



Andrena fulva © Frank Vassen/Flickr

Business and nature working together: **action by the horticulture sector to protect wild pollinators**

Business and nature working together: **action by the horticulture sector to protect wild pollinators**

This document has been drafted by Arcadis within the framework of the contract No 07.0202/2018/795538/SER/ENV.D.2 “Technical support related to the implementation of the EU Pollinators Initiative”. The information and views set out in this document may not be comprehensive and do not necessarily reflect the official opinion of the Commission, or Arcadis and partners. The Commission does not guarantee the accuracy of the data included in this document. Neither the Commission nor Arcadis or any person acting on the Commission’s behalf, including any authors or contributors of the notes themselves, may be held responsible for the use which may be made of the information contained herein. Reproduction is authorised provided the source is acknowledged.

More information: https://ec.europa.eu/environment/biodiversity/business/index_en.htm

Arcadis Belgium. 2020. Business and nature working together: Action by the horticulture sector to protect wild pollinators. Technical guidance prepared by Arcadis for the European Commission under contract No 07.0202/2018/795538/SER/ENV.D.2 “Technical support related to the implementation of the EU Pollinators Initiative”.

Authors: Kim Driesen (Arcadis), Hans Van Gossum (Arcadis)

List of contributors: Evelyn Underwood (IEEP), Gabrielle Flinn (IUCN), Catarina Ferreira (IUCN)

Date of completion: August 2020

Manuscript completed in August 2020

The European Commission is not liable for any consequence stemming from the reuse of this publication.

Luxembourg: Publications Office of the European Union, 2020

© European Union, 2020

The reuse policy of European Commission documents is implemented based on Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39).

Except otherwise noted, the reuse of this document is authorised under a Creative Commons Attribution 4.0 International (CC-BY 4.0) licence (<https://creativecommons.org/licenses/by/4.0/>). This means that reuse is allowed provided appropriate credit is given and any changes are indicated.

For any use or reproduction of elements that are not owned by the European Union, permission may need to be sought directly from the respective rightholders.

PDF ISBN 978-92-76-22851-6 doi:10.2779/198201 KH-03-20-618-EN-N

GETTING IN TOUCH WITH THE EU

In person

All over the European Union there are hundreds of Europe Direct information centres. You can find the address of the centre nearest you at: https://europa.eu/european-union/contact_en

On the phone or by email

Europe Direct is a service that answers your questions about the European Union. You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
- at the following standard number: +32 22999696 or
- by email via: https://europa.eu/european-union/contact_en

FINDING INFORMATION ABOUT THE EU

Online

Information about the European Union in all the official languages of the EU is available on the Europa website at: https://europa.eu/european-union/index_en

EU publications

You can download or order free and priced EU publications at: <https://op.europa.eu/en/publications>. Multiple copies of free publications may be obtained by contacting Europe Direct or your local information centre (see https://europa.eu/european-union/contact_en).

EU law and related documents

For access to legal information from the EU, including all EU law since 1952 in all the official language versions, go to EUR-Lex at: <http://eur-lex.europa.eu>

Open data from the EU

The EU Open Data Portal (<http://data.europa.eu/euodp/en>) provides access to datasets from the EU. Data can be downloaded and reused for free, for both commercial and non-commercial purposes.

Table of content

BUSINESS AND NATURE WORKING TOGETHER: ACTION BY THE HORTICULTURE SECTOR TO PROTECT WILD POLLINATORS	2
BUSINESS AND NATURE WORKING TOGETHER: ACTION BY THE HORTICULTURE SECTOR TO PROTECT WILD POLLINATORS.....	6
Why is this guidance needed?.....	6
Why should your business care?.....	6
What can your business do?.....	6
1. WHAT YOU AS A BUSINESS MANAGER SHOULD KNOW ABOUT POLLINATORS.....	8
1.1 Importance of pollinators for horticulture	10
1.2 Site and value chain impacts	12
2. WHY DO POLLINATORS MATTER TO YOUR BUSINESS?.....	13
3. WHAT CAN YOUR BUSINESS DO?.....	16
3.1 Actions for companies active in the cultivation of plants, plant material and seeds.....	17
3.2 Value chain actions	19
3.3 Site/local level actions.....	20
4. WHAT ARE FRONT-RUNNERS ALREADY DOING?	23
5. FURTHER READING	27
References.....	29
Annex I.....	30
Credits.....	30

Business and nature working together: **action by the horticulture sector to protect wild pollinators**

Why is this guidance needed?

This guidance document for businesses is part of the broader implementation of the EU Pollinators Initiative¹. The initiative was adopted by the European Commission (EC) on 1 June 2018, setting the framework for an integrated approach to address the decline of pollinators in Europe through three priorities:

1. Improving knowledge on the decline of pollinators, its causes and consequences;
2. Tackling the causes of such decline;
3. Raising awareness, engaging society and promoting collaboration.

One of the important actions of the initiative is to encourage and enable the business sector to take action for wild pollinators.

This document aims to provide such guidelines to the horticulture sector. Its scope includes both site-specific local actions as well as measures across the value chain that can contribute towards the conservation and restoration of wild pollinator populations. The guidance document also informs businesses on the risks that stem from the decline of wild pollinators, and opportunities that arise from taking action to reverse this negative trend.

Pollinators – such as bees, hoverflies, moths, butterflies and beetles – are declining dramatically around the world, and Europe is no exception. With pollinator populations being essential in underpinning the stability of pollinator services over time, this decline of pollinators puts managed and natural ecosystems functioning at risk.

Why should your business care?

The loss of pollinators would decrease crop production by more than 90% in 12% of the leading global crops. With horticultural businesses facing possible shortages of plant or seed material, reduced production and a decline in crop quality, it's no overstatement that pollinator decline calls for urgent conservation action.

However, the horticulture sector can turn this problem into an opportunity. Restoring pollinator populations to healthy levels will help prevent economic losses, provide other environmental and social benefits and assist the company in building/maintaining a good rapport with the public.

What can your business do?

The horticulture sector is well placed to contribute towards stopping the decline of wild pollinators. The sector can lead by example showing how horticultural plants are produced and which producing practices should be rewarded.

This guidance provides recommendations for action by

this business sector to protect wild pollinators illustrated with examples of companies taking the lead in creating opportunities for both the sector and pollinators.

¹ COM(2018) 395 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1528213737113&uri=CELEX:52018DC0395>

The horticulture sector can:

- ▶ make a well-considered choice of plant species, considering the importance of the plant species for pollinators, and avoiding invasive alien species;
- ▶ convince its suppliers to take measures directly on the fields, for example by creating multifunctional field margins, installing patches of flower rich habitat and thereby diversifying their production landscapes and increasing habitat heterogeneity;
- ▶ avoid the usage of pesticides, by adopting integrated pest management (IPM) practices;
- ▶ promote actions to ensure healthy pollinator populations within the value chain;
- ▶ encourage its suppliers to take action by offering long-term contracts tied to commitments to deliver richer biodiversity on their land and greater diversity of habitats for pollinators;
- ▶ raise awareness of the role of pollinators to its stakeholders and encourage them to partake in actions that promote pollinator conservation;
- ▶ direct its customers into buying native, pollinator-friendly plants and provide them with advice on how to apply sustainable management practices that ensure varied and rich flowering from early spring to late autumn to benefit bees, butterflies and other insects;
- ▶ monitor and evaluate the impacts of its actions on wild pollinators;
- ▶ partner up with NGOs, local nature authorities and/or academics when drafting, implementing and evaluating actions for pollinators, whether they focus on company's site or the supply chain.





