

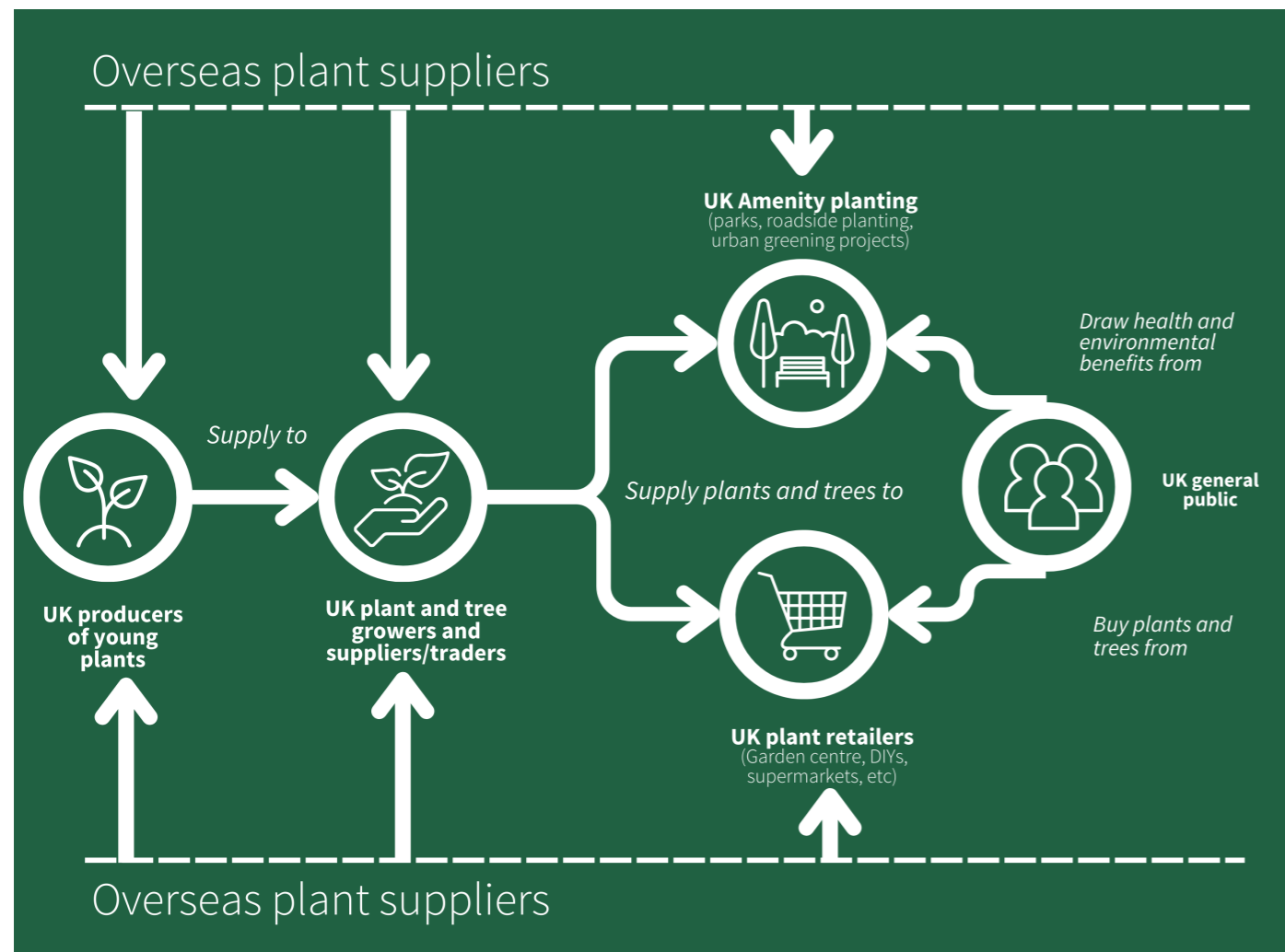


# **From Nursery to Nature:** The Value of Plants

October 2023

# Executive Summary

Plants and trees are the quintessence of our nation – our green and pleasant land. The UK is blessed with a thriving industry that has developed the capability over centuries to supply the plants and trees that go into our domestic gardens, urban green spaces, and countryside.



This industry spans the supply chain of the UK's plants from 'nursery to nature', from the nursery businesses which grow our plants through to the landscape into which these plants and trees are supplied where they provide environmental, economic, and social benefits for our nation.

This research report brings together a comprehensive review of the evidence demonstrating the extent of value plants provide.

It combines one of the most comprehensive literature reviews ever conducted into research into the value of plants with original research conducted by the HTA among 2,000 consumers into their plant purchasing behaviours.

In economic terms, UK growers produce plants and trees worth £1.54 billion per year at farm-gate prices<sup>1</sup>. Over 20,000 people are employed in these businesses, making them a

vital part of the UK's rural economy<sup>2</sup>. Consumers spend nearly £3 billion per year on plants and trees for their homes and gardens, with around half of this being spent in the UK's garden centres which receive around 200 million visits per year<sup>3</sup>; by contrast the total attendance at the UK's Premier League football matches for the 2022-23 season was 15 million<sup>4</sup>. Once supplied into nature, the plants and trees produced by horticulture add significantly to value of the UK's assets. The estimated value added to the UK's housing stock by proximity to green spaces has been assessed by the Office of National Statistics at £2.8 billion<sup>5</sup>.

In environmental terms, the UK horticulture industry and the plants and trees it produces are vital contributors to the nation's wellbeing. For instance, the value from urban cooling provided by the UK's urban vegetation was estimated by the Office of National Statistics at £430 million in 2020<sup>6</sup>; in a city like London the cooling effect of vegetation was estimated at 0.24°C. In the context of global warming, our nation's capacity and capability to produce the plants and trees that provide these ecosystem services is vital to making our urban spaces liveable. In terms of mitigating and reducing air pollution, the planting of a hedging barrier around schools has been shown to reduce the concentration of particulate matter, nitrous oxide, ozone and other atmospheric toxins by up to 77%<sup>5</sup>. Indeed, the annual value of air pollution removal services by urban vegetation was around £800 million in 2021<sup>6</sup>. The UK's domestic gardens in urban areas cover an area greater than

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the environmental benefits of the plants and trees produced and maintained by the UK horticulture industry that they support seven of the ten goals of Defra's Environmental Improvement Plan. We set out these goals and our asks for government support in our accompanying document *Delivering the UK's Environmental Improvement Plan 2023 through the Value of Plants*.

The UK's capability and capacity to supply the plants and trees that support in the context of the climate emergency is strategically vital. However, as well as providing environmental and social benefits, the UK horticulture industry thrives (as does any industry) by satisfying its customers' needs profitably. To meet the expectations of the UK's 30 million gardeners for plant quality and health, environmental impact, beauty and affordability, there needs to be a continued supply of plants from the industry that also that provide these ecosystem and economic benefits. Should the UK's plant and tree production fall short in any of these respects, the volume of supply is likely to fall with a knock on impact on the economic and environmental benefits delivered.

*Our modelling shows that even a modest 5% increase in the price of plants retailed (relative to the rest of the economy) would be likely to lead to a fall in the volumes of plants supplied of just over 10%*

Our consumer research shows UK horticulture – and the nation – approaching a moment of truth. The cost of living crisis and squeezed consumer incomes has left gardeners highly sensitive to the price of their plants. Our modelling shows that even a modest 5% increase in the price of plants retailed (relative to the rest of the economy) would be likely to lead to a fall in the volumes of plants supplied of just

three times the Greater London area, and provide habitat for pollinators and wildlife that is vital for ecosystems. Indeed, so extensive and pervasive are

over 10%, with the impact even more pronounced among lower income and socially disadvantaged

groups. This suggests that passing on the cost increases in the supply chain to consumers is likely to lead to reduced industry contributions to the UK economy, and fewer plants and trees supplied into the environment.

However, our research also shows that consumers' expectations from their plants, and the potential for the industry to add value goes well beyond price. Across all plant purchasers, our research suggests that the lost volumes that would result from a 5% increase in prices could largely be offset should those plants demonstrably be: sourced from growers with robust plant health controls; produced in peat-free growing media; certified as having a minimal environmental footprint; grown in Britain; and in the case of hardy stock come with a plant guarantee of one year or greater. Indeed, consumers particularly value 'value added' traits which pertain to plant health and quality, as well as environmental impact.

These findings are especially pertinent in the current economic and regulatory context the UK horticulture industry is facing. On the one hand we conclude that increased costs specific to horticulture such as managing the transition to peat-free production, rising input and seasonal labour costs, and the costs of new regulations such as those relating to cross-border trade in plants risks the environmental, social and economic value provided by our industry. On the other hand, our research suggests that inward investment from horticulture businesses - supported by government - in measures to improve and promote the biosecurity, quality and environmental impact of plants will add significant value to consumers and sustaining the volumes of plants and trees supplied into our natural environment.

## Foreword



*"As a country, and as a planet, climate change is presenting the biggest existential threat for centuries. Plants and trees offer vast benefits for mitigating these effects and play a critical role in improving the environment and wellbeing of our nation."*

Our association traces its roots to 1899, when a group of nurserymen grouped together to support and safeguard the future of horticultural production in the UK. Nearly 125 years later so much has changed, but a constant through this period has been the value of the UK's plants and trees.

This report is perhaps the most comprehensive review ever conducted of the evidence for just how much economic, environmental and social value plants provide to the UK. It also contains the findings of the first ever review of price-demand elasticity for garden plants. We find our industry at a point where new costs unique to plant production are putting extra pressure on plant prices compared with the wider economy. In this report we quantify how much this extra price inflation of plants could reduce demand for both plants and the flow of benefits they provide UK's citizens. We also show that the innovative work of the UK's growers in producing ever more sustainable, locally produced high quality plants is increasingly valued by gardeners.

