

Helping bees by appreciating common native wildflowers

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Bees feed primarily on pollen and nectar provided by flowers. Unfortunately, agricultural intensification, urbanisation, land conversion and other factors have reduced flower abundance. One obvious way to counteract this decline is simply to make more flowers available, particularly in the summer when floral resources are in short supply relative to the needs of honey bees, other bees and flower-visiting insects (Ratnieks & Harris, *BeeCraft*, August 2023).

So, how can we cause there to be more flowers? Planting flowers seems an obvious solution but is difficult on a grand scale, although there are schemes to incentivise farmers to provide additional flowers on farmland. In August 2023, the UK Government started a Sustainable Farming Initiative (SFI) to incentivise many things relating to the environmental stewardship and wildlife conservation in agricultural land. This makes sense given that most (71%) of the UK area is agricultural land and has large effects on water resources, greenhouse gas production and capture, biodiversity, not to mention food production and food security. The National Farmers Union (NFU) seems generally positive about the SFI and has produced a helpful list of the incentives, some of which are relevant to bee food supply including hedgerows, buffer strips in arable and pasture fields, grass leys with flowers including clover and so on.*

Gardens and parks are places where flowers and shrubs are widely grown for their ornamental value. There are great opportunities here to increase the food supply for bees and other flower-visiting insects. LASI research has shown that summer-blooming garden ornamental plants can vary one hundredfold in the numbers of insects they attract, meaning that the same amount of cost and effort by a gardener can result in anything from a large to a negligible additional bee food supply (Garbuzov & Ratnieks 2014a). LASI's research in a local park (Garbuzov, Samuelson & Ratnieks 2017) and garden centres (Garbuzov, Alton & Ratnieks 2017) shows that most of the flowers on sale or being grown are not particularly bee friendly.

Another, and probably simpler, way to have more flowers is to encourage existing wildflowers, that is, native species that are already widespread and abundant, with flowers that provide pollen and nectar. There are many such species in Britain and elsewhere. Encouragement would benefit from greater appreciation. Many native species that are major pollen and nectar sources, such as dandelion, are underappreciated because they are considered weeds. Others, like bramble, are disliked because of their vigorous growth or thorns. Some, such as ivy (*Hedera helix*), have inconspicuous flowers and are easily overlooked as being helpful to bees and other flower-visiting insects (Wignall et al 2023). What does it take for people to accept and enjoy more wildflowers in their lawns, parks, roadsides, and fields? Greater appreciation probably requires education. Increasing the appreciation of local wildflowers could help improve nectar and pollen supply and also help reconnect people with plant diversity and nature (Wignall et al 2023). This article describes some LASI research projects on encouraging the planting and growth of wildflowers and improving people's attitudes to them.

Examples

Underappreciated bee-friendly native wildflowers

Ivy is a very common and well-known climbing plant in Britain and much of Europe. In Sussex, and probably the rest of Britain and Ireland, it is the main source of autumn nectar and pollen. This is because it is both widespread and abundant and because its open flowers make the nectar and pollen accessible to all insects.

Even insects with short tongues can gather ivy nectar, unlike plants such as lavender that secrete nectar at the base of a long flower tube accessible mainly to longer-tongued insects like bumblebees and butterflies. Honey bees can struggle to access lavender nectar (Balfour, Garbuzov & Ratnieks, 2013).

Ivy is visited by all autumn-active flower-visiting insects, including honey bees, ivy bees, bumblebees, hover flies, other flies, butterflies and wasps. Pollen traps we put onto hives in Sussex, southern England, showed that 90% of the pollen collected in autumn was from ivy (Garbuzov & Ratnieks 2014b; Hennessy et al 2021). Ivy grows on walls, tree trunks and in hedges, and is abundant in both rural and urban areas. However, ivy suffers from misguided concerns that it parasitises the trees that it climbs. In fact, ivy only uses the tree for support and its own roots are in the ground. Ivy is a true native wild plant. Birds eat its berries as winter food and disperse its seeds in their droppings. As a result, ivy can spring up almost anywhere. If ivy were to disappear, it would surely be catastrophic for autumn-flying flower-visiting insects. (See also August *BeeCraft*.)

Bramble, also called blackberry, has parallels with ivy. It is abundant in both urban and rural areas, has seeds dispersed by birds and mammals, and has open flowers that are accessible to all types of insects. In Sussex, bramble blooms for a long period, typically starting in late May and continuing throughout summer and even into autumn, with peak bloom in June. Pollen traps we put on hives in Sussex showed that 31% of the pollen collected from late May to early August was from bramble (Wignall et al 2020).

