

Syngenta Public Policy Position on Enhancing Agricultural Biodiversity

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Introduction

Agriculture depends on a complex variety of plant and animal life. This variety and variability of animals, plants and micro-organisms, used directly or indirectly for food and agriculture, is referred to as 'agricultural biodiversity'.¹ Agricultural biodiversity is the backbone of agriculture sustaining the ecosystem functions that underpin soil health and plant pollination, thereby helping ensure farmers can grow the food needed to sustain growing populations over the world. Besides resources for food, fuel, and fiber, biodiversity within agriculture also provides access to a range of social and economic benefits, allowing opportunities to enrich surrounding communities.²

Despite this, agricultural biodiversity – and biodiversity more broadly – is increasingly under threat, as habitats are lost due to climate change, urban sprawl, and agricultural intensification and expansion.³ Over-exploitation and unsustainable land use are among the leading causes of biodiversity loss and land degradation worldwide.⁴ Farmland is often managed in ways that significantly change the way water and nutrients cycle, potentially placing stress on biodiversity both on and off the farm.⁵ In addition, growing demand for agricultural products leads farms to expand, causing natural areas to suffer from deforestation and land clearance.⁶

What can be done?

In order to protect and restore biodiversity in agricultural landscapes it is essential to increase the quantity and quality of habitat on and around farms, while optimizing farm yield and profitability. This includes establishing farm edge habitats, un-cropped or set-aside areas such as field margins, field corners, buffer zones, and protected areas.

Besides enhancing biodiversity along the margins of a field, biodiversity can also be enhanced within. Sustainable soil management practices such as diversified crop rotations and green manuring, cover crops, intercropping, and conservation tillage affect water content, nutrient levels, and the number, variety, and health of the micro- and macro-organisms in the soil. This in turn adds to the quality and quantity of soil organic matter. As a result, increasing the count and diversity of these organisms aids the establishment, growth, and nutrient content of the crops we grow, and improves the health and fertility of the soil itself.⁷ Therefore, enhanced soil biodiversity offers potential advantages to yield and crop

¹ FAO (1999).

² Syngenta (2018a).

³ IPBES (2019).

⁴ The overwhelming majority of governments reporting to the CBD cite habitat loss and degradation, climate change, excessive nutrient load, and other forms of pollution, over-exploitation and unsustainable use, as well as invasive alien species as pressures or direct drivers affecting biodiversity in their countries. Secretariat of the Convention on Biological Diversity (2010).

⁵ Willett *et al.* (2018), EAT–Lancet Commission report

⁶ FAO (2016).

⁷ Conti (2015).

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profitability, with soil fauna playing an important role in nutrient cycling and soil structure maintenance, thus hindering the loss of productive land and reducing the need for additional crop inputs.⁸

Simultaneously, achieving higher yields on-farm can reduce the need for agriculture expansion into the remaining natural habitats vital for biodiversity and other ecosystem services.⁹ Achieving more from each crop, per hectare of land, per drop of water and per measure of farm input, helps to reduce pressure on land occupancy and can provide more space for biodiversity and ecosystem conservation.¹⁰

Protecting uncultivated land, and promoting the use of sustainable intensive agriculture on cultivated areas, can also be shown to help increase the number of pollinating insects,¹¹ prevent soil erosion,¹² control pest populations,¹³ and shield our valuable freshwater resources from agro-chemicals run-off.¹⁴

Despite the potential for long-term gain, many farmers perceive barriers to adopting sustainable intensive agriculture, lacking short-term incentives to justify the time and money required. In solving this problem, an effective starting point may be asking: “How can we persuade farmers of the importance of enhancing biodiversity?”

What role does Syngenta play?

Syngenta supports farmers to improve the productivity of their crop, encouraging them to adopt higher yielding crop varieties, precision application of agrochemical and organic biological products, optimized irrigation strategies, and digitally advanced mechanization. Furthermore, Syngenta supports and enables farmers to do so while maintaining and improving the sustainability of their businesses, providing innovative solutions that drive business growth and reduce the ecological and environmental impacts of agriculture.

We recognize that improper use crop protection products can compromise agricultural biodiversity, and as such we invest heavily in product stewardship and safety initiatives to train applicators on their safe and responsible use. Similarly, we are investing in and exploring opportunities for precision application technology, remote sensing, and biologicals, to help farmers sustainably optimize their use of our products.

We launched [our Good Growth Plan](#) in 2013 to improve the sustainability of agriculture through six commitments to be achieved by 2020.¹⁵ Although we already surpassed our 2020 target to enhance biodiversity on 5 million hectares of farmland in 2017, we continue to invest in both new and existing

⁸ Bedano and Domínguez (2016).

⁹ Byerlee, Stevenson, and Villoria (2014).

¹⁰ Chaplin-Kramer *et al.* (2015); Pretty and Bharucha (2014).

