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Farmland:

actions to help pollinators

All-Ireland Pollinator Plan 2015-2020

Implementation coordinated by the National Biodiversity Data Centre

National Biodiversity Data Centre
Documenting Ireland's Wildlife

Origin Green IRELAND
An initiative by Bord Bia Irish Food Board

pollinators.ie

Guidelines 5

pollination
pɒlɪˈneɪʃ(ə)n/
noun
The movement of pollen to allow plant fertilisation
'Bees are our most important insect pollinators'

Pollination, which plays a vital role in the reproductive cycle of flowering crops and wild plants, brings substantial economic benefits to agriculture, tourism and exports, as well as human health and wellbeing.

Why do we need pollinators?

Pollinators are important to farmers who grow pollinator-dependent crops and to those of us who want to grow our own fruits and vegetables. Even if we don't currently grow these crops, we should aim to retain the ability to do so for future generations.

We know that 78% of our wildflowers also benefit from being pollinated by insects – without bees we will lose the colourful and distinct natural beauty of our landscape, which makes it a pleasant place to live, an attractive destination for tourists, and a selling point for our agricultural produce abroad.

All-Ireland Pollinator Plan 2015-2020

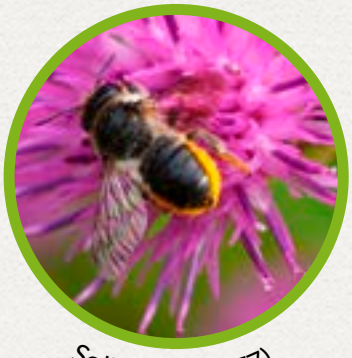
Unfortunately our pollinators are in decline, and the problem is serious. **One third of our 98 bee species are threatened with extinction from the island of Ireland.** If we want them to be here to pollinate crops and wild plants for future generations, we need to manage the landscape in a more pollinator-friendly way and create a network of diverse and flower-rich habitats. The All-Ireland Pollinator Plan 2015-2020 is supported by over 80 governmental and non-governmental organisations who have pledged to deliver 81 actions to achieve this goal and make Ireland, North and South, more pollinator friendly. It is a shared plan of action. Everyone, from farmers to councils, local communities, businesses, schools, gardens and transport authorities have a role to play in the Pollinator Plan.

It is farmers, as keepers of the countryside, on whom we are most reliant to make the Pollinator Plan work.

There are 98 different types of bees in Ireland:

Honeybee (1)

Bumblebees (20)



Solitary bees (77)

Pollinators on farms

Traditional farming was very pollinator friendly because it was naturally flower-rich. There were hay meadows, annual flowers in cereal crops, more wildflowers along lanes and in field corners due to less spraying, more flowers in hedgerows due to less mechanisation and we grew more of our own fruits and vegetables. In the past 50 years, advances in farming have reduced the amount of flowers and it is inevitable that we now have fewer bees. The Pollinator Plan is not about 'returning to days of old' or reversing progress, but about working out new ways to provide enough food for our pollinators in the modern farmed landscape.

Taking actions to support bees on your farm will benefit *farmers* by:

- Reinforcing Ireland's vital green image in premium markets.
- Contributing towards Bord Bía's Sustainability Criteria, a component of their Quality Assurance schemes.
- Maximising production value via increased yields of crops.
- Saving time and money in many cases.
- Providing additional benefits such as improving natural pest control or protecting watercourses by creating pesticides/fertiliser buffer zones.
- Keeping farming options open for your children and their children's children. The value of many pollinator-dependent crops has increased by approximately 20% just in the past decade. Given our changing climate and the volatility in global markets it is hard to predict the most profitable way for future generations to farm. In the future, pollination services may be even more important to how your land is farmed.
- Maintaining a healthy and sustainable farm ecosystem and ensuring your land remains in as good, or better, a natural state as when you got it.

"In ABP Food Group, we understand the influence a healthy ecosystem has on the agri-food sector. The All-Ireland Pollinator Plan offers an accessible, measurable framework that allows us to log our actions for biodiversity and effect change. The integrity of our natural environment is a pillar of our sustainable future, in which we all have a stake."

ABP Food Group

WHO are our pollinators?

