



The Farming for Nature Manual

Practical tips
from farmers to farmers
to protect and enhance
biodiversity on farmland

Outline



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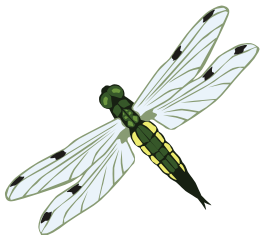
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Foreword

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1 Getting Started

Why 'farm for nature'?

As farmers, we have the privilege of working with nature every day to produce food for a growing global population. But we're not just feeding people: by carefully managing our natural resources - from the soil beneath our feet to the plants and animals that call our farms home - we are also helping to create farming landscapes that are not only productive, but are also healthy and sustainable.

Luckily, we don't have to do all the heavy lifting ourselves - once you start working with, instead of against, natural systems on your farm, you'll start to discover the many ways that nature can do some of the hard graft for you!



7

SIMPLE WAYS NATURE CAN BENEFIT YOU AND YOUR FARM

- 1** Healthy insect populations can boost crop pollination and yields.
- 2** Healthy soils are more productive, lead to better nutrient cycling, improved soil structure, and more nutrient-dense crops.
- 3** Healthy wetlands and watercourses provide clean water for livestock and people, and reduce the risks of floods and droughts.
- 4** Healthy, diverse hedgerows provide browse, shelter and shade for livestock, windbreaks for crops and protect against flooding and erosion.
- 5** Healthy wildlife habitats can qualify you for an increasing range of financial schemes and supports.
- 6** Healthy, diverse farm ecosystems create more opportunities for future generations facing an unpredictable future.
- 7** Healthy farms mean healthy farmers! Nature rich farms can provide a safer and more enjoyable environment for the farmer, farm family and wider community.



Where to start?

Understanding nature on your farm

Have you ever taken a moment to simply walk around your farm and observe it with fresh eyes? It can be easy to get caught up in the day-to-day tasks and miss out on the bigger picture. So, why not take a break on a quieter day and enjoy some time exploring and reflecting on nature on your farm. Better yet, grab a family member, friend, or colleague [children can be great at this!] and make it a group activity. It can be surprising what fresh perspectives others can bring to the table.

As you walk the farm, take note of any areas that could use some improvement or attention. Don't worry; Rome wasn't built in a day, so it's okay if you can't tackle everything at once. However, identifying areas where you can make small improvements is a great place to start. Who knows, you may even stumble upon a new idea or solution to a problem you've been facing!

Here are some questions to ponder to get you started:

- Is there more or less nature on my farm than there used to be?
- If farming for climate and nature pay better in future, is my farm well positioned to benefit?
- How healthy is my soil? Will my soil microbes and earthworms be alive and kicking in ten, twenty or thirty years?
- Am I making the most efficient use of farm inputs? Are fertiliser, farmyard manure, herbicides or other inputs used only where needed, or is there some wastage?
- How does water work on my farm? Am I in control of inflows, usage, wastage and outflows, or are my valuable soils and farm inputs escaping down the drain?
- What is the impact of my farm on the surrounding countryside? [Air, soil, water, wildlife]?
- Where are the current hotspots for nature on the farm?
- In what condition would I like to pass the farm ecosystem on to the next generation?



With these thoughts in mind, take a few extra minutes to sit down and map out how your farm is currently providing space for nature.

Mapping nature on your farm in 5 simple steps

Creating a nature or “habitat” map for your farm is easier than you might think and it’s a great way to understand the biodiversity of your land and make informed decisions about your farming practices.

1 Sketch

To get started, all you need is a sketch of your farm, including all manmade features, such as field boundaries, roadways, and the farmyard. Or, if you prefer, you can use a photocopy of a land boundary map, or even a printout of a Google Map or Google Earth map with the farm boundary marked in. Don’t forget to include outfarms!

2 Add natural features

Then, simply draw on the natural features of your farm, such as streams, woodland areas, wetlands, hedgerows, field margins, rough grazing, etc. Don’t worry if you miss something, the following chapters will help you to better understand habitats on your farm and you can always add to the map as you go.

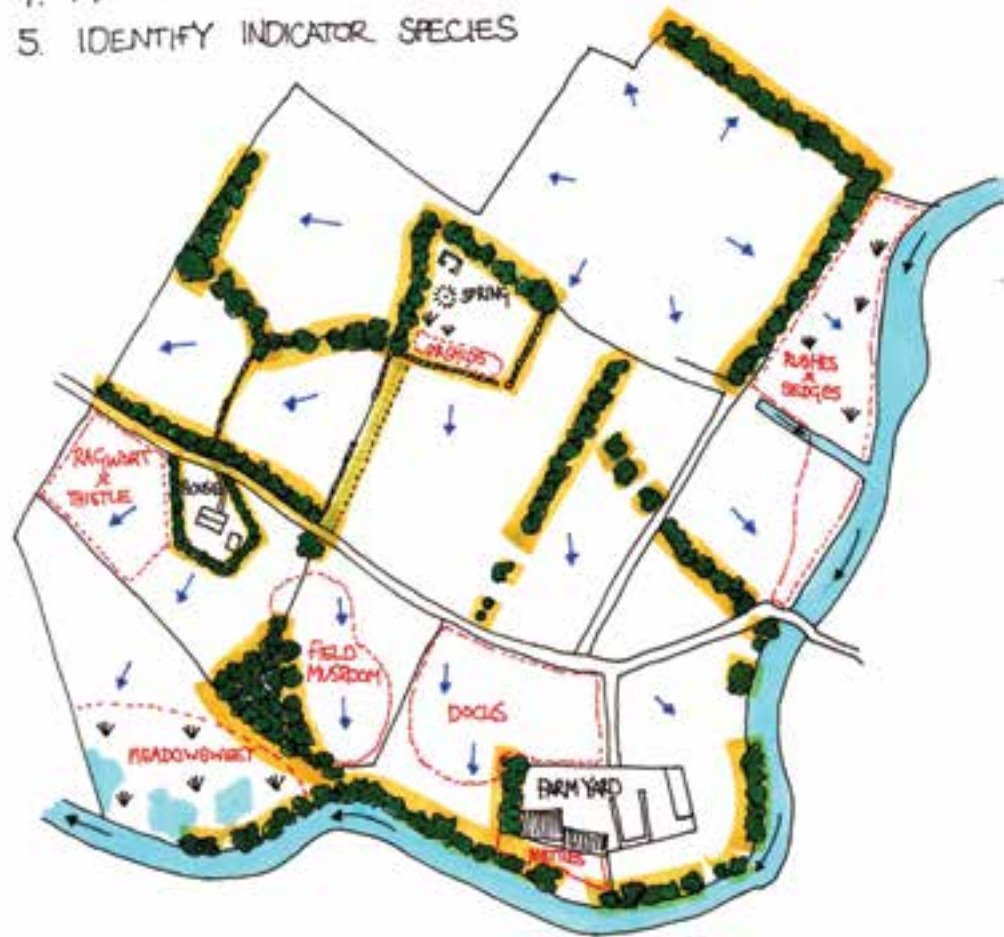
3 Identify corridors & connectivity

Once you’ve marked out these habitats on your map, the real fun begins. You can start building on what you’ve drawn by identifying wildlife corridors and landscape connectivity. Did you know that many species of native Irish wildlife prefer not to cross open fields? That’s why wildlife corridors are so important: they allow wildlife to pass freely around the countryside. For example, a male pine marten could occupy an area of up to 80 hectares and requires a connected landscape to move about with ease. Bats and owls also use hedgerows for navigation as they travel and hunt in the skies at night. So, take a closer look at your map and see whether your habitats provide connected pathways across your land or if these ‘wildlife corridors’ are fragmented.

1. SKETCH FIELD BOUNDARIES
2. ADD NATURAL FEATURES



3. IDENTIFY WILDLIFE CORRIDORS
4. MAP WATER AND NUTRIENT FLOW
5. IDENTIFY INDICATOR SPECIES



-  WILDLIFE CORRIDORS
-  OVER GROUND FLOW
-  INDICATOR SPECIES

4 Map water and nutrients

Once you've marked out your habitats and corridors, it's time to think about how water travels around your land. You can do this by marking the flow of water using arrows on your map. Why is this important? Well, the path that water takes is often the same path that farm run-off, excess nutrients, or sediment may take. By understanding how water moves on your farm, you'll be better able to create clean water habitats, protect your soil, and avoid wasting precious nutrients or polluting watercourses. Understanding the natural water sources and where the water flows will also help you to make informed decisions about where to plant trees, create wetlands, or install buffer strips to filter out any water contaminants.

5 Identify indicator species

The next step is to identify some of the species of plants and animals present on your farm and what they can tell you about the quality of your soil, water, and other environmental conditions. For instance, many earthworms can indicate healthy soil, while many docks can indicate soil compaction. By knowing what these "indicator species" are telling you, you can catch environmental issues early on, and you'll be better equipped to make informed decisions about your farming practices, saving time and resources in the long run. To help you identify indicator species on your farm, check out Appendix 1 at the back of this manual. Once you have identified a few indicator species, mark these species on your map – you can build on this list over time.

And that's it – you now have a habitat map of your farm!
As you learn more about nature on your farm, you can add other features to your map, for example species that you discover, or areas that you identify where your habitats or wildlife corridors could meet up with those of your neighbours in the wider environment.

Your unique farm habitat map can now form the basis for your long-term farming for nature plan.

Making your plan in three steps – retain, enhance, create!



If you're a farmer just starting out on your farming for nature journey, the "hare's corner" approach, where you start by simply leaving a small space for nature in a corner of a field, or making a small intervention such as building a pond, can be a great place to start. On the other hand, if you're already quite far along on your farming for nature journey, you might start looking more seriously at a "holistic" or whole farm approach, where you explore how you can work more in line with nature across all of your farming systems and across all of your lands.

Retain

Grab a bright marker and start by marking on your farm map all of the existing areas that are providing space for nature on your farm. You have most of this work done already, as the areas that provide the most benefit for nature are generally the same natural features that you marked on your map for step 2 of 'mapping nature on your farm' on pX. Some examples of these are hedgerows, streams, field margins, farm roads with grassy borders, woodland, wetland, bog, coastal dunes, old stone walls, and old pasture, but there are many more! Take note of these features; when you are deciding on what actions to take for nature on your farm, these are the features that you want to make sure to retain!

Note: If you are unsure about what's providing valuable habitat on your farm, then this can be a good time to consult with other farmers in your area that are further along the farming for nature journey. To connect with other farmers, the farming for nature online forum is a great place to start, or check out our "Horse's Mouth" farmer-to-farmer mentorship programme.

Enhance

Next, have a closer look at all of your valuable existing habitats and think about how you might be able to enhance their value for wildlife throughout the seasons. The management tips in the following chapters will help you with this. Often, there is a huge amount that can be done in terms of retaining and enhancing current habitats on a farm, before moving on to creating new ones.

Create

However, as you continue down the farming for nature journey, you will likely start to see opportunities for designing exciting new habitats and nature friendly farming systems on your land. This is the time to create! Are there habitats or species that you would like to have on your farm but don't have at the moment, for example a pond or wetland, native woodland or a species-rich meadow? Or would you like to help nature and the climate (and your pocket) by reducing your carbon footprint on farm? The tips in the following chapters will help you with this.