Dandelions and white clover are native wildflower species that provide pollen and nectar. Both are often found in lawns but are not always appreciated. Garden centres sell herbicides for these and other lawn 'weeds' (Wignall et al 2023). White clover is unusual because it is also an agricultural crop. It is often sown with grass seed in pastures to improve soil fertility. White clover and many related species in the bean family house bacteria in special root nodules. The plant provides the bacteria with energy and the bacteria convert the nitrogen in the air into a form that plants can utilise (Harris & Ratnieks 2021). It is one of Britain's most important nectar sources (Williams, Carreck & Little 1993).

In Britain, five species of native wildflower are officially termed injurious weeds. These are technically illegal to have on your land. Two are docks (*Rumex*) that are mainly wind pollinated and so do not attract flower-visiting insects. The other three are ragwort and two species of thistle. They are very common in road verges, fields and waste land. We compared the numbers of flower-visiting insects on these three species with 14 other wildflower species growing beside them in pasture fields in Sussex. These other species were officially recommended as good for pollinators. On average, the injurious weeds had twice as many insects. In addition, they have more insect species that feed on their leaves (Balfour & Ratnieks 2022).

Local views of wildflowers in a suburban park

LASI carried out a study at a local park, the Saltdean Oval in Brighton, with encouraging results that showed both how simple it can sometimes be to encourage existing wildflowers and also the positive responses of park users (Garbuzov et al 2015).

The park had been mown for many years to keep the grass short. Subsequently, the local council's parks department cut half only once per year. This became 'long grass'. But it was not just grass. Many native wildflowers were already growing among the grass. The mowing had not killed them but had greatly reduced their bloom. Without any planting, they were now able to bloom profusely in the long grass area resulting in a remarkable display of colour.

We made counts of flower-visiting insects and found that there were 50 times as many in the long-grass area than the short-grass area. This was a good result for the flowers and the insects. But what did the public using the park think?

By interviewing park users, we found that the most popular recreation activities were to relax (42%), walk (42%), walk the dog (63%), take children to play (45%), look at plants (18%), look at insects (21%) and 'other' 8%. (Many people did more than one thing.) Importantly, looking at plants and insects were popular.

Most people (61%) had noticed the change in management, the wildflowers in the long grass (72%) and also bees or butterflies (79%). Almost all (97%) thought it was good to encourage insects and wildflowers. Most (74%) said that the amount of long grass was appropriate, some (23%) said it was too much, and 3% too little. As we all know, you cannot please everyone but over three times more respondents were happy than not.

These results show that many local park users enjoyed looking at nature in the park including flowers and insects, noticed what was going on and supported efforts to help nature. A key reason that most people were happy was no doubt because half the park remained as short grass. This gave ample space for activities such as ball games and strolling.

Improving appreciation and encouragement

Local wildflowers: do they need their own name or term?

Nowadays, the word wildflower is often used to sell seed mixes that can include non-native species. These may be wildflowers in some part of the world, such as the North American prairies, but often they are not wildflowers where they are planted. In other cases, they may be native species but with seed gathered in a different country. True wildflowers are those native to the local area. Planting 'wildflower' seeds is much the same as planting out an area with bedding plants, and indeed considerable time and effort must be spent preparing the ground to receive the seeds. In addition, many of these 'wildflowers' are annuals giving a burst of colour that declines in subsequent years. By contrast, many bee-friendly wildflowers are perennials.

Wildflowers in a suburban lawn

Even a small patch of garden, lawn, field edge, or roadside might have multiple wildflower species that bees and insects will visit when in bloom. In late June, we studied a small patch (161m²) of lawn that had been uncut for two weeks in a suburban garden in Uckfield, a small town in Sussex, (Ratnieks & Flockhart 2020). In bloom were ten native species, none of which had been planted. Six were abundant and four (white clover, red clover, bird's-foot trefoil, selfheal) had numerous foraging bees and flower-visiting insects.

Promotion and education

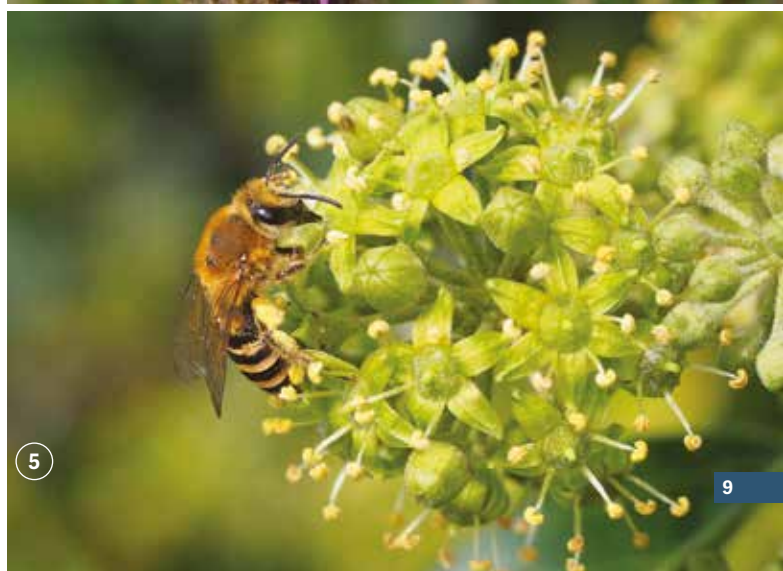
One challenge in appreciating these true local wildflowers may be that there is no word or term for them. Given that the word wildflower has been somewhat usurped by people trying to sell seeds that are not native wildflowers, there appears to be a need for a suitable word or term specifically for them. Maybe we need a competition or a campaign to select or popularise one.