1. WHAT YOU AS A BUSINESS MANAGER SHOULD KNOW ABOUT POLLINATORS

Pollinator populations are essential to underpin the stability of pollination services in the short- and long-term. Indeed, without pollinators, a large majority of flowering plants will not be able to reproduce and eventually will decline, causing serious cascading effects across ecosystems and business value chains. Many fruits, nuts and vegetables will be lost from our diets, but also other important raw materials and products, such as vegetable oils, cotton and flax, plant-based pharmaceutical and cosmetic products. In essence, pollinators play a crucial role in maintaining terrestrial ecosystems healthy and resilient, which in turn deliver essential services to our businesses and society at large.

Pollinators – such as bees, hoverflies, moths, butterflies and beetles (Figure 1) – are declining dramatically around the world, and Europe is no exception [1, 2]. Many species are threatened with extinction creating a pollination deficit [3]. This puts managed and natural ecosystems functioning at risk, with businesses facing possible serious shortages of raw materials, a decline in crop quality and challenges with the security of the supply chain.



Figure 1. A snapshot of the diversity of wild pollinators

In addition to the impact on farmers' crops, the loss of wild pollinators will also lead to serious problems in terms of the benefits to society that our already fragile ecosystems are delivering. The reduced growth of specific pollinator-dependent vegetation on a mountain slope, for example, could lead to an increased erosion effect or flooding. To maintain our ecosystems and

landscapes healthy, wild pollinators are crucial allies. Indeed, we rely on wild pollinators for very important services in maintaining our ecosystems. There are no alternatives to species rich communities, and both businesses and society should therefore increase their efforts for the protection and restoring of wild pollinator populations.

² Pollination is the transfer of grains of pollen between flowers which enables the reproduction of flowering plants (both wild and domesticated). Without animal pollinators, many plants cannot set seed and reproduce. When humans benefit directly from this function, pollinators thereby deliver a free pollination service.

1.1 Importance of pollinators for horticulture

For this guidance, horticulture has been defined as the cultivation, processing and sale of plants. These plants have a range of purposes such as for food, materials, to facilitate hobbies and for decoration [4]. Many important resources are produced by horticulture such as fruit, nuts, vegetables, aromatic plants, medicinal plants, seeds, flowers, potted ornamental plants; and plants that are used in landscaping (e.g. trees, shrubs, turf and ornamental grasses) [5].

Pollination is crucial for plant reproduction. Many horticultural crops require cross-pollination by pollinators in order to produce fruit and therefore seeds [6]. Although some plants can self-pollinate,

the produce higher quality fruits and seeds if they are cross-pollinated with the help of pollinating insects. More than three quarters of the leading types of global food crops, occupying 33-35 per cent of all agricultural land, rely to some extent on animal pollination for yield and/or quality [4] (see Figure 2). Furthermore, it is expected that total pollinator loss would decrease crop production by more than 90% in 12% of the leading global crops [6]. Although exact figures are lacking for the horticulture, negative impacts can be expected. Reduced reproduction and flowering of plants due to the disappearance of pollinators would put horticultural businesses at great risk.

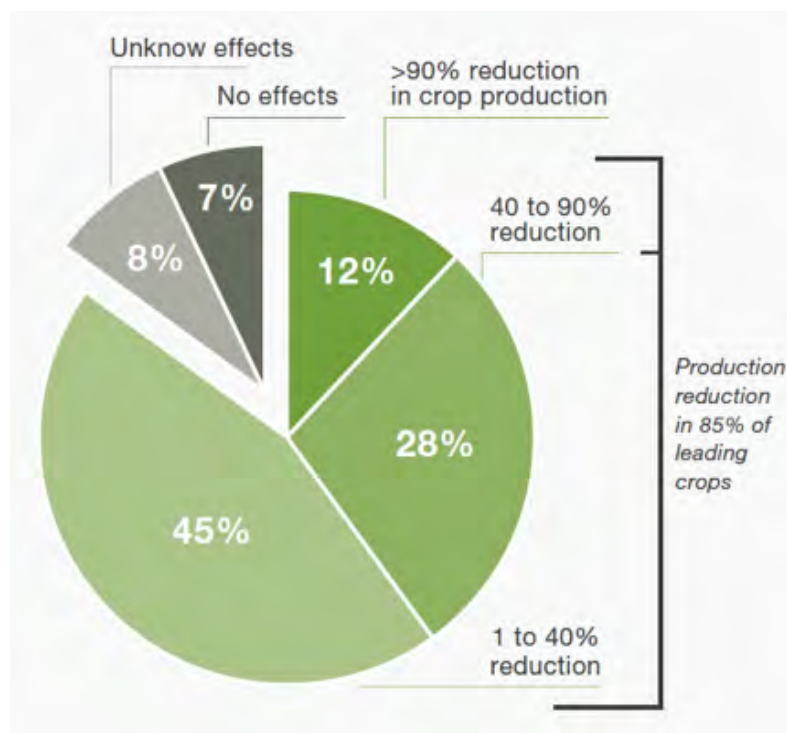


Figure 2. Percentage dependence on animal-mediated pollination of leading global crops that are directly consumed by humans and traded on the global market [6]

Copyright © 2016, Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)

In addressing this challenge, it is important to note that quick solutions such as ensuring insect pollination by providing a single managed species (such as the western honey bee or the buff-tailed bumblebee) is risky and does not provide a long-term sustainable replacement to a diverse community of wild pollinators.

Species richness and abundance of wild pollinators underpin effective and stable crop pollination over time and space, thereby safeguarding the quantity and quality of crop yields. Maintaining a diverse wild pollinator community ensures that plants will be pollinated even in cases where certain species fail to perform. It will also provide resilience to dynamic agricultural environments and acts as a buffer against extreme future environmental and climatic fluctuations, such as those expected to occur in the context of climate change. While measures promoting pollination by managed pollinator species can play a role in specific cases in the short-term (for example in biodiversity-

deprived areas), they are costly and do not present a sustainable solution in the longer-term. Evidence shows that investing in the conservation and creation of pollinator habitats around pollinator-dependant crops is a much more worthwhile and preferred investment [7], especially because it enables the rendering of (wild) pollination services for free [8] and in a more effective and efficient manner than single managed species.

Differences between honey bees and wild bees

Honey bees and wild bees are often both included when bee conservation and campaigns are conducted. Obviously, the two have much in common, however, there are key differences. Conversely, there are around 2,000 bee species in Europe and the honey bee is just one of them.



© Shaith/Shutterstock



© Tom Meaker/Shutterstock

- ▶ Honey bees are generalists, feeding on many different types of flowers.
- ▶ Honey bee occurrence and density depends on the location of bee hives, which is determined by beekeepers.
- ▶ Some wild bees are generalists, whilst others are specialists and exclusively feed from one or a small number of flowering plant species.
- ▶ Wild bees usually occur in lower densities, but due to their species variety have a much more diverse ecological role: they feed and make their nests in many different habitats.
- ▶ Several crops and flowers (such as legumes) can only be pollinated by specific wild bees.

In general, wild bees are more effective and efficient pollinators than honey bees and they provide the service for free. Honey bees have a role to play, but maintaining a species-rich pollinator community is critical for a sustainable pollination service.