Almost there! – now simply list the key actions you've identified in terms of retaining, enhancing and creating wildlife habitats on your farm (for some quick inspiration, check out our '8 simple actions to consider today'). Take a moment to consider your own list of actions and think about which ones you would like to take, and have the resources to carry out, over a period of say five or ten years. That's it – you now have a plan for nature for your farm and are ready to get going on your farming for nature journey!



DON'T FORGET!

CONNECTIVITY If you are creating new habitats on your farm, remember that they are more likely to be colonised by wildlife if they are close to, or connected to, existing habitats.

RETAIN EXISTING HABITATS Don't destroy one valuable habitat to create another!

HELP IS AVAILABLE! Need more help identifying habitats or choosing actions on your farm? Try the FFN farmer's forum, join the 'Horse's Mouth' mentorship programme or check out our list of recommended advisors that can help you to take nature to the next level on your farm.



My top hack for making better on farm decisions is to learn more about nature:

"The more informed you are the better the decisions you will make. Take some time to study and watch birds, on your own or with someone who perhaps knows more than you do - you will learn more."

Anthony Mooney, Beef farmer, Co. Kildare

**What about my 'neat' farm?**

If you're concerned about what your farm might look like under more nature friendly management then perhaps start small, maybe with one pond or 'hare's corner', and observe how nature returns. Over time, you may notice your mindset about neatness changing – areas that once looked 'messy' or 'abandoned' now look full of life and naturally beautiful. Likewise, areas that once looked 'neat and tidy' can now look

8 SIMPLE ACTIONS TO CONSIDER TODAY

1 Allow hedgerows to grow tall and wide, to flower in summer and to bear fruit and seed in winter. This will provide habitat for wildlife, and food for birds and pollinators, throughout the year.

2 Create flowering field margins by fencing livestock or sowing crops a metre or more in from the field edge. This will benefit bees, birds, butterflies and much more.

3 Create a clean water pond in sunny spot on your farm. Watch as it becomes a lively hub for nature both above and below water!

4 Protect your soil by always keeping it covered, and by reducing poaching by livestock and compaction by heavy machinery. This will boost both soil biodiversity and productivity.

5 Reduce (or eliminate) all of the 'cides' (pesticides, herbicides, fungicides, molluscicides, etc.) from your management routine. The suffix 'cide' comes from the Latin word 'killer' and all of these 'cides' can do great damage to biodiversity on your farm.

6 Reduce or eliminate the spreading of chemical fertilizers and avoid heavy slurry applications – over-fertilisation can damage soil, increase weeds and pollute watercourses.

7 Reduce or completely avoid the use of toxic rodenticides; these poisons can escape into the wider environment and harm wildlife.

8 Consider providing a sanctuary for the key species you wish to attract to your farm, e.g. earth banks for solitary bees, nesting cups for swallows and house martins, hibernation spots for bats, boxes for barn owls, seed-bearing plots for yellowhammers, goldfinches and linnets, dead leaves and decaying wood for insects and hedgehogs, long grass for moths and hares, piles of stones for basking lizards...the choice is yours!



empty, sad or devoid of nature and life. We find that maintaining clear paths and tidy fencing can also be enough to let other people know that the 'messy' nature around the farm is intentional and that by farming for nature you are actually taking more, not less, care of your farm.

Remember – every farm is different, no farm is perfect, and every farm has something to offer. Whatever our starting point and whatever the nature of our holdings, we can all find simple ways to do more to protect and enhance nature on our farms.



Related Chapters

Please see our list of references to support this chapter in **Further Reading** page XX.

Also see the **Glossary**, page XX, for some of the terms explained.



2 The Bottom Line

Can 'Farming for Nature' make financial sense?

As farmers, we know that the world around us is always changing, and we have to keep up in order to succeed. Nowadays, we also have to think about how our farming practices impact the environment and the health of our land. But the good news is, we can find ways to adapt that are not only more sustainable but can also benefit our bottom line.

One way we can do this is by turning to nature-based solutions. These innovative approaches to farming can help us work with, instead of against, nature. By doing so, we can create thriving ecosystems on our farms that are sustainable, productive and profitable for years to come.

In this chapter, we've compiled a list of ten profit-driving nature-based solutions that have been successfully adopted by trailblazing Irish farmers and that are informed by scientific research. By implementing these solutions, we can make a positive impact on both the environmental and economic sustainability of our farms.

While nature-based solutions can be a great way to achieve a sustainable and economically viable farming operation, it's important to remember that each farm is unique. What works for one farmer may not work for another. As farmers, we have the privilege of experimenting and finding out what works best on our own farms. However, before making any significant changes, it's best to do some research, seek advice and speak with other farmers that have successfully implemented these solutions. By learning from the experiences of others, we can all gain valuable insights and avoid potential pitfalls.

1. Find the sweet spot

It is true that shifting from intensive, high-input farming methods to more nature-friendly approaches can reduce yields. However, as many farmers will have experienced, productivity and profitability are not necessarily one and the same. Due to shifting market forces, we're sometimes rewarded with low prices for high yields and vice versa. Likewise, there are a number of ways in which nature-friendly farmers can maintain or even increase their farm profitability despite a possible drop off in yields. Here's why:

- Nature-friendly farming practices can offer better cost-to-value ratios than intensive farming methods. By reducing bought-in inputs, farmers can lower their production costs while at the same time selling their 'nature-friendly' products at premium prices.
- Likewise, reducing reliance on external inputs, such as chemical fertilisers and imported meal, can make farming operations more self-sufficient. This in turn can help nature-friendly farmers to avoid being squeezed by market forces and to achieve greater resilience and financial stability in the long run.

- A third benefit of nature-friendly farming practices is that they can help reduce labour costs. By working with, rather than against, nature, farmers can let natural processes do some of the heavy lifting for them. This can free up time and resources for other important tasks.

Considering the above, it's worth taking a step back and running the numbers for your own farm. Despite the potential reduction in yield, could a more nature-friendly operation actually be more profitable in the long run? Finding the sweet spot on your own farm is a question of balancing inputs and outputs, and adjusting your management to focus on 'optimum' rather than 'maximum' production.

Our top hack for being profitable is to find the best natural balance between inputs and outputs on our farms:

"Through working with Farming For Nature, I am amazed by all the larger more commercial farmers having those light bulb moments when they questioned all they were putting into their farm (not just fertilizer and chemicals but also labour) and weighing up what they get out of it in return - and then making the change and not looking back - less costs, better life, more time for family."

Nia O'Malley, Beef farmer, Co. Galway



“Productivity is output per unit input. The more I learned about the true cost of the inputs I used, the more I realised how unproductive I was. That’s why I farm with nature.

I used to farm with a big focus on maximising profit. Plans were generally made assuming the best [weather, government policy, animal and crop health, farmer and family health etc.]. It left a lot of room for things to go wrong. I now farm for resilience and I have found that resilience comes through working with nature. This makes it more likely that I will be profitable in the good years and the bad and farming is a lot more enjoyable as a result.

The more my profitability became dependent on fertilisers, pesticides, bought in concentrates, bought in labour, bank debt, merchant credit, expensive and increasingly short-lived technology, the more vulnerable I became, the less enjoyable farming became and the more nature suffered. Now I’m linking my profitability to nature: the more I find ways to work with nature the more I profit from nature!

I think most farmers underestimate the scope to reduce costs and remain profitable by farming with nature. It’s not a blueprint that is encouraged by the industry. I think it’s time that farmers stopped farming for the industry and start farming for our own, our families and our communities wellbeing. That will see us looking back to nature.”

John McHugh, Dairy farmer, Co. Laois



2. Uncover hidden profits in grass

In Ireland, we are fortunate to have ideal growing conditions and a lengthy grazing season, which results in most of our livestock herds being fed primarily on grass or grass forage [i.e. 90% grass-fed]. This makes our livestock industries highly competitive on the global market: the cost of producing 1kg of liveweight gain or 1kg of milk solids from grazed grass is only 15-20% of the cost of the same output from intensive concentrate-based systems.

However, we have increasingly relied on external inputs, such as fertilizers and imported feeds, to grow our livestock industries. The production of chemical fertilizers relies heavily on fossil fuels, while the manufacture of soy-based meal is contributing to the alarming deforestation of the Amazon rainforest. These inputs are also expensive for farmers.

As the prices of these commodities continue to rise, innovative farmers are using pasture management solutions to reduce their dependence on expensive inputs and instead uncover the hidden profits in grass. For example:

1. Mob grazing and holistic planned grazing

These are grazing management strategies that are already widely used in New Zealand and the US, and are now beginning to be adopted by farmers in the UK and Ireland. Farmers adopting these methods work to optimize pasture productivity by frequently moving livestock between small pastures at high stocking densities. This system mimics the natural grazing strategy of wild cattle, which evolved to move in large migratory herds that heavily grazed and trampled one area of grass and then naturally moved on. For millions of years, grasses co-evolved with cattle and so are adapted to be grazed in this way. Farmers are finding that mimicking these natural processes can increase sward productivity and reduce reliance on costly synthetic fertilizers by promoting optimal regrowth, increasing pasture diversity, decreasing weed burdens, and building healthier soils.

2. 100% pasture-based farming

Pasture-based farmers feed livestock on 100% grass, herb and legume rich pasture and pasture based forages (i.e. hay, haylage and silage). Recent studies conducted in the UK reveal that 100% pasture-based farms can surpass their more traditional counterparts through cost reductions in feed purchases and by securing premium prices for their products.

3 Grass measuring

If you don't measure it you can't manage it! Grass measuring is helping farmers to lower feed and fertilizer costs. By measuring grass growth, farmers can improve its utilisation and enhance sward quality, leading to lower feed and fertiliser expenses, as well as increased weight gain or milk yields and a lower environmental impact.

My top hack for increasing profits is to measure grass, ensuring high quality swards and reduced need for chemical nitrogen:

“Measuring grass identifies how much grass is growing on a weekly basis. This ensures there is high quality available for the cows. Better quality grass produces higher milk solids and cows produce less methane from high quality grass. The better quality grass has reduced our concentrate feed usage from 1200kgs to 700kgs. Also, measuring grass identifies fields that may need nitrogen or not. During the summer months a lot of organic nitrogen is released from the soil, which eliminates the need for chemical nitrogen, but you can't put a measure on this free nitrogen unless you are measuring grass.”

Gearoid Maher, Dairy farmer, Co. Limerick



Implementing these solutions, which decrease dependence on external inputs in grass-based systems, is assisting farmers in addressing the mounting global pressure to diminish the climate impacts of milk and meat production. At the same time, they can lower expenses and boost profitability by maximizing grass growth and producing premium goods.

3. Cash in on subsidies and supports

While it comes with some red tape, overall in Ireland we are fortunate that our farming activities are supported and subsidised by both the state and the European Union. The majority of farmers in Ireland receive these subsidies. However, as we as a society face the challenges of the dual biodiversity and climate crises, the focus of the eligibility requirements for these payments is increasingly shifting towards environmentally sustainable farming practices. In the future, it's likely that agri-environmental schemes will continue to provide ever-greater incentives to farmers who contribute the most to society, not only through food production, but also through environmental measures.

Taking advantage of these schemes can significantly help farmers to cover the capital costs of transitioning to more nature-friendly farming methods. Participating in these schemes now may also put farmers in a better position to avail of future schemes that reward, for example, the protection of biodiversity and water quality and the capture and storage of carbon.

It's worth speaking to other farmers and to your farm advisor regularly to keep abreast of new schemes – also, it's a good idea to keep an eye on offerings from other organisations that provide financial supports to farmers who farm with nature in mind, such as the National Parks and Wildlife Service.