¹¹ Aizen *et al.* (2009); Bianchi *et al.* (2006); Carreck and Williams (1998); Hackett and Lawrence (2014); Martin *et al.* (2015); Sutherland *et al.* (2006); Tscharntke *et al.* (2012).

¹² Field margins can help in controlling soil erosion by blocking winds and regulating water flow to reduce sediment discharge. Donnison (2011); Power (2010); Vandaele (2010); Woodland Trust (2014).

¹³ Restoring dense networks of non-crop habitats provide favorable conditions and requirements for natural enemy populations, supporting greater populations and species richness to effectively suppress pests. Letourneau *et al.* (2011).

¹⁴ Field margins, especially grass buffers, reduces leaching of agrochemicals into surface water bodies. Power, (2010); Stoate *et al.* (2009); The Woodland Trust (2014).

¹⁵ Syngenta Good Growth Plan (2013).

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biodiversity initiatives.¹⁶ We have now implemented 301 projects in 39 countries, benefiting a total of 6.4 million hectares.¹⁷

This is not to mention our commitment to rescuing farmland on the brink of degradation, which, through projects to encourage minimum soil disturbance, crop rotation, and permanent soil cover using crop residues or cover crops, has improved the health of 10.8 million hectares of farm soil; in excess of 800,000 hectares over our original 2020 target.¹⁸ With improved soil structure, greater access to nutrient resources from residual crop litter, and minimal disturbance from farm equipment, these steps can also be considered positive factors in enhancing soil biodiversity by protecting and enabling life beneath the soil.

A vital part of this is helping farmers manage less-productive farmland alongside fields and waterways to reintroduce local species, provide buffers for soil and water, and reconnect habitats for wildlife.

Syngenta projects and engagements to enhance biodiversity

- [Operation Pollinator](#)

The pollination of plants by bees and other pollinators is essential for many important crops. Our Operation Pollinator program aims to provide more and better habitats to boost pollinator numbers and health by protecting and enhancing overall biodiversity, improving crop yields, and securing a balance between sustainable farming and environmental protection. By creating areas with natural resources for feeding and breeding around cropped land on commercial farms, Operation Pollinator aims to increase the number and variety of pollinating insects on cropland, including bees, beetles, ants, and other flying species such as hoverflies, and butterflies.

Syngenta provides appropriate seed mixtures of local origin, agronomic training, and advice on establishing and managing field margins for pollinators. During the past 15 years, we have helped farmers establish and manage field margins in oilseed rape, sunflower, apples, pears, melons, vines, and olive crops. As of 2018, we have helped agronomists train more than 2,500 farmers with these practices.

Operation Pollinator extends to 18 countries in Europe,¹⁹ as well as the United States, Canada, Brazil, India, China, Korea, and Japan. The program is supported by a wide range of stakeholders, from universities to government bodies, farmer organizations, NGOs and food chain partners. Seed mixtures have been specifically selected and adapted to local conditions in each country according to soil type, climate, crops, and farming systems.

¹⁶ Syngenta measures progress towards its “Help biodiversity flourish” commitment by tracking the number of hectares of farmland where biodiversity conservation practices have been established and the number of hectares that have benefited from them. Syngenta (2018b).

¹⁷ For accounting purposes, Syngenta reports three hectares of established MFFM as 100 hectares of land that has benefitted from managed margins. On this basis, Syngenta has reported 5.6 million hectares of improved farmland since 2013. Syngenta (2013); Syngenta (2019).

¹⁸ Syngenta (2013); Syngenta (2019).

¹⁹ In the European Union, farmers engaged in Operation Pollinator may also benefit from the Common Agricultural Policy through payment for implementing so-called ‘greening measures’. The policy focuses on creating ecological focus areas, diversity of crops, and maintaining permanent pastures. These three measures will represent a third of future direct payments to farmers.

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-Operation Pollinator project examples:

- **KOREA:** We collaborate with Andong University to implement Operation Pollinator in apple and hot pepper orchards to understand how pollinators and natural enemies influence crop pollination and yield on flowering trees and plants. The results have been positive. Biodiversity-rich field margins provide habitat to beneficial insect populations, while the crops cultivated close to these margins generate higher yields.
- **INDIA:** Our Operation Pollinator program in India investigates how diversifying floral resources, by planting local indigenous crops (such as sesame, buckwheat, and niger), could increase pollinator populations in the main growing fields of tomato and redgram. This program is a collaboration with Karnataka University and runs in two districts in Karnataka State.
- **CHINA:** We have been running Operation Pollinator projects on kiwi, apple, and citrus orchards in China since 2016, with the support of Apiculture Research Institute, Golden Wing Mau, and Haisheng Group. The project helped us establish a collaboration with National Agro-technical Extension and Service Center (NATESC), Zhejiang University, and the Dingxi Agriculture Bureau to fund low-risk crop protection solutions for kiwi and rice, and help local farmers to achieve higher income by planting marginal crops such as sunflower.
- **USA:** R.D. Offutt, the largest potato grower in the US, planted non-productive corners of its potato fields in Minnesota with regional wildflower seeds to create environmentally diverse habitats and increase the number of pollinators. The habitats provide forage for honeybees, monarch butterflies and other pollinating insects. They also help reduce soil erosion and protect water resources. Syngenta advised on how to prepare the sites and which plants to use.

