How do GO members support biodiversity?

Summary

Our recent review, Every Garden Matters (https://www.gardenorganic.org.uk/news/every-garden-matters), showed that domestic gardens can make an important contribution to biodiversity, especially in a time of increasing urbanisation. Following on from this, we surveyed our members and supporters to evaluate what contribution they were making to biodiversity through their everyday actions. It won't be a surprise to find that most were carrying out actions that would have a positive influence on biodiversity. Of the respondents, 90% had a compost heap, 85% had a wildlife area, 70% had a pond, 64% had a bug hotel and 62% had a bird box. Two thirds of respondents had at least 4 out of 5 of these features. Pesticide use was also low, with 70% never using even organic pesticides. It was also encouraging that on average, 25% of the gardens comprised of ornamental borders, which contained diverse plantings: a third of borders comprised of 25 or more types of plants.

The 'Principles of Organic Gardening' (POGS) are a set of guideline that gardeners can use to self- assess to what extent they are growing organically. Amongst our supporters, 51% said that they thought they followed organic guidelines, despite not being aware of POGS, but only 9% said that they regularly consulted POGS to inform their gardening practices, and 21% said that they had looked at POGS a few times. It is clear from this, that the POGS are being underutilised and the charity could make more of this resource.

Introduction

The area of domestic gardens in the UK is estimated to be 4,330 square kilometres (Thompson and Head n.d.), which is slightly more than a fifth the size of Wales. With increasing urbanisation, they play a vital role in providing habitats and wildlife corridors in built up areas. The importance of this is backed up by estimates of the total urban area covered by private gardens in Europe and New Zealand which range from 16 to 36% (Goddard, Dougill, and Benton 2013)

Earlier this year, Garden Organic conducted a review of the recent work on biodiversity in domestic gardens (Pearce 2024). It highlighted the importance of domestic gardens in conserving biodiversity and suggested some key actions that gardeners can take.

Further to this, in September, we conducted a survey of Garden Organic supporters and members. The purpose of this was to evaluate:

1) The current understanding of biodiversity amongst our supporters
2) The actions they currently take to conserve biodiversity within their gardens and if any improvements can be made
3) The impact that the charity currently has on biodiversity conservation within their gardens.

Understanding biodiversity

Biodiversity is a concept that relates to the variety of life found in an area. The Oxford English dictionary definition of biodiversity is:
" Diversity of plant and animal life, esp. as represented by the number of extant species. (*Biodiversity*, *n. Meanings, Etymology and More | Oxford English Dictionary* n.d.)
We asked our supporters what they understood by the term biodiversity.
There was a wide range of responses, but 67% of responses contained one or more of the following words: "Wide", "Range", "Diverse / diversity", "Mix", "Varied", "Variety"

Some of our members gave very concise definitions such as:
"The number of different species found in a specific area"

There has been much debate about what is a useful way of defining or measuring biodiversity. Counting the number of species is the simplest measure, but some argue it should also convey other concepts that are relevant to the situation such as the range of habitats and ecological processes or the extent of native species in an area. This has led to many different definitions over the years, that although aiming to help has often created confusion (DeLong 1996). Many of our members acknowledged the nuances beyond counting species when conveying biodiversity with definitions such as:

"Variety of plants and animals making up a functional ecosystem"
"The range of life in all forms in an area - plants, fungi, insects, microorganisms; the more the better."

The importance of biodiversity internationally first took centre stage in 1992 when the Convention on Biodiversity was first opened for countries to sign at the 'Rio Earth Summit'. It recognised that the contributions that biodiversity made to all aspects of a functioning healthy planet including ensuring continued food security, clean water, medicine and shelter and that action needed to be taken to halt its decline (Secretariat of the Convention on Biological Diversity 2000).
Some our responses conveyed the importance of biodiversity:

"High biodiversity contributes to resilience, allowing ecosystems to adapt to changes and disruptions like climate change"