Pollination occurs when pollen is moved between flowers, leading to fertilisation and successful seed and fruit production for plants. For crop producers this means reliable yields of high quality produce, and for consumers it means the availability of a range of fruit and vegetables at an affordable price. It also means a diverse and plant-rich natural landscape that is wildlife friendly.

Most insect pollination on the island of Ireland is carried out by bees, and in fact, most is provided by *wild* bees. We have one type (species) of managed honeybee and 97 different wild bees. That includes 20 bumblebees and 77 solitary bee species. Research shows that reliable pollination services depend not only on healthy honeybee populations, but also on an abundance and diversity of wild bees and other insect pollinators.

WHAT do our pollinators need to survive?

Food: Lack of food is a major cause of pollinator declines. Bees feed only on pollen and nectar from flowers. Nectar gives the adults energy for flying and they feed pollen to their young. To have a healthy balanced diet, bees need to be able to feed on a range of different flowers from MARCH right through to OCTOBER. Spring is when bees are most at risk of starvation.

Shelter: Bumblebees nest in long grass (often at the base of hedgerows). Most solitary bees nest by making little tunnels in bare soil, while a small number nest in existing cavities in dry stone walls, masonry or wood.

Safety: Bees need to be protected from insecticides. Equally, they need areas of food and shelter that are free from herbicides and fungicides.

This guideline document, developed with farmers, and in consultation with farming organisations, explains 5 actions you can take to help pollinators. All these actions are evidence-based, *i.e. scientific studies show these actions have a positive impact on pollinators. These actions are about farming* ***with*** *nature. Often they are 'do not' actions rather than 'do', so that nature itself can do the work.*

5 actions for *bee-friendly* farming:

1. Maintain native *flowering* hedgerows
2. Allow wildflowers to grow around the farm
3. Provide nesting places for wild bees
4. Minimise artificial fertiliser use
5. Reduce pesticide inputs

The following pages provide more details on these five actions.

Landscapes that support high quality dairy, beef, lamb and cereals are also capable of supporting pollinators

POLLINATOR ACTION 1

Maintain native *flowering* hedgerows

As landscape features, hedgerows are synonymous with our green image that is so important in selling our produce abroad. Flowering hedgerows are vital to the survival of pollinators, providing food, shelter and transport corridors.

Minimum target for pollinators

- Allow your hedgerows to flower.
- Allow at least one Whitethorn/Hawthorn in each hedgerow to grow into a mature flowering tree.
- Plant some pollinator friendly trees to grow as individual mature specimens around the farm.

Benefits to your farm:

- Maintaining good native hedgerows supports our green image in international markets.
- Hedgerows provide animals with both shelter from freezing winds in winter and shade during the summer months. This can help mitigate against stress related illnesses (Milk Fever, Grass Tetany, Mastitis, Heat Stroke, and Photosensitisation).
- Hedgerows provide a drainage mechanism, helping to soak up excess water on the land. A reduction in surface water in paddocks is known to help reduce a variety of animal diseases and the organisms that cause disease such as Liver Fluke.
- Help to act as a physical barrier to the movement of animals, which can decrease the spread of disease through animal-to-animal contact.
- Using hedgerows to slow winds and reduce excess soil moisture can increase grass growth to further enhance grazing quality and quantity.
- Provide a habitat for other beneficial insects that help with natural pest control.
- Hedgerows provide privacy and can abate smell/noise pollution.

"For most farmers, working with nature is their favourite part of the job. We view the land and plants as part of the family, we are all attached. We need proper information. If we don't know what harm we are doing, we won't see the need to change."

H. Harris, Tillage Farmer

Blackthorn

Benefits to pollinators:

On farmland, hedgerows are vital to the survival of pollinators. Good hedgerows can provide food (flowers) from spring right through to autumn, shelter for nesting and overwintering, and act as corridors that help pollinators move through the landscape. This action is about protecting what native hedgerows you already have on your farm, but making sure they are allowed to flower.

"With 7 million cattle to feed daily on this island, providing space for wildflowers or bees or wildlife will always be a challenge, but what a great legacy to leave our children if we can pull it off!"

Agricultural Advisor

Whitethorn/Hawthorn is also called the May bush. It is easy to see from a distance which hedgerows are pollinator friendly as they will be white in May.

AIPP Gold Standard

Have 150m/ha flowering hedgerow on your farm

Hedgerows provide shelter for livestock.