My top hack ... :

“Farmer quote – how supports (e.g. BISS, TAMS, ACRES, Organics) are providing financial rewards that make nature-friendly farming more attractive”

Farmer



4. Dodge the squeeze by getting ahead of restrictions

While eco-schemes are increasingly rewarding nature-friendly practices, there is no doubt that restrictions on environmentally damaging practices are also tightening up. Such restrictions may result in a tight squeeze for many farmers as they are forced to change practices in line with new legislation. By choosing to adopt more nature-friendly practices now, farmers can stay ahead of the curve and minimize the risk of costly penalties in the future.

My top hack for being resilient going forward is to be aware of shifts in the global mindset:

“Any commercial farmer wishing to remain profitable has to get an understanding of the restrictions that are coming down the track.”

Colm Flynn, Arable farmer, Co. Kildare



5. Shorten supply and distribution chains

Farmers looking to make the most out of nature-friendly or organic production often consider buying and selling directly.

By cutting out the middleman and using delivery services, farmers markets, or local networks to distribute your produce, you can charge premium prices and save on transportation costs and emissions. This can give your bottom line a boost by increasing efficiency and capturing more product value. Collaborating with other farmers to create local processing and marketing networks can also be a game-changer; this is the basis of the success stories of BioAlpin in Austria and the Italian dairy and cattle sectors. Recent research has also shown that many consumers want to support Irish farmers and buy local, but lack opportunities to do so. Is there someone in your community (a shop owner, another farmer, a restaurant owner?) with who you could start a conversation about direct selling and local collaboration?

My top hacks for profitability are setting the price and keeping the profits!

“By creating my own customer base and selling direct to them it means (1) I am the price setter and (2) I get 100% of the end sales price.

As well as the economic benefits there is a great feeling of value being the food producer in the community as well as having a platform to communicate to your customers/community about how their food is produced and the benefits it has to nature in their environment.”

Cathal Mooney, Mixed farmer, Co. Donegal



6. Create economies of scope rather than scale

Within just a couple of generations, Irish farmland has undergone a rapid transition towards specialisation. Most farmers have shifted towards single enterprise production and away from the diverse mixed farms of previous generations. However, some farmers are finding that adding diversity back into their enterprises is not only bringing back nature to their land, but is also benefitting their pocket!

Specifically, mixed farming spreads risk, making the enterprise as a whole more resilient to market forces. Additionally, diverse enterprises create what are known as 'synergistic loops', where the production of one product benefits the production of another. For example, some farmers use chickens to clean up pasture after livestock, reducing the parasite burden. This practice improves both egg and livestock production, while also reducing the economic and environmental costs associated with feeding chickens and with dosing livestock. On mixed farms, these 'synergistic loops' mimic natural ecological processes, harnessing the power of nature to facilitate economies of scope [cost savings based on variety] as an alternative to economies of scale [cost savings based on volume].

My top hack ... :

Farmer quote on circular economy of growing own feed crops – i.e. dung as fertiliser and grain as feed.

Farmer



7. Unlock natural sources of nitrogen

Many nature-friendly farmers are leveraging the power of plants to capture atmospheric nitrogen and convert it into a usable form for plant growth, a process known as 'nitrogen fixation'. 'Nitrogen fixers' are plants that have symbiotic relationships with bacteria that live on their roots. These bacteria convert atmospheric nitrogen into a usable form for the plant and for neighbouring vegetation. Additionally, when the nitrogen-fixing plant eventually decomposes, it releases the stored nitrogen back into the soil, enhancing soil fertility for future crops.

Farmers can harness this process by, for example, incorporating nitrogen fixers such as clover into grasslands, including peas and beans in crop rotations, or even planting native alder trees in hedgerows. Recent research has demonstrated that utilizing these nitrogen fixers in crops and swards can significantly reduce the need for chemical nitrogen application, resulting in both cost savings and reduced environmental damage.

My top hack for increasing profits is to increase clover and reduce chemical nitrogen:

"On our farm we have increased the amount of clover and reduced our chemical nitrogen usage from 250kgN/ha to 100kgN/ha. We incorporated red clover into our silage fields, which in turn has eliminated the need for chemical nitrogen."

We also do a nutrient management plan every year. This identifies what we need to apply and where we need to apply it. By doing this it eliminates the overuse of nutrients, which in turn has a huge beneficial impact on soil health and water quality."

Gearoid Maher, Dairy farmer, Co. Limerick



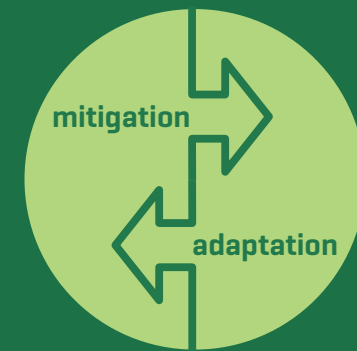
8. Become climate resilient

Within just a couple of generations, Irish farmland has undergone a rapid Climate change is threatening the economic viability of farming systems on a global scale. The impacts of climate change vary depending on factors such as geography, temperature, rainfall, and human activity. Extreme weather events such as floods and droughts, desertification, water scarcity, and food insecurity are some of the challenges that different countries face. Within a country, different regions and communities can also be affected differently. For instance, coastal communities are more vulnerable to sea level rise and storm surges, while mountainous regions may face risks such as landslides and melting glaciers.

These changes in weather patterns are already damaging crops and livestock systems in many developing countries, and extreme weather events are becoming more common in Europe, including Ireland. The hottest temperatures ever recorded in Ireland occurred in 2022, and research predicts reduced spring rainfall, increased droughts and heat waves in summer, heavier rainfall, and more frequent and intense storms in autumn and winter. These changes are likely to intensify during our lifetimes and for the next generation. These changes to weather patterns will have significant impacts on Irish farms, and it is crucial to take action now to boost farm resilience. Otherwise, we could face significant problems down the line.

Fortunately, many of the sustainable farming practices described in this book can help to make farms more resilient to the extreme weather events caused by climate change. For example, maintaining healthy soils can boost productivity during droughts or floods, managing healthy woodlands and wetlands can help to slow the flow of water across your land after heavy rainfall, while maintaining tall and wide hedgerows can provide natural shelter and shade for crops or livestock during storms or heatwaves. Incorporating these natural solutions into your farming system can therefore not only help nature, but also reduce the economic risks associated with climate change.

What's the difference between climate mitigation and adaptation on my farm?



Climate mitigation is concerned with reducing the amount of heat-trapping greenhouse gases [GHGs] in the atmosphere. On-farm this can be achieved both by reducing emissions [e.g. by limiting the use of fossil fuels] and by increasing carbon capture and storage [e.g. by managing healthy soils and hedgerows]. Climate mitigation actions are crucial if we are to slow the current rate of global warming.

Climate adaptation, on the other hand, can be understood as the actions we can take to make our farms more resilient to the changing weather patterns associated with climate change [e.g. increased droughts and floods]. Luckily, many on-farm climate adaptation strategies are also climate mitigation strategies. For example, promoting the health of soils, woodland and water systems can both reduce the impacts of droughts and floods [adaptation] and help to capture and store more carbon [mitigation].

My top hack for reducing economic risk is to mitigate against climate change:

“Climate change mitigation and farming for nature go hand in hand - what benefits one is good for the other. It is very often a case of achieving better outcomes with less effort, providing you know what you are doing.”

Andrew Bergin, Tillage farmer, Co. Kildare



9. Get biodiversity working for you!

Intensive management can lead to little space remaining for nature and ultimately to the breakdown of natural processes on our farms. However, when we ease off on intensive management practices and make a bit more space for nature, we can get these natural systems working for us.

For instance, a greater abundance of pollinating insects can improve crop yields, while more predatory insects can reduce crop pests. Increased populations of soil microbes and fungi can boost soil productivity and sward health, while a healthy population of barn owls and buzzards can control rodent populations. The more wildlife-rich your farm, the more you stand to benefit from the ecosystem services driven by biodiversity.

My top hack for increasing profits is to make peace with nature:

“Start by making peace with nature. In doing that I gained a tremendous ally ... I let the weed re-balance my depleted soils, I let the hedge provide shelter for the storms to come, I let the scrub buffer the extremes of drought and flood.”

John McHugh, Dairy farmer, Co. Laois



Related Chapters

Please see our list of references to support this chapter in **Further Reading** page XX.

Also see the **Glossary**, page XX, for some of the terms explained.



3 BOOSTING BIODIVERSITY AROUND YOUR FARM

As farmers, we control more than 65% of the land cover in Ireland. This means we can have a hugely positive role in protecting Ireland's biodiversity and in ensuring we retain space for nature on our island.

In a time of growing biodiversity, climate and food security crises around the world, many Irish farmers are beginning to take things into their own hands. From beef to dairy, arable to horticulture and across all other sectors, farmers are finding new (and old!) ways to make a difference for nature in their daily working lives. These farmers produce great food, look after their farm environment, make a decent living for their families and support their local communities. They are also a huge learning resource, full of innovative ideas and practical experience, accumulated over many years - often generations - on the ground.

In this chapter, we'll bring you some practical advice from these farmers and others on how - and why - they do what they do, day in day out! Alongside these farmer's top tips, we'll also bring you the results of new



research from Ireland and elsewhere, which is increasingly showing how farming for nature can not only benefit biodiversity and climate, but also food production and the farmer’s pocket.

As with all suggestions concerning farming and nature, circumstances will change from field to field and farm to farm so it’s not possible - or wise - to be too prescriptive. We always recommend that you begin by looking after, and ideally enhancing, what you already have in terms of habitats and species, giving nature the chance to do the ‘heavy lifting’ so to speak. Where this isn’t possible and you want to create new habitats or change your farming system, it’s best to proceed with some degree of caution [and consultation], observe the impact, and respond accordingly. And be patient, change does take time! Best of luck on your farming for nature journey!

In this chapter:

Grassland Systems 33-69

Arable Land

Bogs & Uplands

Wetlands, Ponds & Watercourses

Woodlands

Field Boundaries

Gardens & Orchards

Farmyards & Buildings

Soils

“Actions can start with very small steps and work best when built up gradually by the farmers as they learn what works well for them and for their farms. And be prepared to accept an odd mistake along the way - you won’t find a prince without kissing a few frogs.”

Andrew Bergin, Tillage farmer, Co. Kildare



Grassland Systems

In Ireland, almost 60% of our total land area is dedicated to grassland! This includes pasture, rough grazing and fields cut for hay, haylage or silage. Over the past 50 years, the production of livestock from grassland has significantly intensified. Unfortunately, this intensification has come at a cost for our grassland biodiversity. However, we now know that making simple changes can positively impact the native flora and fauna of Irish grasslands, without compromising production standards. Here we bring you top tips, drawn both from new research and from the boots-on-the-ground experience of other Irish farmers, which will help you to boost biodiversity in your grassland system.