For policy makers, the report provides a rich evidence base for how horticulture underwrites vital social, economic and environmental policy goals. Indeed, seven of the ten goals of Defra's Environmental Improvement Plan rely substantially

on a thriving horticulture industry and the plants and trees it grows.

For businesses in horticulture, there are insights into changing consumer expectations from the plants they purchase. We share detail on the value consumers attach to assurances around plants' environmental impact, their plant health, provenance, and quality assurance. These insights shed light on emerging promotional opportunities to satisfy gardeners' increasing expectations from the plants they purchase.

I hope that you find this report useful, insightful, and above all interesting. I'd also encourage you to read our call to action for policy makers – Delivering the UK's Environmental Plan through the Value of Plants - which we have produced in response to this report's findings. This call to action sets out our proposals for how the value of plants evidenced in this report can be safeguarded and enhanced for future generations through collaboration between government and the environmental horticulture industry.

**Fran Barnes**

**Chief Executive Officer  
Horticultural Trades Association**

The UK's plants, trees and the richness they bring to life in the UK is easy to take for granted. And yet almost all of us on any given day will encounter plants, trees, and flowers, either at home, in the workplace or out in the natural environment.

Indeed, even in the UK's urban spaces, Ordnance Survey assesses that 29.5% of the UK's total urban area is accounted for by domestic gardens, not counting nearly 50,000 hectares of public parks and gardens<sup>6</sup> – an area almost equivalent to the whole of the Isle of Man. With such familiarity it is perhaps easy to take these green spaces, and the system that has developed over generations to supply the trees and plants in them, for granted. And yet in the context of the climate emergency there is a growing understanding and evidence base for the environmental, social, and economic value that plants, trees, and the industry that furnishes the UK with its green infrastructure provides.

This report firstly describes the system represented by the UK's horticulture industry that produces and supply the trees and plants for our green spaces, a journey from our plant nurseries out into the natural environment – from nursery to nature. This brief description outlines how the UK's plants and trees are produced, and the activity and challenges the industry is embracing to further 'add value' to our plants, for instance in reducing the environmental impact of production, ensuring robust biosecurity for the country, and creating jobs and contributing to the UK's green growth.

Once plants are established in nature, whether in a hanging basket, a park or garden, or a sustainable urban drainage system, they provide substantial economic, environmental and social benefits. This report provides a comprehensive review of the evidence for these benefits, and summarises how these benefits underwrite substantial parts of the UK's environmental policy goals; notably we assess that plants, trees

and the horticulture industry that produces them contribute to the delivery of seven of the ten goals of the Environmental Improvement Plan.

Finally, in the current context of a cost of living crisis and climate emergency, the wants, needs, and expectations of the UK's 30 million gardeners are constantly changing. Increasingly we anticipate that consumer expectations for the environment and plant health will increase in the coming years. The consumer research we present in this report provides insight into the very real impact that assurances for consumers in these and other respects is likely to have on the volume of plants and trees purchased. The research also shows the challenge facing the industry of inward investment in the supply chain to deliver this value-added for gardeners, whilst ensuring that the costs of this investment do not increase prices to the end consumer to the extent that socially and economically disadvantaged communities are 'priced out' from the environmental and social benefits of plants, trees and gardening.



## UK plant production supports the economy and employment

Most of the UK's home-grown plants and trees begin their journey with the UK's commercial growers. These businesses produce a range of 'crops' for the UK, from trees to houseplants.

There are a variety of specialisms among the UK's 300-400 growers and producers of plants and trees, who nurture and raise seed, cuttings, plug or young plants into the plants and trees that are

domestic and international tourism. This wider industry was valued by Oxford Economics in 2019 as supporting contributions to UK GDP of £28.8 billion, with the potential to grow to £41.8 billion to national GDP by 2030<sup>2</sup>. Without the plants and trees grown and supplied by the UK's plant and tree growers, this economic contribution to the UK's economy would be vastly reduced, and would rely substantially more on plant and tree imports from overseas. Such a shift away from UK-grown plants and trees to imports would carry adverse consequences and risks to the UK, for instance the loss of UK green economy jobs, reduced self-sufficiency to produce the green infrastructure our society needs, and an increased risk from the introduction of overseas plant pests and diseases which in the past have had a devastating effect on the UK's landscape and flora.

*In 2022, UK production of ornamental plants was valued at £1.54 billion<sup>1</sup> and a further £760 million of plants and bulbs were imported in the same year to meet growing demand for plants, trees and green infrastructure in the UK*

supplied to retailers such as garden centres, or to amenity customers such as housing associations, public parks, local authorities or other land-owners. In 2022, UK production of ornamental plants was valued at £1.54 billion<sup>1</sup> and a further £760 million of plants and bulbs were imported in the same year to meet growing demand for plants, trees and green infrastructure in the UK<sup>1</sup>.

Whilst it is beyond the scope of this report to provide a detailed description of the varied and complex processes that are involved in producing the UK's plants and trees, it is pertinent to note some of the current challenges and initiatives being embraced by the UK's growers in order to

UK production of plants provides livelihoods for many UK residents and overseas seasonal workers, many of whom operate family-owned businesses and SMEs, directly employing over 20,000 people and contributing £183 million in tax revenue to the exchequer<sup>2</sup>.

These growers are one of the fundamental pillars of the wider environmental horticulture and landscaping industry, which includes garden retail, wholesale, garden goods manufacturing, landscape services, arboriculture and

*UK production of plants employs over 20,000 people and contributes £183 million in tax revenue to the exchequer*

add value to the UK's plants. In section 5 we will show how the expectations of the UK's gardener for healthy, UK-grown plants with a minimal environmental footprint are playing a role in purchase decisions, and ultimately on the volume of plants and trees making their way into the UK's gardens to the benefit of the environment. It is therefore important to note the challenges and investment required in order to ensure this value added is provided.

The production of plants and trees at this scale involves complex business processes to ensure

and improve plant quality whilst reducing environmental impact. A current challenge being embraced by the sector is a transition away from the use of peat as a substrate in plant production with a view to reducing the environmental impact of plant and tree production. Ultimately the removal of peat from production will contribute to a reduction in the sector's environmental footprint, and there is some evidence for consumer preference (albeit very modest) for plants produced in peat-free growing media. The UK's growers halved the volume of peat used to produce the UK's plants and trees between 2011 and 2022<sup>6</sup>. However, extensive trialling and investment in new equipment is required to reliably produce high quality plants and trees in different growing media that carries a higher cost than peat-based alternatives. Similarly, growers are now making substantial investments in developing the knowledge and skills how to work with these new growing media in order to most sustainably produce quality plants and trees. Often different irrigation and nutrition regimes are required to produce plants and trees of equivalent quality for the end-consumer.

Similar challenges are involved in reducing the environmental impact of plant and tree production. For example, investment in water resilience across the sector in reservoir construction and rainwater capture technologies is reducing reliance on mains water, as is the adoption of more efficient irrigation technologies in nurseries. As of 2020 41% of the UK's growers had on-site reservoirs<sup>7</sup>, with a further 19% looking to invest in reservoirs to improve water resilience, reduce the environmental impact of plants produced, and reduce cost in the supply chain.

UK growers are a key link in the supply chain for plants and trees and their movement across the UK. Plants and plant material are bought in and sold on by growers, often across international borders. With such movement of plants comes the risk of introducing and/or spreading plant pests and diseases with the potential to inflict serious damage to the UK's landscape. To contextualise the risk of more serious pest and disease outbreaks

the cost of Ash Dieback, a disease which is set to devastate the UK's Ash trees, is estimated to be £14.8 billion to the UK's economy<sup>8</sup>.

In response, the industry and government have collaborated to develop a robust Plant Health Management Standard to set out 'what good looks like' in terms of good practice, and to underwrite bio-security in the supply chain for plants and trees. Increasingly certifications which require growers to demonstrate high standards of biosecurity are being specified by the UK's plant and tree retailers and public sector customers. For instance, the HTA's Ornamental Horticulture Assurance Scheme (OHAS) requires high standards of biosecurity to be maintained, and includes growers with a combined crop value of around £300 million, a significant proportion of UK output. The consumer research which we share in section 5 of this report suggests that consumers, and especially keener gardeners, value the assurance that a plant has been sourced from a grower with robust controls on plant pests and diseases, although not to the extent that a significant price premium could be commanded for such assurance; we assess that this expectation will increase over time as consumers become more aware of the importance of robust biosecurity in the supply chain, as they have around standards in the food supply chain.

This presents a challenge for growers in particular in making the inward investment needed to develop and sustain the good biosecurity practice and its certification, especially in the context of generally increasing business costs and the specific investment challenges faced by growers in ensuring that the UK's plants and trees continue to meet the value expectations of consumers and regulators. Indeed, the issue goes beyond one of simple productivity and competitiveness insofar as reduced output (or a higher cost output that reduces supply) carries with it reduced downstream environmental and social benefits from these plants.

Lastly, we should note that production at scale of plants and trees worth £1.5 billion requires a

substantial labour force with a range of technical, commercial, scientific and other skills. Just over a third of that labour input in UK growers consists of seasonal workers<sup>9</sup> – often but not always relatively low-skilled workers who are involved during seasonal peaks associated with key stages of the crop production cycle, for instance potting plants, lifting field-grown plants and trees, and so forth.

Attracting and retaining sufficient skills and people to be able to meet demand is a significant challenge for UK growers, with a reported unfilled people vacancy rate among UK growers of 7.7%<sup>11</sup>.

Keys to growers unlocking productivity gains include widening its appeal and accessibility as a career, and being able to invest in mechanisation and automation to mitigate shortfalls in labour supply and to increase productivity to remain competitive.