Often overlooked for its wildlife value, Bramble is a very important food source for bees.

What does a pollinator-friendly hedgerow look like?

- Contains a mix of native pollinator-friendly trees/shrubs that provide food.
- Managed so that as much as possible is allowed to flower each year.
- A 1.5-2m border at the base is protected from fertiliser and pesticides. This allows wildflowers to grow and provide food. This long grass will also provide nesting habitat for bumblebees.
- It may have small areas of south or east-facing exposed bare earth at the base to provide areas for mining solitary bees to nest.

The ideal native hedge is made up of 75% Whitethorn and 25% of at least 4 other species.

Intensively managed hedgerows don't offer flowers for bees or shelter for livestock.

In springtime each bumblebee queen needs to visit 6,000 flowers a day to get enough energy to raise her first batch of young. Hedgerows that are allowed to flower are the most important sources of food for these bees in spring. If the colony doesn't get off to a good start there will be fewer bees around when we need them to pollinate our crops, fruits and vegetables later in the summer.

Native flowering hedgerow plants that are good for pollinators:

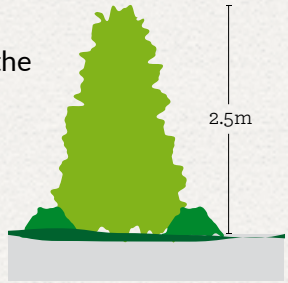
Hedgerow Management advice:

Cutting to encourage flowering

- Leave at least one mature Whitethorn/ Blackthorn tree within each hedgerow.
- Where possible, cut hedgerows on a minimum 3-year cycle. Cutting annually stops the hedgerow flowering and fruiting.
- Where possible, cut in rotation rather than all at once as this will ensure some areas of hedgerow on your farm will always flower (Blackthorn is white in March. Whitethorn flowers at silage time in May).
- Hedges managed for pollinators should ideally be cut between Nov-Jan. If they must be cut outside this, cut in rotation, so some areas remain undisturbed.
- Let some Bramble and Ivy grow in hedgerows. They are key nectar and pollen sources in summer and autumn.
- Where hedgerows must be cut along the roadside for safety, allow the inside to flower.
- Aim for a hedgerow that is as high as possible, but at least 2.5m above ground level or above the bank.
- Let some of your hedgerows grow wild, side-trimming only.

Hedgerow base

- Avoid spraying the hedgerow base, use mechanical weed control and spot spray only in exceptional cases
- Leave an unfertilised buffer margin at the hedgerow base



A pollinator-friendly hedgerow should be flowering, at least 2.5m in height, and should be trimmed in an A-shape.

Willow is a very important food source in early spring when queens emerge from hibernation. Having Grey/Goat Willow, Whitethorn, Whitebeam, Crab apple or Wild Cherry as individual mature trees around the farm will provide important food for pollinators.

POLLINATOR ACTION 2

Allow wildflowers to grow around the farm

By avoiding over-management of non-productive areas, you can increase wildflowers in non-farmed areas and ensure that you have food sources for pollinators throughout the year.

'Non-farmed' areas include farmyards, farm laneways, field margins, arable margins, watercourse margins and field corners.

Minimum target for pollinators

- Ensure there are always some wildflowers flowering in non-farmed areas from spring right through to autumn.

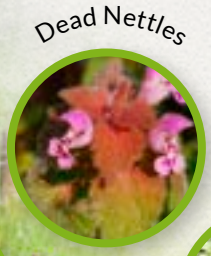
Benefits to your farm:

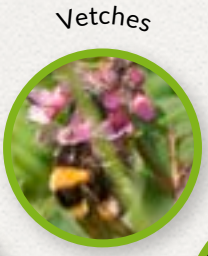
- Wildflowers help create a colourful and distinct rural landscape that creates a pleasant place to live and work and is a selling point for agricultural produce abroad.
- Increases the biodiversity value of your farm in areas where there will be no loss to production.

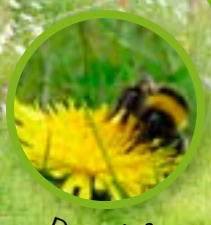
Benefits to pollinators:

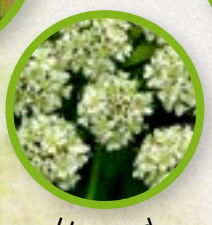
- Having flowers available across the seasons on the farm will help pollinators survive throughout their entire annual lifecycle. Wild bees don't make honey, so they are never more than a few days away from starvation – they need an uninterrupted source of wildflowers for food. Additional flowers are particularly important in summer after hedgerows have finished flowering.