10 actions for nature in grassland systems

1. Tailor your grazing regime to the natural carrying capacity of the farm
2. Cut late and maintain diverse areas of grassland
3. Manage hedgerows for livestock & nature
4. Manage drainage to allow for wet grasslands
5. Reduce livestock access to rivers and waterways
6. Minimise supplementary feeding
7. Minimise anti-parasitic drug use
8. Minimise and optimise the use of chemical inputs
9. Consider mixed grazing
10. Maintain multi-species swards



Actions explained:

1 Tailor your grazing regime to the natural carrying capacity of the farm

Figuring out your optimum stocking rate involves a bit of experimentation and sometimes we can get things wrong, especially with changing weather patterns. While in the past high stocking rates were encouraged, we now know that overstocking can lead to higher financial costs in supplementary feeding and can have a long-term negative impact on the biodiversity and soil health of your farm. Likewise, high stocking densities are associated with impaired carbon sequestration, increased greenhouse gas emissions and increased risks for nitrogen leaching from urine patches. In comparison, at lower stocking densities, herbivores can actually enhance soil nitrogen cycling and the productivity of swards, leading to increased soil carbon, better soil health and increased biodiversity!



TOP TIPS

Tailor your grazing regime to the type of grassland you have

Overgrazing will lead to compaction and poaching and to open space in the sward for weeds to colonise, whereas undergrazing will encourage the growth of scrub.

Experiment!

Avoid sticking to the same grazing regime every year – keep experimenting, observing, recording and adapting!

Try conservation grazing

The goal of conservation grazing is to create a balance between the needs of the ecosystem and the needs of the livestock. This helps to promote biodiversity, prevent the spread of invasive species, and maintain healthy habitats for a variety of wildlife. When thoughtfully managed, cattle can be very useful conservation grazers. Horses and ponies can also be used to restore rough grasslands that have been

historically undergrazed, just be careful not to let them overgraze. Sheep and goats can be good for controlling brambles and thorns, while pigs can be excellent at regenerating annual wildflower plots by rootling soil. While some people prefer to use traditional or native breeds (see Chap x), most breeds can do a good job once the habitat is suitable for them.

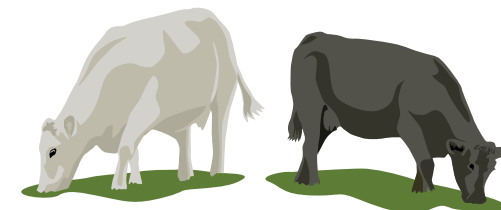
Experiment with mob grazing or holistic planned grazing

These grazing management strategies are already widely used in New Zealand and the United States, and are now beginning to be adopted by farmers in the United Kingdom and Ireland. Farmers adopting these methods work to optimize pasture productivity by frequently moving cattle between small pastures, leaving plenty of time for pastures to fully recover between grazings. A recent review of scientific evidence suggests that, while the high disturbance associated with these stocking densities can damage some habitats, overall these methods lead to healthier soils and to a greater diversity of wildlife habitats across the farm than conventional grazing regimes.

Invest in infrastructure

Without good farm roadways and multiple entrances and drinking points in paddocks, it can be difficult to avoid poaching during wet weather, even at low stocking densities. If you're looking to update your on-farm infrastructure, speak to your farm advisor about grants that might be available to help you to do so.

Whatever method you choose for your grazing land, make sure to complement it with other nature friendly actions, such as managing species rich hedgerows and protecting watercourses.



Our top hack for maximising grassland productivity is holistic planned grazing:

"By far the most dramatic change I have seen on the farm is when I went to daily moves of our livestock onto fresh pasture in our holistic planned grazing system based on the work of Alan Savoury. By mimicking how nature has managed grasslands for millions of years I have seen the grasses starting to express themselves in their true form. For me growing healthy grasses is the fastest way to build soil organic matter and in turn store carbon from the atmosphere safely in the soil again.

It makes me smile to think that plants and soil microbes can turn one of our biggest problems into a solution and a side effect is lush grass that can feed our livestock."

Cathal Mooney, Mixed Stock Farmer, Co. Donegal

"Holistic planned grazing involves dynamically timing grazing events so the livestock's effect on the land builds fertility and resilience. It consists of plotting grazing moves on a grazing chart, so the livestock are in the right place at the right time for the right reasons. In practice, the animals move from paddock to paddock, mirroring natural herd bunching behaviour, but what sets holistic planned grazing apart from a fixed rotation or mob grazing is that the pace of the rotation changes in sync with the rate of pasture growth. When pasture growth is fast, the rotation speeds up to avoid whole pastures going rank, and when the growth slows down, the rotation slows to avoid overgrazing. The principle goal is to prevent overgrazing of plants - overgrazing is defined as subjecting a plant to grazing before it has time to fully recover from the previous grazing.

In tandem with avoiding overgrazing, there are many other considerations when planning the timing of grazing events. For example, the ecological goals established for each paddock, the livestock nutritional requirements throughout the year, and

making decisions that will positively impact existing and future wildlife habitats and the farmer's quality of life. All these issues and more can be marked on the grazing chart to help the farmer to make the best holistic decisions as the grazing season progresses.

Holistic management can seem overwhelming, so make small changes and focus on avoiding overgrazing. There is no prescriptive "right way". It is a continuous learning process that strives to make the best decisions for your own context. Take your time and observe. Learn everything you can about understanding how ecosystems work and farm in sync with those processes.

Benefits:

- Timing grazing events and recovery periods in sync with the natural plant growth rates will harness more solar energy through photosynthesis, optimising pasture growth and creating more robust and deeper root systems.
- Deeper roots improve water infiltration and storage capacity, reducing flooding while making pastures more resilient to drought.
- The dynamic rotation and often longer recovery periods increase pasture plant diversity and ensure no plant dominates.

Pasture diversity is more resilient to adverse conditions and has significant benefits for the health and welfare of livestock.

Building heavy covers during the growing season that can be grazed into the non-growing season will shorten the housing period and all the associated costs.

Holistic management can seem overwhelming, so make small changes and focus on avoiding overgrazing. Take your time and observe. Learn everything you can about understanding how ecosystems work and farm in sync with those processes. There is no prescriptive "right way". It is a continuous learning process that strives to make the best decisions for your own context."

Cathal Mooney, Mixed stock farmer, Co. Donegal



2 Cut late and maintain diverse areas of grassland

Grassland biodiversity includes everything from microscopic soil invertebrates to apex predators like the barn owl. Diverse, species-rich grasslands that are allowed to grow tall, flower and set seed, before being lightly grazed or cut for hay, will support the greatest diversity of life. Managing areas of your grazing platform in this way can make a huge contribution to on farm biodiversity.



TOP TIPS

Cut your flowering meadows as late as you can

Longer swards with more plant diversity will provide more food (seeds and insects), shelter and protection from predators for many birds and small mammals.

Consider cutting for hay (weather permitting) or even haylage rather than silage

This will allow you to cut later, meaning plants have the chance to flower and to set seed, replenishing the seed bank and providing food for birds and pollinating insects. It also means ground nesting birds such as the meadow pipit and curlew have time to raise their broods before fields are cut. If you have to cut for silage in early summer, perhaps consider leaving one or two fields for a later cut of hay. There is usually a good demand for hay from species-rich meadows. If this isn't possible, then consider leaving field margins of rough grass in your silage fields.

Mowing from the centre of the meadow outwards will help to give wildlife (and chicks that can't yet fly) a chance to escape into adjacent areas

Leaving an uncut strip along the field margins can also provide a refuge for creatures escaping the mower!

Letting plants go to seed before mowing will replenish your seed bank

If you do have to cut the meadow early one year, it's doubly important to resume cutting later in future years, as repeated early cutting will deplete the seed bank over time.

SPECIES SPOTLIGHT

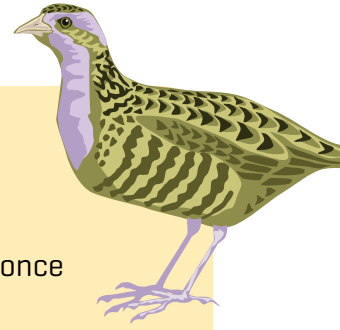
The corncrake

The corncrake's loud and insistent *kerrx-kerrx* call was once a common feature of our hay meadows in summer. Unfortunately, agricultural modernisation has resulted in serious declines in corncrake numbers across Europe. Reductions in their numbers are largely due to a decline in their breeding habitat, the traditional (late-cut) hay meadow. Cutting pasture during the breeding season (May-August) causes destruction of nests and chicks. The earlier that mowing occurs, the larger the negative impact on corncrake breeding success. Now corncrakes are only present in small numbers in north Donegal and western parts of Mayo and Connaught, where traditional haymaking still takes place.

Research on corncrake population declines has shown that ensuring that some tall vegetation is present from spring to autumn, that mowing is carried out late (after chicks have fledged) and that starting to mow from the middle of the field instead of at the edges (so chicks that can't yet fly can escape to the field boundaries) can make a big difference to the breeding success of the corncrake and other ground nesting birds. In areas of West Connaught and Donegal the National Parks and Wildlife Service have been supporting farmers to carry out these measures since the 1990s. Although overall numbers remain very low, (in 2019 there were just 62 calling males recorded in West Connaught and 101 in Donegal) these numbers have doubled since these measures began, showing how nature can come back from the brink if we give it half a chance!

If you are lucky enough to see or hear corncrakes on your land, do contact the **Corncrake Life Project** to let them know!

www.corncrakelife.ie



Lightly aftergraze your meadow with cattle, horses or sheep to enhance the vegetation structure for wildlife

Light grazing can help produce a varied sward structure, which can benefit a greater diversity of birds, insects and small mammals. Livestock will also provide food for dung beetles, which will naturally recycle the nutrients in your meadows!

Maintain a diversity of grass lengths across the farm to provide a variety of habitats for insects, birds and small mammals

Longer swards with more plant diversity will provide more food (seeds or insects), shelter and protection from predators for birds and small mammals. Simple ways to do this are to fence off certain areas, reduce your stocking density to let taller grass grow and for longer into the season, maintain some areas or corners of rough grazing, or allow longer grasses to grow along field boundaries or hedgerows.

SPECIES SPOTLIGHT

Cowslip

Cowslips are native to Ireland and are mostly found in well-drained, herb-rich meadows and grasslands. Along hedgerows, you can often see cowslips growing close to blackthorn. Traditionally the drooping yellow flowers were a common sight in seasonally grazed hay-meadows, but have become increasingly rare. Research has shown that changes in land-use practices, such as the loss of traditional hay-meadow management, the loss of semi-natural grazing areas, an increase in ploughing and the use of nitrogen fertiliser have contributed to this decline. Cowslips are also dependent on foraging insects for pollination, but populations of Irish pollinators are in steep decline. Fortunately, research has also shown that eliminating the use of nitrogen fertiliser and adopting late summer grazing or cutting for hay instead of silage can help this beautiful flowering plant, and others, to bounce back!



Conserve what you have

If your grassland is already filled with native wildflowers, protect them! In a study on Irish plant pollinator networks, bramble, white clover, creeping buttercup, knapweed, hawkbit and field thistle were found to attract particularly high numbers of insect visitors. Do you already have some of these species flowering on your land?

Don't reseed old meadows with wildflower seed mixes

Naturally occurring flowers usually provide better food for locally occurring pollinating insects than bought in seed mixes. Wildflowers also often grow better on less fertile soils, so hold off on the fertiliser if you want to create a diverse flowering meadow!

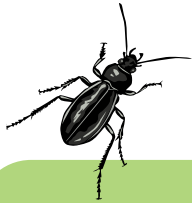
Leave some seed-bearing plants to stand into the autumn/winter

This provides food and shelter for birds as they try to build up energy for the winter ahead or for long flights overseas. Did you know that even some of our small birds like the willow warbler overwinter as far away as southern Africa?! For the birds that stay behind, winter seeds such as the seed heads of thistles, teasel and burdock provide much needed food when little else may be available. For example, of nine resident Irish farmland birds that have declined by more than 50% in the last 25 years, eight feed on seed heads in winter!