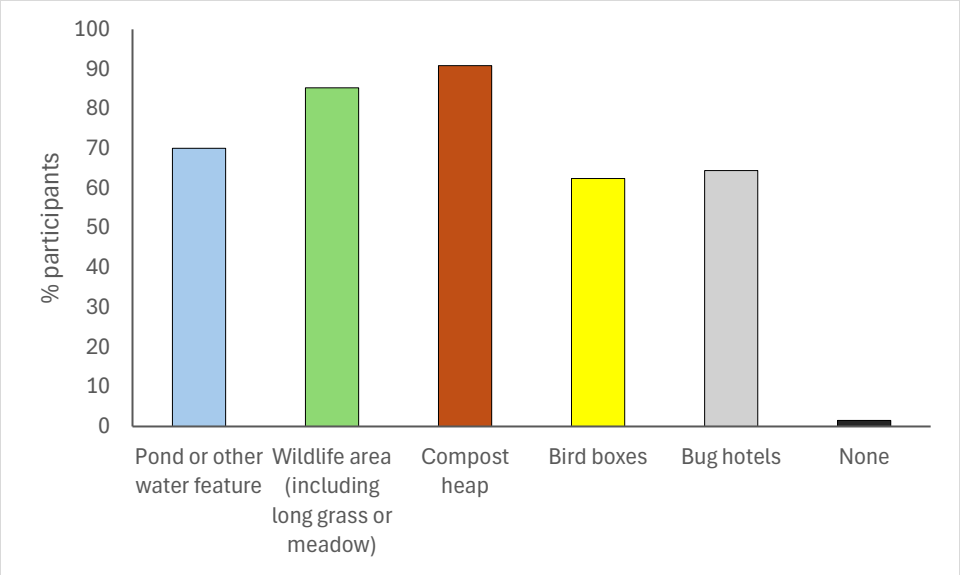
For comparison with the general public, a survey of residents within the EU and the UK in 2018 showed that 71% of those interviewed had heard of the word and 41% knew what it meant (*Public Awareness of Biodiversity in Europe* 2021). However, despite not always being able to define it, at least 80% considered biodiversity loss a serious problem and agreed that halting it is important.

Actions people take to conserve biodiversity in the garden

Features

A high proportion had features that benefit biodiversity with over 90% having a compost heap and 85% having a wildlife area. Around two thirds of participants had four or more of these biodiversity features within their garden.

A compost heap, was one of the most popular features. It not only adds to soil biodiversity of micro and mesofauna (Ros et al. 2006) but it can also shape above ground floral diversity increasing the biodiversity of insects (Blubaugh, Chesnut, and Hagan 2024). Wildlife areas were also a popular feature. These can feature in a number of ways, but one of the simplest is to leave an area of the lawn unmown. In a study in France, reducing mowing frequency significantly frequency increased species richness France (Chollet et al. 2018). Similarly, a study from the Czech republic showed that leaving a mosaic lawn significantly increased biodiversity (Rada et al. 2024). Leaving patches of plants that are sometimes considered weeds can also boost biodiversity, for example, nettle patches can boost diversity, both in nettle feeding and generalist caterpillars (Delahay et al. 2023). Wood piles are also a good source for boosting biodiversity – in a study of gardens in Sheffield, found 90 different organisms in a wood pile (Gaston et al. 2005).
A pond can make a significant contribution to urban biodiversity and wildlife corridors (Hassall 2014). Urban ponds generally have less diversity than rural ponds but they still make a valid contribution. Often the variety of shape and sizes of ponds found in an urban area help add to the diversity (Oertli and Parris 2019, Hill et al. 2021).



We also asked what other actions people took to conserve biodiversity in their garden. The most common words used were 'let', 'leave' and 'allow' – all words associated with a reduction in interventions and disturbance. This relaxation in cultivation can lead to creating new wildlife habitats – eg leaving some grass to grow, leaving plants over the winter, letting an area grow wild, leaving an area uncultivated. Participants also took action to create additional food sources – eg 'allowing' plants to form seed heads.