Important wildflowers from spring to autumn


Dead Nettles


Vetches


Dandelion


Hogweed


Ox-eye

Spring

A flower-rich field margin

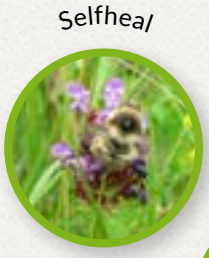
This action will also benefit all other wildlife on the farm

Fertilised and reseeded vs. natural regeneration on a farm in Co. Galway.

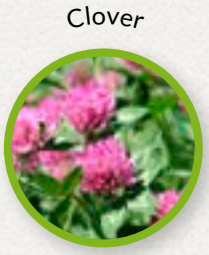
Managing non-farmed areas to be pollinator friendly:

- Allow wildflowers to flower. Cut these areas once a year in autumn, after flowering, and remove toppings (to avoid soil enrichment – wildflowers thrive in lower fertility soils). Do not spray or fertilise. If managed in this way, they will gradually become more flower-rich over time. In areas where one annual cut is not possible, reduce your cutting to at least allow Dandelions bloom in spring and Clovers in summer.
- Avoid 'over-neatness'. Remember bees and other wildlife see and need a very different landscape to humans.
- If you have to control noxious weeds in these areas, pull or use spot treatment.

Large carder bee on Knapweed.



Selfheal

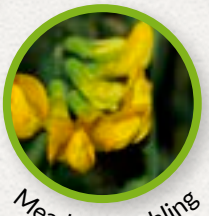


Clover

Woundwort

Knapweed

Bird's-foot-trefoil



Meadow Vetchling

Devil's-Bit Scabious

Protect flower-rich areas

All other naturally flower-rich areas on your farm —like old pastures that have not been reseeded in living memory, wet grasslands, edges of ponds, woodland edges or areas of bogland— should be protected and maintained as they are vital for pollinators and other wildlife. A future guideline document will cover supporting pollinators on lower intensity and high nature value farms.

Hay meadows

Managing some hay meadows (however small) can be an important action both historically and culturally, but also for conserving our pollinators, wildflowers and other wildlife. If the weather should be unfavourable for hay making then haylage is fine. The important thing is to have a later cutting date than for silage as this lets the wildflowers bloom.

Heath bumblebee collecting pollen. Dandelion is one of the most important food sources for our pollinators in spring.

If not over-managed, farm laneways and other non-farmed spaces can offer pollen-rich wildflowers throughout the year for bees.

Research has shown that when you double your wildflowers, you can increase the abundance of bees up to 16-fold!

Bumblebee and hoverfly on thistle.
This hoverfly (right) is a bumblebee mimic

Thistles need to be managed but are very good sources of food for bees when they flower and for birds when they go to seed. Keep areas with Bramble or Ivy – these are extremely important food sources in late summer and autumn.

The farm garden

The farm garden can be important for pollinators. Growing some of your own fruit and vegetables can save money and is a way of helping children connect with nature. Grow pollinator-friendly fruits and vegetables like currants, blackberries, raspberries, strawberries, tomatoes, courgettes, field/runner beans, pumpkins. Consider having a small farm orchard with apples and damson plums – select a mix of early, mid and late flowering varieties.

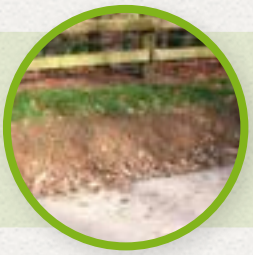
Plant a range of ornamental plants or shrubs that will flower from spring through to autumn to provide additional food for bees. Keep your garden pesticide and fertiliser free so that it is a safe spot for pollinators.

The All-Ireland Pollinator Plan has a set of guidelines for making gardens pollinator friendly. It includes lists of ornamental shrubs, plants and bulbs that provide food for bees. See www.pollinators.ie

POLLINATOR ACTION 3

Provide nesting places for wild bees

Creating good nesting habitats is simple and inexpensive. It is also completely safe; wild bees do not live in large colonies that need to be defended as honeybees do. Wild bees have no interest in humans, are not aggressive and pose no threat.



