I am in charge of my time."

Traditional farm enterprises are demanding in terms of time and labour input, especially if you aim to make a half-decent profit. This is particularly true if you are responsible for the management and welfare of livestock. Gerard is one of a growing number of landowners who have not only considered their enterprise options but have also taken proactive decisions to improve their lifestyle.

Each landowner who plants trees usually identifies a number of reasons for doing so. While the financial benefits can be highly attractive, another reason is the improved labour situation – more quality time is freed-



up to develop the farm (and forest) and also to pursue other hobbies and interests.

Gerard Deegan has 145 acres of good-quality land in Cooksborough, Co Westmeath. Up to 2012, Gerard was an organic dairy farmer, milking 35 cows and supplying Glenisk Dairies, while also managing a calf-to-beef system. Gerard developed an interest in different poultry species which he also raised organically.

As the years passed, Gerard found his main farming enterprise to be getting more stressful. After considering many different options including land leasing, Gerard decided he would plant up to 75% of his farm in trees and continue to farm the rest.

"Forestry was a good option as I could still draw Basic Payment entitlements on the planted land," says Gerard. "The forest premium is available for 20 years and as I was in

REPS at the time, the FEPS scheme appealed to me."

In 2012, Gerard planted 43ha (107 acres) of mixed woodland under FEPS. Gerard said: "This scheme suited me from an environmental point of view as I was an organic farmer. Working with my forester, I was able to plan and organise the layout of the forest.

"This included the species composition plus also the access paths that were installed at the time of planting. I deer-fenced at the time of establishment due to the threat from the locally increasing deer population."

Gerard planted approximately 20ha with conifers mainly Norway spruce plus some Scot's pine and European larch. The conifer species were to provide an early timber return. He also planted over 20ha in broadleaves, predominately ash, plus oak, beech and sycamore.



Key messages

According to the 2017 DAFM Forest Service statistics for Ireland between 1980 and 2016:

- 286,479ha of private woodland was established,
- 83% of this area was developed by farmers.
- 21,994 private forest owners have received grant aid to establish forests.

reduce your stress



Gerard Deegan on one of the many access paths through the forest (taken within the beech plot).

The species were planted in blocks, and each is easily accessible via the access paths that were installed at planting. The tracks and field headlands are fully maintained by topping two to three times a year to ensure ease of access at all times.

Gerard also opted to plant a number of specimen trees sporadically along the various paths, with additional samples added each year to ensure further diversity. Even though the site was managed by his forestry company, Gerard also carries out some maintenance. This has safeguarded not only full stocking across the site, but also ensured that the crop has developed uniformly.

During winter 2017/18, for example, Gerard walked each line of broad-leaves and shaped each tree while also removing the odd large side branch to facilitate future shaping. The development of the site has been phenom-

enal, with spectacular height growth across all species on site, which surprises me every time I visit.

"In 2012, when I planted the forest I got out of milking altogether," says Gerard. "I still farm 14ha where I keep an organic suckler herd, with a calf-to-beef enterprise. I have also more than doubled the number of poultry (including hens, broilers, geese, turkeys and ducks) which I rear organically in the farmyard along with some pigs. These are for our own use and for selling locally. I really enjoy keeping up with some farming."

Gerard has also recently become involved with Social Farming Ireland, which has allowed him to develop his love for helping people and their needs. He says: "The benefits that people with special needs gain by partaking in both the farm and forest activities are brilliant for both the

participants and myself."

In the future, Gerard intends to enhance his existing resource by installing some additional leisure facilities within the woodland. This will include seating plus information stations describing the different species of trees, wildlife and walkways through the wood.

Even though Gerard changed his main enterprise to tree farming, he is as busy as ever, though the work is not as time critical and demanding. "For the first time in my life I feel that I am in charge of my time," he concludes.

Autumn is a good time to take stock of your farm enterprises. It is also a good time to consider forestry as it allows plenty of lead-in time if considering forestry during the upcoming planting season. For further details contact your local Teagasc forest advisor, at any Teagasc office.

botanic gardens

Why drought-tolerant grasses might be the future for Irish lawns

With its cold, wet spring and extremely dry summer and hosepipe ban, 2018 has delivered many challenges for gardeners trying to produce healthy lawns

Colm Dockrell

Lecturer at the Teagasc College at the National Botanic Gardens

As many Irish lawns contain large amounts of perennial ryegrass and annual meadow grass, the severe drought resulted in extensive areas of brown grass. This is not surprising as annual meadow grass, with its extremely shallow roots, and perennial ryegrass, with its broad leaf and high water use rate, are both very intolerant of prolonged dry conditions.

So how are we going to enjoy beautiful lawns if these conditions are going to be part of our future? It all comes down to the grasses we grow.

Some grasses are able to stay greener than others by being more water-efficient or more tolerant of dehydration due to morphological features such as rolled leaves, underground rhizomes or deep roots, etc.

Here are some of the best choices for prolonged drought conditions:

Fine fescue

The fine fescue group includes slender and strong creeping red fescue and chewings' fescue. They have been used in lawn mixtures for decades. They are relatively low maintenance grasses, requiring low levels of nutrition and they are also reasonably shade tolerant. Their ability to withstand drought comes from their rolled leaf structure which gives them a low water use rate and strong ability to withstand dehydration.

The two creeping fescues have strong underground rhizomes which help them to find water and recover and repair damage after a prolonged drought. Unfortunately, the fescues have a poor tolerance of "traffic"



Some grasses can stay greener by being more water-efficient or more tolerant of dehydration.

which is why we find them more frequently used in mixes with perennial ryegrass and smooth-stalked meadow grass.

Tall fescue

Although a member of the genus *Festuca*, tall fescue is a very different plant structurally to the fine fescues. Tall fescue is a tufted perennial grass which produces broad flat leaves and exceptionally long roots. Older cultivars had coarse leaves but newer cultivars have denser and finer leaves making them more suitable for most amenity situations.

The species' superior heat and drought tolerance comes from its extensive root system which can extend as deep as one metre in well prepared ground. Tall fescue also has reasonably good shade tolerance. On the downside, the absence of stolons and rhizomes means it does not have great recovery properties when the cover of grass is lost due to heavy traffic.

For this reason, it is best used in mixes with perennial ryegrass and

smooth stalked meadow grass and even the fine fescues. As the leaf width of a new cultivar declines, the mowing height will also decline from the current recommendation of 30mm to 60mm.

Smooth-stalked meadow grass

At first glance, this grass is not usually regarded as being drought-tolerant as, like most of the other meadow grasses, it will go brown during drought periods. However, smooth-stalked meadow grass actually exhibits almost total dormancy during periods of extreme drought and will recover very quickly when normal rainfall is restored.

This quick recovery is due to the presence of strong, vigorous rhizomes. This is a very durable, hard-wearing grass that is widely used in both sports pitches and for hard-wearing utility lawns. It is, however, very slow to establish from seed and for this reason is best used in mixes with some of the other grasses that I mentioned earlier.

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1. O' Doherty et al., 2014, Effect of exposure to *Neospora caninum*, *Salmonella* and *Leptospira interrogans* serovar Hardjo on the economic performance of Irish dairy herds, J Dairy Sci, 98: 2789-2800

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