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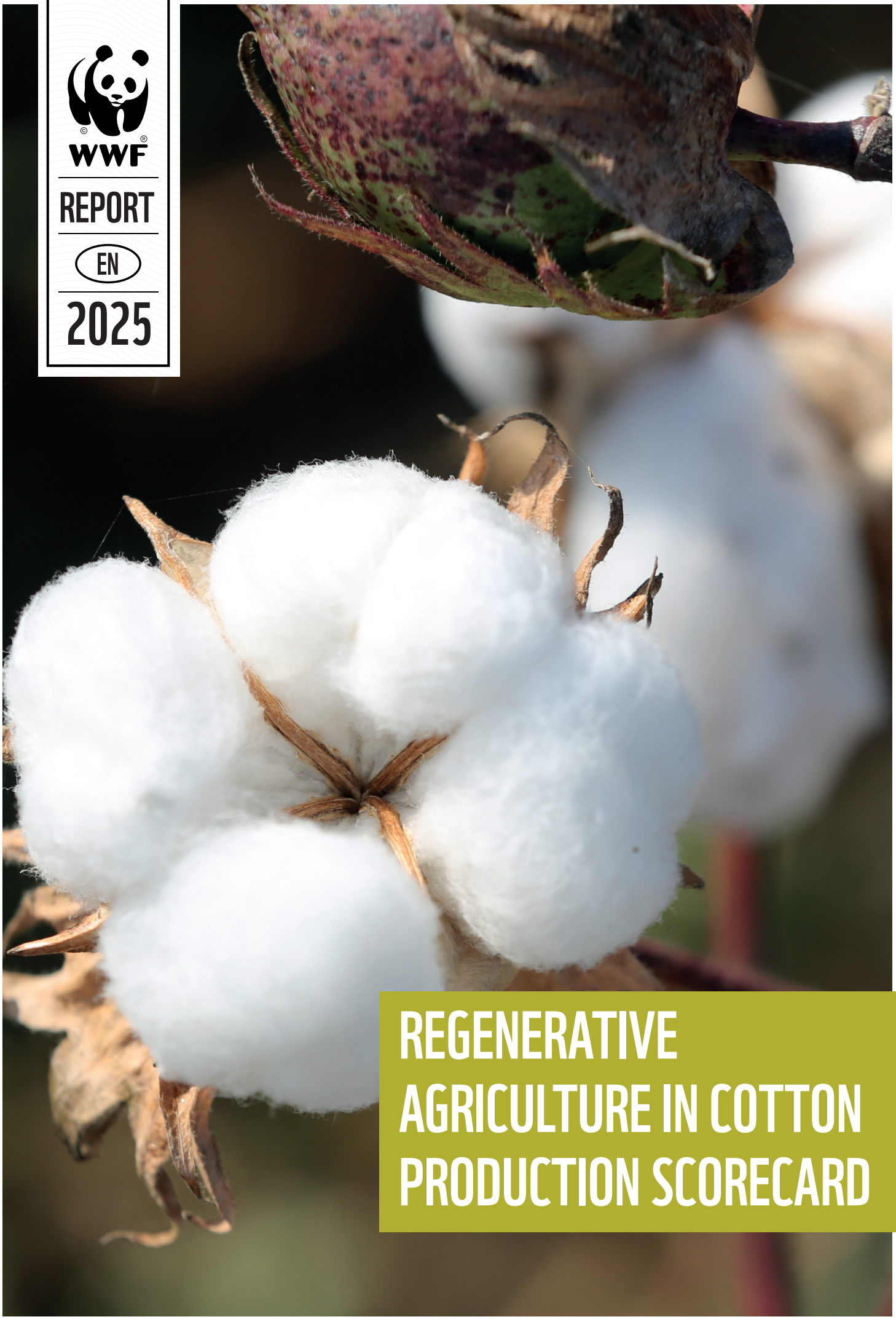

REGENERATIVE AGRICULTURE IN COTTON PRODUCTION SCORECARD

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INTRODUCTION

WWF-Türkiye is working to promote agricultural practices that prioritize soil health.