Minimum target for pollinators

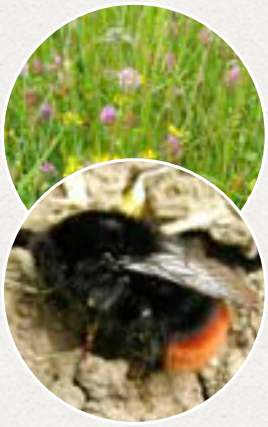
Create/maintain some nesting habitat for bumblebees, mining solitary bees and cavity-nesting solitary bees on the farm. It is important to keep all nesting habitat free from pesticides.

Benefits to your farm:

- Ensuring that wild bees can survive on your farm protects your ability to grow certain crops and many fruits and vegetables.
- It will also create habitats for other insects, many of which are beneficial for pest control.
- It is very low cost and could be a way of including children in activities on the farm.

Benefits to pollinators:

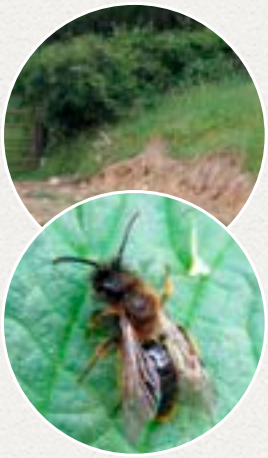
- Provides safe areas for wild pollinators to hibernate, nest and breed.
- No matter how many flowers grow on your farm, without suitable nest sites, bees can't survive there. When creating nesting habitat think carefully about where to put it and ensure that there are flowers nearby.



How to provide nests for Bumblebees

Our 20 species of Bumblebee nest in long or tussocky grass.

- Leave long grass along the base of hedgerows, along lanes or in field margins and corners uncut from March until October.
- Bumblebee colonies die off in October/November (while mated queens go into hibernation) so it is okay to cut or manage these areas in late autumn/winter.



How to provide nests for Mining Solitary bees

Our 62 species of mining solitary bees nest by making tiny burrows in bare earth (soil, sand, clay and peat). They will nest in flat well-drained areas, but generally prefer south/east-facing sheltered banks.

- Where there is south or east-facing exposed bare earth at the base of hedgerows allow these areas to remain.
- In winter, create new earth banks elsewhere by scraping away top layer of soil – they just need to be stable and free draining. Avoid creating these areas anywhere that is vulnerable to soil erosion e.g., on steep slopes near watercourses.
- If you have old gravel pits, avoid levelling these out as they provide excellent nest sites for mining bees.

How to provide nests for Cavity-nesting Solitary bees

Our 15 species of cavity-nesting solitary bees make their nests in existing cavities in south-facing stone walls, masonry, wooden structures or commercially available bee nest boxes.

- Drill small south or east-facing holes in wooden fences or concrete structures.
- Alternatively, create your own bee box by drilling holes in untreated wooden blocks and attaching them to an outdoor structure. Installing a number of small boxes is better than one large one because it minimises the risk of disease and predation.
- Holes should be 10cm in depth and 4-8mm in diameter at a height of at least 1.5-2m. It is important to have holes of different sizes for different bees.

Beekeeping

If interested, you could invite a local beekeeper to keep some hives on your farm. You'll be helping produce honey while the bees pollinate your plants. To find out more contact the Federation of Irish Beekeepers' Associations www.irishbeekeeping.ie; the Ulster Beekeepers Association *www.ubka.org* or the Institute of Northern Ireland Beekeepers *http://www.inibeekeepers.com*.

For additional information see our '*How-to-guide: Creating wild pollinator nesting habitat' www.pollinators.ie*

POLLINATOR ACTION 4

Minimise artificial fertiliser use

Pastures that included Clover and other legume rotations were more common before the arrival of chemical fertilisers, and are becoming relevant again as a way of reducing costs.

Minimum target for pollinators

- Only use fertilisers where required and do not spread unnecessarily in awkward corners, turning circles, buffer strips, etc.
- Ensure accuracy in fertiliser spreading and avoid spreading close to the base of hedges or hedgerow margins – fertiliser here prevents the growth of pollinator-friendly wildflowers.
- Use clovers, peas/beans or other herbal leys in some areas of the farm instead of chemical fertilisers.