## 2. The Retail of Plants and Trees

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Supporting a supply chain of garden goods, providing jobs and economic benefits

In 2019, garden retail directly contributed £2.2 billion in GVA to the UK's economy. Much of this contribution is highly reliant on plants, and has the potential to rise to £2.5 billion by 2030<sup>2</sup>. In addition, garden retail directly contributed £532 million in tax revenue for the exchequer and employed 87,000 people in 2019<sup>2</sup>.

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HTA research estimates that UK consumers spent £2.2 billion on plants for outdoors in 2022, and a further £500 million on houseplants<sup>3</sup>. Garden centres are the leading sales channel for the

But as described earlier in the report, plants play a key part in supporting a wider supply chain of goods produced by UK manufacturers – for example, when a plant is purchased, the ‘basket’ often contains compost, a pot for the plant, plant foods to feed it, and so forth. To this effect, an HTA analysis of garden centre sales data found that in 2022 49% of transactions containing outdoor containers, 48% of transactions containing growing media and 41% of transactions containing chemicals and fertilisers also contained a plant<sup>10</sup>; suggesting that a fall in the volume of plants sold is highly likely to involve a substantial ‘knock-on’ economic impact for garden retailers and the manufacturers of these ‘link-sale’ items. In this sense the economic value of the UK's plants and trees reaches far and wide into the economy.

*UK consumers made an estimated 200 million visits to garden centres in 2022*

purchase of plants (see Figures 1 and 2), many of which are small family-owned businesses, with UK consumers making an estimated 200 million visits to garden centres in 2022<sup>3</sup>. By contrast, the total attendance at all Premier League football matches in the 2022-23 season was around 15 million<sup>4</sup>.

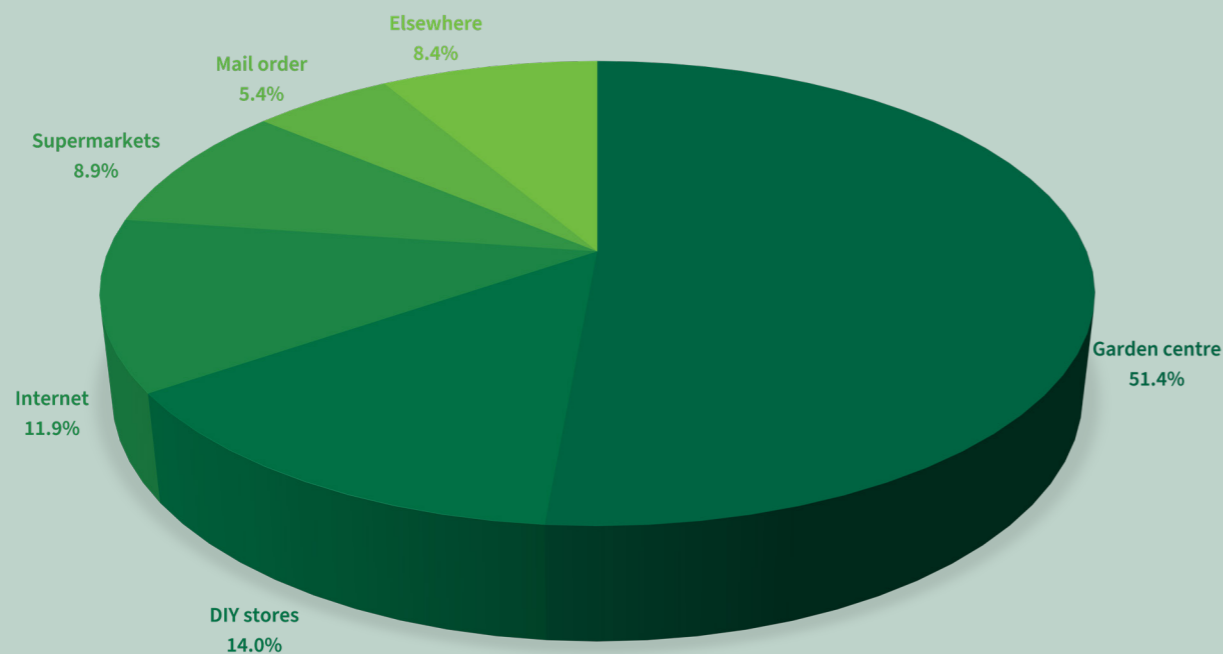


Figure 1. The proportion of total outdoor plant spend (£) made in each sales channel

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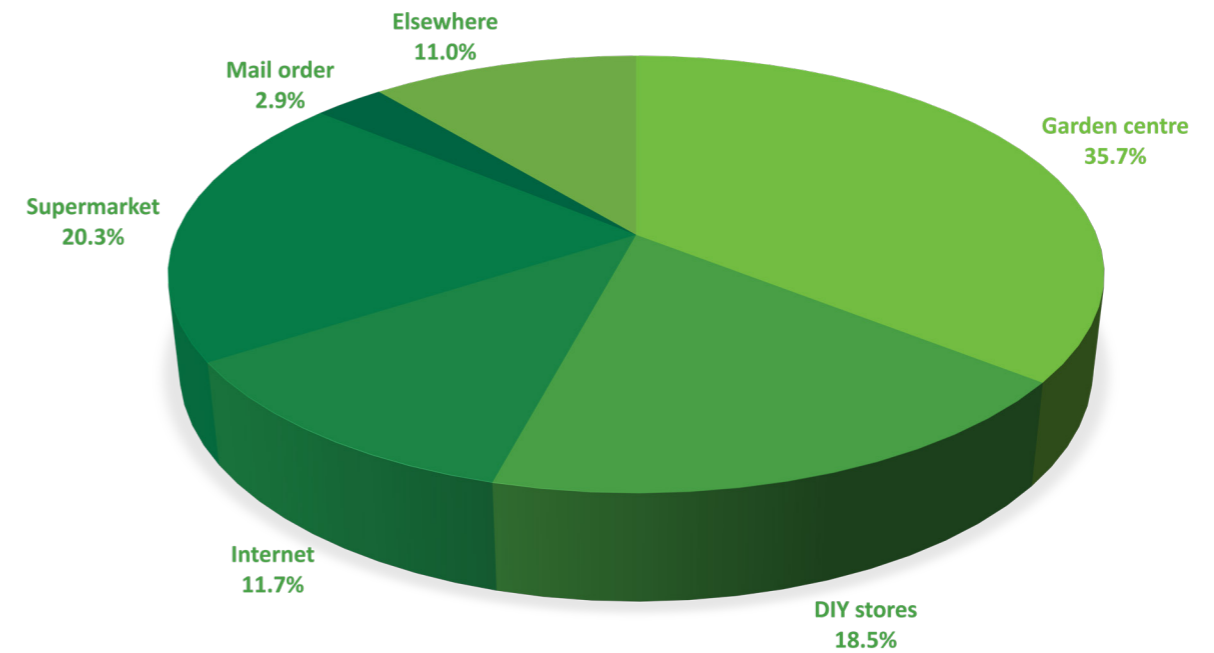


Figure 2. The proportion of total houseplant spend (£) made in each sales channel

Similarly, plants started out as the core offering for many garden centres who have since developed into larger destination centres with cafes and restaurants, children's play areas and grottos at

pattern, with younger consumers accounting for a greater proportion of spending on houseplants than outdoor plants. In this sense houseplants play a critical role in ‘introducing’ gardening to younger consumers who are less likely than average to own their own homes and gardens. It's likely that houseplants play a critical role in developing interest and engagement in plants which develops into further interest in, and higher spending on, gardens and plants in later life. Whilst HTA research shows that consumers aged over

*UK consumers spent £2.2 billion on plants for outdoors in 2022, and a further £500 million on houseplants*

Christmas to name a few attractions. Catering typically makes up around 15% of annual turnover for garden centres that have a café/restaurant<sup>11</sup>; and these are hospitality outlets and economic activity that wouldn't exist without the plants that drive the core part of the business.

### Plants play an important role in the accessibility of gardening and connecting with nature

60% of UK adults (around 32 million) bought one or more outdoor plants in 2022, whilst 46% (24 million) purchased one or more houseplants<sup>3</sup>. Whilst participation in gardening and outdoor plant purchasing is more pronounced among older consumers, houseplant purchasing patterns show a subtly different demographic

55 account for 48% of total spending on outdoor plants, consumers aged between 25-34 are the highest spending age group for houseplants, accounting for 23% of total consumer houseplant spend<sup>3</sup> (see Figure 3). Under 55's account for 66% of total houseplant spend, demonstrating that the desire to engage with plants and the health, psychological and environmental benefit they provide is not limited to any specific age group.

As well as appealing across the age ranges, houseplants also provide a means of connecting with nature and gardening as a hobby among socially-disadvantaged groups in the lowest household income brackets, and among consumers without access to a garden or outdoor space of their own. In fact, 29% of UK adults without access to a garden bought a houseplant in 2022<sup>3</sup>, providing access to the health and wellbeing

benefits of plants which we describe in Section 4. HTA consumer research data demonstrates high levels of indoor and outdoor plant purchasing across income groups, although there is a correlation between higher levels of purchasing and income. For instance, figure 4 shows that 48% of people with a household income less than £15,000 per year were active in the outdoor plant market, and 32% in the houseplant market<sup>3</sup>. We

might conclude that whilst at present plants and trees are relatively affordable across the income spectrum, this has the potential to change should the price of plants and trees increase, which would risk disconnecting more socially and economically marginalised groups from the health, environmental and social benefits provided by plants which we describe in section 4.