Keep an eye out for colonising species such as bramble, bracken or rushes in your hay meadows

While these are native species, if unchecked they will eventually reduce the plant species diversity of your grassland. For more information see the chapter on colonising and invasive species p.XX.





Our top hack for increasing insect and bird life in meadows is to cut late and leave some behind:

“We make hay in our meadows every summer, weather good or bad, using the traditional way, not using fertilizer or herbicides. Mowing starts end of June. This gives skylark, meadow pipit, warblers and others more time to nest successfully. Not using fertilizers and herbicides leaves a species rich meadow that is more attractive to birds. Although thistles are usually viewed as unwanted weeds of grazing pastures, their flowers and seeds are of immense feed value to all the finches e.g. yellowhammer, goldfinch, linnet. Be courageous and leave some for the birds!”

Anthony Mooney, Beef farmer, Co. Kildare

“Over the last 2 years I’ve made a conscious decision to cut grass less often so as to leave more space for insects. I take just one cut of grass for fodder and also raise the slides on the topper to leave a longer thatch and hence leave more living space for insects, frogs and newts. This summer into autumn we have noticed a huge increase in caterpillar numbers especially the hairy horse caterpillar. I also observed an increase in wild flowers especially types of vetch and also knapweed growing in fields away from the hedges.”

Gerry Fitzsimons, Beef farmer, Co. Cavan



3 Manage hedgerows for livestock and nature

Hedgerows provide essential habitat for wildlife in grassland landscapes. They can also improve soil quality, mitigate flooding, store carbon, prolong the grazing season and increase animal welfare and production efficiency. For example, research has shown that by providing shade and shelter, hedgerows can help to reduce stress related diseases like milk fever, mastitis, heat stroke and grass tetany and, by soaking up excess water, they can reduce instances of liver fluke.

Tall, wide hedgerows packed with native trees, shrubs and flowers are best for wildlife – and will also provide diverse browse and an important natural source of vitamins and minerals for livestock! Incorporating field margins at the base of your hedgerows, and making sure to connect hedgerows to other landscape features and habitats [e.g. stone walls, rivers, woodlands, wetlands] will help to create a rich web of wildlife corridors across your farm!

For top tips on hedgerow management see the Field Boundaries section on page XX.

“A neat box hedge that isn’t allowed to fruit or flower, isn’t a functioning hedge, it is just a pile of sticks”

Boyd Bryce, Arable and Sheep farmer, Co. Donegal



4 Manage drainage to allow for wet grasslands

In the past, farmers were encouraged to drain wet pasture. However, we are now beginning to recognise the importance of retaining, enhancing or creating wet grassland as habitat for wildlife.



TOP TIPS

Retain water on your land to create pools and floods in winter

Often this can be as simple as blocking a small section of farm drain. Slow moving floods and standing water will provide wonderful habitat for overwintering birds, including ducks, geese, swans and waders, and, in many cases, will also carry nutrients and sediment from elsewhere that will fertilise your pasture.

Keep wet grasslands damp into July and August

These wet grasslands will provide important habitat for many species, including charismatic breeding 'wading birds' such as lapwing, snipe and curlew.

Graze the area as needed to stop plants such as willow from colonising your wetland and drying it out

Species-rich grasslands should ideally be allowed to flower and set seed in summer without excessive disturbance. However, some wet grasslands may need light summer grazing if they are too wet to graze in winter. To avoid damaging the nests of ground nesting birds though, it's still best to graze after the bird-breeding season (grazing from early August).

Our top hack for boosting biodiversity is restoring and retaining species rich wetlands:

"Wetlands are a specialised habitat, once common, but not any more. Making a wetland can be as simple as blocking a drain or drainage pipe"

Anthony Mooney, Beef farmer, Co. Kildare

"There are a lot of birds on my farm in the wetlands and grazed areas especially along the callows. Cattle can be grazed on the callows in July after the birds have hatched. This should be done in rotation with ponies. This management also benefits plants like orchids and butterfly species like the marsh fritillary butterfly."

Noel Kiernan, Beef, sheep and forestry farmer, Co. Longford

5 Reduce livestock access to rivers and watercourses

Significant contamination is caused by dung and sediment being washed into waterways when animals come to drink. Buffer strips around rivers and watercourses not only prevent livestock from getting access to waterways, but they also entrap nutrients and prevent harmful microbes being washed into rivers and waterways in surface runoff. Allowing native vegetation to grow along the riverbank will also stabilise it against erosion.



TOP TIPS

Fence off watercourses from livestock

To prevent bank erosion or water pollution.

Provide alternative water sources

Such as solar pumps or pipe and trough systems.

Maintain wide buffer strips

Between grazing land and rivers and waterways.

For more farmer's tips on managing rivers and watercourses, see Wetlands, Ponds & Watercourses [page XX].

6 Minimise supplementary feeding

The production of soya-based meal is contributing to rapid destruction of the Amazon rainforest. The production and transport of these feeds is also not only costly for the climate but for the farmer's pocket. In addition to being expensive, feeding forage or grain that has been harvested elsewhere increases the risk of introducing seeds or weeds of invasive species.



TOP TIPS

Grow your own!

Growing your own feed crops on your farm has several advantages, including cost savings by avoiding the mark-up that comes with purchasing feed from a third party. You also have greater control over the quality of the feed your livestock consumes, which can lead to improved animal health and productivity. Additionally, growing your own feed crops can be a more sustainable option, as it reduces transportation costs and greenhouse gas emissions associated with transporting feed from distant sources. Overall, while it may require some upfront effort and investment, the long-term benefits of growing your own feed crops can be significant.

Extend the grazing season

Careful management of pastures and stocking rates can help to extend the grazing season, minimising housing time and thereby reducing the need for supplementary feeding.

Switch to 100% pasture-based farming

Pasture-based farmers feed livestock on 100% grass, herb and legume rich pasture and pasture based forages (i.e. hay, haylage and silage). Recent research in the UK showed that 100% pasture-based farms can surpass their more traditional counterparts in terms of profitability through cost reductions in feed purchases, by selling direct and by securing premium prices for their products.

My top hack for minimising supplementary feeding is 100% grass-fed beef and direct sales:

“With the rising cost of synthetic fertilisers, feed costs will follow just as dramatically. As herbivores have evolved to eat rough fibrous plant material, feeding them on a 100% grass-fed diet will lead to a much superior product and a much lower cost to produce. With the superior product a much higher price can be had, which will offset any losses in lower yields.

By creating my own customer base and selling direct to them it means [1] I am the price setter and [2] I get 100% of the end sales price. As well as the economic benefits there is a great feeling of value in being the food producer in the community, and in being able to communicate to my customers about how their food is produced and the benefits it has to nature.”

Cathal Mooney, Mixed farmer, Co. Donegal



7 Minimise anti-parasitic drug use

Did you know that livestock dung plays a crucial role in supporting various wildlife species? In fact, for many species of beetle and worm, amongst other creatures, dung is a crucial food source. These dung-lovers creatures are themselves essential food sources for numerous other native species, ranging from fungi and robins to badgers and bats, making dung a critical component of a thriving grassland ecosystem.

When livestock is dosed with anti-parasitic drugs, these drugs pass out of the animals in the dung. The presence of these chemicals in dung

causes serious damage to dung loving insects. Insect eating birds that were once abundant around the farm, such as swallows and house martins, are also becoming increasingly rare because (amongst other factors) the insects on which they once fed are now getting scarce. To protect our native dung-lovers, consider alternative methods to maintain a low parasite burden in your herd.



TOP TIPS

Eliminate routine dosing with anti-parasitic drugs like Ivermectin

International research has shown that sites at which Ivermectin was used had 44% fewer dung beetles per cow pat than sites where the drug was not used.

Always use faecal dung tests before dosing

Dung tests simply involve posting a dung sample to one of the laboratories in Ireland that offer this service. You will receive the results back within a few days, allowing you to make an informed decision about whether dosing is really necessary.

Try rotational and mixed grazing

Moving animals regularly and grazing paddocks with more than one species will help to break the life-cycle of the parasites and reduce your herd's parasite load over time.

Harness the power of natural anthelmintics

Including, for example, chicory, sainfoin and birdsfoot trefoil in multi-species swards, or willow in hedgerows or a silvopasture (agroforestry) system, can help to naturally lower parasite burdens.

SPECIES SPOTLIGHT

Dung beetles

Did you know that there are more than 40 types of dung beetle in Ireland and that they play a vital role in keeping your herd and pasture healthy?!



Once it lands on your pasture, a cowpat immediately becomes a breeding ground for many internal parasites such as liver fluke and roundworms. While wet, it also leaches methane into the atmosphere and can cause nutrient run-off in surface water. However, when a cowpat is mixed into the soil, rather than sitting on top of it, it is one of the best and most natural soil conditioners out there. So, how do dung beetles help?

At the first sniff of a whiff of dung, dung beetles unfold long flight wings and fly straight to the source – often crash landing right into the pat itself. Once here, the first wave of dung beetles drink the nutrient rich juices from the cowpat. This dries out the pat, preventing the growth of parasite eggs and larvae, thus reducing the parasite burden in your pasture. The next wave of beetles (helped by earthworms) then begin to drag the remaining dung deep down into the soil. A dung beetle can bury 250 times its own bodyweight in dung in a single day! This boosts soil organic matter, helps to prevent nutrient run-off, aerates the soil and puts the key nutrients contained in a cowpat (nitrogen, phosphorus and potassium) within reach of the roots of the grass. These actions are so valuable to farmers that the Australian Department of Agriculture has invested millions of dollars in increasing dung beetle populations on agricultural land!

Irish dung beetles, however, are in big trouble. Many research studies have now shown that even tiny amounts of widely used dosing and worming (anthelmintic) products (particularly Ivermectin based products) in dung negatively affects dung beetles, confusing their sense of smell and damaging their ability to move. Chemical inputs (fertilisers, herbicides, pesticides, fungicides) and soil disturbance from ploughing can also damage the life cycle of the dung beetle. In agricultural areas in Ireland and in Europe, these practices have led to a sharp decline in dung beetle numbers, in some cases resulting in the long-term accumulation of dung on top of the ground. How can we help to boost dung beetle populations? Eliminating the use of routine dosing products (particularly ivermectin) will help dung beetle populations to bounce back on your land. Reducing management intensity on your grasslands will also give these beetles the chance to do the hard work of nutrient recycling for you. Ultimately, livestock farmers with a lot of dung beetles will have less work to do to maintain healthy pasture than those without.

Our top hacks for maintaining healthy herds and pasture are natural anthelmintics and integrated parasite management plans:

“Willow is a natural de-wormer, so if you have the opportunity to grow it for your grazers to eat at different times of the year or pollard it and let them feed on it, it will work its magic.”

Paul McCormick, Agroforestry farmer, Co. Cork

“Dung is a microhabitat for a whole diverse range of small creatures but, for me, the king of these is the indomitable dung beetle. These beetles move in to dung soon after it has been expelled from the animal. They drink the nutrient-rich juices from the pat, dehydrating parasite and fly eggs and rendering them immobile. As the pats dry out, they become appealing to earthworms, which complete the cycle by digesting these stores of nutrients and mixing them with the topsoil. We also have a number of beetle species who burrow into the soil to lay their eggs, bringing the pat down along with them and placing it at the roots of herbage where all kinds of parasites, flies and animal pathogens won’t come in contact with their intended hosts. This burrowing effect not only aerates the soil and plant roots, but also reduces the risk of nutrient run off polluting our waterways.