Benefits to your farm:

- Legumes like Clover will naturally fix Nitrogen, reducing demand and cost of artificial N from fertiliser
- Planting a species-rich sward with a diverse range of productive grasses, herbs and legumes (sometimes called *herbal leys*) can provide benefits to soil structure, drought resistance, nitrogen fixation, season-round yield, and more balanced mineral and protein content.
- Reduction in chemical fertilisers will prevent waste and reduce costs.

Benefits to pollinators:

- When they flower, Clovers and other legumes (such as peas and beans) are excellent food sources for pollinators.

Most wildflowers thrive on lower fertility soils. Keep fertilisers away from non-farmed areas to encourage wildflowers. Be sure not to replace existing areas that are already good for wildlife. Always try to preserve any areas on the farm that are already naturally flower-rich.

"The multi-species leys on the farm have proven beneficial to a multitude of bees. They have enhanced the quality of the fodder for the animals and helped improve the health and fertility of the herd, ultimately making our farm a more pleasant and sustainable place to work and live."

K. & M. McCall, Suckler Farmers

This action will also benefit all other wildlife on the farm

Recent Irish research shows that multi-species swards, with lower levels of N fertiliser used, have higher dry matter yields and significantly less emissions of the potent greenhouse gas Nitrous Oxide (NO) per tonne of herbage than perennial ryegrass swards.

Using clovers

- A mix of ryegrass and 3 white clovers (small, medium and large varieties) allows clover to compete and provide naturally fixed N in a wide variety of sward heights.
- For pollinators, including some wild clover is preferable as it tends to be longer lived and flower for a longer period than agricultural cultivars.
- In annual mixes, annual Crimson Clover is recommended for bees as perennial clovers won't provide much pollen and nectar in the first year.
- Clover and other legumes only present a risk of pasture bloat in areas with more than 50% clover.
- Allowing clover to flower, even for a short period, is extremely beneficial to bees.

Recent Irish research shows that lambs reared on more diverse, lower input swards grew significantly faster, had lower intestinal worm burden, were slaughtered earlier and had a higher kill-out percentage than those reared on higher nitrogen input perennial ryegrass.

On tillage farms, legumes like peas and beans can be used to fix Nitrogen, as well as providing important food sources for pollinators during flowering.

Herbal Leys

Other options include the use of species-rich swards (herbal leys), with a diverse range of productive grasses, herbs and legumes. These can produce well-balanced forage across the season as opposed to a spike of productivity which is typical of single grass species systems. Many of the species used in herbal leys are deep-rooting and can unlock resources from the subsoil that are not accessible by the shallow-rooted grass-only systems currently favoured. Well balanced species-rich mixtures do not require high fertiliser inputs and should provide increased levels of minerals and vitamins to livestock. Also, if herbal leys are grown for approx. 5 years they will substantially improve and restore the soil's natural fertility and improve soil drainage structure due to deep root action. Leys with plants high in tannins, such as Sainfoin, Bird's-foot-trefoil or Chicory are also effective at reducing worm loads in livestock. These plants are excellent sources of food for pollinators.

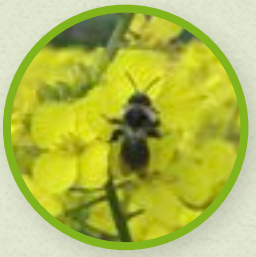
POLLINATOR ACTION 5

Reduce pesticide inputs

__Insecticides__ can harm pollinators directly, killing them outright or affecting their behaviour and ability to complete their life cycle. Fungicides and herbicides harm pollinators indirectly: __herbicides__ can greatly reduce the wildflowers that pollinators depend on for food, while __fungicides__ can increase the toxicity of some insecticides.

