



# EIPWALES

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## European Innovation Partnership (EIP) Wales

### A guide to Pollinator friendly grassland farming



Working in partnership with



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# Why do we need to conserve pollinators?

Declines in pollinator numbers are well-documented and urgent action is required to try to halt and reverse those declines. Pollinating insects are important for the contribution they make to food production as well as pollinating non-food commercial crops and of course, wild flowers. When pollinating insects are mentioned the emphasis tends to be on bees but there are also many other insects including wasps, flies, beetles, butterflies and moths that are equally as important.

In the UK there are approximately 270 species of native bees which includes 1 honey bee, 245 solitary bee species and 24 bumblebee species.



Honey bee

Bumblebees are familiar farm and garden visitors but their numbers have declined significantly in both abundance and distribution. These declines are due to many factors including agricultural intensification and increasing urbanisation. Since the 1940s, 98% of flower-rich grasslands have been lost in the UK.

The value of pollinators to UK farming has been estimated at £500 million but because this service takes place with little intervention from the farmer it is largely overlooked. A variety of pollinators is required to pollinate different plants. For example, different species of bumblebee have different tongue lengths and are suited to foraging on, and therefore pollinating, different plant species. Honey bees are excellent at pollinating apple trees or white clover but their short tongue length means they are no good for crops like field beans or red clover, these are best left to the long-tongued bumblebees.

Much of the research on enhancing pollinator numbers has been focussed on arable production but there is a role for livestock farmers to play as well, particularly in Wales where grassland is the dominant landscape.



Trackside containing wildflowers

A group of organic farmers from the Calon Wen Co-operative accessed funding from the European Innovation Partnership (EIP) Wales. This farmer-led project, called Pasture for Pollinators, looked at improving forage availability for bumblebees on their farms without compromising their farming enterprises.

# What do bumblebees need?



Male early bumblebee on bramble, Anna Hobbs

Bumblebees need a continuous supply of flowers to forage on to provide them with high energy nectar and protein-filled pollen.

In February and March queen bumblebees will be emerging from their winter hibernation and will immediately need a food source to enable them to establish their nests. Throughout the spring and summer they will need plenty of flowers to gather food for the young and finally through to the late autumn when the new queen bees stock up on food ready for hibernation.

Secondly, bumblebees require suitable habitats for nesting and hibernation. This may be hedgerows or areas of tussocky grass.

Other pollinators have other requirements, for example, many hoverflies, which are also important pollinators, need water to complete their life cycle.

The adults of butterflies and moths require flowers for their food but the larvae need specific foodplants. Many pollinators use basking sites e.g. bare earth to warm themselves in order to be active before they can fly off to gather food.