Cotton, a raw material for both the food and textile industries, is cultivated in our country. However, agricultural production is under threat worldwide, including in Türkiye, which is among the 20 countries with diminishing soil reserves. In Türkiye, where 36 percent of the total surface area is arable, only 1 percent of agricultural land is classified as high-quality and fertile[1].

This highlights the importance of the concept of 'soil health'. This concept is closely related to the abundance and richness (diversity) of living organisms in the soil. The ability of the soil to fulfill the vital activities of living organisms determines the level of soil health. It is important to note that soil health is a prerequisite for achieving 'fertile soil'. In Türkiye, the ratio of soil organic matter, which is vital for ensuring crop production, should be a minimum of 3 percent[2]. Ensuring healthy soil structure is paramount to safeguarding agricultural production.

Traditional and intensive tillage methods are the main causes of the loss of soil health thus soil fertility. The use of heavy machinery in agricultural production processes can cause soil compaction, leading to decreased soil oxygenation and water permeability. Commonly used machinery, such as ploughs, can disrupt the connection between the root system and the soil, leaving the most fertile topsoil unprotected against rain and wind. In Türkiye, 70 percent of surface soils are vulnerable to water and wind erosion[3]. This has resulted in an increased use of fertilizers and pesticides by farmers to counteract the effects of erosion.

Soil carbon management is crucial for maintaining soil organic matter content, soil quality, and fertility. The adoption of alternative conservation tillage methods and modifications to agricultural production practices has the potential to enhance soil health, mitigate the environmental impacts of farming, and ensure the sustainability of production and farmers' livelihoods in the long term.

WWF-Türkiye is committed to promoting agricultural practices that protect soil health. A notable initiative is regenerative agriculture in cotton production in the province of Aydın, located in the Büyük Menderes Basin — one of Türkiye's 25 river basins.

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1 Sait Gezgin, Organic matter status of Turkish soils, organic matter resources and utilisation. Organomineral Fertiliser Workshop, 12, 16.

2,3 WWF-Türkiye, Region-specific Soil Conservation Methods for the Health of Our Agricultural Soils, https://wwftr.awsassets.panda.org/downloads/tarm_topraklarmzn_sal_icin_toprak_koruma_yontemleri_web_forma.pdf, accessed: 8 Eylül 2024.

Aydın is the second-largest cotton producer in Türkiye. The Söke Plain, where 98 percent of agricultural land is dedicated to cotton production, is a key economic driver, supporting the livelihoods of approximately 30,000 people. The Söke Plain is strategically located between the Bafa Lake Nature Park and the Büyük Menderes Delta National Park. These two areas meet the criteria for 'Wetlands of International Importance' and provide vital shelter and breeding grounds for numerous bird species. These areas have been designated as Important Bird Areas (IBAs) and are home to many globally endangered species, including the Dalmatian pelican, the European eel, and the Eurasian otter. The region's economic importance is underscored by its support for diverse activities, including agriculture, fisheries, and ecotourism, particularly cotton production, which provides livelihoods for over 100,000 people. However, both the welfare of the region's inhabitants and the biodiversity of Lake Bafa and the Büyük Menderes Delta are at risk. Urban and industrial wastewater from the upstream provinces of Denizli and Uşak is a key contributing factor to the pollution of Lake Bafa and the Büyük Menderes Delta. The pressure on these areas is increasing due to pesticides and fertilizers used in agricultural activities in Aydın, which are washed out of the soil and mix with the rivers and industrial wastewater. This situation can cause fish deaths in the region's rivers, especially during the warmer months.

The organic matter content in agricultural soils in Söke is currently 0.5 percent, which is well below the ideal rate of 3 percent. This may result in agricultural soils in the region becoming unable to support cotton plant growth, potentially leading to a decline in productivity. To improve soil health in Söke, ensure environmental and socioeconomic sustainability, and reduce the use of polluting inputs in agricultural production, we initiated regenerative agriculture pilot practices on 7.9 hectares of 'Better Cotton' land in 2020. By 2023, the size of the pilot practices had expanded to 17.9 hectares.