Herbicides: minimum target for pollinators

- Avoid spraying close to the base of hedgerows. If necessary, these areas should be strimmed/mowed instead.
- Avoid spraying non-farmed areas where wildflowers are or could grow.
- Where weed control is necessary, pull or use selective spot treatment where possible.
- Avoid spraying pollinator nesting sites such as soil banks or stone walls



Insecticides: minimum target for pollinators

- Reduce the number and frequency of pesticide applications in accordance with an appropriate integrated pest management strategy.
- Spray pesticides only in calm weather and use low-drift nozzles to avoid pesticide drift onto wildlife areas and to reduce costs. Do not spray when bees and other insects are most active during the middle of the day.
- Inform your local beekeeping association in advance of crop spraying so that beekeepers can take action to protect any hives in the vicinity, e.g. see BeeConnected www.beeconnected.org.uk

Pesticides play a role on most modern farms but should always be used sustainably under the relevant policies across the island of Ireland. Even if you do use pesticides, there may be small actions that could be taken to reduce their use and help pollinators.

Benefits to your farm:

- Reducing pesticide use can save time and money.
- Reducing chemical inputs can improve the 'green' credentials of your produce.
- Reducing use as part of an integrated pest management strategy can help prevent pesticide resistance building up in the pest population.
- Reducing pesticide use can ultimately increase natural enemy abundance and thus natural pest control.
- Reducing herbicide use in grassland can increase abundance of naturally beneficial herbage, giving livestock a more balanced diet.

Benefits to pollinators:

Reducing pesticide use will ensure there are more wildflowers for pollinators to feed on, and will increase overall bee health.

Seed treatments:

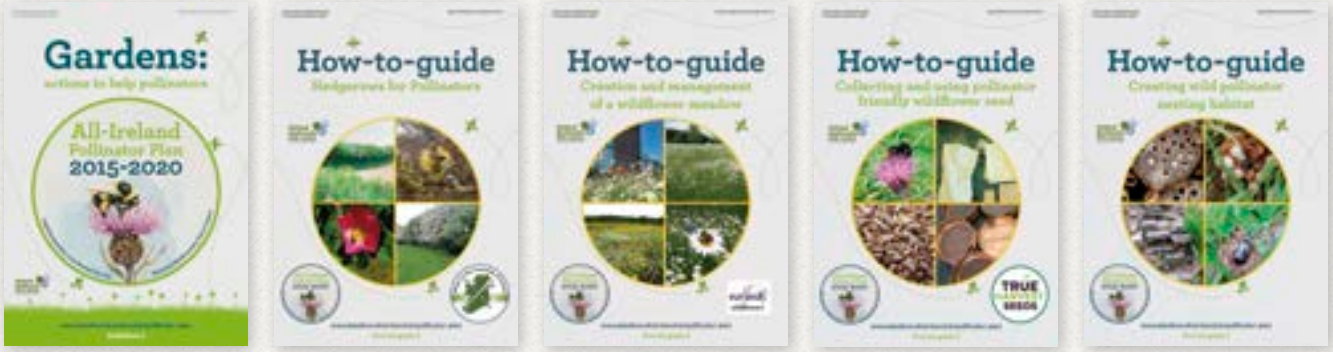
Many seeds come pre-treated with systemic insecticides and fungicides to protect both the young seedlings and later the adult plants. Although research is still being carried out, many studies have shown that seed treatments can persist in the soil, leach into waterways and harm pollinators and other wildlife. Ask your supplier if your seed is treated, and with what, so that you are not inadvertently using insecticides that are not required.

Organic farmers cannot use any synthetic pesticides or fertilisers and will reach the AIPP gold standard on actions 4 and 5. For more information please see www.iofga.org, the website of the Irish Organic Farmers and Growers Association.

The Large carder bee is vulnerable across Europe making Ireland's populations even more important to protect.

More flowers + less chemicals = more bees!

This booklet is one of a series of Farming Guidelines produced under the All Ireland Pollinator Plan, which will also include one for Horticulture and one for Lower Intensity or High Nature Value farms. For more information and other useful resources, such as our 'How-to-guides', please see **www.pollinators.ie**



You can also record all the actions you have taken on your farm for pollinators on our Actions for Pollinators mapping system. See http://pollinators.biodiversityireland.ie/

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National Biodiversity Data Centre
Documenting Ireland's Wildlife

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About the National Biodiversity Data Centre

The National Biodiversity Data Centre is a national organisation that collects and manages data to document Ireland's wildlife resource, and to track how it is changing. Find out what biodiversity has already been recorded in your local area: **maps.biodiversityireland.ie**

Help us to build up the knowledge of biodiversity in your local area by submitting sightings to **records.biodiversityireland.ie**

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