• **Multifunctional Field Margins²⁰**

This project is an extension of our Operation Pollinator project. The wild relatives of conventional crops, as well as many species of bird, small mammals, and medicinal and ornamental plants, can flourish in and around agricultural landscapes, living alongside crops and livestock; though many of these plants and animals are suffering decline.²¹ Overall, there is a lack of management concerning non-cropped farmland in current agricultural practice, limiting the possible benefits to biodiversity these spaces can provide.²² As well, ongoing efforts by farmers to consolidate fields can reduce the size of marginal areas and hinder general landscape diversity.

Syngenta, working with partners, encourages farmers to establish and manage biodiversity rich spaces along field margins, corners, and within buffer zones where access by large-scale farm machinery is

²⁰ Syngenta (2018a).

²¹ Biesmeijer *et al.* (2006); Norris (2008).

²² In 2016, Syngenta has collected evidence on the availability of non-cropped farmland for biodiversity enhancement through an external third-party organization, [Kynetec](#). Approximately 3,700 farmers cultivating 20 crop types in 36 countries were interviewed. Of these, 3,000 farmers (80%) shared information. On average, growers have 6% non-cropped farmland at the global level (3% in Asia Pacific, 6% in Europe and Africa and 11% in Latin America). For a majority of the growers, none or only a small percentage of this land is managed for biodiversity enhancement. - Syngenta elaboration on Market Probe - Kynetec (2017).

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limited. These multifunctional field margin (MFFM) projects have made a significant contribution to The Good Growth Plan's target of enhancing biodiversity on 5 million hectares of farmland.²³

MFFMs help reduce soil erosion, regulate water drainage and irrigation, and attract predatory invertebrates who act as natural pest control and thereby improve crop yield and quality. MFFMs also provide a network of societal benefits in recreational services and aesthetic value, among others²⁴.

Multifunctional Field Margins (MFFMs): Assessing the benefits for nature, society and business

In 2018, together with Arcadis and Bioversity International, Syngenta developed a paper, "*Multifunctional Field Margins: Assessing the benefits for nature, society and business*", to examine how agricultural biodiversity can be enhanced with the use of multifunctional field margins. The paper recommends some design principles and protocols to establish and manage field margins for biodiversity benefits, and makes a first attempt at ascribing a monetary value to the most important benefits: natural and social capital.

The resulting insights have allowed us to showcase with evidence the business value for farmers while enhancing biodiversity and providing broader societal benefits. The paper also helped us to develop new guidelines on the design, implementation, monitoring and management of MFFMs.

Through this paper we are specifically targeting food value chain companies to value and adopt MFFM in their procurement schemes.

- **Sustainable forest management and restoration of degraded farmlands**

For Syngenta, agricultural biodiversity enhancement also applies to sustainable forest management and to degraded farmland restoration. We engage farmers, farm cooperatives, and local municipalities to carefully manage forests to ensure the safety of wildlife and to preserve the natural environment. The focus is on protection, restoration and management of forests and degraded farmland. The forest is a working environment, producing fuel and fiber and generating ecosystem services for agriculture and societies.

Working with TNC to protect forests in Brazil

Syngenta and The Nature Conservancy (TNC) have collaborated for more than a decade to protect and restore native habitat in agricultural landscapes across Brazil's soy-growing regions. As part of the Soja+Verde project, TNC and Syngenta worked together to map critical areas for conservation (Permanent Protected Areas, or PPA) as defined in the Brazilian Forest Code. The maps were used to help farmers document and understand their legal obligations for habitat protection and restoration, and served as the basis for an action plan to achieve compliance. As a result of this collaboration, Syngenta and TNC were able to develop forest protection plans for an agricultural area of more than 5 million hectares in Mato Grosso, over an area larger than Switzerland. To speed up compliance, Syngenta and TNC engaged in partnerships that could support farmers in ecological restoration. This work continues today, where TNC and Syngenta are working to understand and document the benefits that conserved river corridors and other habitats offer to the farmers and public of Mato Grosso.

²³ The MFFM projects contributed 5 million benefited hectares out of a total 5.6 million benefited hectares reported in the last four years (2014-2017) within the Biodiversity commitment of The Good Growth Plan. As such, MFFM projects represent approximately 90% of total benefited hectares reported by Syngenta. – Syngenta (2013).