Modern farming techniques have depleted a lot of our beetle populations. Practices such as grassland tillage, wet [runny] dung pats derived from modern grass management and the removal of animals from fields in autumn (leaving no food for the beetles until spring) have all contributed to beetle decline. However, the biggest factor of all is the use of anthelmintics to “control” parasites in animals. These animal remedies are toxic to beetles. Also, with resistance to these drugs becoming more common, we need to keep these medicines for the most susceptible stock and use them only when we can demonstrate a need.

The real tragedy of losing beetles (and other dung derived insects) is their loss as a food source for the wider animal kingdom. These beetles are a food source for birds, bats, foxes and badgers. The smaller of these creatures being prey in turn for other creatures. We can turn this story around though, more animals (farmed responsibly) mean more



dung pats, more dung pats mean more beetles, more beetles mean more food available for predators.

Addressing these issues is what the aim has been on our farm. An integrated parasite management plan has to be part of animal management.”

Bruce Thompson, Dairy farmer, Co. Laois

8 Minimise and optimise the use of chemical inputs and slurries

The manufacture of chemical fertilisers generates ~1.4% of all carbon dioxide emissions and the application of both slurry and fertilisers releases nitrous oxide, a gas with 300 times the global warming potential of carbon dioxide. Chemical inputs and heavy slurry applications also wreak havoc on biodiversity, killing soil microbes and insects and polluting watercourses – events that have knock-on consequences all the way up the food chain. A nutrient management plan can help you to reduce your use of these inputs by improving their efficiency.



TOP TIPS

Treat your slurry with respect!

Slurry is an increasingly valuable farm asset; don’t waste it by spreading out of season or by allowing it to run-off your fields.

- **Consider your slurry storage requirements**
There is a slurry storage deficit on ~40% of Irish farms. Could a slight reduction in stocking rate take the pressure off in terms of slurry storage?
- **Use low emissions slurry spreading (LESS) wherever possible**
Research has shown that, at a spreading rate of 1000 gallons per acre, LESS can provide an extra 3 units of nitrogen (N) per acre in comparison to traditional splash plates and ammonia emissions can be reduced by up to 60%. LESS also results in faster growth and reduced contamination of the sward, meaning better clean-outs after grazing. Injection is the best method, followed by the trailing shoe and finally the dribble bar, although all three will result in extra N per acre in comparison to the splash plate.

- **Spread on warmer days!**
To maximise nutrient absorption, spread fertiliser, slurry and farmyard manure on warmer days [soil temp at least 6°C].
- **Soil test before spreading slurry**
Regular soil testing can help you to save costs and make the best use of inputs. For example, cattle slurry is a particularly good source of P and K. Its use should therefore be targeted to those fields with a high requirement for P and K.
- **Transporting slurry can make sense**
Research has shown that fields located further from the farmyard often have low levels of P and K. As chemical fertiliser prices continue to rise, it is increasingly making financial sense to transport slurry further from the farmyard to those fields that need it most!

Maintain optimum soil pH

[Between 6.0 and 7.0] to maximise nutrient uptake by swards in intensive systems.

- Maintaining optimum soil pH can help you to optimise and reduce your fertiliser use. In 2016, research showed that 65% of grasslands in Ireland were below the optimum pH for productivity and farmers are now being incentivised to spread more lime to reduce this percentage.
- However, some of our wild plants do prefer more acidic [e.g. Devil's bit scabious] or alkaline [e.g. greater knapweed] soils. As such, we should also consider the necessity of maintaining some diversity in soil pH across Irish grasslands and meadows in order to conserve our native plants.

Experiment with new sward mixes, inputs and technologies

- **Try mobile phone operated GPSs and tractor sensors**
To maximise nutrient uptake through more targeted spreading.
- **Include nitrogen fixing legumes**
In swards or feed crops [e.g. clover, vetch, beans].
- **Maintain 15-20% clover in the sward**
To increase dry matter production, improve milk yields and naturally fix nitrogen. But remember – spreading chemical nitrogen inhibits the growth of clover!

- **Experiment with new inputs**
There are many new soil treatments coming on the market that can help to reduce fertiliser requirements. These focus on improving the biology of your soil, which will naturally boost soil health and improve sward productivity [see chapter on soils p.XX and on inputs p.XX]
- **Switch to protected urea**
Agriculture accounts for 98% of Irish ammonia emissions. Protected urea is treated with an active ingredient called a urease inhibitor, which reduces the loss of ammonia from fertiliser. Extensive trials in Ireland have shown that paddocks treated with protected urea consistently yield as well as those treated with CAN or unprotected urea, but that protected urea results in a 79% reduction in ammonia loss in comparison to unprotected urea and a 71% reduction in nitrous oxide emissions [a damaging greenhouse gas] in comparison to CAN.
- **Finally, If you don't measure it you can't manage it!**
Check out PastureBase Ireland for a wide range of tools to help you to better understand grass growth patterns on your farm and to optimise [and reduce] fertiliser usage.

My top hack for reducing expensive inputs is Korean natural farming:

“Don't be wasting all your money on expensive inputs, like chemical fertilizer, when everything you need is inside your own gate.

There are three 'rights' in Korean natural farming: the right nutrient, the right time, at the right dose. The right nutrient is something you can see only with a microscope: microbes. As one of my fellow colleagues in America always says, “Become a lazy farmer and let the microbes do your work!”

I don't feed my cows meal because I produce nutritious grass. I don't use fertilizer. I have no inputs. No inputs for 75 cows! In Korean natural farming we spend our money on our family.”

Thomas Stack, Dairy farmer, Co. Limerick



For more information on Korean natural farming, see page XX.

9 Consider mixed grazing

Mixed grazing is a farming practice that involves the grazing of two or more livestock species on the same pasture. It is a land-use system that has been practiced for centuries and is gaining renewed interest due to the numerous benefits it provides. Traditionally, Ireland's grasslands were maintained through mixed livestock grazing. However, single species livestock management has now largely replaced this system. Unfortunately, research has shown that biodiversity has declined in areas where mixed grazing has been replaced by single species livestock management. However, research has also shown that, where reinstated, mixed-grazing can have a range of benefits including boosting biodiversity and sward productivity and even increasing soil carbon sequestration!



TOP TIPS

Boost productivity

One of the primary advantages of mixed grazing is improved pasture productivity. By combining different livestock species, farmers can ensure that pastures are utilized more efficiently. This is because each animal species has different grazing preferences, which can help to maintain a balanced pasture composition. Furthermore, mixed grazing promotes enhanced nutrient cycling by ensuring that all nutrients are distributed evenly across the pasture. In addition to boosting sward productivity, research has shown that incorporating mixed grazing can improve livestock productivity and even reduce methane emissions.

Reduce the parasite load on pastures

Different livestock species have different susceptibility to parasites, and mixed grazing can help reduce the build-up of parasites on the pasture. This is because grazing different species together can help break the parasite cycle and reduce the need for costly parasite treatments.

Boost biodiversity

Mixed grazing can promote biodiversity by creating a more diverse habitat. By grazing different livestock species together, farmers can create a varied landscape that supports a wider range of flora and fauna. This can be especially beneficial for pollinators and other beneficial insects that play a critical role in maintaining healthy ecosystems.

Reduce costs

As different species favour different plants and parts of the plant, mixed grazing can also reduce labour and feed costs by maximising the use of available resources. This makes mixed grazing a more cost-effective and efficient land-use system, which can help farmers maintain profitability and sustainability over the long term.



My top hack for maintaining healthy pasture is mixed grazing:

"I have found goats and pigs to be very beneficial to clear overgrown scrub and woodland. Using the goats to clear upper levels and then letting the pigs rotavate the soil clears the way for grasses to come back and bring overgrown parts of the farm back into a more productive state. Timing is everything to get the desired effect when using animals in this way.

Using small groups of poultry to increase the fertility with their manure while generating a profit through eggs/meat is a very cost-effective way to add nutrients to your farm as well as diversifying the number of income streams. Their scratching behaviour is excellent at regenerating thatch covered and mossy ground."

Cathal Mooney, Mixed farmer, Co. Donegal

10 Maintain multi-species swards

Planting a multi-species sward with a diverse range of productive grasses, herbs and legumes can improve soil structure, drought resistance, nitrogen fixation, season round yield and can provide a more balanced mineral and protein content for your livestock.

Historically, farmers planted a wide range of different species to improve soil condition and to provide a balanced diet for livestock. In recent years, diverse swards have largely been replaced by monocultural swards of perennial ryegrass [PRG]. While PRG is highly productive, these single-species swards lack the mineral content, drought and flood resistance and soil conditioning capabilities of multi-species swards. Monocultural PRG swards also provide little habitat for biodiversity and as such have been referred to as 'green deserts'.



TOP TIPS

Include white clover in pastures

Clover naturally fixes nitrogen from the air into a form of nitrogen that can be used by the plants. It does this by means of bacteria that live on its root nodules. Extensive trials in Ireland have shown that Irish farmers use less nitrogen and have higher dry matter content when they have a clover content of 20% or above in their swards. - Remember to prevent cattle from gorging on white clover as this can cause bloat. Restricting grazing may be necessary.

Clover is not the only legume that fixes nitrogen!

While there has been much hype about the power of clover to fix nitrogen, many other species of legume are also great nitrogen fixers, as well as having a range of other benefits for grazing livestock. For example:

- Birdsfoot trefoil is a protein rich nitrogen fixer that also reduces methane emissions and is a natural anthelmintic.
- Vetch and hairy vetch fix nitrogen and are high in protein.
- Sainfoin, translated from French as 'healthy hay', is a deep rooting nitrogen fixer, a natural anthelmintic and produces a high yield with little or no fertiliser required.

Improve your soil structure

Monocultural pastures of perennial ryegrass [PRG] have very simple shallow root structures. This means that the sward is consistently drawing nutrients and water from only the upper level of the soil. Combining a variety of productive grasses, herbs and legumes with different rooting structures allows nutrients to be drawn from a variety of soil depths. This more complex root structure also promotes better soil infiltration and soil health and helps to ensure that some species in your sward will continue to be productive across a wider variety of weather conditions [e.g. cold spells or summer droughts].

Improve mineral content

Including herbs and legumes in your pasture can boost the mineral content of your sward.

- Salad burnet, for example, is a deep rooting perennial herb. It has a deep taproot that lifts trace elements from deep within the soil profile, making them available to both grazing livestock and [through dung and decaying plant material] to other plants with shallower rooting systems.
- Other useful deep-rooted herbs to consider adding to your sward include sheep's parsley [high in iron and vitamins A and C and known for enhancing fertility in breeding stock], yarrow [improves circulation and blood flow in livestock] and chicory [high protein content and natural anthelmintic].

Consider 'green hay'

To naturally boost meadow diversity with local seed, consider spreading 'green hay' cut from another local species-rich meadow. This can be trampled in by livestock and will naturally boost the diversity of your seed bank. This can be a great alternative to a reseed.

Familiarise yourself with new species

When deciding on your mix, do some research into the persistency and grazing preferences of the various species available to you. Chicory, for example, really comes into its own in its second year, while salad burnet is a strong perennial once established, but can disappear if heavily grazed during its establishment phase.