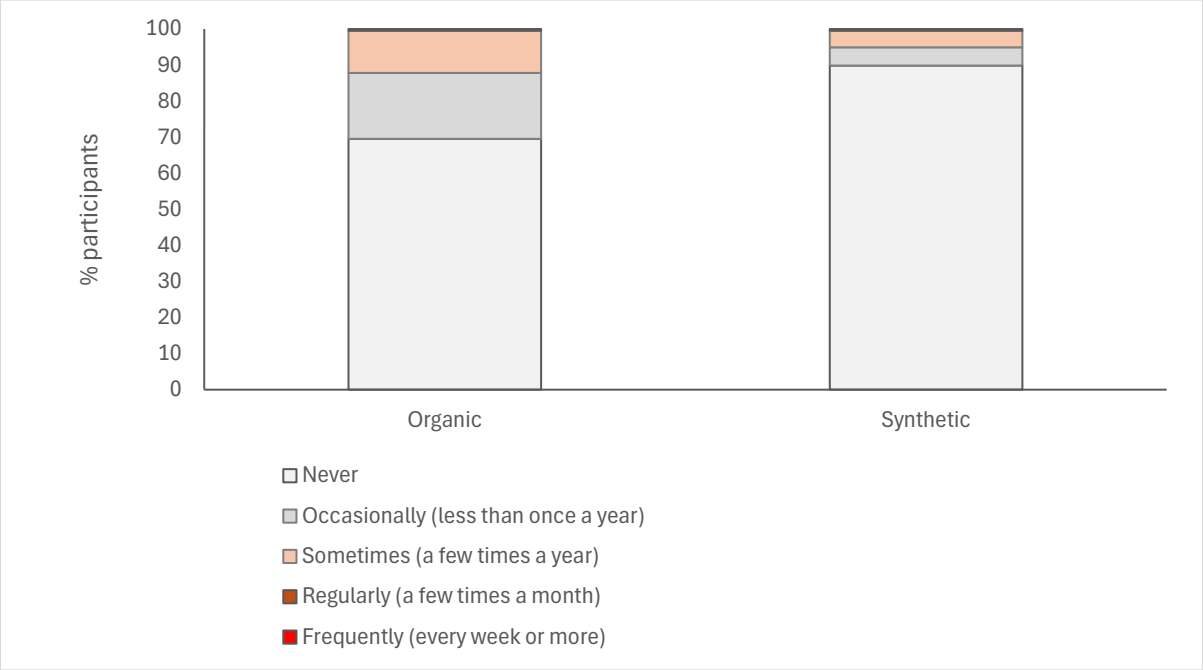
"My approach is wildlife first, me second. I do so I can to increase diversity and improve connectivity. I don't use any chemicals and encourage natural processes. I'm happy to share my space and food."

Pesticides

Pesticides were used very sparingly by participants in the survey. Only minimal numbers using 'organic' or environmentally friendly pesticides. 70% never used organic pesticides and 90% never used synthetic pesticides. The use of organic pesticides was occasional (18%) or sometimes (12%) and nobody used them regularly. This is encouraging as other studies have shown that use of pesticides in the garden is associated with reduced biodiversity (Delahay et al. 2023).

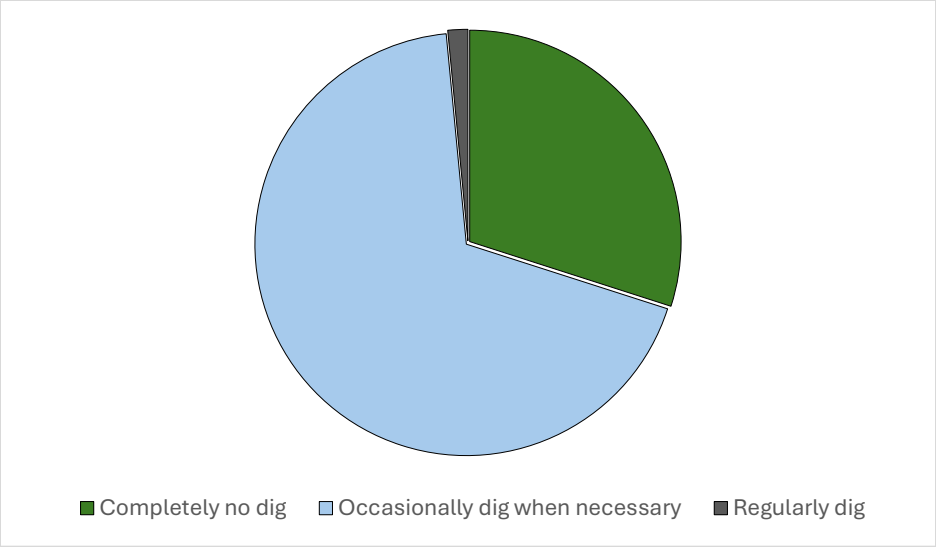
Other studies of pesticide use have thrown up different proportions of participants that use pesticides. A study run by the British Trust for Ornithology found that 32% of participants used pesticides, with around half of those comprising glyphosate (Tassin De Montaigu and Goulson 2023). Another study of 163 allotment users in the UK (Dobson, Warren, and Edmondson 2021) found that a rather higher proportion of growers used chemicals with 74% applying pesticides and 40% applying herbicides.