In addition to the impact on horticultural crops, the loss of wild pollinators will also lead to serious problems in terms of the benefits to society that our already fragile ecosystems are delivering. The reduced growth of specific pollinator-dependent vegetation on a mountain slope, for example, could lead to an increased erosion effect. In order to maintain our ecosystems and landscapes healthy, wild pollinators are crucial allies. Species-rich grasslands for example, deliver

many ecosystem services such as water supply and flow regulation, carbon storage, erosion control, climate mitigation and cultural ecosystem services, and their health depends on pollinators. There are no feasible alternatives to species rich pollinator communities that can work on a large scale. Thus, both businesses and society should therefore increase their efforts to protect them.

³ Ecosystem services: the benefits to humans derived from nature, with pollination being the free service provided by wild pollinators.

1.2 Site and value chain impacts

Any business is a value chain as is shown in Figure 1 with environmental and social impacts occurring across the value chain.

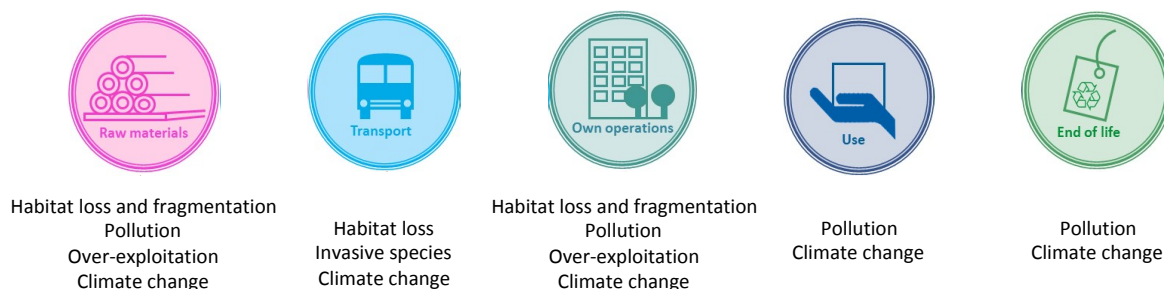


Figure 1. Value chain link with key drivers of biodiversity loss

As companies are being pressed to account for those impacts, they are turning to their supply chain to disclose information in order to monitor and reduce impacts. This includes keeping track of where materials come from, under what conditions they are mined or manufactured, where and how things are made, how products are packaged, transported, used and disposed of. This information is subject to scrutiny by stakeholders, investors and regulators alike [11].

Understanding the full environmental footprint behind products has become a critical challenge for the private sector and associated players such as manufacturers and retailers. Advances in accounting and reporting methodologies will enable companies to identify suppliers that perform best on reducing resource dependence, social and environmental impacts. This will allow companies to encourage suppliers to cost-effectively manage risk and opportunity in their own supply chains and product development [11].

When looking at the full value chain of the horticulture sector, the cultivation of plant material is the first step. The value chain furthermore includes all elements leading to the growing of horticultural crops and the production of services (e.g. recreation, carbon storage etc.). After the growing of the crops, the products are processed, packaged and distributed to the retailer, where the products are put up for sale. Finally, the horticultural products are consumed (in case of food crops), used (in case of materials, cut flowers and ornamental plants) and disposed of, or planted at the end-user's premises (e.g. orchards, gardens, parks, etc.).

Although the biggest environmental impact the horticulture sector may change is the cultivation process of plant material and crops, the various stages in the value chain are important when evaluating and understanding the full environmental footprint of the business' products.





2. WHY DO POLLINATORS MATTER TO YOUR BUSINESS?

Managing a business at any value chain level and the ecosystem services involved implies evaluating risks and opportunities against the various aspects of running a business: operational, regulatory and legislation, marketing and reputation, financial and societal. Table 1 shows the risks and opportunities that are relevant for the horticulture sector.

The horticultural cultivation process very much depends on pollination services. Therefore, it is paramount for this business sector to work towards restoring pollinator populations to healthy levels, and thereby creating gains through higher quality seeds and plants. This will help prevent economic losses. Restoring pollinator habitats will also provide other environmental and social benefits and assists the company in building/maintaining a good rapport with the public. The latter can also translate into direct benefits, such as hiring and maintaining workforce.

Importantly, the sector is well placed to act positively and effectively for wild pollinator populations and the companies in horticulture businesses can turn the reversing of pollinator decline into a broad range of opportunities.

Griffioen Wassenaar developed the green horticulture concept GreentoColour®, which focusses on the organic cultivation of plants for public green spaces. The company gives advice on the design of planting in order to create a varied and rich flowering from early spring to late autumn to benefit bees, butterflies and other insects.

Interested in what other front-runners are doing? See Chapter 4.

Ecoflora partners with local NGOs, Natuurpunt and Natagora, to promote local plants and seeds to Belgian society and bringing these to public and private gardens.

Interested in what benefits this has created for the company? See Chapter 4.

The flowers produced at the flower picking garden of “Het Wijveld in bloei” are grown completely free of chemicals and artificial fertilizer. Due to the great diversity of species, diseases and pests remain limited.

Interested in what your business can do? See Chapter 3.

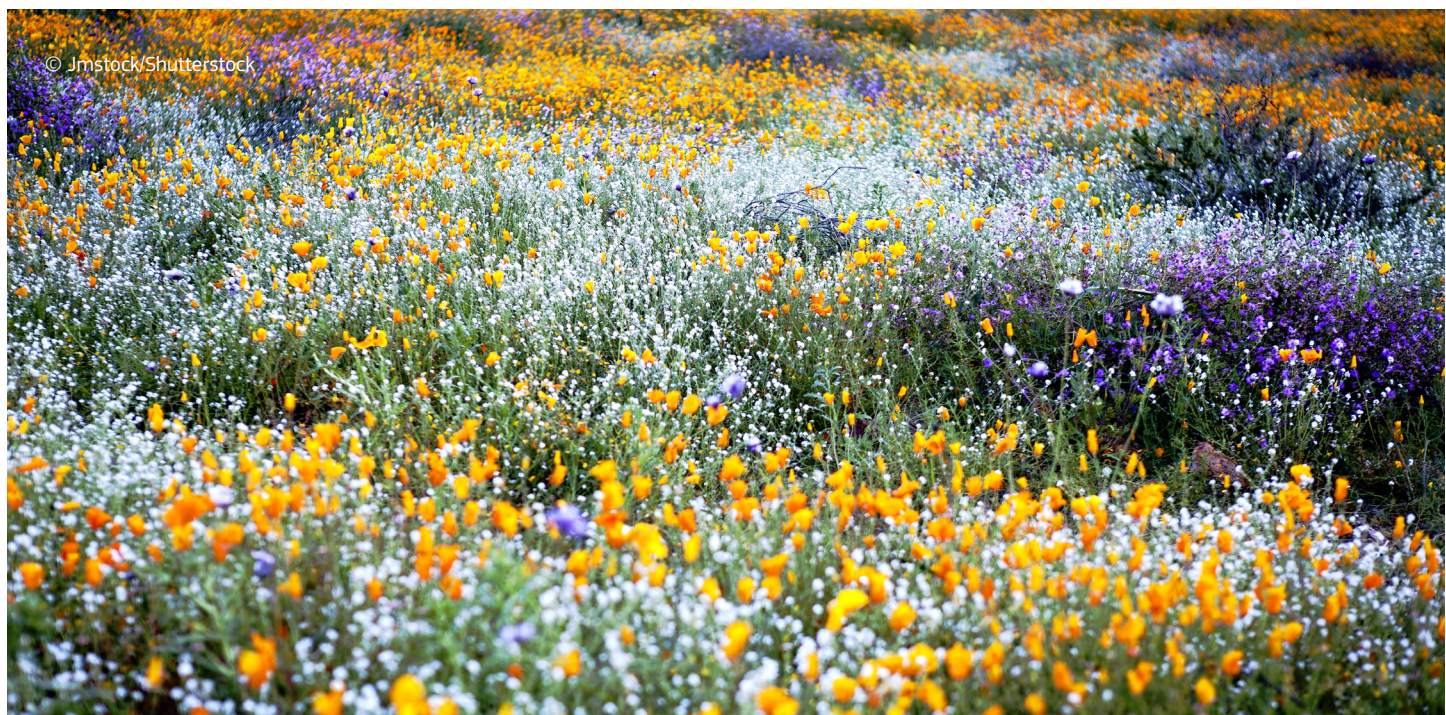


Table 1. **Why** pollinating insects matters to your business and **what** to do (risks & opportunities for the horticulture sector that are of key importance and sector-specific are highlighted in **bold**).