Türkiye ranks seventh in the world in terms of cotton cultivation area and sixth in cotton production. It is among the top 10 countries in cotton fiber production and exports of textile and apparel products. In Türkiye, cotton is primarily produced in Şanlıurfa (35.8%), Aydın (15.2%), Diyarbakır (11.2%), Hatay (9.2%), İzmir (7.7%) and Adana (6.4%).

Our primary objective is to start in Söke and Aydın and promote the nationwide adoption of regenerative agriculture practices in cotton production, a sector that plays a significant role in Türkiye's economy. We aim to contribute to the development of technical and financial programs that will support the adoption of regenerative agriculture practices in Türkiye. We intend to leverage the experience and insights gained from our pilot studies to inform the scientific components of these programs. To this end, we have developed the "Water and Soil Management in Cotton Production" guide and videos, which provide technical information on field-scale practices to mitigate risks and support sustainable cotton production.

In order to guide the implementation of regenerative agriculture practices in cotton production, we also make the Regenerative Agriculture Scorecard available to all relevant parties. We hope that our work will contribute to the sustainability of cotton production in Türkiye and the welfare of our farmers.

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WHAT IS REGENERATIVE AGRICULTURE?

Regenerative agriculture is a holistic approach that places soil health at the center, aiming to improve the resources used in agriculture beyond conservation and enhance the livelihoods of those engaged in agriculture. It is a practice that seeks to increase the quantity and vitality of soil organic matter, which in turn benefits agricultural production. This is achieved by fostering the growth of beneficial microorganisms such as bacteria, fungi, nematodes, protozoa, and predatory organisms like arthropods that consume them.

The approach is based on five key principles:

1. Tillage should be minimized and only performed when absolutely necessary.
2. Maximize crop diversity.
3. Ensure the soil surface is always covered.
4. Plan for year-round living root growth.
5. Integrate animals into the system with a structured grazing plan.

Regenerative agriculture is a key driver of economic efficiency and environmental responsibility, focusing on minimizing the use of toxic inputs such as agrochemicals. This approach contributes to enhancing water quality and catchment health at both the micro and macro levels.

WWF-TÜRKİYE'S REGENERATIVE AGRICULTURE PRACTICES IN COTTON PRODUCTION

Our pilot practices include cover crop cultivation, no-till direct cotton cultivation, and compost application (biological soil amendments). To observe and record the effects of these practices, we are implementing a monitoring and evaluation program based on physical, chemical, and biological parameters for soil health.

ECOSYSTEM SERVICE RESTORATION

BENEFITS

- SOIL HEALTH RESTORATION
- PRESERVATION OF WATER RESOURCE QUANTITY AND QUALITY
- BIODIVERSITY ENHANCEMENT
- CARBON SEQUESTRATION
- FARMERS WELFARE

PILOT APPLICATIONS

NO-TILL / DIRECT SEEDING

DIVERSE CROP ROTATION

COVER CROPPING

COMPOST APPLICATION

MACHINERY AND EQUIPMENT

NO-TILL MACHINERY (DIRECT SEEDER)

PLANT DIVERSITY (RYE, VETCH, BARLEY, WHEAT)

ROLLER CRIMPER

SPRAYER FOR COMPOST APPLICATION

COVER CROP, DIRECT SEEDING METHOD, AND COMPOST APPLICATION

The application of cover crops contributes to the reduction of soil erosion, the enhancement of soil fertility, the improvement of soil structure, and the mitigation of competition between the primary crop and weeds. Additionally, it helps manage pest and disease cycles. Cover crops also increase biodiversity in the field and create wildlife habitats. Maintaining soil surface coverage with plant biomass throughout the year acts as a protective barrier against the damaging effects of extreme cold in winter and extreme heat in summer. Furthermore, cover crops reduce surface evaporation and prevent soil water loss, thus helping to conserve soil moisture.