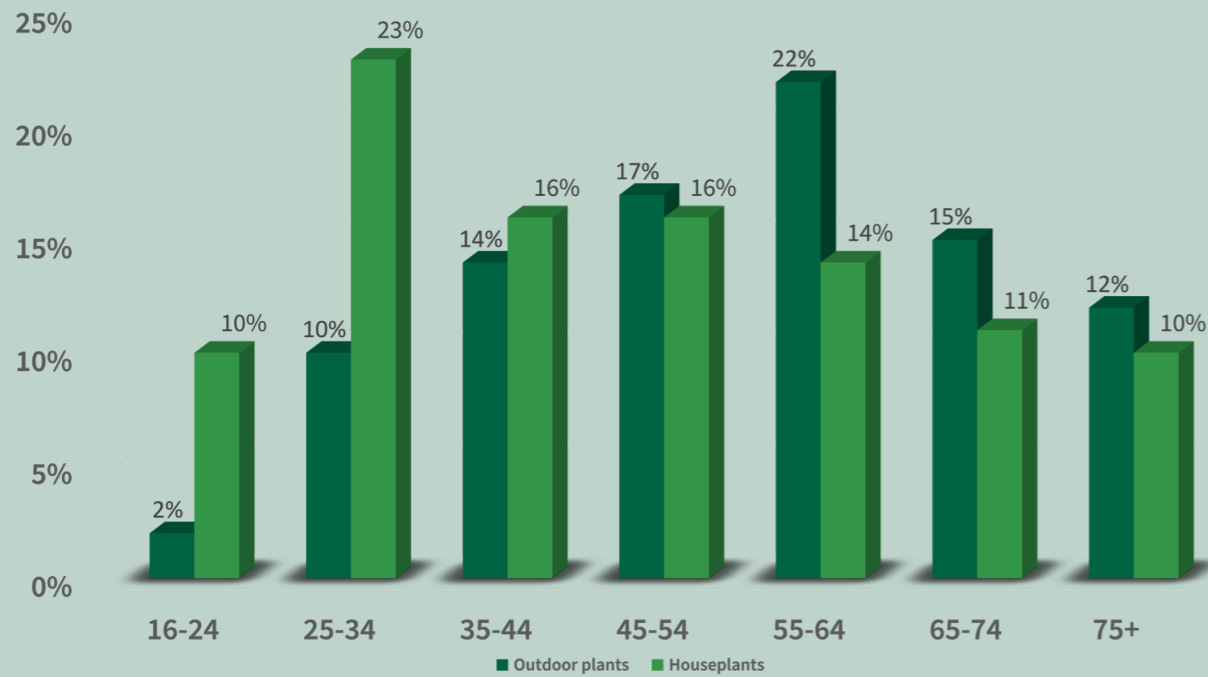


Figure 3. The proportion of total outdoor plant and houseplant spend by age group (2022)



Figure 4. The proportion of people who purchased outdoor plants and houseplants in the last year by household income groups (2022)

# 4. Into Nature

The environmental value plants and trees provide.

Once supplied into nature – that’s to say our domestic gardens or the wider landscape, the plants and trees produced by the UK’s horticulture industry deliver a substantial range of environmental, economic and social benefits to the nation. In environmental terms, the horticulture industry and the plants and trees it produces underwrites seven of the ten goals of the UK’s Environmental Improvement plan.

## Goal 1 – Thriving Plants and Wildlife

Domestic gardens account for almost a third of the UK’s urban areas, providing invaluable support for wildlife. As well as providing habitat in their own right, domestic gardens and the plants within them form vital wildlife corridors, helping species

to other habitats such as grassland and woodland, where bees can access many gardens with a higher diversity of plant species and flowering phases<sup>14</sup>.

Plants are also vital for the functioning of many ecosystems and provide many of the ecosystem benefits that we feel from nature. Plants offer provisioning services by way of physical materials and food, and regulating services such as carbon storage and maintaining the oxygen cycle. They provide supporting services like maintaining healthy soils and providing space for wildlife.

## Goal 2 – Clean Air

A key ecosystem benefit of plants and trees is their ability to remove particulate matter that is less than 2.5 microns in width (PM2.5) from the atmosphere; PM2.5 is one of the deadliest pollutants affecting people. For the UK as a whole woodlands are estimated to account for over 80% of all PM2.5 removed by vegetation, despite only accounting for 12% of the UK land area<sup>15</sup>. Drilling down into the effect of urban vegetation on removal

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to move between areas of public green space like parks and the wider countryside, and between areas of green and blue space. These habitat networks also provide important refuge and a food source for migratory birds and enable our native fauna to move safely between areas of their territory in an ever-expanding urban landscape. Research has shown that increasing the richness, cover or density of native plants in urban green spaces is linked to increases in animal biodiversity, with the biggest factor being the resources provided by the plant itself<sup>12</sup>.

Plants and gardens are also vital for the provision of pollen and nectar for our pollinators. Studies have found that more bee and hoverfly flower visits are recorded in allotments and domestic gardens than most other land uses<sup>13</sup>. Bumblebee nests have also been found more often in domestic gardens compared



of PM2.5 from the air, the estimated value of this ecosystem service provided by plants in terms of avoided negative impacts to human health was worth £667 million in 2021 alone. Furthermore, the impact of this urban green infrastructure on air quality is substantial. According to the Office

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of National Statistics<sup>6</sup> Urban vegetation removed 26,913 tonnes of ground-level ozone in 2021, substantially improving air quality in our towns and cities and supporting the Environmental Improvement Plan's 2040 target of reducing the population's exposure to PM2.5 by 35% compared with 2018 levels.

In the context of the climate emergency, we can anticipate an increasing need for green infrastructure in the coming years to mitigate this consequence of global warming; pollution exacerbates, and is exacerbated by, climate change. Looking at the impact of urban vegetation on air pollution more widely than PM2.5, substantial evidence exists for the value of plants in cleaning the air. A recent research study showed that planting a physical barrier of hedging around schools can reduce the concentration of particulate matter, nitrous oxide, ozone and other atmospheric toxins by up to 77%<sup>16</sup>, and along with other interventions such as air purifiers and vehicle-free zones around schools this is a way of reducing school children's exposure to harmful pollutants. The air pollutant removal services provided by vegetation was valued at £2.4 billion in 2020<sup>17</sup>.

### Goal 3 – Clean and Plentiful Water

As noted in section 1, the UK's growers are investing substantially in reservoir construction and other water resilience measures such as rainwater capture to remove stress on the UK's water supply. However, the benefit that plants and trees provide in water management are substantial. For instance, trees and hedging around fields slow the runoff of water from irrigation or rainfall, and reduce the risk of flash flooding<sup>18</sup>.

### Goal 7 - Mitigating and Adapting to Climate Change

Trees are carbon sinks, and can sequester carbon from our atmosphere, locking it away in their trunks and leaves. One report estimates that all trees across Great Britain currently sequester around 16 million tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e) per year<sup>19</sup>. They also estimated

*Total carbon storage by trees in Great Britain (both above and below ground) is just over 980 million tCO<sub>2</sub>e<sup>22</sup>, making trees a valuable weapon in the fight against climate change*

that total carbon storage by trees in Great Britain (both above and below ground) is just over 980 million tCO<sub>2</sub>e<sup>20</sup>, making trees a valuable weapon in the fight against climate change.

Focusing in on the plants and trees produced for horticulture specifically for amenity spaces such as parks, street-scapes and urban green spaces, the Office for National Statistics estimates that around 1.4 million tonnes of CO<sub>2</sub> was sequestered by the UK's urban trees and woodland in 2017, with a monetised carbon saving value of £89 million<sup>6</sup>. Looking more widely than our urban areas, UK tree production nurseries play a vital part in underwriting the government's ambition to plant

30,000 hectares of woodland by 2025 as part of the nation's strategy to mitigate the effects of climate change.

### Goal 8 – Reduced Risk of Harm from Environmental Hazards

Plants are a key element in mitigating and adapting to the effects of climate change as our future is set to see a changing climate and more extreme weather events.

According to a study by the European Commission, mean average city tree coverage across the EU was 11%, but increasing tree coverage to 30% lowered temperatures by an average of 0.4°C, with a maximum effect of 5.9°C in some areas. This decrease in temperature was estimated to have the potential to avoid 2,644 premature deaths and nearly 40% of all deaths attributable to Urban Heat Island effects<sup>21</sup>. Furthermore, the urban cooling services provided by vegetation in the UK was valued at £430 million in 2020<sup>6</sup>; and in London City region, gardens have an annual cooling effect of -0.24°C.

The roots of plants and trees also enable effective percolation of water into the soil which recharges underground aquifers<sup>22</sup>. Furthermore, the Local Government Association notes that "Sustainable drainage systems (SuDS) are designed to manage stormwater locally (as close to its source as possible), to mimic natural drainage and encourage its infiltration, attenuation and passive treatment. SuDS are designed to both manage the flood and pollution risks resulting from urban runoff and to contribute wherever possible to environmental enhancement and place making"<sup>23</sup>.

Susdrain ([www.susdrain.org](http://www.susdrain.org)) provides numerous case studies of SuDS schemes which incorporate rain gardens, public planting, and green roofs which mitigate and retain rain water in the soil, reducing strain on the UK's water courses and the risk of urban flash flooding. Among their case studies is one for the Aquifer Partnership (TAP)

partnering with Moulsecocomb Primary School to renovate the school's courtyard space to a water-friendly garden with emphasis on education and play opportunities. Downpipes draining a large area of the school's roof space were disconnected and directed into the SuDS features which include ponds with aquatic plants and permeable planted areas with wildlife attracting perennial plants. The total catchment of the rain garden is 637 m<sup>2</sup> and total water attenuation capacity of the feature is 23

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cubic metres of water.