²⁴ Syngenta, Arcadis, and Bioversity International (2018).

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- **Landscape Connectivity**

Biodiversity is frequently damaged as species habitats are lost or fragmented. These smaller and more isolated populations can lead to limited genetic variation, as well as poor evolutionary adaptability, increasing the risk of extinction. Such trends are also exacerbated by climate change.

Restoring riparian forests in Colombia

For the past 24 years we have been restoring and managing riparian forests in Colombia through the Ecoaguas program. The program illustrates the type of social-environmental initiative Syngenta can contribute to. Its purpose is to preserve, restore and protect the native riparian tropical forests and establish education processes to promote a culture of environmental awareness and activity in local communities. Such activity focuses on sustainable practices that contribute to the efficient use of water as a primary resource for planting and growing crops such as sugar cane, rice, potatoes, bananas, corn, coffee, flowers and vegetables.

More than 1,200,000 native trees, raised in 656 nurseries, have been planted and with more than 100 protected species.

When individual field margins are connected, different features of the landscape become integrated, creating rich habitats on marginal and less productive farmland alongside fields and waterways. Such interconnected habitat infrastructures and corridors within and between landscapes provide multiple ecological benefits at a landscape level. For instance, they facilitate the movement of seeds and animal species (gene flow for genetic diversity), act as windbreaks, prevent erosion and improve soil fertility and health.

Syngenta runs projects and engagements with farmers and local communities to understand and adopt practices for connected landscape features.

The edges of arable fields or riparian lands are ideal for establishing biodiversity corridors, often being less fertile, less productive or inaccessible to modern farm machinery, and so are considerably less valuable for crop production. More insight into and evidence for the benefits of connected landscapes will increase community acceptance and support for establishing them as a way to achieve biodiversity benefits. As such, Syngenta advocates for sensible policies and calls for support to promote landscape connectivity conservation in both rural and urban landscapes.

Call to Action for landscape connectivity conservation

In 2017, we worked with the World Business Council for Sustainable Development (WBCSD) on the publication, "Landscape Connectivity: A Call to Action". It sets out an agenda on wider action to promote biodiversity conservation through connected landscapes. This paper is a call to relevant stakeholders to take a lead to raise awareness and scale-up actions on the ground for landscape connectivity conservation: by establishing multi-stakeholder action-based platforms, supporting and incentivizing spatial planning for landscape connectivity (e.g. introducing green infrastructure in and around urban areas).

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Conclusion

Biodiversity in agricultural landscapes is in decline globally. Syngenta is seeking the most effective ways to reverse the impact of agriculture on biodiversity loss, by driving agricultural intensification without taking land out of production or expanding into untouched native habitats. With its focus on sustainable intensive agriculture, combined with the utilization of marginal or unproductive areas of farmlands, Syngenta is enhancing biodiversity in agricultural landscapes, while improving crop productivity. This approach also helps farmers to improve soil fertility, build resilience against climate change, enhance pollination and pest control services, and better shield natural waterways from residues and run-off.²⁵

We believe concerned stakeholders should work together to identify programs encompassing a variety of local partnerships and environmental and cultural approaches for agricultural biodiversity enhancement.

The way ahead

We will continue to engage with farmers to bring them the knowledge and solutions needed to improve the profitability of their own operations, while at the same time enabling them to improve the sustainability of their businesses.

We will do this by accelerating innovation that address interconnected environmental, societal and economic challenges. Biodiversity degradation and climate change will increasingly become central drivers for our innovation alongside meeting farmers' needs. We will research and develop products in consideration of externally verified [sustainability principles](#), specifically addressing climate change and biodiversity loss. Alongside this, we will support and encourage on-ground adoption of practices that enhance biodiversity on and around fields and arable land, as well as driving productivity on the land used by farming to prevent, reduce or mitigate expansion into natural landscapes.

We will continue to measure and report the progress we make towards agricultural biodiversity enhancement and will monitor environmental and societal impacts of our biodiversity projects. We will keep on investing in existing and new biodiversity projects and programs to further improve biodiversity in agricultural landscapes. We will continue to train our local sales teams to effectively roll out biodiversity projects.

We will maintain frequent dialogues and engagements with local stakeholders (universities, farmers, cooperatives, value chain partners, etc.) to better understand local needs and opportunities. We will join with partners and stakeholders to advocate for policy changes and to bring farmers technologies and practices they need to be successful in enhancing biodiversity; for example seeds, crop protection, machinery, financial services, and agronomic protocols.

²⁵ Syngenta, Arcadis, and Bioversity International (2018).

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We will also develop a strong case for the benefits of agricultural biodiversity in each region in which we operate, as well as engage with lead farmers to showcase these benefits and disseminate their knowledge to other farmers.

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