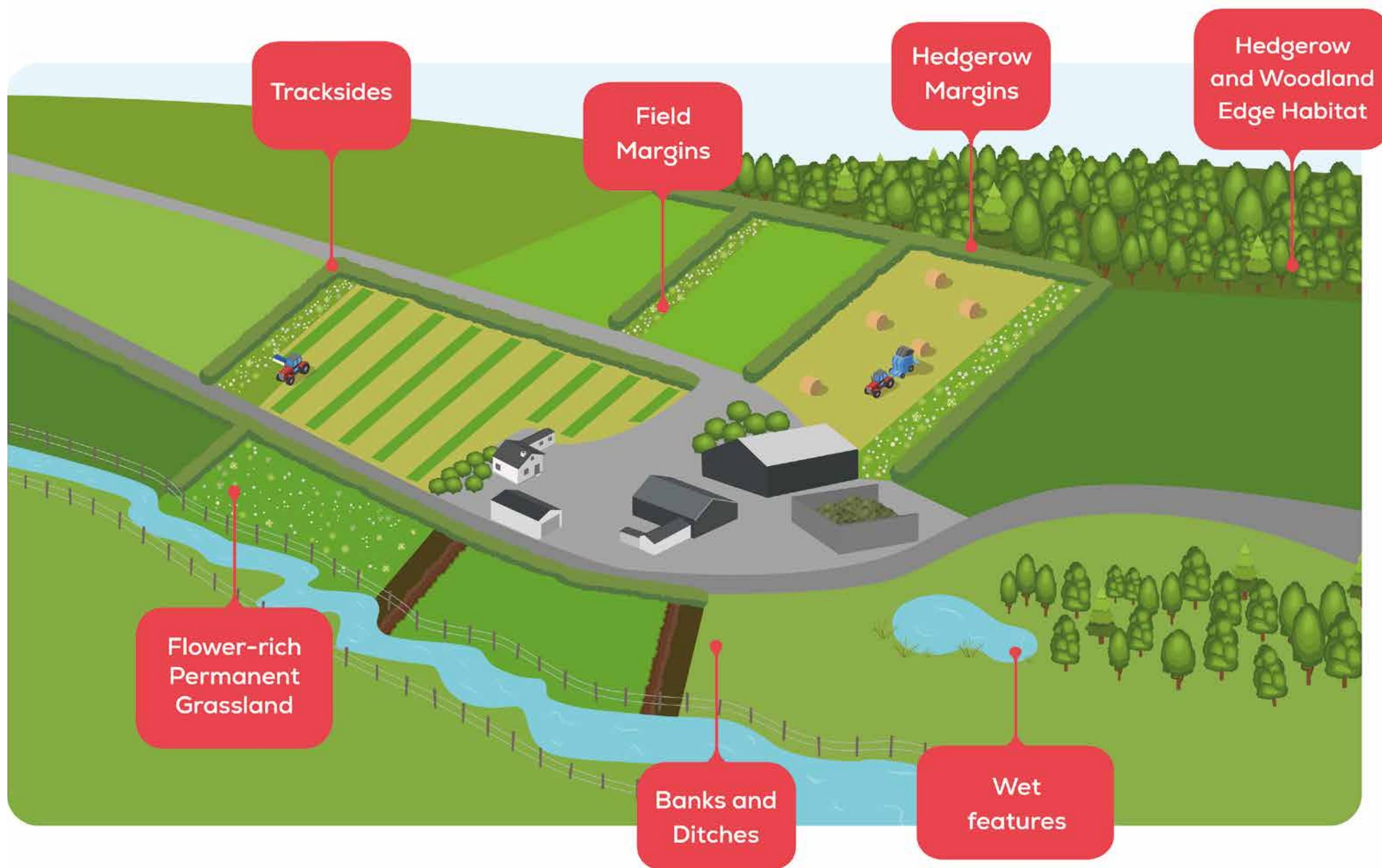
This booklet brings together some of the actions that can be taken by livestock farmers to increase pollinator numbers on their farms. The more actions that can be implemented the better but it is important to remember that even small scale changes will contribute to helping pollinators.



Burnet moth on bird's-foot trefoil, Anna Hobbs



## Where can I help pollinators on my farm?



# Where can I help pollinators on my farm?

## Field Margins

- Plant diverse legume-rich leys in silage fields, alongside standard leys containing ryegrass with red and white clover.
- Leave an uncut or ungrazed field margin when a field is cut for silage, or when it is grazed, in order that some of the pollinator forage is retained instead of going from 'feast to famine'. These margins should be a minimum of 2m wide.
- By the time the field margins mature, the plants in the rest of the field have started to flower, and the pollinators can move back out into the field.
- Cut or graze the margin during the next silage cut or grazing session and leave another uncut or ungrazed margin on the opposite side of the field.

## Hedgerow Margins

- Allow wildflowers to persist within hedgerow margins in silage fields by leaving an uncultivated margin around the field edge.
- These margins should be a minimum of 2m wide.
- Only cut hedgerow margins after the wildflowers within them have flowered and set seed. As well as providing forage for the pollinators the flowers are able to complete their lifecycle and provide forage for pollinators in subsequent years.
- Allow areas of tussocky grass to develop in both south/south-east facing and north facing hedgerow margins for nesting and hibernation habitat, respectively.
- For nesting and hibernation areas, leave uncut for 2-3 years to become tussocky.