Our sample of gardeners who are supporters of an organic gardening organisation are unlikely to be a true reflection of pesticide use by the public as a whole.



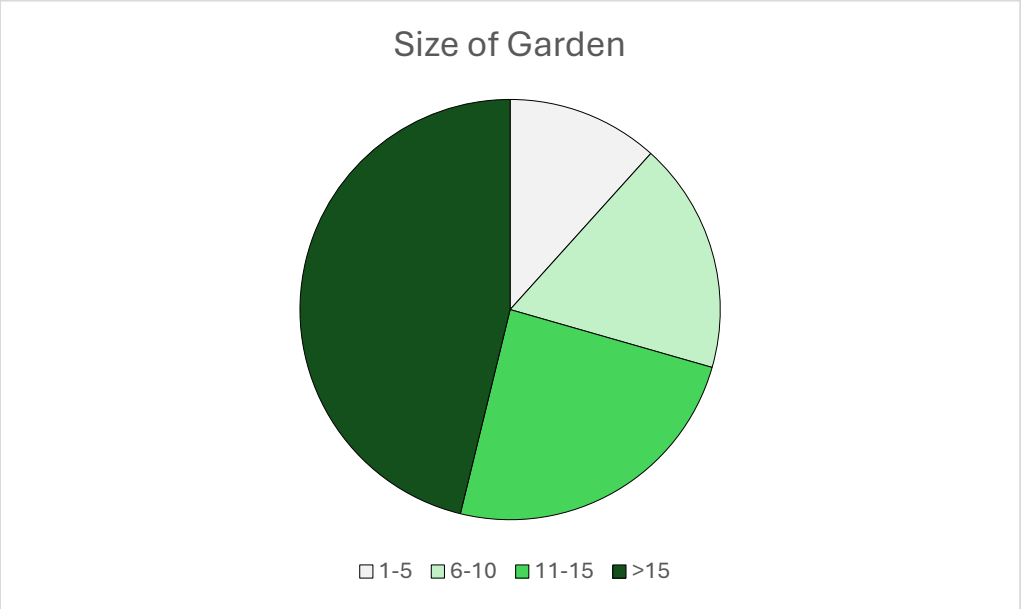
Digging

The popularity of no dig growing has increased rapidly over the last ten years. In our sample only a very small proportion (2%) said they dig regularly, with the vast majority (68%) saying that they only dig occasionally when necessary. In our sample, 30% were completely no dig. There has been a lot of research looking at 'no till' agriculture but less looking at gardens. A garden study in Poland showed around 20% more earthworms in no dig garden compared to conventionally dug (Mazur-Pączka et al. 2024). At an agricultural scale, a study in Georgia showed an increase in soil biodiversity with time with no till but after an initial increase, it took a longer time to reach levels of undisturbed soil. (Adl, Coleman, and Read 2006). No till has also been shown to increase the mycorrhizal populations, which are a good indication of soil health and will boost plant resilience (Schalamuk et al. 2016).