	Risks	Opportunities
Operational Regular business activities, expenditures, and processes	<ul style="list-style-type: none"> ▶ Disruption of cultivation of pollinator-dependent plants and plant material. ▶ Alternatives to pollination by wild insects entail high costs and are less effective and efficient, if at all feasible. 	<ul style="list-style-type: none"> ▶ Assure the sustainable cultivation of pollinator-dependent plants and plant material. ▶ Provision of other ecosystem services and associated benefits (e.g. by linking water and carbon management with pollinator-friendly actions).
Legal and regulatory Laws, public policies, and regulations that affect business performance	<ul style="list-style-type: none"> ▶ New pollinator strategies⁴, including legislative elements. ▶ Increased compliance costs (e.g. due to future ban on the use of certain pesticides). 	<ul style="list-style-type: none"> ▶ Reduce compliance costs and/or other costs by: <ul style="list-style-type: none"> a. anticipating negative impacts, e.g. the use of pesticides; b. being proactive on compensation measures; c. embedding pollinator risk identification within the supply chain management and certification schemes (e.g. ISO14001).
Financing Costs of and access to capital including debt and equity	<ul style="list-style-type: none"> ▶ Increased financing costs (higher interest rates or harsher conditions), due to increased interest of the finance sector in how businesses in which they invest are dependent on ecosystems services such as pollination. 	<ul style="list-style-type: none"> ▶ Gain or maintain investor interest and confidence, which can improve access to finance and/or reduce financing costs. ▶ New «green funds» may become available. ▶ New environmental markets might emerge (e.g. carbon offsets, habitat credits etc.).
Reputational and marketing Company trust and relationships with direct business stakeholders	<ul style="list-style-type: none"> ▶ Changing customer values or preferences may lead to reduced market share. E.g.: organic farming responds to a specific consumer demand for sustainable food products, promoting more sustainable farming practices and contributing to the protection of the environment and improved animal welfare. Consumers have become more environmentally aware and organic sales are increasing significantly⁵. ▶ Public campaigns, e.g. negative publicity on companies selling plants containing high pesticide residue levels. ▶ Increased staff turnover, which in turn leads to higher recruitment and retention costs. ▶ Reduced loyalty of key suppliers or business service providers. 	<ul style="list-style-type: none"> ▶ Maintain a good relationship with direct business stakeholders, such as customers, suppliers and employees. ▶ Improve physical and mental wellbeing of employees. ▶ Improve ability to attract and retain employees. ▶ Emerging environmental markets and products may offer new revenue streams (e.g. carbon offsets, habitat banking etc.). ▶ Growing demand for credibly certified products (e.g. eco labels, pollinator-friendly production labels, etc.), which a bee-friendly production process could qualify for. ▶ Differentiating the business to key customers who demand strong sustainability commitments in an increasingly competitive market.
Societal Relationships with the wider society	<ul style="list-style-type: none"> ▶ Local communities may hold the horticulture sector responsible for the decline of wild pollinators and the loss of benefits they provide to the society. 	<ul style="list-style-type: none"> ▶ Local communities may benefit from other improved ecosystem services that come along with the implementation of pollinator-friendly measures, e.g. through improved recreational access to green areas, cleaner air and improved regulation of water flows.

⁴ Promote Pollinators, Coalition of the Willing on pollinators (<https://www.promotepollinators.org/>)

⁵ European Union. 2019. Organic farming in the EU – A fast growing sector. EU Agricultural Markets Briefs No13 – March 2019.



3. WHAT CAN YOUR BUSINESS DO?

The horticulture sector is well placed to contribute towards the efforts to tackle the decline of wild pollinators. The sector can take measures directly on the fields – such as the creation of multifunctional field margins and installing patches of flower rich habitat –, take efforts to reduce its pesticide use and increase awareness of stakeholders in general (e.g. customers, companies in the value chain etc.). The sector has the unique opportunity to simultaneously conserve wild pollinator populations and to benefit from their contribution to pollination. As such, they can set the scene on how plants are cultivated in a sustainable way and on which production practices are rewarded.

3.1 Actions for companies active in the cultivation of plants, plant material and seeds

Strategic actions

A high-level significant step for the horticulture sector is to integrate biodiversity conservation into the companies' core business strategies. The sector may therefore capitalize on the associated opportunities while setting and working towards commitments to minimize its impact on biodiversity, including wild pollinator populations. This commitment will help companies to maximise opportunities to make a positive contribution to the protection of biodiversity and ecosystem services in which pollinators and their habitat play an important role. This is fundamental to the long-term health of the business and the wider society in which it operates.

Make a well-considered choice of plant species

The horticultural sector can facilitate or even set the scene on which plants are cultivated and how the cultivation takes place in a sustainable manner. The sector can influence the supply of plant species that will be used and planted in gardens and parks, and thus can have a significant influence on the state of wild pollinator populations and overall biodiversity. The horticultural sector should therefore make a well-considered choice on which plant species it cultivates and promotes to its customers, taking into account benefits to pollinators.

The sector can also play a role in avoiding the promotion of invasive non-native species. For example, the sowing and propagation of alien (non-native) plant species that are evergreen and have big flowers is very popular, but in some cases they are also invasive species. Plant species such as Himalayan Balsam (*Impatiens glandulifera*) have a significant negative impact on biodiversity, particularly on wild pollinators⁶, especially in natural areas. Furthermore, eggs or hibernating animals of invasive alien invertebrate species are often transported in plant pots⁷, allowing these species to enter new ecosystems and endanger soil fertility, food production and wildlife. Not all introduced species become invasive, and the amount of harm caused to agriculture, garden plants, wildlife and the economy varies widely from one species to the next. But each new species that gets introduced is a risk.

When considering plant species, it is also important to take the pesticide use into account. Recent studies pointed out that pesticides persist in plant tissues long enough to contaminate pollen during flowering after purchase [12, 13], and this has clear implications for the health of pollinating insects. It is therefore also very important to consider the cultivation process and to avoid the use of pesticides.

Manage the production landscape to support rich biodiversity (or request and assist your suppliers in doing this)

Horticultural farmers should take efforts to diversify their production landscapes and increase habitat heterogeneity. Sector specific measures, such as the implementation of multifunctional field margins with native, pollinator-friendly plants between production fields⁸, and ensuring sustainable management of production habitats (e.g. flower-rich semi-natural permanent grasslands) can provide pollinators with needed natural habitat in close proximity to the horticultural operations. By investing in ecological infrastructure, direct economic advantages can often be obtained⁹.

