The Good Growth Plan Progress Data - Soil

Rescue more farmland

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1. Summary

Syngenta launched the Good Growth Plan to address the huge challenges of feeding a growing world population sustainably. One of the key commitments of the Plan is to help rescue more farmland. Our commitment is to promote and support in-field adoption of certain soil management and use practices that will sustain soil productivity and support crop productivity for a long time.

Sustainable farming needs resilient, healthy soils to secure our food supply for the long term and help increase yields right now. Poor management practices degrade millions of hectares.

We're working with partners to improve these practices. To achieve this commitment, we're focusing on conservation agriculture. This lets farmers improve cropping while protecting soil and water resources on which production relies.

We're advising farmers and giving them the tools they need to implement these practices globally, in partnership with external stakeholders such as academics, policy makers and soil experts. Together, we're assessing the best ways to make soil more productive, selecting the most promising projects, and tailoring them to local conditions and then getting them under way with the help of local farmers.

The Soil dataset shows aggregated hectares of farmland reported since 2013 that benefit from soil conservation practices established in collaboration with Syngenta. The dataset also includes a description of the project objectives and the carbon benefits potential. The number of hectares of benefited farmland are tracked locally through in-field assessments, documented, and reported by project managers.

2. Structure of the data

Variable name	Definition	Unit	Type of data
Country	Country		String
ContinuousSoilCover	Maintaining crop residue or vegetative (crop) cover on the field to protect the soil against erosion and retain soil moisture		String
ControlledMachineryTraffic	Controlled traffic on cultivated fields reduces the area of the field that is used for driving farm machinery on by sticking to certain travelling lines or paths (i.e. controlling exactly when and where traffic moves in-field). Soils are damaged by heavy or repeated agricultural machinery passes		String

	on the land. Controlled farm traffic helps in preventing soil being compacted on a larger area of the field and as such improves the water holding capacity of the soil	
CropRotation	Growing different crops sequentially on the same field during different seasons and years	String
MinimumOrNoSoilDisturbance	Implementing minimum or no tillage practices to reduce soil disturbance, beneficial for improving soil fertility and structure	String
SoilNutrient Management	Optimizing soil nutrient management through active management of soil carbon and soil organic matter levels, including optimal application of organic and inorganic fertilizers in the right quantities, at the right time, and at the right place. This entails linking soil, crop, weather, and hydrologic factors with cultural, irrigation, and conservation practices	String
WaterUse Management	The management of water resources on farm can help increase crop production, prevent soil erosion, and avoid salinization. This may include the adoption of approaches such as: Advice to farmers on soil and water management to allow for improved water retaining/holding capacity of the soil and/or for better irrigation management, e.g. when to apply irrigation and in what amount; Provision of tools/services to farmers for better soil and water management, for example diagnostic tools	String
OtherSoilConservation Practices	Other practices include the implementation of farming practices that support ecosystem resilience and soil fertility. This would include integrated farm management practices, agriculture inputs (e.g. seeds, fertilizers, and crop protection), farm diagnostic, management tools or training activities related to the above mentioned practices	String

ImplementedHectares	Hectares of land on which good soil management practices were implemented	Hectares	Numeric
BenefitedHectares	Hectares of farmland that benefit from the positive change brought in by implemented good soil management practices	Hectares	Numeric
CarbonBenefits	The total annual mitigation potential of soil (implemented) hectares	Tons CO2e/year	Numeric
Reporting Year	Syngenta's non-financial indicator reporting period is October to September		Categorical

3. Background and methods

3.1. Description of project activities

The aim of our Soil commitment is to support the establishment of "healthy, functional, and resilient ecosystems" in a way that is progressively more integrated with our commercial operations. Sustainable farming needs resilient and healthy soils to secure our food supply for the long term and help increase yields right now. We know that poor soil management practices degrade millions of hectares of farmland.

To achieve this commitment, we're focusing on good soil management practices, such as conservation agriculture – combining minimum or no tillage, crop rotation, and continuous soil cover. These practices foster healthy productive soils that can store more water and reduce erosion and crop damage. This lets farmers improve cropping while protecting soil and water resources on which production relies. For instance, minimum or no tillage minimizes soil disturbance. Crop rotation counteracts weed, disease and insect damage and builds soil fertility, and covering the soil with crops and crop residues reduces erosion and pesticide runoff.

We're advising farmers and giving them the tools they need to implement these practices globally, in partnership with external stakeholders.

Soil fertility improvement within agriculture landscapes has many different meanings as well as ways of implementation in the different geographical regions.

The following three techniques are usually universally described as conservation agriculture:

- Minimum or no soil disturbance – Implementing minimum or no tillage practices to reduce soil disturbance, beneficial for improving soil fertility and structure.
- Crop rotation – Growing different crops sequentially on the same field during different seasons and years.

- Soil cover – Maintaining crop residue or vegetative (crop) cover on the field to protect the soil against erosion retain soil moisture.