## Flower-rich Permanent Grassland

- Manage unimproved or semi-improved grassland for pollinators, e.g. graze down grasses prior to wildflower flowering season, during which grazing pressure to be reduced or removed to allow flowering plants to proliferate.
- Introduce flower seed such as clover into less diverse grassland.
- Restoration of improved grassland may be considered in some fields by allowing soil fertility to fall, as wildflowers generally require nutrient-poor soils. Manage the grass to reduce its vigour, especially with coarse grasses.
- Cut later in the summer to allow wildflowers to set seed.
- No fertilizers or herbicides should be used near wildflowers areas.
- Allow some poaching by livestock to create bare earth patches into which wildflowers may seed.

## Banks and Ditches

- Patches of bare earth on the hedge banks provide pollinator basking and nest sites.
- Allow tussocky grass to develop on both south/ south-east facing and north facing banks to provide nesting and hibernation sites for bumblebees.
- Manage ditches on rotation so that there will always be ditches at different stages across the farm and habitat will not be lost all at once.
- Aim to increase the period between ditch clearing without affecting the ditch function.
- Allow a buffer strip either side of the ditch to protect it.
- Cut the bank vegetation on a 2 - 5 year rotation and ideally only cut half of the vegetation of a ditch in any one year.

## Hedgerow and Woodland Edge Habitat

- Manage hedgerows on a 2 - 3 year rotation to allow them to mature and produce flowers.
- Aim to cut around a third of the hedgerows every year.
- Fill gaps with local provenance species that will provide forage for pollinators, such as grey or goat willow, crab apple, thorn and rose species.
- Ensure mature standard trees within the hedgerows are managed to allow them to provide pollinator forage. If species like grey and goat willow are allowed to flower they can provide vital food for queen bumblebees when they emerge from hibernation in spring.
- Enhance woodland edges by allowing scrub species, such as bramble, ivy and rose to grow, as well as longer vegetation, including grasses and herbs like white deadnettle and black horehound.

## Wet features e.g. ponds and their margins

- Ensure the water is clear and has low levels of nutrients.
- The most productive ponds are those with a wide shallow margin or 'drawdown' zone.
- A generous buffer zone around the pond ensures field applications do not reach the pond.

## Tracksides

- Encourage wildflowers present to flower and increase in abundance by cutting/ grazing after the flowering season.
- If tracksides have a poor wildflower assemblage, introduce seed e.g. red clover.





As part of the EIP Wales project, six farmers from the Calon Wen organic dairy co-operative undertook a series of interventions with the aim of increasing pollinator numbers on their farms. The following case studies highlight some of what they achieved.



### Case Study 1: Argoed Farm, Mold

At Argoed Farm, leaving uncut and ungrazed field margins was successfully achieved in both cutting and grazing regimes. These field margins in a diverse herbal ley were left uncut throughout the flowering season to provide an increased amount of forage for pollinators.

The majority of the fields on the holding contain older, modern leys of white clover and ryegrass. The white clover in the leys provides forage for bumblebee species with short tongues. The farmer has also been trialling 'scratching' in herbal ley seed into older leys. This method of introducing a wider variety of plants into more improved fields appears to be working and a wide variety of short and long-tongued bumblebees as well as a range of other pollinators was observed.

Delaying cuts to some of the field hedgerows meant that hedgerow plants were allowed to flower, providing important spring forage for pollinators as well as pollen and nectar sources later in the season.

Two parcels of permanent grassland are managed sympathetically. The hay meadow is managed in a way that maximizes biodiversity. Another field is being managed to reduce soil fertility, which is having a positive impact on wildflower abundance.

Another important feature at Argoed Farm, that exists on many farms, is the orchard and kitchen garden. Orchards, and other wooded areas, provide important spring blossom before many of the field wild flowers have started to grow.