⁶ See also IUCN (2019) under Chapter 5.

⁷ <https://www.buglife.org.uk/blog/potted-plant-problems/>

⁸ See also 'A guide to pollinator-friendly farming', a guidance prepared by the Institute for European Environmental Policy for the European Commission (Keenleyside, 2019)

⁹ By investing in natural infrastructure or services provided by ecosystems as an alternative to grey infrastructure, businesses harvest the strengths and benefits of nature, diversify their risk management strategies and improve their company's capacity to adapt to climate change. Above all, natural infrastructure brings direct economic advantages, from capital cost savings, reduced operational and maintenance costs, to innovation. (Source: <https://www.naturalinfrastructureforbusiness.org/about/>)

In order to achieve this, the business sector could:

- protect the pollinator resources that already exist on grower lands;
- prioritize species-rich pollinator communities for the delivery of pollination services;
- switch to ecological practices, which nurture rich biodiversity;
- direct its customers into buying native, pollinator-friendly plants and provide them with advice on how to apply sustainable management practices that ensure varied and rich flowering from early spring to late autumn to benefit bees, butterflies and other insects;
- (influence the supply chain to) ban or at least decrease the usage of pesticides, by adopting integrated pest management (IPM) practices [14];
- and take pollinator-friendly actions directly on the field. Especially for larger horticultural fields or for orchards, pollinator strips of wildflowers with supplemental nesting materials should be used as «stepping stones» for bees to move in from suitable habitat nearby.

It is important to understand that quick solutions such as pollination by managed species (honey bees or bumblebees) are risky and do not provide a long-term sustainable alternative to a diverse community of wild pollinator species.

The Interreg-project ‘Meer natuur voor pittig fruit’ (or in English: ‘More nature for pungent fruit’) [15] showed the benefits of the natural approach in which nesting places for native pollinator species (bee hotels filled with

bamboo pipes or wooden blocks with drilled holes) were provided at pear and apple orchards in Flanders and the Netherlands, resulting in the spontaneous or natural occupation of the hives by etching bees that are naturally present in the environment. The natural approach requires small investments in the development of flowering meadows and patches in and around the orchard and more space for natural elements, which also attracts other pollinators. The study has shown that deployment of an integral pollination approach does require some growers to adopt a different way of dealing with the cultivation in general: more naturalness should be tolerated, sparing spontaneous growth of wild herbs as a source of food for wild bees. The results of this study are not only relevant for the production of fruit trees with a more natural approach being adapted being relevant across the entire variety of the horticulture sector.

In order to contribute to improving the state of pollinators, cooperation with NGOs and/or academics is strongly recommended. It is considered a best practice to involve these expert stakeholders when drafting and implementing actions for pollinators, whether they focus on a company’s site or the value chain. Furthermore, NGOs can add value when selecting pollinator-friendly seed mixes and plant species to cultivate or sell. As a result, the horticultural retailer can benefit from the advertising by local NGOs to its members and the organisation of group purchases through the NGO. See example of Ecoflora in Chapter 4 as an example of cooperation with local NGOs.



3.2 Value chain actions

Encourage the entire value chain to act

Environmental friendly value chain solutions can help companies to increase corporate image, employee satisfaction, customer loyalty/satisfaction and better relations with stakeholders, while positively impacting overall biodiversity and ecosystem services.

In order to make a value chain environmental friendly, it is necessary to consider all activities in the value chain such as design, supply, production, assembly, packaging, logistics, distribution, marketing, after-sales and appropriate product disposal.

Improving the value chain performance with environmental friendly solutions includes the reduction of energy consumption, environmental accidents, air emission, waste, harmful gasses, etc. Companies should ensure that its products and operations cause the least damage to the environment during the whole product life cycle via green purchasing, green design, internal environmental management, green production, environmentally friendly packaging and transportation. Reverse logistics activities such as reuse, remanufacture and recycle that are used at the end of product's life cycle contribute to the sustainability of products [16]. An example of Griffioen Wassenaar is shown in Chapter 4.



Another important impact on the functioning of our ecosystems and subsequently on climate change, is the harvesting of horticultural peat. The mining of peat from very high fragile ecosystems may cause a potential degradation of natural habitats of biodiversity and living organisms. Furthermore, the intensive use of peat in horticulture industry may cause the release of CO₂ from these ecosystems as it is a non-renewable source, besides causing destruction of important pollinator habitat. It is therefore recommended for horticultural farmers to search for alternative substrates [17], such as wood residues, forest harvest materials, urban wastes, composts etc., from sustainable sources.

To reinforce efforts like these, companies should monitor suppliers' sustainability performance and hold them accountable for it. Once companies know where their supply-chain issues are, they can set goals for lessening the resulting impact. Ultimately, consumer-based companies can only achieve ambitious sustainability goals if they set high standards for their suppliers' performance and stop doing business with suppliers that fall short.

Subsequently, the company can audit its suppliers to determine if they are taking appropriate measures for maintaining or restoring wild pollinator populations and assist them with managing their impacts, for example by rewarding them with long-term contracts or funding tied to commitments to delivering rich biodiversity on their land and providing diversity of habitats for pollinators. Long-term contracts thereby enable the suppliers to invest in long-term measures which is crucial to reverse the negative trends of pollinator populations.

The sector could also invest in research to improve the efficacy of pest management in pesticide-free and horticultural farming systems, find alternatives for peat and improve the role of ecological principles and/or

ecological infrastructure in sustaining beneficial biodiversity while assuring farm profitability and yields, and to quantify the indirect (and sub-lethal) effects of genetically modified crops on pollinators [14].

Raise awareness

Orchards and horticultural cultivation/production sites are not isolated from the wider environment, also in terms of their pollination function. Local authorities can make an important contribution here and set an example for private individuals to improve the state of wild pollinator populations of the 'surrounding green space' [15]. The horticulture sector should take the opportunity to motivate the municipalities and residents for more attention to pollinators in the construction and management of public and private gardens. Through information meetings and workshops, the knowledge and awareness of the local community and authorities on the bee diversity that is (still) present in the region could be strengthened. In doing this, an added value can be provided both for pollinators as for the cultivation/production sites as such.

Horticultural companies can also raise awareness within the landscape sector on the pollinator potential of certain species and influence the choice of species in an initial phase of the design process. An example of Griffioen Wassenaar's concept GreentoColour is shown in Chapter 4.

Public interest in pollinator conservation has increased markedly in the past decade and the number of homeowners seeking assistance in pollinator conservation is rising as well. Horticultural retailers' should make sure that they are able to meet the specific needs of customers who want to use their landscape for pollinator conservation and seize the opportunity to raise awareness to the public on the importance of pollinators and the need for their conservation, and provide them with the appropriate native, pollinator-friendly planting material.