### Goal 9 – Enhancing Biosecurity

As noted in section 1, UK growers and the wider horticulture industry have been at the heart of developing the Plant Health Management Standard (PHMS) with Defra and other stakeholders. As of 2023 around one in seven UK commercial growers had adapted the Plant Healthy biosecurity certification as a route to certifying compliance with the PHMS, and growers with an aggregate crop output value of around £300 million had adopted the OHAS certification scheme which itself is closely aligned with almost all of criteria set out in the PHMS. This collaboration between industry and government provides a good foundation on which to build to further strengthen the UK's protection from plant pests and diseases.

A robust UK plant and tree production capacity is an essential part of protecting the UK's natural landscape from overseas plant pests and diseases. Of particular concern in the Environmental Improvement Plan is the potential for *Xylella Fastidiosa* to reach and become established in the UK. Indeed, the Environment Improvement Plan's plans to introduce stringent requirements for



inspection, testing and pre-quarantine of species such as lavender and rosemary prior to import underlines the value of UK domestic production in ensuring a continued presence of these plants in the UK landscape. In HTA’s consumer survey (see section 5), lavender was the most frequently given response when asked about which garden shrubs had been last purchased by respondents. The more domestic production is able to supply demand, the greater the positive impact both on the UK’s biosecurity and urban biodiversity.

**Goal 10 – Enhancing beauty, heritage, and engagement with the natural environment**

The target set out by the plan that everyone should live within 15 minutes’ walk of a green or blue space, which includes a provision for creating or significantly refurbishing over 100 green spaces through the Levelling Up Parks Fund, is recognition of the value that plants and trees provide towards this goal. First and foremost, this value manifests itself in the fact that around 30 million UK adults participate in gardening. However, garden tourism – the leisure visits to the UK’s parks, gardens and green spaces by UK and overseas visitors, contributed £1.5 billion in direct GVA contributions to the UK economy in 2019<sup>24</sup>.

The UK has an international reputation and is regarded as the ‘gardening capital of the world’, this is demonstrated through the fact that one-third of all international tourist visits to the UK involve at least one trip to a park or garden<sup>25</sup>. The RHS Gardens at Wisley, Rosemoor, Hyde Hall, Harlow Carr and Bridgewater are home to 25 National Plant Collections<sup>26</sup> which draw in visitors from across the globe. In 2019, expenditure from visiting parks/gardens was valued at £1.2 billion from over 182 million trips<sup>27</sup>. Kew Gardens and RHS Garden Wisley held 2nd and 3rd place in the top ten most visited paid attractions in England in 2022<sup>28</sup>. Cities and tourist hotspots are also increasingly advertising their green initiatives and credentials to attract tourists, for example Cornwall’s Eden Project continues to be a trailblazer, and its new Growing Point plant nursery is heated by geothermal energy, harvests rainwater and produces over one million plants per year<sup>29</sup>.

Indeed, the UK is leading the way in greening its urban environment and developing green cities which bring people closer to plants, trees and the range of benefits they bring. Appendix 1 provides three mini-case studies (two UK and one international) of urban greening initiatives which show how plants trees grown, and maintained through horticulture that are enhancing beauty and citizen’s engagement with nature.

# 4. Social and Health Benefits

The social and natural capital value that plants and trees provide

Aside from their contribution to the environment, plants and trees provide substantial value in terms of their contribution to the UK’s physical and mental health, and the sheer enjoyment from gardening and exposure to plants. Plants and trees are also a vital part of the UK’s ‘balance sheet’ of assets – its ‘natural capital’. Natural capital can be defined as “the stock of renewable and non-renewable resources (e.g. plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people.”<sup>30</sup> Plants not only contribute significantly to natural capital in their own right – Defra has estimated that the total natural capital value of the UK’s plants at £11.6 billion per year<sup>31</sup> (this doesn’t factor in domestic gardens, and excludes agricultural crops) they also support the health of other forms of natural capital such as soil, water, air and animals. There is a rich and growing evidence base for the contribution plants make to the UK’s natural capital, and the resultant flow of benefits to the UK’s citizens.

*Defra has estimated that the total natural capital value of the UK’s plants at £11.6 billion per year*

metres squared<sup>3</sup>. Gardening is a popular pastime in the UK, with one in four (25%) people claiming to regularly do gardening in their free time or as a hobby or interest, with a further 40% occasionally doing so (see Figure 6)<sup>3</sup>. Plants, trees and flowers are an important part of this, with 62% of UK adults with a garden/outdoor space claim to using their spaces to grow them<sup>3</sup> – this is equivalent to over 23 million people. Over half (60%) of UK adults bought outdoor plants in 2022, spending £66.95 on average<sup>3</sup>. Meanwhile a further 46% bought houseplants, spending an average of £30.71<sup>3</sup>.

**Exposure to Plants Provides Comfort in Tough Times**

The COVID pandemic caused a retreat to nature and outdoor spaces, as a response to uncertain times and a means to keep busy and healthy whilst other leisure pursuits were unavailable. In 2019, 57% of UK adults with access to a garden or outdoor space said they used them to grow plants, trees or flowers. But in 2020, this figure increased to 64% - equivalent to an extra 3 million new plant gardeners!<sup>32</sup>

**Plants are Loved by a Nation of Gardeners**

The majority of UK adults have access to a garden or outdoor space for gardening (91%), and 76% have a private garden (see Figure 5), of which the average garden size (front, sides and back) is 16

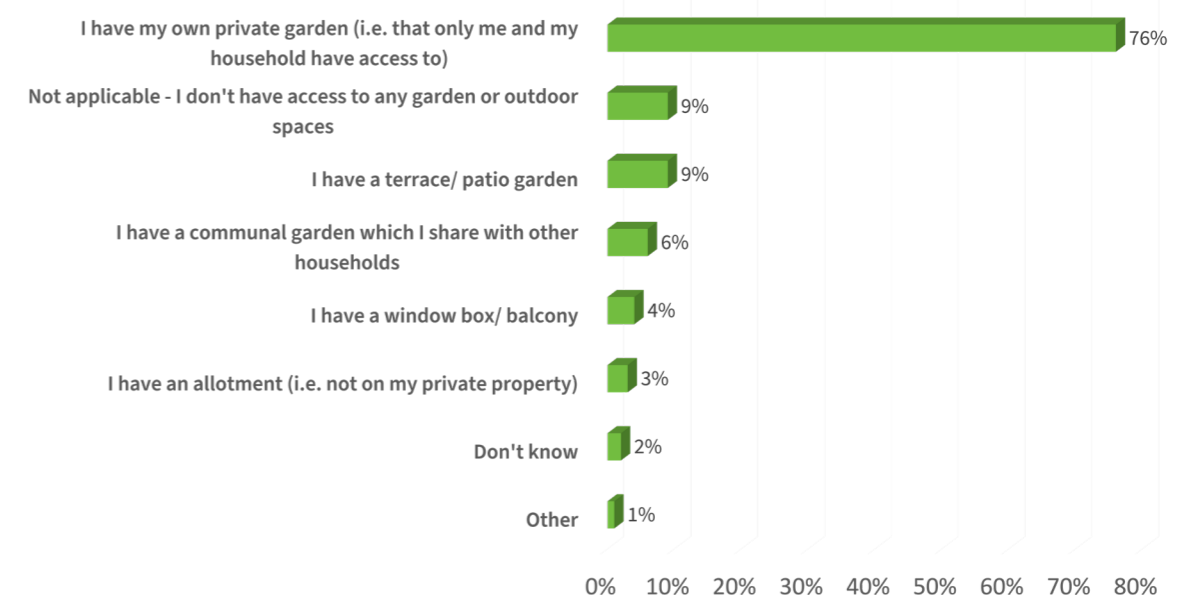


Figure 5. Access to gardens and/or outdoor space for gardening

*The leisure visits to the UK’s parks, gardens and green spaces by UK and overseas visitors, contributed £1.5 billion in direct GVA contributions to the UK economy in 2019*

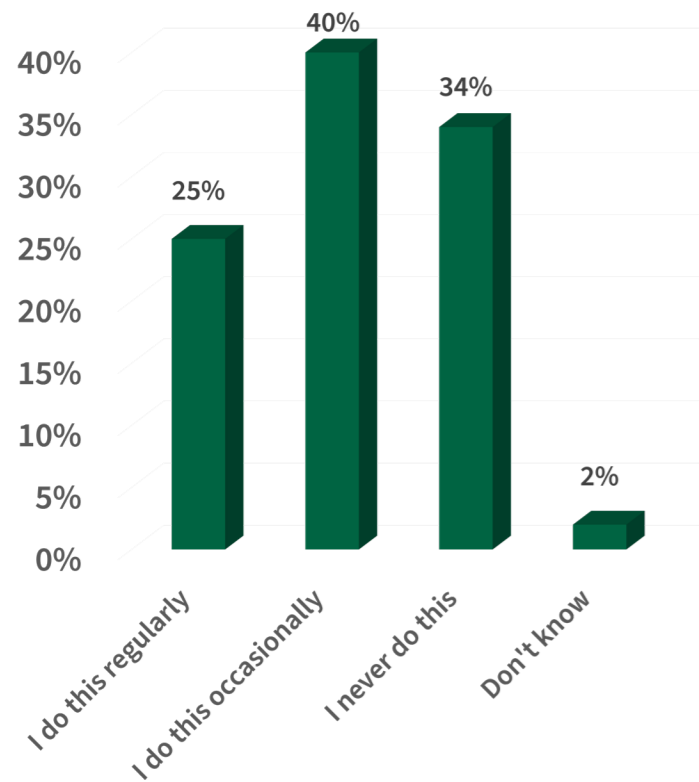


Figure 6. The proportion of UK adults who enjoy doing gardening in their free time or as a hobby/interest.