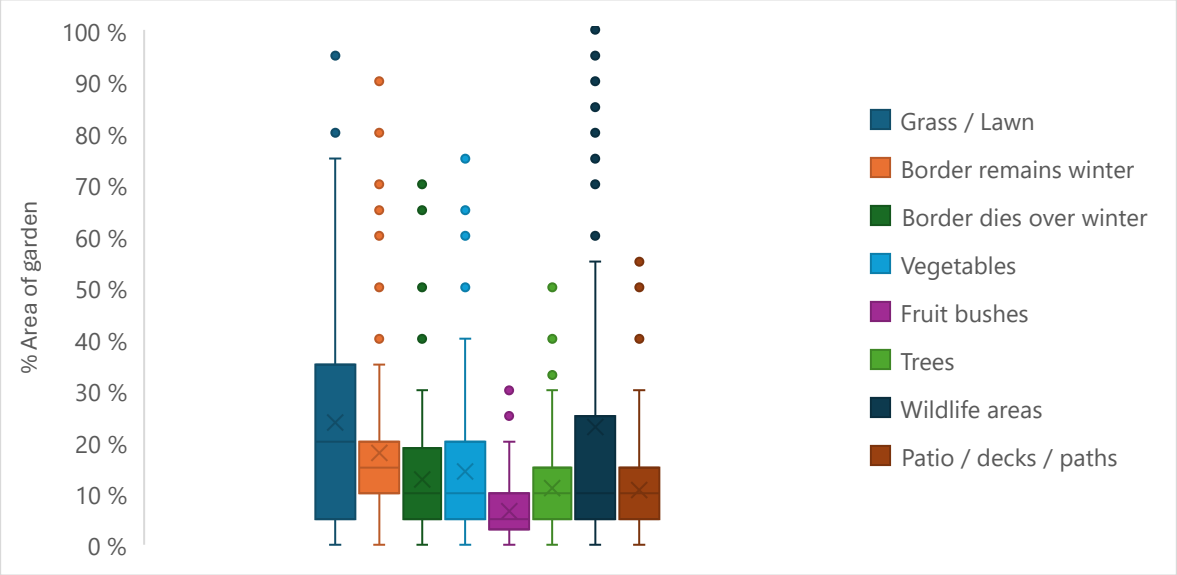
Size of garden

Almost half had a garden that was larger than 15 parking spaces or 180m^2. This is pretty close to the average size of a garden in the UK (Office for National Statistics 2021). Just over 10% had a small garden that was between 1 and 5 parking spaces. The majority of studies have found that larger gardens are more likely to be more biodiverse (Delahay et al. 2023, Kabir and Webb 2009, Loram et al. 2008) and that the area of vegetation is the most important factor determining bird diversity and plant diversity (van Heezik et al. 2013). However, it appears that the size of garden is not an important factor for ensuring that there is a provision of nectar to support insect biodiversity (Tew et al. 2022).