Monitor and evaluate the impacts of your actions on wild pollinators across the value chain

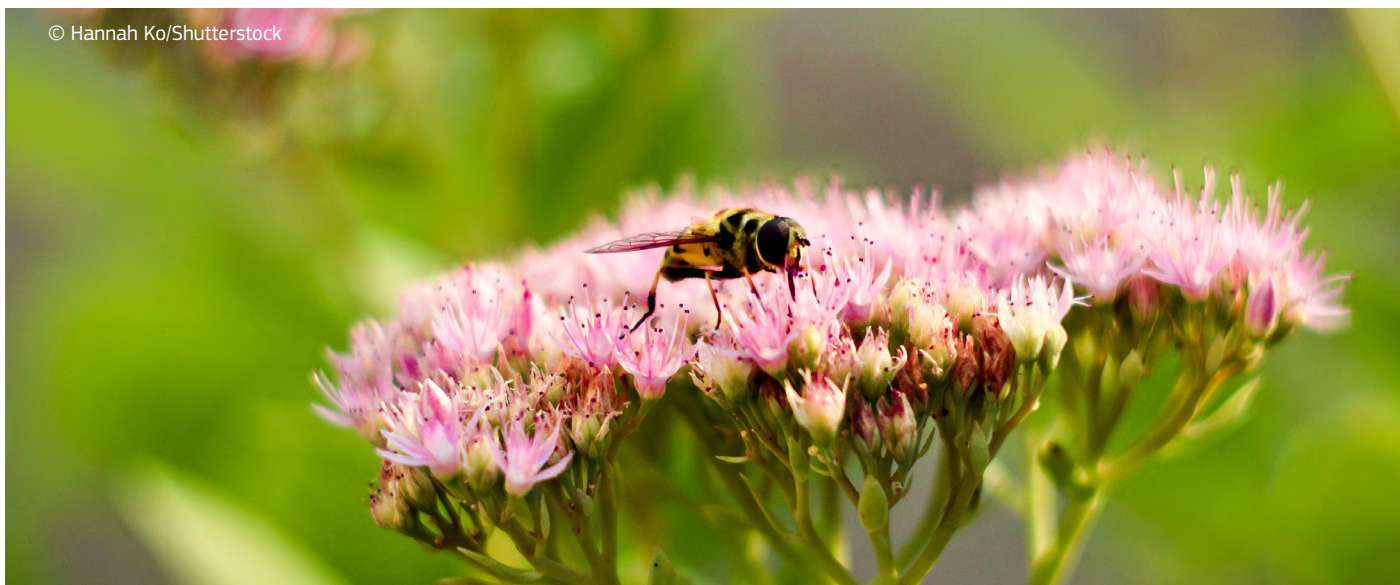
In order to assess the impacts of undertaken actions, it is fundamental that businesses ensure systematic monitoring of wild pollinator populations in the area of actions. This will enable to evaluate to what extent their goals are achieved, and provide invaluable knowledge on how to improve actions in the future. Monitoring can be also a management tool for project managers to track the achievement of outputs: planned activities and set milestones across a value chain.

In order for your business' efforts to be recognized, academia and local NGOs could be crucial partners to assist with the monitoring on the ground and the evaluation of action plans. They can also help with the design of conservation measures and strategies if no in-house knowledge is available.

3.3 Site/local level actions

While the previous chapter focused on sector-specific actions, this last chapter gives an overview of measures that can be applied to all business sectors, since they target individual business locations (for example, the premises of a business' headquarters or an industrial facility), as well as the company's properties that have not yet been developed for business purposes.

© Hannah Ko/Shutterstock



Action within companies' grounds

Businesses can draw up a long-term action plan, alongside a management plan, that identifies and protects the areas on the company's premises that are already providing food (for example, patches of wildflowers, weeds or flowering hedgerows) and shelter (like bare soil, long grass and dry-stone walls) for wild pollinators. In order to ensure pollinator-friendly management, the following actions are key:

- ▶ Reduce mowing frequency to create species-rich grasslands. Natural habitats can be further supplemented by artificial ones (for instance, bee hotels).
- ▶ When planting for pollinators, use native species (like seed mixes, clovers, bulbs, trees and shrubs). Ensure that wild pollinators have foraging resources during the whole vegetation season.
- ▶ Ensure connectivity with surrounding areas of green infrastructure and nature importance by creating grasslands and other types of vegetation that support rich biodiversity.
- ▶ Avoid and control the spread of invasive alien species¹⁰, both plants and animals.
- ▶ Consider the construction of green roofs and walls¹¹, as they can provide considerable feeding ground for wild pollinators.
- ▶ Reduce light pollution, as artificial light can negatively affect insect populations.
- ▶ Adopt a pollinator-friendly management protocol and do not use pesticides (insecticides, fungicides and herbicides), as these can be harmful to wild pollinators.
- ▶ Ensure contractors that manage the company's land are aware of the company's intentions to enhance wild pollinators and how this should be realised.



It is recommended that businesses partner with local NGOs/authorities or experts to include biodiversity and ecosystem services at the design stage of the company's site. They can also help with development of key performance indicators (KPIs) and, as it was already mentioned, with monitoring, reporting and evaluation of outcomes. The company could, for example, monitor the presence and diversity of local pollinator species at the company's site and the wider environment either through local partnerships or by engaging in local citizen science programmes¹².

These actions within the companies' grounds can benefit wild pollinators and overall biodiversity most when they are applied early in the design stage of the company's site when the landscaping and infrastructure features are still open for creativity. **When securing habitats for wild pollinators, the main guiding principle is to let nature regenerate on its own.** This can be complemented by additional planting of native flowers seed mixes, if/when needed.

¹⁰ See also 'Managing invasive alien species to protect wild pollinators': technical guidance prepared by IUCN (2019) for the European Commission.

¹¹ See also 'A guide for pollinator-friendly cities: How can spatial planners and land-use managers create favourable urban environments for pollinators?' by Wil et al. (2019), guidance prepared by ICLEI Europe for the European Commission.

¹² See also 'Citizens for pollinator conservation: a practical guidance': guidance prepared by the Institute for European Environmental Policy (2020) for the European Commission.

Generic actions which do not require any land holding

It is recommended for businesses to embed pollinator-friendly actions into the company's strategy and daily operations:

- ▶ Integrate pollinator-sensitive practices into the company's environmental management system and/or other certification schemes or standards.
- ▶ Introduce internal biodiversity policy commitments that include measures to improve pollination. For example, by implementing a biodiversity- or pollinator-friendly purchasing policy, the business can direct its suppliers to reduce the negative impacts on pollinators.
- ▶ Link the business' strategy to national and international biodiversity policy (including the EU Pollinators Initiative) and to the SDGs¹³ (namely SDG 15 "Life on Land", SDG 2 "Zero hunger" and SDG 12 "Responsible consumption and production").



In addition, the company can invest in projects to restore, create and connect pollinator habitats to reduce the environmental footprint of their buildings and operations and obtain general environmental benefits (reduced solid waste and wastewater, less pollution, energy efficiency etc.) and implement green procurement. Overall, these improvements will benefit nature and wild pollinators alike.

Also, the company can take efforts to **raise awareness** of:

- ▶ **the local community:** sponsor creation/restoration of pollinator habitats or arrange an expert to give a training/lecture on the conservation of wild pollinators;
- ▶ **the business' workplace:**
 - ▶ organise pollinator awareness training sessions or workshops for employees (for example, on how to ensure their own gardens are pollinator-friendly, or how to observe and record wild pollinators in order to help monitoring efforts);
 - ▶ include environmental considerations at each stage of the procurement process of goods, services and works (i.e. green procurement);
- ▶ **the business sector:** share your experiences regarding the implementation of pollinator-friendly measures with the EU Business @ Biodiversity Platform¹⁴ at relevant conferences or seminars, and/or through social media using the #EUPollinators.



**Business @
Biodiversity**

¹³ <https://sdgs.un.org/goals>

¹⁴ <https://ec.europa.eu/environment/biodiversity/business/>



4. WHAT ARE FRONT-RUNNERS ALREADY DOING?

This section presents a limited, non-exhaustive set of examples of businesses taking action for pollinators, to illustrate the diversity of potential actions that could be uptaken by the horticulture sector. The list has been generated by consulting the members of the EU Business and Biodiversity Platform¹⁴, and through literature review.