Include plantain (ribgrass) in pastures

Certain plants, including plantain, can cause cattle to excrete less nitrogen in their urine: recent research showed a 20-60% reduction in nitrogen leaching with a 30% plantain content in the sward; with its long taproot, plantain is also a drought tolerant and soil conditioning plant and it has a high (20%) protein content, which can boost meat and milk production!

Consider the pros and cons of red clover for silage fields

Red clover also fixes nitrogen and therefore can reduce fertilizer costs. Silage incorporating red clover can also have a feeding quality of about 3% higher crude protein than grass silage. However, it has high P and K requirements and a persistency limited to four or five seasons, meaning reseeds are necessary. These factors can limit the sustainability of red clover silage swards.

Provide for pollinating insects

Species such as clover, yarrow and chicory, if allowed to flower, can also provide food for pollinating insects. For example, in a recent Irish farmland study, farms with more clover were found to attract significantly higher numbers of bees.

Reduce risk

Single species (monocultural) swards are at risk of poor production due to drought or disease. Diverse mixes spread this risk, as each species will perform better in different circumstances.

Keep an eye out for schemes

Speak to your farm advisor about current supports for multi-species swards.

Agroforestry/silvopasture

Is another great way to diversify your pasture – check out our top tips on p.XX.

Consider your own farm

Some species are only suitable for certain land types, e.g. wet or dry, or certain species of livestock e.g. cows but not horses. As with all management changes, do some research and consider your unique

requirements before deciding which sward mix is best for you and your farm.

Finally - remember – don't reseed old meadows!

Old hay meadows will provide a much greater diversity of plant species than any bought in multi-species sward mix. If you are lucky enough to have old hay meadows on your land, then you already have the very best 'multi-species swards'!



My top hack for herd health is maintaining species-rich pastures:

"We've all heard the saying a 'balanced and varied' diet is best for our health. Its no different for our ruminants. Species rich grasslands have much to offer.

Here are the top benefits I see when grazing my herd on species rich grasslands:

1. Cow Health. Cows have a nutritional wisdom you and I do not: they know what they need. Our job is simply to offer them the ability to find what they need by encouraging as much diversity in our grasslands and hedgerows as possible. For example, plantain (often deemed a weed), is a natural anthelmintic plant, high in protein and micro nutrients and it has been shown to reduce ammonia in urine! I've watched cows enter fields and seek out plantain and chicory (another anti-wormer). I've seen them reach as high as they can for ash leaves, gently pick hawthorn, bare tree trunks of ivy and chow down on 'sticky-wicks' (a.k.a. cleavers, which are high in iron).

2. Farm Finances. Through grazing practices, longer rotations and access to diverse pasture, we haven't had to carry out routine worming doses on the farm since 2017. We also don't give mineral bolus or feed concentrate grain or meal. Different plants have different length roots with each bringing something

different to the rhizosphere. The cows can get everything they need from a healthy soil with diverse pasture. After calving and during peak lactation the most we have supplemented their diet with is rock salt or seaweed.

3. Resilience. A healthy soil and diverse pasture will serve you best in times of drought or flood. Each plant can tolerate different conditions, meaning when one is doing poorly another will be doing well. For example, in the heatwave of summer 2018, my cows slowly worked their way through knee high meadow fescue, a type of grass which can tolerate long droughts.

4. For nature. We once had an ecologist out on the farm to survey our old stone walls for biodiversity. He ended up finding even more life in the middle of the meadow than along the rich stone walls: from grasshoppers to dragonflies and meadow pipits to hares. Diversity begets diversity. Diverse pasture is a win-win for people, place and planet."

Sinead Moran, Dairy Farmer, Co. Mayo

What are 'species-rich grasslands' and how should they be managed?

Species-rich grasslands are diverse ecosystems that are home to a wide range of plant and animal species. They are characterized by a mix of grasses, wildflowers and herbs, and can support a variety of wildlife, including insects, birds, and mammals. Unfortunately, these grasslands are becoming increasingly rare due to intensive farming practices, development, and other human activities.

In Ireland, species rich grasslands are often also referred to as 'unimproved' or 'semi-natural' grasslands. This means that they have been largely farmed without the use of fertilisers (including slurries) or other chemical inputs, such as pesticides or herbicides, and have not been ploughed or re-seeded in recent times. As a result, they support a variety of wildflowers and grasses that cannot thrive in more intensively managed swards. This variety of plant species in turn attracts a wide variety of wildlife including insects, birds and small mammals. In the oldest meadows, you can even find anthills, showing that the land has never been ploughed.

These species-rich habitats are also fragile; if management practices become more intense, or if the area is not managed at all, the diversity and abundance of species will fall significantly and it is usually very difficult, if not impossible, to restore them all. The continued existence of these important habitats therefore relies on 'light touch' farming practices, such as conservation grazing and cutting for hay.

SPECIES SPOTLIGHT

Orchids

Did you know we have 29 species of orchid in Ireland? You will generally see them flowering in mid-May here. Native Irish orchids are usually found in undisturbed areas, where the soil is low in nutrients and where there is little competing vegetation. All orchids require nutrient poor soil and most prefer soil that is neutral or alkaline. Most orchids will grow best in well managed habitats where the soil is left undisturbed – they don't like ploughing! However, light soil disturbance by winter grazing livestock may benefit some orchid species. Pastures that are lightly grazed or are traditionally managed for hay production can be particularly rich in orchid species.



Examples of species rich grasslands

In Ireland, there are many terms used to describe different forms of species-rich grassland. Sometimes these can be used interchangeably, or more than one grassland type can occur in a small area. This means the language used can sometimes get a bit confusing, but the important thing is to understand your own grassland and what species it supports. The better you understand your own grassland the better you will be able to manage and protect it long term. Below we've outlined a few of the more common types of species-rich grassland in Ireland. What kind of species rich grassland do you have on your farm?

Wet grassland

This is a common semi-natural grassland type in Ireland. Plant species include rushes, orchids, ragged robin, and forget-me-not amongst many others, while birds such as curlew, snipe and meadow pipit rely on these grasslands as breeding grounds. For more information on wet grasslands including fens, turloughs, callows and peatlands, see chapter XX, p.XX.

Calcareous grassland

These dry grasslands are some of the most species rich in Europe. They are found in areas with free-draining mineral soils, often on underlying limestone [e.g. The Burren and the Aran Islands in Co. Clare and the Dartry mountains, Co. Leitrim and Co Sligo]. It can be exceptionally flower-rich and is a particularly good habitat for orchids. Other common species include fairy flax, wild thyme, devil's bit scabious, plantain, bird's foot trefoil, kidney vetch, salad burnet, harebell and lady's bedstraw, as well as a variety of grasses and sedges.

Molinia grassland

This is a less common type of wet grassland with a tall [20-60cms] grass sward. It is widespread but mainly occurs in the north and west of Ireland on relatively nutrient poor and damp soils. Molinia [purple moor grass] is prominent but shouldn't dominate [should not cover >50% of meadow]. When well-managed, molinia meadows can support a range of plants including sedges, rushes, mosses, meadow thistle, sweet vernal grass,

meadowsweet, tormentil, marsh horsetail, water mint, sneezewort and the purple-flowered devil's bit scabious - which attracts the rare marsh fritillary butterfly!

Lowland hay meadow

These grassland areas can be either wet or dry and are managed by taking a single annual cut of hay. Few of these rich meadows now remain in Ireland. Our remaining lowland hay meadows primarily occur on our fertile river plains, such as those of the River Shannon and the River Moy. The Shannon Callows account for 27% of our remaining lowland hay meadows. Common species include oxeye daisies, common knapweed, yellow rattle, vetches, yarrow, meadow foxtail, and wild carrot, amongst many more.

Acid grassland

Generally found in upland acidic areas, acid grasslands support mat-grass, sheep's-fescue and sedges, whilst mosses and liverworts can also be abundant. For more farmer's tips on upland grazing see chapter XX, p.XX.

Machair

Machair is a Gaelic word that refers to low-lying, fertile coastal plains. This complex habitat supports an incredible array of wildlife, including birds, wildflowers and invertebrates. It is also one of the rarest habitats in Europe - occurring only on the west coastlines of Ireland and Scotland. Machair provides a particularly important breeding habitat for our threatened breeding waders, including redshank, dunlin and lapwing.

Heath

This habitat is characterised by low-growing shrubs and heathers and a lack of trees. Unlike peatlands, which have a thick layer of [often wet] peat soil, heaths have thin, nutrient poor soils and are generally drier. They support a unique array of plants and animals, including insects [e.g. marsh fritillary butterfly], mammals [e.g. Irish hare] and birds [e.g. curlew and skylark], amongst many others. For more farmer's tips on upland grazing see chapter XX, p.XX.





If your farm has been intensively managed and no longer supports species-rich meadows or grasslands, then don't despair!

Simply experiment with some of the tips and hacks in this chapter to start to restore them. Even though it may take some time for the grasslands to reach their former glory, it's amazing to see how much life can return in just a few short years. Why not give it a try and witness the incredible transformation of your farm?

Does managing your grazing land for nature make financial sense?

See what this livestock farmer has to say:

"Farming alongside nature has reduced our expenses. So how did this work for us?"

We gave up on striving for high stocking rates years ago. The result has been healthier cattle, and so less vet's bills, thus reduced expense. Our lower stocking rate means less need to push the soil beyond its capacity, so less fertiliser use, healthier soil and reduced expense.

We are lucky to have the land suitable for growing some barley, leaving us self-sufficient in feed and straw. The cereal crop adds to the diversity of species on the farm. We've reduced to almost no chemicals on the crop, which is a further reduced expense and also has improved soil health. We've also seen an increase in insects, which has wider benefits for nature.



The cereal rotation means that we are reseeded regularly, and for the last ten years we have gone to more mixed seed mixtures with the emphasis on older less demanding grass types and clover. This has resulted in less fertiliser cost and it also benefits nature.

Including species such as plantain and yarrow help to combat the worm load in cattle. We haven't used chemical dose on the stock for a couple of years, with no adverse effects. This both reduces costs and labour. It's also hugely beneficial for soil health and biodiversity.

I have continued the practice of hedge laying, which leaves the hedges much better for biodiversity and means better hedges for livestock shelter. This contributes to the thrive of the animals as they have better weights and so they have increased value at sale. A lot of our fields are also much easier to fence due to the quality of the hedges, which reduces expense. Another added bonus is that we produce our firewood from the hedge maintenance work, so eliminating household fuel bills, which is a big one.