### Case Study 2: Cop House Farm, Saltney Ferry, North Wales

Cop House Farm focused on creating wildflower banks on field margins using spoil from ditch management. Plants were allowed to colonise naturally from the seed bank within the soil and an abundance of wildflowers provided a valuable food source for many pollinators throughout the summer.

Strips of uncut or ungrazed field margins were also left at Cop House Farm throughout the season. The mix of species in these herbal leys provided a continuous supply of forage to the pollinating insects while grazed or cut fields recovered.

The field hedgerows are managed in a rotation allowing some areas to become mature enough to flower which provides spring forage for pollinators when there may be little else to forage on.

These images show how wildflowers are encouraged along field boundaries and tracksides across the farm providing forage for insects as well as suitable nesting and hibernation sites. Arable wildflowers e.g. cornflower, corn marigold, corn spurrey, charlock, wild pansy, common fumitory, oxeye daisy, red deadnettle, redshank and poppy are common across the farm in the cereal crops and provide forage for pollinators as well as providing habitat for predatory insects which can help control aphids and other crop 'pests'.



### Case Study 3: Bwlchwernen Fawr, Lampeter

At Bwlchwernen Fawr the emphasis was on how the farm as a whole could provide better habitat for pollinators. This included looking at the management of the significant network of banks and ditches as well as preserving some unimproved fields that provide good habitat for bees.

An aim of the project was to trial leaving uncut margins in grazing and silage fields but this proved problematic at this site. Messages were not always successfully relayed to contractors cutting the fields resulting in accidental mowing of trial areas and there were also issues of cows breaking through fences and accessing these areas. These were important lessons in the practicalities of implementing some of the interventions that are advocated to increase pollinator numbers.

The generous banks and ditches present on the farm provide a wide diversity of forage plants including; ragged robin, marsh thistle, greater bird's-foot trefoil, tormentil, foxglove, wild angelica, bilberry and gorse. Additionally, the banks provide nesting and hibernation habitat for bumblebees and other pollinators. Bare earth on some of the south/ south-east facing banks provide solitary bees with nesting sites and areas for pollinators to bask in order to become active. It is hoped that these banks and ditches can be managed on rotation into the future in order to retain this valuable habitat on the farm every year.

With less improved fields, notably unimproved marshy grassland, management suggestions considered ways to retain this valuable habitat and allow flowering over the summer period, in order to provide for pollinators and enable wildflowers to multiply.



### Case Study 4: Cornish Farm, Wrexham

Cornish Farm has a wide variety of pollinator habitats and a good reserve of wildflower species across the farm.

The hedgerow margins are particularly important because of the wildflowers contained in them such as common vetch, cow parsley, meadowsweet, creeping buttercup, field speedwell, cowslips, tufted vetch, common bird's-foot trefoil, hedge woundwort, black knapweed, cross-wort, meadow vetchling and yarrow. To help these areas persist it was suggested to leave an uncultivated two metre wide margin and prevent any grazing or cutting until after the flowers have set seed. The hedgerows themselves are species rich and this provides early sources of nectar and pollen for pollinating insects. Managing these on a two or three year rotation will ensure that there are always mature areas available to produce plenty of flowers.

Wildflowers are abundant on the tracksides at Cornish Farm. These tracksides can be managed by cutting after flowers have set seed and where practical allowing plants such as thistles, brambles and burdocks to grow as these are extremely valuable food sources for pollinators.

Cornish Farm also has a network of ponds, which provide for a huge diversity of pollinators and other wildlife. Wildflowers in the pond margins include common bird's-foot trefoil, yellow flag iris, black knapweed, common vetch, and tufted vetch. Ponds need to be managed to maintain open water and wildflower areas around the pond must be monitored to prevent the coarse grass and scrub taking over.





## Bee friendly silage harvesting

**Silage harvesting:**  
Leaving a 2-4 metre strip of forage uncut along the sides of fields provides flowers for bumblebees and other pollinators to forage in.