Griffioen Wassenaar

Company: Griffioen Wassenaar, owner of the concept GreentoColour®, is a Dutch perennial nursery that yearly cultivates millions of perennials grown for public greenery and garden centre sales (i.e. Hello Garden).

Action:

- Griffioen Wassenaar cultivate plants sustainably by using natural fertilizers and substrates that are low in peat. No neonicotinoids are used in the cultivation process.
- The company developed the GreentoColour® concept, which focusses on the organic cultivation of plants for public green spaces. The concept emphasizes the design of planting with a varied and rich flowering from early spring to late autumn to benefit bees, butterflies and other insects.
- Griffioen Wassenaar perennial nursery works together with the local NGOs “Bijensterichting”, “Nederland Zoemt” and “de Vlinderstichting” with the aim of promoting pollinators and biodiversity through the right range of perennials.
 - De Bijensterichting is committed to the protection of honey bees and wild bees in the Netherlands. The aim of their collaboration with Griffioen Wassenaar is to inform consumers about which species of perennial plants attract bees.
 - De Bijensterichting has developed a demonstration garden with native species, to show that ornamental gardens can also serve as a source of food for wild pollinators. Griffioen has sponsored the perennial plants for the large borders of the demonstration garden, including the special bumblebee border that focusses on plants catered to bumblebees specifically.
- Griffioen Wassenaar holds the MPS-GAP, ‘On the way to PlanetProof’ and Groenkeur certificates. ‘On the way to PlanetProof’ farmers and horticulturists work on cleaner air, fertile soil, good water quality and animal welfare. They pay attention to more nature on the farm, circular waste processing and recycling.
 - The company offers the possibility to deliver the plants without pot. By simply removing the pots at the nursery shortly before transport and giving them a second, third or fourth life through reuse in the own nursery, the use of biodegradable pots or other solutions is skipped. This saves transport costs, 40% of the planting costs for the recipient of the plants and there is no waste flow.

Benefits for the company:

- The cooperation with local NGO gives their product more legitimacy.
- The company was able to differentiate its business to key customers such as local governments who demand strong sustainability comments and where the importance of bees and butterflies plays a role in landscape design.

More info:

<https://www.greentocolour.com>

https://www.greentocolour.com/wp-content/uploads/2020/04/StadGroen_fotospread-bijen.pdf

<https://www.bijensterichting.nl/demostratietuin-volop-in-ontwikkeling/>

¹⁵ https://ec.europa.eu/environment/biodiversity/business/index_en.htm

Het Wijveld in bloei

Company: “Het Wijveld in bloei” is a flower picking garden in Ghent, Belgium, that started in 2014. The picking garden is located on the field of the organic farm Wijveld. Picking is done through a picking subscription which is in accordance with the Community Supported Agriculture (CSA) principle. CSA means that the consumer supports the farmer in his/her survival. Consumers pay their subscription in advance, which allows them to come and pick bouquets in the field whenever they feel like it.

Action:

- The cultivation from seed to flower takes place entirely within the company. A conscious choice was made for short chains and local sales, to limit the impacts of the value chain.
- All flowers are organically grown outdoors, with the smallest possible ecological footprint.
- Between April and October, ca. 50 different species of flower are grown. The farming of vegetables by the neighbouring CSA farm and the flowers of “Het Wijveld in bloei” support and complement each other, providing the perfect wild pollinator habitats. For example, fennel and dill plants are good hosts for the caterpillars of the Old World swallowtail (*Papilio machaon*).
- The flowers are grown completely free of chemicals and artificial fertilizer. Due to the great diversity of species, diseases and pests remain limited. Moreover, the company provides the soil with natural manure or compost so that the plants can grow healthily and vigorously.
- There are always more flowers sown than allowed to be picked, ensuring food for insects at any time. Furthermore, the company allows wild plants such as certain weeds to bloom to the advantage of insects, e.g. dog trot, yarrow etc.
- The company promoted its operation on a local market organised by the local NGO for ecological gardening “Velt”.

Benefits for the company:

- The CSA principle guarantees the farmer a more secure income and a financially carefree start to the season.
- Choosing for a chemical-free flower production process, the company was able to differentiate its business to key customers who demand strong sustainability comments in an increasingly competitive market.
- The local NGO for ecological gardening “Velt” promoted the company on their website this linked to an article on harmful pesticides that typically go with flower bouquets.

More info:

<https://www.hetwijveldinbloei.be/>



Ecoflora

Company: Ecoflora is – the only – ecological nursery and garden shop in Belgium, focussing on the cultivation of native perennials and herbs, but also offering native hedging plants, old fruit tree varieties, flower bulbs and seeds for flower meadows and vegetable gardens. The shop offers a supply of more than 600 species, ranging from common to very rare species of Belgian flora. Attached to the nursery is an ecological garden shop, where among other things, organic vegetable garden seeds and planting material, potting soil, organic fertilizers, specialised books, compost silos, bird nesting boxes and chestnut garden products are sold.

Action:

- Ecoflora use multiple communication channels (facebook, in store, on their website, through local NGOs...) to provide advice on the construction of native flower meadows and how to make a lawn more biodiverse specifically aimed to benefit wild pollinator populations.
- The horticultural player partners with the local NGOs Natuurpunt and Natagora to promote local plants and seeds to Belgian society and bringing these to public and private gardens. Ecoflora supports Natuurpunt and Natagora with a financial contribution (of several thousand euros) on the sale of flower meadows and nest boxes/feeding systems.
- The company gives a discount to members of local environmental NGOs 'Natuurpunt' and 'Velt'.

Benefits for the company:

- Through this cooperation, Natuurpunt members receive a discount and Natuurpunt itself also receives an annual commission on Ecoflora's sales. Ecoflora benefits the advertising that Natuurpunt makes to its members and the group purchases they organise.

More info:

<https://www.hln.be/in-de-buurt/asse/lente-komt-eraan-gemeente-verdeelt-bloemenzaad~a9569312/>

<https://www.ecoflora.be/nl-nl/partners/>

<https://vhm.be/onewebmedia/Presentatie%20bloemenweides%20-%20Bart%20Kersschot>





5. FURTHER READING

EU Pollinators Initiative:

- <https://ec.europa.eu/environment/nature/conservation/species/pollinators>
- https://ec.europa.eu/environment/biodiversity/business/news-and-events/news/news-84_en.htm

IPBES reports:

- <https://ipbes.net/global-assessment-report-biodiversity-ecosystem-services>
- <https://ipbes.net/assessment-reports/pollinators>

Asselman, E., Naar een integrale bestuiving en meer biodiversiteit in de teelt van appel en peer - Fruittelers gaan aan de slag met metselbijen en andere 'wilde' bestuivers, in Meer natuur voor pittig fruit. 2019. [In Dutch]

IEEP 2020. Citizens for pollinator conservation: a practical guidance. Guidance prepared by the Institute for European Environmental Policy for the European Commission.

IUCN. 2019. Managing invasive alien species to protect wild pollinators. Technical guidance prepared for the European Commission under contract No 07.0202/2018/795538/SER/ENV.D.2 "Technical support related to the implementation of the EU Pollinators Initiative".