Similarly, during periods of economic uncertainty, like the previous 2007/8 financial crisis, we have seen a tendency for people to retreat to the garden and enjoy the sense of self-sufficiency that growing your own food can bring; not necessarily as a means of saving money, but to gain comfort from having a sense of control and autonomy. In 2022, 36% of UK adults said that they used their garden or outdoor space to grow their own food (e.g. fruits, herbs and vegetables), an increase from 31% claiming to do so in 2019<sup>34</sup>.

didn't have outdoor spaces for relief too. As people spent time closer to nature, the benefits to our health, wellbeing and productivity at work became more widely appreciated.

### Supporting our Physical Health

In our October 2022 consumer survey, 77% of UK adults agreed that gardens and green spaces benefit their physical health<sup>3</sup>. Gardening and planting, removing, or tending to plants can also be viewed as an exercise in itself, burning up to 200 calories in a 30-minute long stint<sup>33</sup>, and in turn helping to improve overall health and lower risk of obesity, cancer and cardiovascular complications. One report stated that older people who regularly gardened tended to be fitter<sup>34</sup> due to the accessible physical exercise that gardening provides; an important consideration given the UK has an aging population. Nurturing plants within the garden is a low impact activity, making it a suitable form of exercise for many who are less physically mobile. Meanwhile, as well as exercise, growing fruits and vegetables can improve nutrition, diets and indirectly lower the risk of obesity<sup>35</sup>. Plants also play a key role in improving the quality of air that we breathe and remove harmful pollutants that are risk factors in many cancers and diseases. In 2020, air pollution removal services provided by plants and green spaces led to an estimated 2,001 deaths being avoided and prevented the loss of 49,126 years of life<sup>19</sup>.

### Plants Support our Mental Wellbeing

Increasingly, mental health is recognised as of equivalent importance to physical health, with 1 in 4 people experiencing a mental health problem of some kind each year in England<sup>36</sup>. Mental health problems have been found to cost the UK at least £117.9

billion annually, which is equivalent to around 5% of the UK's GDP. But critically, eight in ten UK adults (81%) believe gardens and green spaces benefit their state of mind<sup>3</sup>. One survey revealed that over half (54%) of UK adults walk in nature and perform gardening to restore mental wellbeing as a form

*Gardening and planting, removing, or tending to plants can also be viewed as an exercise in itself, burning up to 200 calories in a 30-minute long stint*

During the lockdowns, caring and nurturing for our plants gave a sense of purpose to newfound extra available leisure time, whilst as people were encouraged to stay home, houseplants provided a means for bringing the outdoors in for those that

*Eight in ten UK adults (81%) believe gardens and green spaces benefit their state of mind*

of self-care<sup>37</sup> and social prescribing is increasingly being used by healthcare professionals over medicating.

Plants and direct exposure to them have been shown to improve wellness in dementia patients<sup>38</sup>; the smell of plants, as well as the colours can help to pacify those displaying aggression, and the stimulation of olfactory and visual senses even aids with memory activation<sup>40</sup>.

Plants have been found to positively affect self-esteem, stress management and creativity, and help alleviate symptoms of mental health conditions like anxiety, depression, and Post-Traumatic Stress Disorder<sup>39</sup>. One study found that for patients in hospitals, exposure to real plants or even posters of plants, resulted in lower levels of experienced stress<sup>40</sup>.

The concept of harnessing the effects that plants and gardening have on mental health, is not a new concept at all. Gardening is often used as a way of 'social prescribing'<sup>41</sup>, an initiative that can help with mental wellbeing amongst addressing other needs. In addition, the concept of Social and Therapeutic Horticulture utilises the activity of gardening as treatment to help those with mental health conditions<sup>42</sup>.

### Improving Productivity at Work and in Study Environments

Just over half of respondents in the Flower Council's Survey in November 2021 (53%) felt that plants help their home office environment<sup>43</sup>. This is perhaps unsurprising given many studies have found that houseplants help to boost happiness, productivity, and concentration in the workplace<sup>44</sup>.

Indoor plants in the workspace and break areas can lead to healthy, productive workplaces through enhanced attention capacity, lower stress levels, and higher job satisfaction<sup>46</sup> – a benefit for employers and employees alike. One study carried

out in the UK found that office workers who worked in offices with natural greenery saw a 15% rise in productivity over a three-month period, in comparison to those working with no greenery or natural elements in their immediate

*Almost two thirds of primary school head and deputy headteachers agreed that school gardening benefitted pupils physical health and mental wellbeing; meanwhile 74% saw benefits to social skills, and 61% recognised benefit to behaviour*



Figure 7. The proportion of UK primary school headteachers and deputy headteachers who agree school gardening delivers different benefits.

environment<sup>45</sup>. Workers who had access to natural elements such as greenery and sunlight in their offices were also 15% more creative<sup>47</sup>. These benefits remain true for younger people too, with foliage plants in view being shown improve the attention and concentration of 11-13 year old students<sup>46</sup>.

### Supporting Children's Development

Exposure to the benefits of gardening and green spaces in early development in children can have real influence on their physical and mental wellbeing. Almost two thirds of primary school head and deputy headteachers agreed that school gardening benefitted pupils physical health and mental wellbeing; meanwhile 74% saw benefits to social skills, and 61% recognised benefit to behaviour<sup>47</sup> (see figure 7). It can support learning on topics like food production and biology in an engaging way too<sup>49</sup>. In an educational setting, school gardening provides an alternative to the classroom, which can benefit children who struggle to learn in a formal setting. It also creates a 'level playing field' for those children. It teaches children to overcome fears about insects, how to act responsibly with tools, and teaches them a sense of patience whilst they wait for the fruits of their labour. Planting seeds, plugs and young plants can also help develop fine motor skills. It

provides learning in a way that is not standard, providing new experiences that can impact many aspects of growing as a person.

### Plants add Value to our Homes and Properties

With such pronounced social and environmental benefits, it's perhaps not surprising that plants and green spaces have been shown to increase the value of the nation's housing stock. A well-presented garden alone has been seen to add 20% to property value, with 70% of home buyers willing to pay more for a property with an outdoor green space<sup>48</sup>. Furthermore, in 2023 the Office of National Statistics reported that the annual value from house prices that can be attributed to living near to green or blue spaces in the UK was £2.8 billion in 2020, roughly £1,000 on average per household<sup>49</sup>. Yet alarmingly, HTA's October 2022 survey revealed that 19% of UK consumers with a private garden intended to pave over at least some of it in the next 5 years, putting an estimated 3-7% of total UK domestic garden area at risk when size of garden is taken into account<sup>3</sup>. This is concerning given the substantial environmental benefits urban greenery and vegetation that are documented in this report.

*A well-presented garden alone has been seen to add 20% to property value*

## 5. The Future Value of Plants

What value do consumers place on plants?

So far in this report we've described and outlined both the process through which the horticulture industry produces and adds value to the plants and trees it produces, and the economic value this contributes to the UK economy. We have also set out the benefits plants bring to our society once they are supplied into the natural landscape, whether in environmental, economic or social terms. But what of the future? In section 1 we have described some of the developments and investments in the supply chain that are being undertaken in order to continue to add value to plants, for instance in the form of reduced environmental impact, more bio-secure operations, and improved efficiency and quality outputs so as to be able to meet consumers' and regulators' expectations and needs in these respects.

Naturally such investments, especially in the current economic context of high inflation, put pressure on supply chain profitability (and the inward ability to invest) and/or prices for customers; this in turn potentially reduces the volumes of plants and trees supplied 'from nursery to nature'. Of course, the relationship between price and demand is not unique to the supply of plants and trees. What is noteworthy however is that any fall in supply and demand driven by rising prices of plants and trees is likely to reduce the environmental and social benefits of plants described in this report. And to complete the vicious circle, reduced output is likely to constrain the ability of growers to make the investments in the measures needed to continue to add the value to plants that consumers increasingly expect.

With this dilemma in mind, HTA commissioned new research to understand the value that consumers place on plants and potential 'value added' attributes relative to increased prices, and to understand the relationship between increased plant prices across the market and volumes of plants and trees retained to consumers. It is important to note that in this study the analysis of the impact of price

increases for plants relates to sector-wide price inflation of plants compared with inflation across the wider economy; it does not and should not be seen as a guide to the impact on volumes of plants supplied by a single business increasing or decreasing its prices in isolation from the rest of the market and its competition.

### Research Approach and Methodology

The study uses a research technique called conjoint analysis. This methodology does not rely on consumers directly self-reporting their propensity to purchase at a given price as such methodologies are limited in their effectiveness, with a gap consistently appearing between what respondents report in a survey and real-life behaviours. Instead, conjoint analysis presents respondents with a series of trade-offs between two plants with different attributes and price points. Neither choice is 'optimal' – which requires respondents to subconsciously trade-off features against each other. Advanced statistical analysis is then used to unpick these 'trade offs' and attach relative value to different features of a plant in making a purchase decision. For instance, the



statistical analysis provides data on the relative impact that, say, a plant guarantee would have on consumer preference compared with an eco-label or the fact that the plant was grown in the UK. Further, we are able to assess the extent to which the value of these different features would be likely to offset ‘across-the-market’ the impact on falling volumes of sales of plants that might be driven by plant price increases relative to the wider economy. We are also able to explore the impact on this for different consumer demographics, for instance providing insights on what value-added features of plants add most value to different consumers, and on whether price inflation around plants is more or less likely to exclude different demographics from the benefits of plants described throughout this report.

The feature set we tested in the study were those that could be added to a plant’s label or point of sale to promote a potential additional selling point, some hypothetical, some already used in the marketplace; these were:

- Grown in peat free compost
- UK grown
- Pollinator-friendly
- Plant care information provided via QR code
- Certified from a nursery with excellent plant pest and disease controls
- Provision of a plant guarantee (for hardy plants only), where the levels tested were:
  - Lifetime
  - 5 year
  - 1 year

- Environmental rating, where the levels tested were:
  - Eco rating ‘A’
  - Eco rating ‘C’
  - Eco rating ‘E’

In terms of pricing, the effect of price inflation of 5%, 10%, 15%, 20%, 25% and 30% on volumes purchased was tested. Respondents used their most recent plant purchase that included bedding or hardy nursery stock as the basis for the analysis – e.g. they were asked for purchase preferences for modified versions of the plant(s) they last purchased, with the modifications based on different combinations of the feature set and price thresholds for the study.