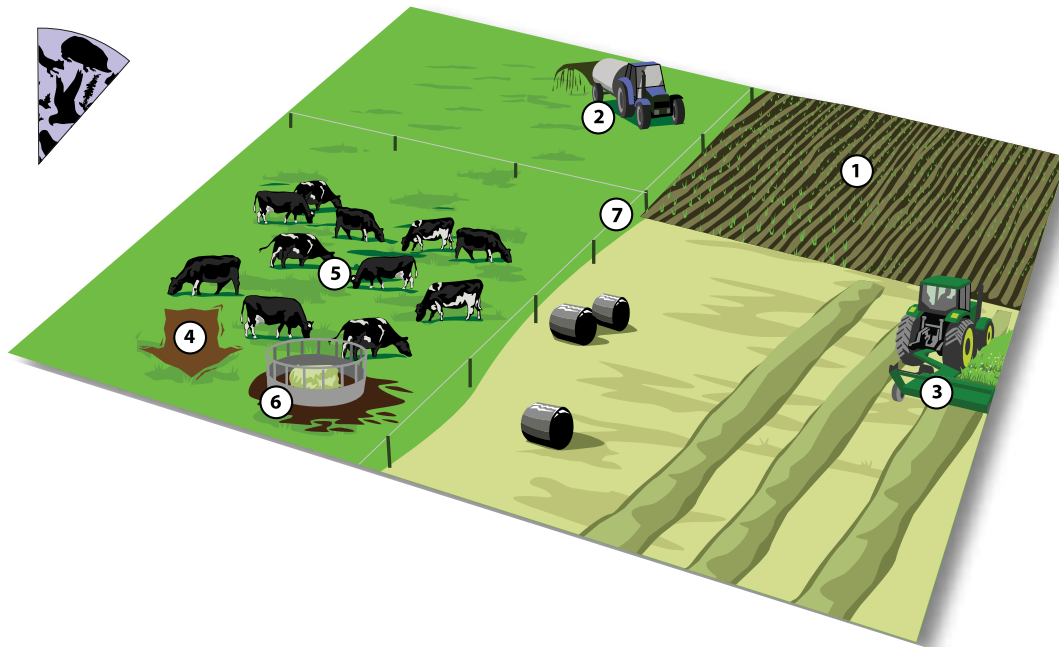
After all that, I suppose what can be said is that making the farm work around nature leads to reduced costs. For years we have been fed a model of farming that associates income only with production at all costs. Our experience is that, despite perceptions, the production side of things is still working well."

James Ham, Beef, Tillage & Forestry Farmer, Co. Westmeath

What do grassland systems that are poor, moderate or good for biodiversity look like?

Poor biodiversity

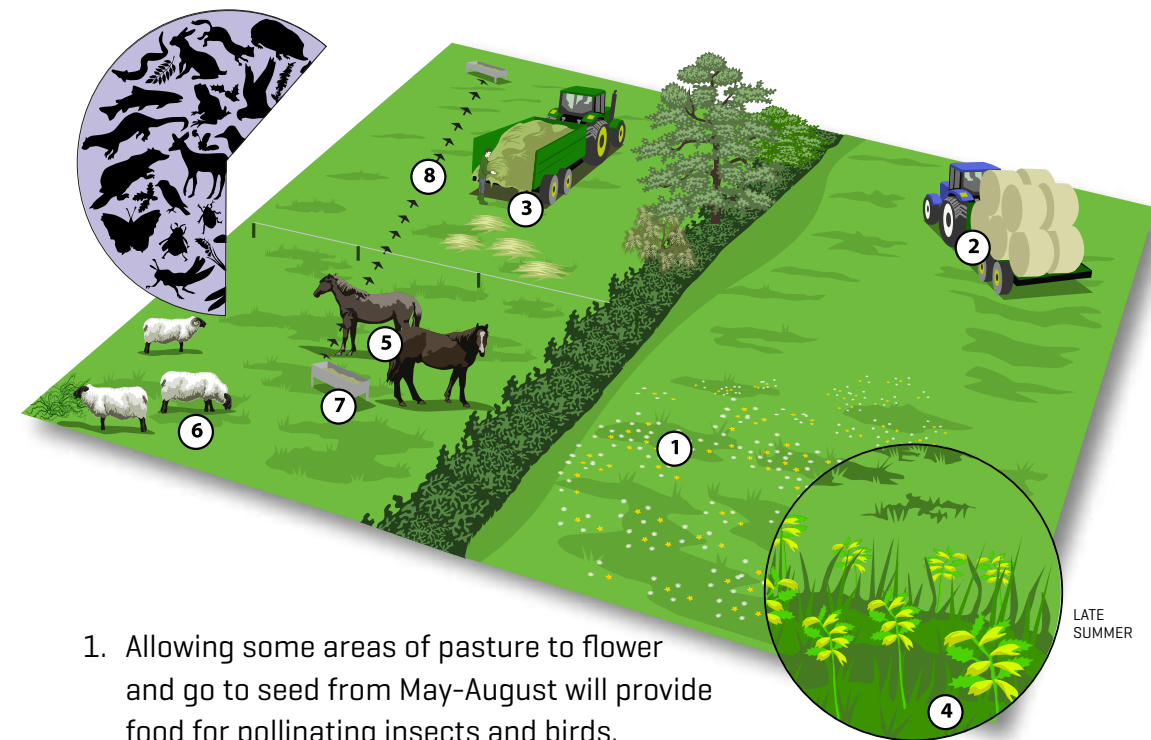
Intensively managed grasslands with little or no space left for nature



1. Reseeding existing species-rich grassland will greatly lower its biodiversity value. Once gone, these meadows are almost impossible to recreate within our lifetimes.
2. Heavy applications of fertiliser or slurry will damage the nutrient boosting microbiology of our soils.
3. Cutting early in the season means that there will be no flowering plants available to pollinating insects from May-July.
4. High stocking densities and intensive management will lead to soil compaction over time.
5. Overgrazing will lead to poaching of soils, damaging their long-term fertility.
6. Supplementary feeding can lead to soil damage when feeders are not regularly moved.
7. Wire fencing provides no value for wildlife and no shade or shelter for livestock.

Moderate biodiversity

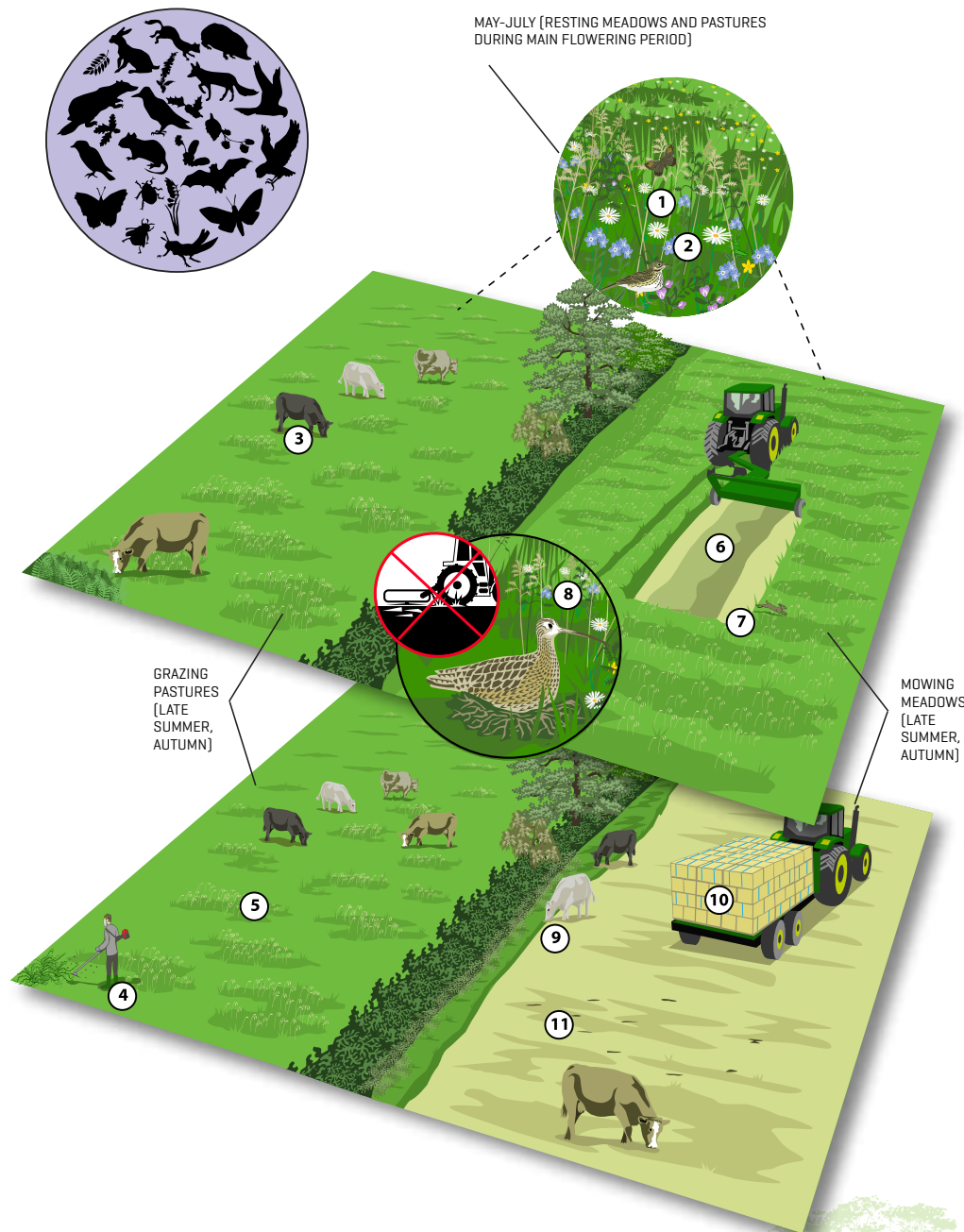
Efforts being made to restore or retain Ireland's species rich grasslands



1. Allowing some areas of pasture to flower and go to seed from May-August will provide food for pollinating insects and birds.
2. Where possible, cutting for hay rather than silage will allow for a later cut, giving time for pollinators to feed, plants to go to seed and ground-nesting birds to raise their broods.
3. Spreading 'green hay', cut from another local meadow, can naturally boost species-richness in species-poor meadows.
4. Mixed grazing with horses and ponies can help to remove rank vegetation from undergrazed pastures.
5. Grazing sheep and goats at the right time can help to control weeds or encroaching bramble.
6. Moving feeders regularly prevents poaching.
7. Reducing or eliminating heavy slurry applications and chemical inputs, including fertilisers, pesticides, molluscicides and herbicides, will lead to more species-rich grassland.
8. Replacing wire fences with species rich native hedgerows, and allowing them to flower and fruit each year, will provide habitat for wildlife and shelter and shade for livestock.

Good biodiversity

Long term management strategies that promote both food production and nature



1. Allowing some areas of pasture to flower and go to seed from May-August will provide food for pollinating insects and birds.
2. Maintaining a wide variety of native plants in your pastures and meadows will provide feeding and breeding habitat for a wide variety of insects and birds.

Grazing pastures

3. Managing grazing carefully will help to avoid over- or under-grazing and poaching.
4. Using topping or mixed grazing can control any unwanted plants or encroaching scrub.
5. Maintaining a grassland structure of 'tufts and lawns' can support a greater variety of species than a uniform sward.
6. Where possible, cutting for hay rather than silage will allow for a later cut, giving time for pollinators to feed, plants to go to seed and ground-nesting birds to raise their broods.
7. Mowing meadows from the inside out will allow wildlife to escape to field boundaries instead of getting trapped in the middle of the field.
9. After cutting, lightly grazing the aftermath can help to boost soil biology, boost soil carbon and provide food for important species such as dung beetles.
10. There may be good demand for hay from species rich meadows.
11. Maintaining tall, wide, flowering and fruiting hedgerows and flowering field margins throughout the farm will provide a refuge for wildlife after meadows are cut.

Learn more about:

- Arable Land
- Bogs & Uplands
- Wetlands, Ponds & Watercourses
- Woodlands
- Field Boundaries
- Gardens & Orchards
- Farmyard & Buildings
- Indicator species
- Native species
- Colonising and invasive species
- Soils