University of Cambridge Institute for Sustainability Leadership, Fauna & Flora International, University of East Anglia, & UNEP-WCMC (2018, April). The pollination deficit: Towards supply chain resilience in the face of pollinator decline. UNEP-WCMC, Cambridge, UK, 42 pp. <https://www.cisl.cam.ac.uk/resources/publication-pdfs/the-pollination-deficit.pdf>

Keenleyside, C. 2019. A guide to pollinator-friendly farming. Guidance prepared by the Institute for European Environmental Policy for the European Commission.

Potts, S. G., Imperatriz-Fonseca, V., Ngo, H. T., Aizen, M. A., Biesmeijer, J. C., Breeze, T. D. et al. (2016). Safeguarding pollinators and their values to human well-being. *Nature*, 540(7632), 220–229. <https://doi.org/10.1038/nature20588>

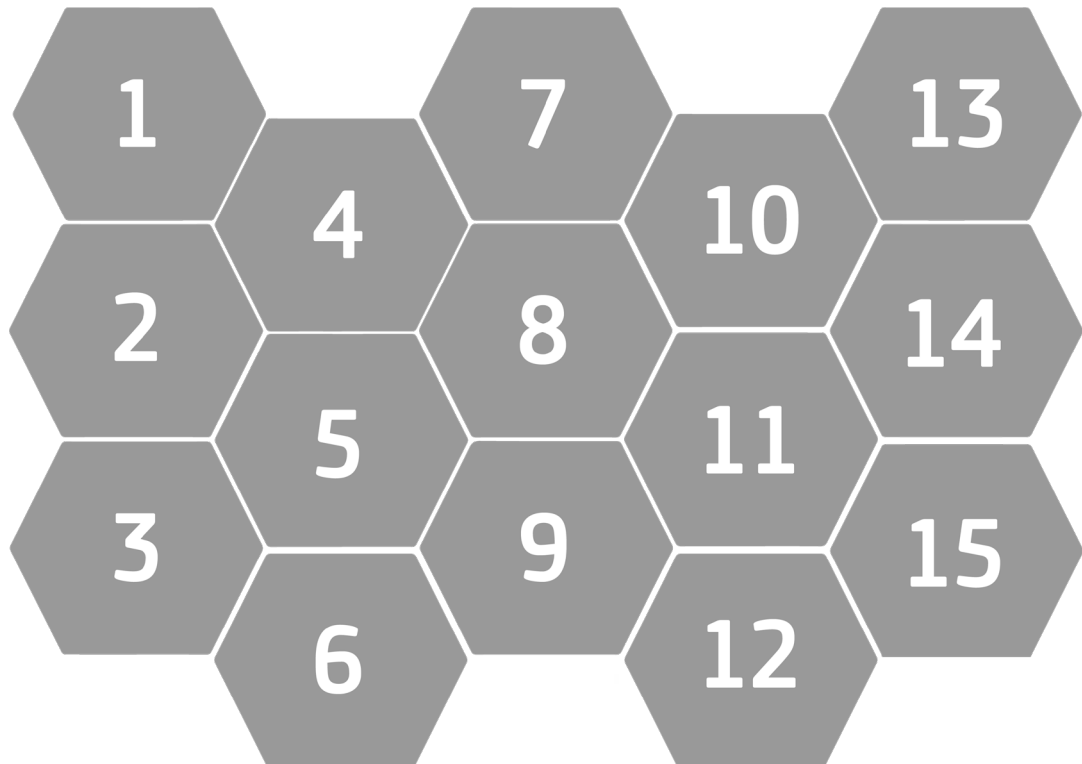
Stathers, R. (2014). The Bee and the Stockmarket – An overview of pollinator decline and its economic and corporate significance. Schroders. http://www.schroders.com/staticfiles/schroders/sites/global/pdf/the_bee_and_the_stockmarket.pdf

Wilk, B., Rebollo, V., Hanania, S. 2019. A guide for pollinator-friendly cities: How can spatial planners and land-use managers create favourable urban environments for pollinators? Guidance prepared by ICLEI Europe for the European Commission.

References

1. Goulson, D., et al., Beed declines driven by combined stress from parasites, pesticides, and lack of flowers. *Science*, 2015. 347(6229).
2. Hallmann, C.A., et al., More than 75 percent decline over 27 years in total flying insect biomass in protected areas. *PLOS ONE*, 2017. 12(10): p. e0185809.
3. UNEP-WCMC, The pollination deficit: towards supply chain resilience in the face of pollinator decline. 2018, University of Cambridge Institute for Sustainability Leadership, Fauna & Flora International, University of East Anglia, & UNEP-WCMC: Cambridge, UK. p. 42.
4. Artieca, R., *Introduction to Horticultural Science*. 2015, Gengage Learning: Stamford, USA. p. 584.
5. Science, I.S.f.H. *Defining Horticulture*. 2020 [cited 2020 30/04/2020].
6. Dag, A., Bee pollination of crop plants under environmental conditions unique to enclosures. *Journal of Apicultural Research - J APICULT RES*, 2008. 47: p. 162-165.
7. Juniper, T., *What has nature ever done for us?* 2013, Profile Books.
8. IPBES, *The assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on pollinators, pollination and food production*. 2016, Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services: Bonn, Germany. p. 552 pp.
9. Stathers, R. *The Bee and the Stockmarket: an overview of pollinator decline and its economic and corporate significance*. 2014.
10. Gough, M. *Bee decline - Briefing Part 5: a business case for pollinators*. 2016.
11. Makower, J., *State of Green Business*. 2013, GreenBiz.com. p. GreenBiz.com.
12. Lentola, A., et al., Ornamental plants on sale to the public are a significant source of pesticide residues with implications for the health of pollinating insects. *Environmental Pollution*, 2017. 228: p. 297-304.
13. Reuter, W., *A toxic eden: poisons in your garden - an analysis of bee-harming pesticides in ornamental plants sold in Europe*. 2014: Freiburg, Germany.
14. Potts, S.G., et al., Safeguarding pollinators and their values to human well-being. *Nature*, 2016. 540(7632): p. 220-229.
15. Asselman, E., *Naar een integrale bestuiving en meer biodiversiteit in de teelt van appel en peer - Fruittelers gaan aan de slag met metselbijen en andere 'wilde' bestuivers*, in *Meer natuur voor pittig fruit*. 2019.
16. Sezen, B. and S. Çankaya, *Green supply chain management theory and practices*. 2016. p. 92-114.
17. Asaduzzaman, M., et al., *Influence of Soilless Culture Substrate on Improvement of Yield and Produce Quality of Horticultural Crops*. 2015. p. 1-32.

Annex I



Credits

1. *Anthidium florentinum* © Alvesgaspar (wikimedia commons)
2. *Megachile centuncularis* © Line Sabroe (wikimedia commons)
3. *Anthophora sp* © Alvesgaspar (wikimedia commons)
4. *Eristalis jugorum* © Frank Vassen
5. *Lasioglossum sp.* © Frank Vassen
6. *Bombyliidae sp* © Frank Vassen
7. *Bombus monticola* © Peter Stronach
8. *Zygaena sp.* © Frank Vassen
9. *Xylocopa violacea* © Andrea Eichler (wikimedia commons)
10. *Bibio marci* © James Lindsey (wikimedia commons)
11. *Vespula vulgaris* © David Whidborne-Shutterstock.com
12. *Coccinella septempunctata* © Ivar Leidus (wikimedia commons)
13. *Lycaena hippothoe* © Frank Vassen
14. *Osmia bicornis* © Dawn Nicoll
15. *Andrena marginata* © Peter Stronach