### The Relationship between Price Inflation and Volumes of Plants Supplied

Modelling from the results showed plant purchases to be highly price sensitive, with price being a bigger driver of purchase volume than any of the value-added features tested on their own. Figure 8 estimates the impact on volumes of plants supplied to the market in the event of an average across-the-board increase in plant prices relative to the rest of the economy. The chart shows the proportion of actual plant volumes retailed to respondents that would be maintained at different levels of across-the-board price increases, assuming that the plants purchased were ‘like-for-like’ in terms of the value added features the plant provided. The modelling shows that at a 5% price increase level, modelled volumes of plant purchase fell by 12.5%, and by 15.4% at the 10%

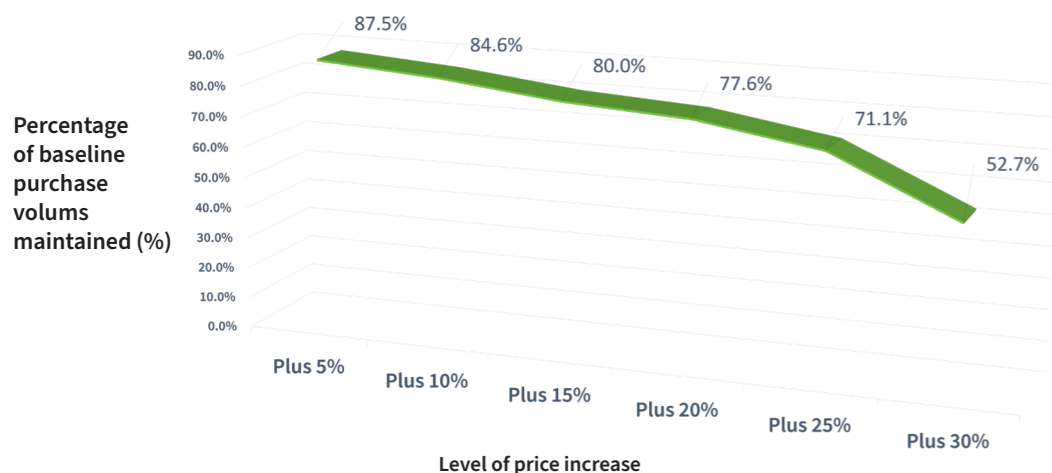


Figure 8. Hypothetical plant purchase volumes (bedding plants and shrubs) maintained at different levels of price increase.

The modelling shows at a 5% price inflation level, modelled volumes of plant purchase fell by 12.5%, and by 15.4% at the 10% price inflation level

price increase level. This demonstrates that any increased costs in the supply chain for producing plants would be likely to materially reduce the volume of plants supplied into the market to consumers should these lead to price increases across the market relative to the rest of the UK economy, for instance were costs unique to the process of producing plants and trees passed on to consumers.

However, as noted this modelling is based on the plants supplied being equivalent in terms of feature sets to those the respondents had last purchased. On average, respondents claimed that the plants they last purchased had 1.4 of the seven

features tested in the study, leaving substantial potential to mitigate any falls in volume by ‘adding value’ to the plants through these features.

The modelling performed shows that the features tested do, to different extents, have a mitigating impact on any fall off in volume sales resulting from price increases. The more features that are added to the plant, the greater the value-added impact on volumes becomes. This suggests that there is an opportunity for retailers to stress these benefits in merchandising to assure shoppers of the value-added provided by plants.

Table 1 shows how the impact each value added feature would have on mitigating the fall off in volumes that would result from a 5% across-the-board increase in plant prices. Or, looked at another way, the relative impact of each value-added feature on consumer preference. The basis for the modelling is in comparison with a plant with none of the value-added features tested in the study.

The presence of a lifetime guarantee (applicable only to shrubs and not bedding plants) commanded the greatest uplift in indicated purchase volumes, increasing volumes by 6.4% compared to a ‘no label’ plant. This was followed by pollinator friendly (+5.9%), a 5 year guarantee (+4.6%) (shrubs only), certified from a nursery with excellent plant pest and disease controls (+4.3%), and the eco rating of A (+4.1%).

Interestingly, when the Eco rating E label was present, the volume fall off was greater than the presence of no feature label at all, suggesting that plant purchasers would be likely to penalise plants either shown or perceived to have a negative environmental impact, for instance in the way in which they are produced. This underlines the likely growing importance for plant production to

Value added feature	Extent of mitigating impact on plant sales volumes
<b>Plant guarantees (shrubs only)</b>	
Lifetime guarantee	6.4%
5 year guarantee	4.6%
1 year guarantee	3.2%
<b>Pollinator friendly</b>	5.9%
<b>Certified from a nursery with excellent plant pest and disease controls</b>	4.3%
<b>Eco-rating</b>	
Eco rating A	4.1%
Eco rating C	2.6%
Eco rating E	-0.4%
<b>Plant care information via QR code</b>	3.9%
<b>Grown in peat free</b>	3.3%
<b>UK grown</b>	1.9%

Table 1. The impact of ‘value added’ features on mitigating the 19.2% fall in plant sale volumes at a 5% price increase level, in comparison to where no ‘value add’ label was present

embrace sustainable methods of production. The presence of a UK grown label was positive, but held less value relative to the other features tested. Whilst we cannot tell from the data, this may be because of factors such as knowledge that certain types of hardy plants cannot be produced in the UK as effectively as overseas, or that consumers on the whole assume that the plants being retailed are sourced from the UK.

The modelling also showed that the addition and combination of feature sets worked in combination to deliver value; the more feature sets that were added to the plant the more value respondents attached to the plant. However, there is a satiation effect in the data. The more features that are added, the less cumulative impact there is on volumes.

Figure 9 shows that when three of the features tested are present, 92.5% of the intended purchase volume is maintained in the context of a 5% across-the-market increase in plant prices. Even at the 20% price increase level, the presence of three features mitigates volume drop-offs by more than half, from 32.2% to 15.7%. But when all seven of the features are present at their most optimum level (i.e. the eco rating is A and the plant guarantee is for a lifetime), we see a small (+2%) volume uplift in plant sales, even in the context of a 5% price increase. Even in the modelling performed on volumes in the context of a 30% across-the-board increase in plant prices, there

is a substantial mitigating effect on the fall off in volumes of plant sales, although there is still a 13.3% fall off in this scenario compared with a scenario in which prices remain constant.

The modelling performed is conclusive in two respects: that there is a high-degree of price sensitivity among gardeners and that price increases for plants relative to the rest of the economy – such as those that might be driven by cost increases in the supply chain specifically affecting plant and tree production - would adversely and substantially impact the volume of plants supplied to consumers and into the natural landscape. The study though is also conclusive that the value-added feature sets tested resonate with plant purchasers, and have potential to re-assure consumers as to the benefits of their plants and encourage further participation in gardening. However, a limit to this modelling is that it does not (and nor would it be practical to) factor in the word-of-mouth impact that across-the-board increases in plant prices might have on the market.

We have modelled the impact on purchased plant volumes of a 5% across-the-board increase in plant prices among different consumer groups should all seven 'value added' features be present at their optimal level. This helps to show the extent to which these value added features might be expected to mitigate or compensate for rising prices among different types of gardener

Price Inflation Level	Garden Proud	Bare and Basic	Convenience Gardeners	Family Focus	Gardening Elders	Backyard BBQs	Alfresco Aspirations	Aging Ambivalent	What Garden?
5%	93%	115%	115%	103%	90%	113%	126%	103%	113%
10%	92%	113%	112%	103%	87%	112%	125%	102%	111%
15%	91%	111%	111%	101%	86%	108%	118%	93%	109%
20%	90%	109%	111%	99%	85%	108%	118%	93%	106%
25%	89%	108%	108%	97%	83%	105%	115%	91%	104%
30%	84%	103%	101%	90%	74%	95%	110%	83%	91%

Table 2. The percentage of baseline plant purchase volume maintained when all 7 features are present at their most optimum level, at different price inflation levels, by HTA Garden Consumer segment.