Other complementary practices may also be applied once conservation agriculture practices are in place.

- Soil nutrient management - Optimized soil nutrient management through active management of soil carbon and soil organic matter levels, including optimal application of organic and inorganic fertilizers.
- Controlled farm machinery traffic – Controlled traffic on cultivated fields to preventing soil being compacted by heavy or repeated agricultural machinery passes on the land.
- Water management for fertile soils – The management of water resources on farm to help increase crop production, prevent soil erosion, and avoid salinization.

3.2. Sources of data

In-field assessments of the hectares implemented with and benefited from soil conservation practices are conducted and documented by local project managers and external stakeholders. The respective data is measured once, either at the time of implementation or at the time of Syngenta's involvement.

3.3. Data collection tools and process

The number of hectares of benefited farmland established through each initiative is tracked and reported using project record-keeping systems and quality assurance processes. The data and respective evidence is documented, reported and consolidated at a country, territory, regional, and global level, using Microsoft Excel templates. A risk assessment has been conducted to identify reporting risks. Identified risks are mitigated by implementation of internal controls.

3.4. Progress measurement

The data are reported annually and cumulatively by adding the hectares that have been newly established or managed in the respective reporting year. The target is to reach 10 million hectares of farmland that have been benefited by soil management practices listed above by 2020.

3.5. Calculation of carbon benefits

To calculate carbon benefits, annual mitigation potentials (tCO_2e/ha/yr) from the IPCC fourth assessment report, Table 8.4[1], were used. Good Growth Plan biodiversity practices are aligned with IPCC practices as follows:

[1] WGIII, IPCC. "Climate Change 2007: Mitigation of Climate Change." Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (2007)

Soil or Biodiversity practice	IPCC practice	Mitigation potential (tCO2-eq/ha/yr)			
		Climate Zone	Mean	Min	Max
Minimum or no soil disturbance - Minimum or no tillage to minimize soil disturbance.	Tillage and residue management (croplands) - Conservation tillage and zero-tillage reduce the use of energy (farm equipment) and increase carbon storage in soils.	Cool-dry	0.17	-0.52	0.86
		Cool-moist	0.53	-0.04	1.12
		Warm-dry	0.35	-0.77	1.48
		Warm-moist	0.72	-0.44	1.89
Crop rotation - Growing different crops sequentially on the same field during different seasons and years. Soil cover - Maintaining crop residue or vegetative (crop) cover on the field to protect the soil against erosion and retain soil moisture.	Agronomy (croplands) - Improved agronomic practices that increase yields and generate higher inputs of carbon residue can lead to increased soil carbon storage.	Cool-dry	0.39	0.07	0.71
		Cool-moist	0.98	0.51	1.45
		Warm-dry	0.39	0.07	0.71
		Warm-moist	0.98	0.51	1.45
Soil nutrient management - Optimizing soil nutrient management through active management of soil carbon and soil organic matter levels.	Nutrient management (croplands) - Practices that tailor nutrient additions to plant uptake	Cool-dry	0.33	-0.21	1.05
		Cool-moist	0.62	0.02	1.42
		Warm-dry	0.33	-0.21	1.05
		Warm-moist	0.62	0.02	1.42
Water-use management - The management of water resources on farm can help increase crop production, prevent soil erosion, and avoid salinization.	Water management (croplands) - Practices that allow for more effective water usage on farms, including more sustainable irrigation and drainage techniques	Cool-dry	1.14	-0.55	2.82
		Cool-moist	1.14	-0.55	2.82
		Warm-dry	1.14	-0.55	2.82
		Warm-moist	1.14	-0.55	2.82

The mitigation potential is multiplied by the implemented hectares. Where multiple practices are adopted within a project, only the practices with the highest mitigation potential is used for the calculation.

In the dataset, the carbon benefits potential for projects with practices not aligned to IPPC practices are indicated as “not available”.

4. Changes versus previous release

Data for Reporting Year October 2019 – September 2020 were added. Carbon Benefits indicator was added.

5. Non-financial performance data quality

The Good Growth Plan data is published as a global aggregate in the Non-financial performance summary of Syngenta AG group (Syngenta)’s Environmental, Social and Governance Report (ESG Report) 2020. Syngenta’s internal controls for non-financial reporting are designed to provide assurance to Syngenta’s Board of Directors and management regarding the reliability of non-financial reporting and

fair presentation of the information published in the Non-financial performance summary. Yet, all internal controls, no matter how well designed, have inherent limitations and therefore may not prevent or detect misstatements. In designing internal controls for non-financial reporting, we used the criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). PricewaterhouseCoopers AG, Switzerland, an independent registered public accounting firm, has issued an opinion on Syngenta's Non-financial performance summary, which is included in the ESG Report 2020.

6. Contact information

For questions and inquiries regarding this dataset and documentation, please contact goodgrowthplan.data@syngenta.com.