**With each cut:**  
Harvest the previously uncut margin but leave another uncut strip on the other side of the field.

Leaving uncut areas that contain mature flowers provides valuable nectar and pollen for a wide range of insects including bees. Beneficial insects will predate pests such as aphids, pollinate crops such as clover or the apples in the orchard and provide a food source for birds and small mammals.

## The benefits of herbal leys

The use of herbal leys across the farms in this project was essential for several reasons. The aim of the project was to increase pollinator numbers and that was achieved if flowers were available to them. The herbal leys helped with this in the grazing and silage fields and leaving uncut or ungrazed margins was extremely important for providing a continuous supply of flowers for the bees and other insects.

Peacock butterfly on creeping thistle, Anna Hobbs



## What did the EIP Wales project find?

The farmers involved in the Pasture for Pollinators project derived immense pleasure from seeing bumblebee numbers on their farms increase.

**This demonstrates how farming is not just about litres of milk or kilogrammes of meat but is also about the benefits to wildlife that can be gained through sensitive farming methods.**

As with all farms, there are many potential suitable habitats but of particular interest in this project was whether the use of uncut or ungrazed margins in silage or grazing fields could provide a continuous supply of flowers to the insects. Under normal grazing or cutting regimes any flowers in the fields are mown or grazed off all at the same time and so for the insects the availability of flowers goes from 'feast to famine' very quickly.

Also of interest was whether leaving uncut or ungrazed margins is practical for the farmer. In most cases it was achieved successfully but problems were encountered where contractors were responsible for mowing fields and messages to leave areas were not understood.

**Aside from their value to pollinating insects, herbal leys are also of benefit within a livestock system.**

The legumes within the ley will fix nitrogen and help build soil fertility, something that is highly valued in an organic system. They are also highly nutritious to livestock increasing the protein content of the forage. Many of the plants within a herbal ley are deep rooted, making them more resilient to dry periods of weather and they are also reported to facilitate the transfer of minerals from deep within the soil, making them more available to the livestock.



Cattle on one of the project farms

## Benefits of multi species leys

Tannins in herbs can help to control parasitic worms naturally which will reduce the farmer's dependency on anthelmintic medicines.

Deep rooting plants draw up more nutrients providing important vitamins and minerals to the animals.



Deep rooting herbs can help reduce soil compaction, increase oxygen levels in the soil and improve drainage

Legume plants fix valuable nitrogen into the soil which can reduce the need for fertilisers



Common blue butterfly on ribwort plantain, Anna Hobbs

# Summary of the EIP Wales project findings

- The bees did not appear to favour any particular flowers in the leys demonstrating that a mix of flowers is important.
- There were more flowers in the margins that were left uncut or ungrazed and this not only increased numbers of pollinators but also increased the diversity of species.
- Results from surveys indicated that pollinators start to utilise the uncut margins for forage from the time that the plants in the leys start to flower in May, so leaving uncut field margins from first silage cuts is useful.
- Pollinator abundance was significantly higher in herbal leys compared to the standard ryegrass and clover leys. Some farms also grew crops of lucerne with clover, and oats with wholecrop peas, and these were as attractive to pollinators as the herbal leys.
- Not all margins are equal. Those that are not shaded and contain the most flowers make the best margins for pollinators. Thus, the location of a margin needs consideration.
- Overall, the outcomes are relatively straightforward. Pollinators are attracted to flowers and don't seem to show strong preferences for the location or content of the flower patches. The more flowers in an area, the more pollinators will be attracted. Providing a succession of flowers throughout the season maintains pollinator numbers and diversity.
- On these organic farms, the intervention measures fitted well within the farming systems. The farmers were already using high clover swards and herbal leys, and providing additional uncut or ungrazed areas did not impact on the overall productivity of the farms.

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For more information on the Pasture for Pollinators EIP Wales project, please visit [www.gov.wales/farmingconnect](http://www.gov.wales/farmingconnect)

For more information on farming for wildlife, please visit [www.farmwildlife.info/](http://www.farmwildlife.info/)