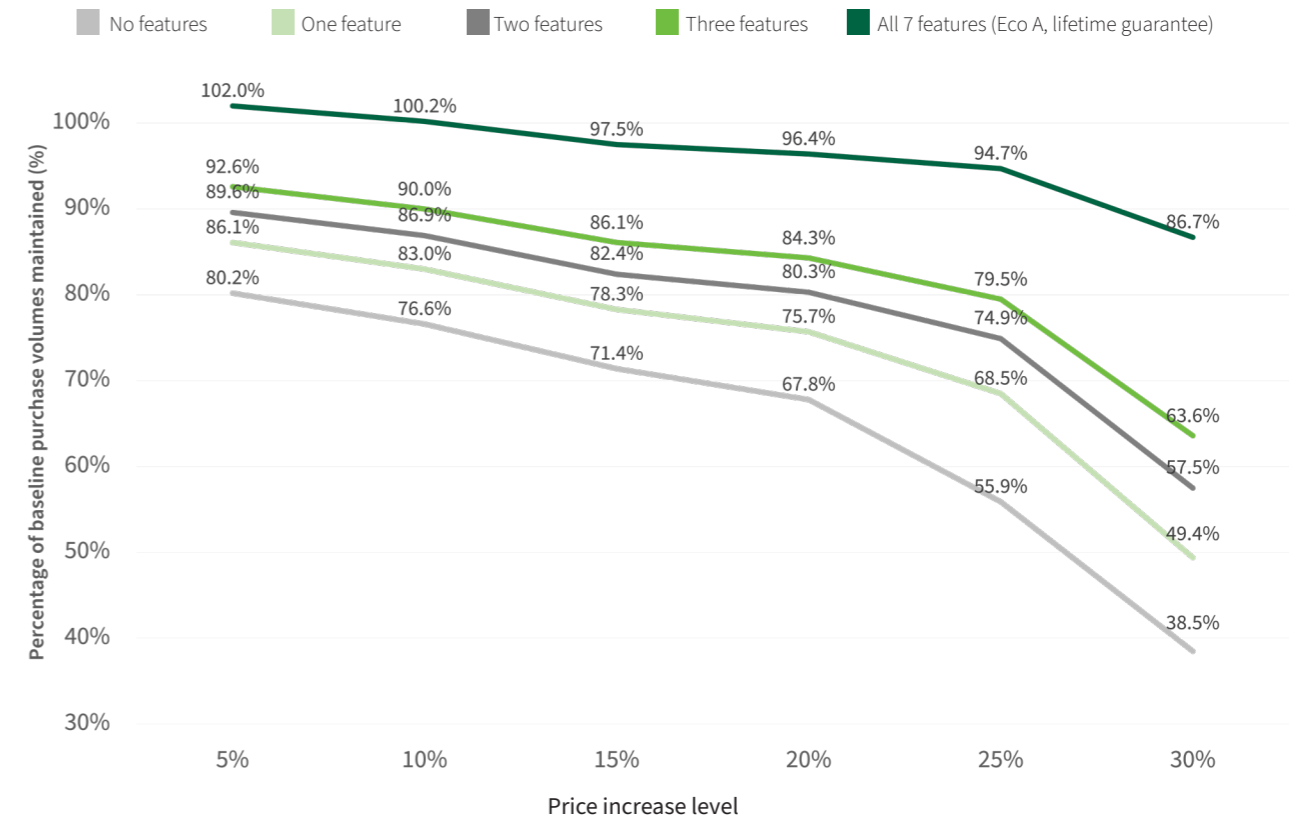


Figure 9. The cumulative impact of 'value added' features on mitigating the volume fall in plant purchases at different price levels.

(Table 2). The modelling is performed using the HTA's Garden Consumer Segmentation, which groups gardeners into nine typologies ([hta.org.uk/gardenconsumers](http://hta.org.uk/gardenconsumers)). Critically, the Gardening Elder and Gardening Proud segments account not only for most consumer spending on plants, but also provide significant 'word of mouth' influence among other types of gardeners, for instance advising grown-up children on gardening and plant choice.

The modelling shows that even at the 5% price increase level with all seven value-added features, purchase volumes among the Gardening Elders (-10%) and Garden Prouds (-7%) fall substantially. These two segments made up an estimated 47% of total outdoor plant and 37% of total houseplant spend in 2022<sup>4</sup>. Meanwhile, the less knowledgeable gardening segments whose plant purchases are less frequent and tend to be lower value seem to value the value added features more, at least in terms of the extent to which they mitigate the impact of price inflation.

This data holds two key insights. Firstly, that the highest spending opinion-leaders in the market are not only acutely sensitive to price increases, but that their expectations from the value-added features of plants that we tested are already high. In short, these features are increasingly 'hygiene factors' in plant purchasing – a base level of expectation rather than something that these more expert and high spending consumers see as differentiators that would justify price increases. Secondly, we could conclude given the opinion leadership role these two consumer groups have in the market, that these expectations are likely to 'percolate' into other consumer groups in the coming years, leading to rising consumer expectations around the quality, provenance, environmental impact of their plants. Thirdly, we would conclude that maintaining and increasing the supply of plants to consumers in future - along with the environmental and social benefits they deliver - will increasingly depend on the horticulture industry being able to keep pace with these consumer expectations.

This report has described the system of plant production and supply that is in place in the UK, and the network of growers and retailers that underpin the supply of plants and trees to our green spaces and domestic gardens.

It has shown the substantial economic benefit that businesses in this supply chain provide to the UK economy, and the specific challenges being faced in this supply chain that necessitate investment, for instance investments in transitioning to more sustainable methods of plant production and developing robust biosecurity practices to protect the UK's natural landscape.

We have also described the huge environmental and social contribution that this supply chain to the UK and its citizens. Indeed the industry and the plants and trees it produces have a key role to play in delivering seven of the ten goals of the government's Environmental Improvement Plan. However, we have also demonstrated that these benefits are at risk, and that plant production and supply is on the cusp of either a vicious or virtuous circle.

In terms of risk, many of the costs of doing business impacting specifically on plant and tree growers, such as the transition to peat-free production, shortages in labour supply, and the ability to invest in areas such as mechanisation and greater biosecurity are necessary to meeting consumer and regulatory expectations. However, this research has demonstrated that these costs

cannot be passed on to consumers without seriously jeopardising the volume of plants and trees supplied, along with the environmental and social value they add to the UK.

In terms of opportunity, there is much to be gained for the UK from a supply chain that is able to sustain the investment needed to deliver plants and trees that are more cost-effectively, sustainably and locally produced in the UK. Our consumer research has shown not only that gardeners are highly sensitive to price, but also that they are increasingly attaching value to the provenance, plant health and environmental impact of their plants. Much benefit has already been derived from policy initiatives which support such improvements in the supply chain, for instance in terms of fiscal incentives to support investment in water efficiency measures such as reservoir construction, and in mechanisation. Sympathetic policy development and collaboration between industry and government to build on this is likely to be key to sustaining and increasing the value that UK-produced plants and trees currently deliver to the country.

The 2023 Environmental Improvement Plan provides a common-ground on which such collaboration can be based. The specific opportunities for such collaboration are set out in more detail in our accompanying document, *Delivering the UK's Environmental Improvement Plan 2023 through the Value of Plants*.

## Case Studies on the Value Plants Deliver to Green Cities

### Inspiring future towns and cities

Urban areas are using the vast array of benefits plants provide to futureproof themselves and protect the people and wildlife living there. The use of living walls, roof gardens, sustainable drainage systems and increased tree coverage all feature and will likely become more prevalent in our future towns and cities.

#### Example 1: Sheffield – “Grey to Green”

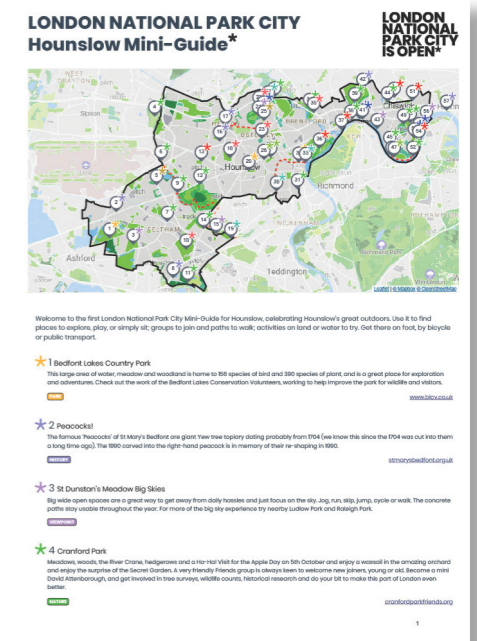
The Grey to Green project<sup>50</sup> has introduced greenery and colour to Sheffield city centre, boasting the UK's longest ‘green street’ corridor and largest sustainable urban drainage scheme. It has converted what was previously a concreted area into a green public space to encourage cycling and walking; and its multi-layer planting beds capture and hold on to debris and pollutants, preventing them from reaching Sheffield's watercourses and the pedestrians walking alongside the development.



The area is also home to ‘Pollen’ – a monthly outdoor flower market that features greenery, live music, art and local produce, showcasing independent businesses from across Sheffield.

#### Example 2: London – a “National Park City”

London's National Park City campaign was launched in 2013 supported by the National Park City Foundation, and aimed to inspire people to make London greener, healthier, wilder and encourage people into the outdoors. The campaign produced a set of accessible maps and posters (The All London Green Grid), allowing people to easily see the network of London's green spaces, of which there are many.



Meanwhile the London National Park city website highlights these destinations and experiences to encourage people to visit them. A group of London National Park City Rangers were set up, largely volunteers, to become trusted people within their communities to facilitate projects, educational activities and youth programmes that help to tackle the climate crises, scale up urban greening initiatives and get people outside. An 'Urban Greening Factor' (UGF) policy planning tool was developed to encourage an increase in the quantity and functionality of green infrastructure in new built environment development projects. It evaluates and quantifies the amount and quality of urban greening to inform decisions about appropriate levels of greening in new developments. Landscaping professionals can use the tool in their plans to identify their UGF score, and make design changes to meet the target scores of 0.3-0.4.

*By 2030, 30 therapeutic gardens will be built across Singapore to offer restorative spaces for people with conditions such as Attention Deficit Hyperactivity Disorder (ADHD) and dementia<sup>38</sup>.*

### Example 3: Singapore - "City in Nature"

Singapore has been greening for almost 60 years and has created a network of nature throughout the urban environment. By 2026, they expect to have more than 300 hectares of gardens and parks, which will be naturalised in various ways as part of their Nature Park Networks<sup>52</sup>.

The use of nature-based solutions such as converting concrete canals into naturalised rivers are used throughout alongside living walls and roofs with the aim to have 200 hectares of skyrise greenery island-wide by 2030<sup>38</sup>.

### Providing jobs and economic activity in the landscape services sector

These urban greening projects clearly require the services of landscaping professionals to bring them to fruition. The landscape services sector supported over 330,000 jobs in 2019 split across both domestic garden and public infrastructure projects, and supported contributions of £13.4million to national GVA and £2.6million in tax revenue to the exchequer<sup>2</sup>.

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