2 Thick-legged flower beetle (*Oedemera nobilis*) on ragwort

3 Honey bee on bramble

4 Clouded yellow butterfly (*Colias croceus*) on knapweed

5 Ivy bee (*Colletes Hederæ*) on ivy





6 Dandelions growing next to the A27

7 Common carder bee (*Bombus pascuorum*) and a flowerful lawn

'Local native wildflower' or simply 'local native' convey the key idea. But is it too clumsy or ill-defined? What better term could be used?

Is a lawn with wildflowers in addition to grass attractive or ugly? Is it a sign of a lazy person or someone who is encouraging nature? Is it something to enjoy and celebrate or to criticise? It is certainly easier, cheaper and probably safer to enjoy the existing wildflowers in a lawn than to go to the cost and trouble of removing them with herbicides, and especially to pay a 'lawn care' company to do it for you.

Long grass is probably not suitable for most domestic gardens, unless the lawn is large. But it is an option for roadsides and parks, as the example of the Saltdean Oval showed. One challenge with long grass is that it can give the impression that the landowner or council is not managing the area properly. One way round this is to mow paths to 'frame' the long grass areas to show that it is being managed and to ease access.

Education, in the broadest sense, might help to increase public appreciation of local native wildflowers. This could be via almost any method, whether formal or informal, and to any age group, including school pupils. Educating the public to appreciate local native wildflowers has every chance of success. Many people probably do not realise that there already are wildflowers everywhere, and this would be a good place to start. They do not have to be expensively planted using commercial seeds (probably sourced from other countries or even of non-native species) after preparing the soil. The study at the Saltdean Oval showed that encouraging the local native wildflowers already present was simple and popular. No planting was needed, and the only management was simply mowing less often.

Many underappreciated local native wildflowers already have signs of appreciation beyond their value as nectar and pollen sources to bees and other insects. Blackberries are probably the most widely eaten of all wild foods in Britain. Ivy is liked because it is evergreen. It is also a girl's name which shows the high esteem it is held in. Spear thistle (*Cirsium vulgare*), one of the injurious weeds, is the national flower of Scotland. Ragwort was eulogised by English poet John Clare (1793-1864) in his poem *The Ragwort*: "Ragwort, thou humble flower with tattered leaves/I love to see thee come and litter gold ...". Many of the local native wildflowers that will grow in lawns are beautiful individually and can even result in spectacular displays in which a lawn becomes white, yellow or blue.

Appreciating local native wildflowers will likely also convey psychological benefits by helping people connect to plants and nature. Indeed, knowledge about native plants seems to be at a low ebb in Britain. A study of A-level pupils (final two years of high school) found that 86% could name only three or fewer common

wildflowers, and a poll commissioned by the UK conservation charity Plantlife found that only 3.5% of British participants were able to name red clover correctly. These figures show the disconnect between people and plants. The term 'plant blindness' has been coined to describe "an inability to notice or appreciate plants, distinguish among species or recognise their importance". Given that bees and flower-visiting insects depend on flowers, and that most life on Earth depends directly or indirectly on plants, this is surely not a good thing (Wignall et al 2023).

What can beekeepers do?

Local native wildflowers help bees and other flower-visiting insects. They don't need planting as they are already widespread. What they really need is to be better appreciated and encouraged. We don't need to plant more ivy, bramble or dandelions, or to encourage weeds. But where these plants grow, and especially where they bloom, perhaps we can leave them be. In some cases, it may take a change in attitude and a relaxation of the urge many people feel to be excessively tidy. Beekeepers benefit directly from wildflowers and are one group of people who should be at the forefront in educating others.

* www.nfuonline.com/updates-and-information/sfi-scheme-guidance-and-information/Hedgerow

Tips on reading scientific papers

On page 40 are the articles cited in the text by author name, along with their web links. Most are from LASI. It can be challenging to read a scientific paper if you are not used to doing this, but the title and the summary or abstract will generally tell you most of what you need to know. If you read the paper, we suggest you don't try to read all of it from start to finish, and don't get bogged down in details of the methods, statistics, and background. Instead, look for the main points. The key results are usually shown in graphs and tables. The final paragraph of the Introduction normally states the aim of the project, and the first paragraph of the Discussion normally states what was found out.

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From page 6

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Scientific papers

Below are the articles cited on pages 6–11.

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