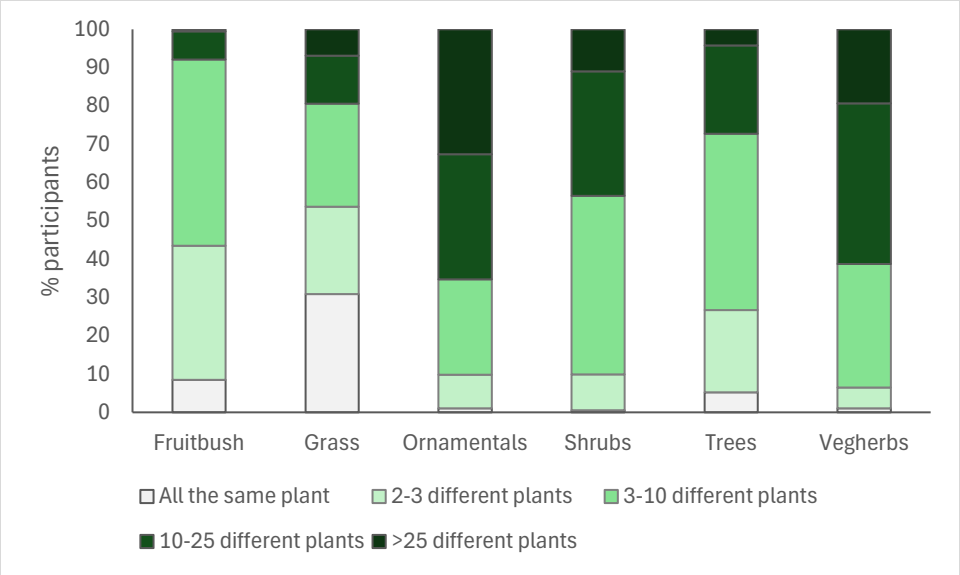


Areas of the garden and plant diversity

It is encouraging that when you added up the area of borders (including both those that remain and those that die back over the winter) it contributes the greatest area of the garden (median 25%). Ornamental borders had the most diverse plantings in this survey with 33% of participants having borders with more than 25 different plants. Having an area of border that remains over the winter is essential for providing habitats for wildlife. The area of floral borders in the garden has been correlated with biodiversity in a number of other studies. Floral richness and diversity has been linked to biodiversity of pollinators in butterfly communities in France and UK (Fontaine et al. 2016) and a study in the UK across 5 cities showed a positive corelation between area of borders and species diversity (Loram et al. 2008). A study of the 7 most common bumblebee species in the UK showed that the area of flowers, tree and shrubs were positively correlated with bee populations but areas of fruit, vegetables, hard paving and lawn were negatively correlated. This demonstrates the importance including floral resources within food area growing areas.

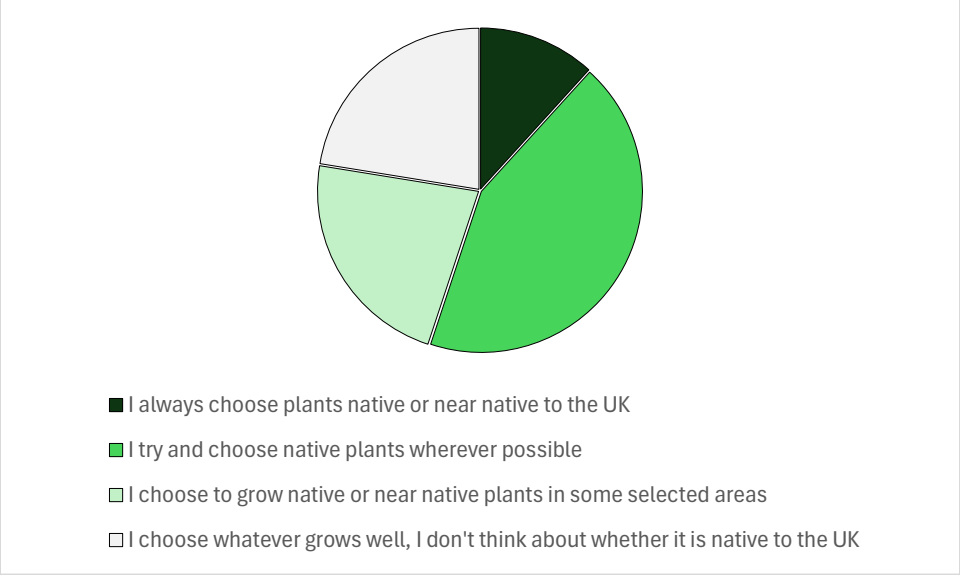


The next biggest area was lawn (median 20%). Lawn was the least diverse with 31% of participants only growing one type of plant and a further 23% only growing 2 or 3 types of plants. However, as stated earlier, reducing mowing frequency is a simple achievable action that can increase the biodiversity and species richness with a lawn (Chollet et al. 2018).



Choice of plants – native vs non native

Participant showed an interest in choosing native or near native plants in their garden, , with 43% stating that they choose native plants where possible.

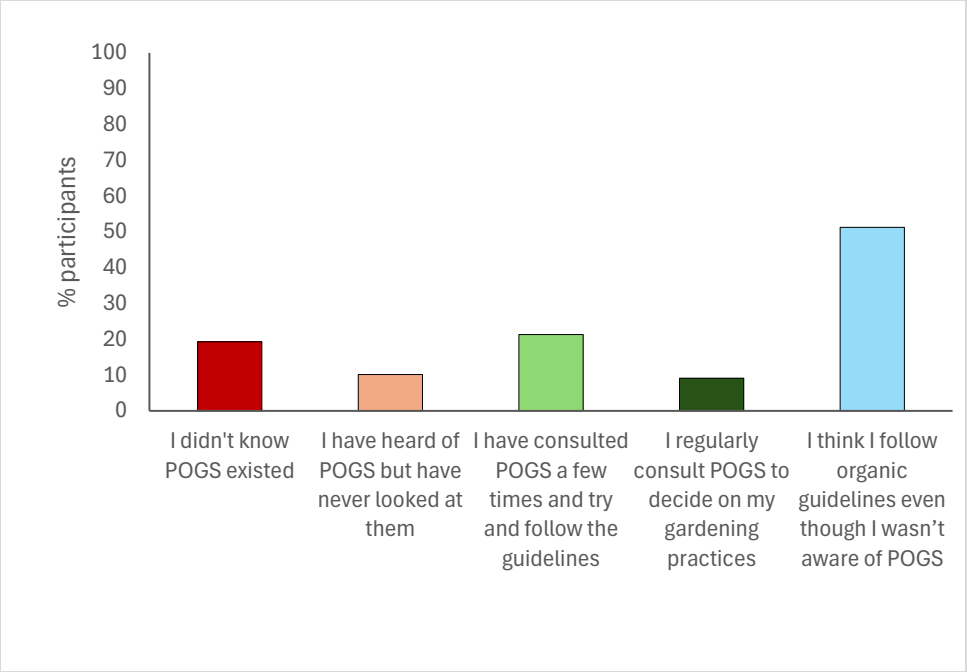


The importance of whether a plant is native to the UK is not simple. A study of 5 cities in the UK found that 30% of the plants recorded were native. (Loram et al. 2008). In a study of gardens in Bristol (Tew et al. 2022), the nectar supply was dominated by non-natives,

which provided 91% of all nectar sugar, while shrubs are the main plant life form contributing to nectar production (58%).
In replicated field trials at Wisley (Salisbury et al. 2020, Salisbury et al. 2017), they found there was generally more biodiversity under native or near native plants, but these differences were inconsistent, varying with season and different phyla.
However, a conclusion that could be draw was that the experiment demonstrated that gardens and other cultivated ornamental plantings support a wide range of soil-surface-active invertebrates regardless of the plants' origin and the more plant matter (canopy cover) available the greater the abundance

Principles of Organic Gardening

The 'Principles of Organic Gardening' (POGS) are a set of guideline that gardeners can use to self- assess to what extent they are growing organically. It is intended to be similar to the organic guidelines used by certifying bodies such as the Soil Association but it is aimed at amateur gardeners rather that commercial growers.
Although, there was quite a low level of awareness of POGS, the majority of people thought that they followed organic guidelines in their daily practice. 51% said that they thought they followed organic guidelines, despite not being aware of POGS. Only 9% said that they regularly consulted POGS to inform their gardening practices, whilst 21% said that they had looked at POGS a few times and try to follow the guidelines.
This suggests that although the charity is being effective in getting its message across about organic gardening, there is a general lack of awareness of the POGS and they are underutilised.



Conclusions and recommendations

Our members had a good understanding of biodiversity and were carrying out many positive actions to promote it within their growing spaces. Measures included having compost heaps, wildlife areas, ponds, bug hotels, bird boxes and little or no use of pesticides.

Most gardens contained a mixture of habitats including ornamental borders, vegetable beds and wildlife areas which were more likely to contain diverse mixtures of plantings.

There was a low awareness of the 'Principles of Organic Gardening' so the charity should take measures to promote this resource more widely

Three simple actions that people could take to further improve the biodiversity within their garden could be:

1. Consult the Principles of Organic Gardening which has lots of useful practical tips for improving biodiversity within the garden
2. Increase the proportion of biodiverse and mixed plantings within the garden
3. Reducing frequency of mowing and leaving some areas completely unmown.

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