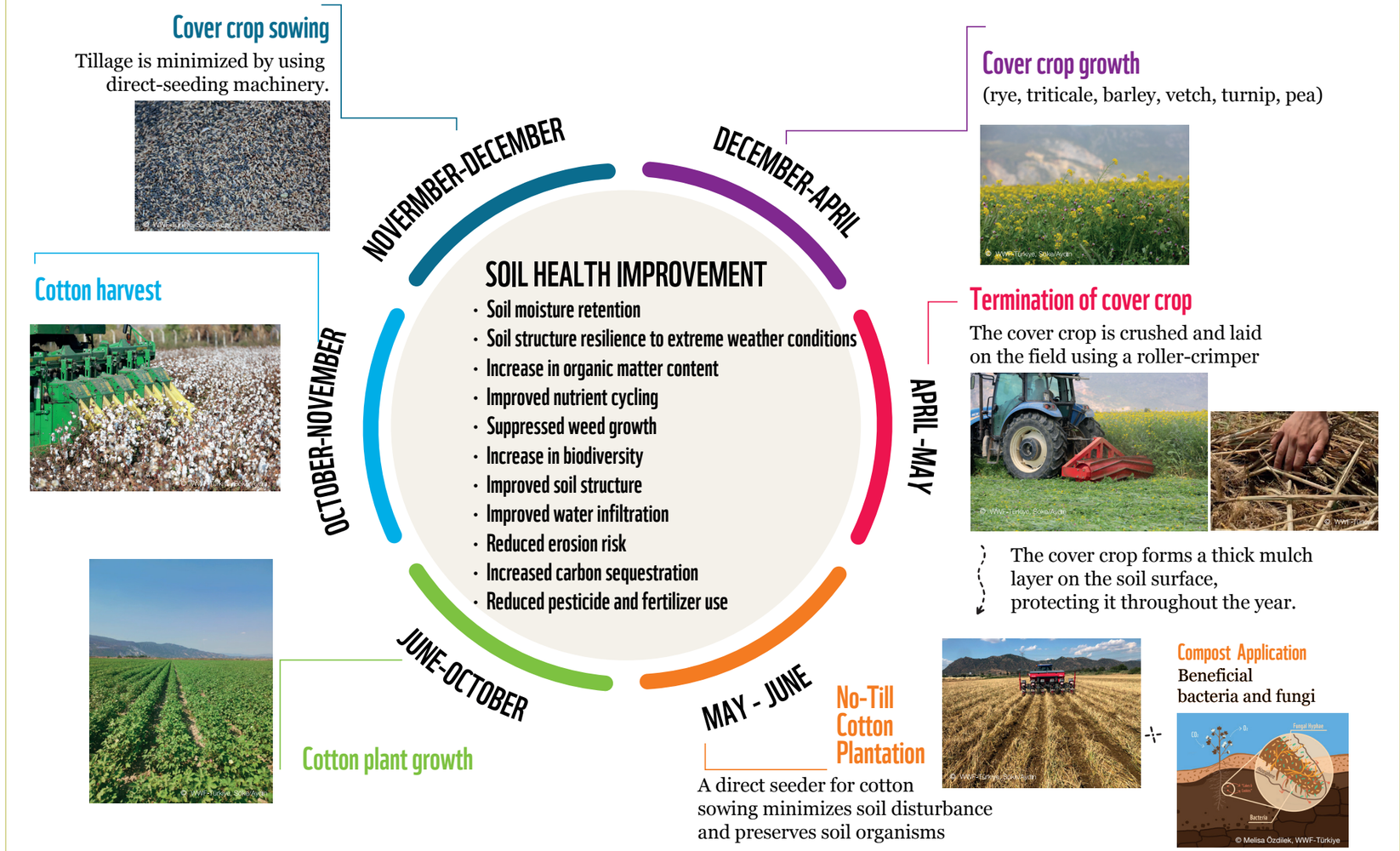
In our pilot studies, we used a mixture of plant species such as rye, triticale, barley, vetch, turnip and pea as cover crops. This approach also enhances crop diversity and biodiversity within the fields. Cover crop sowing begins after the cotton harvest in November. In line with the 'minimum tillage' principle of regenerative agriculture, we have designed 'direct seeding' machines for cover crops and cotton by modifying existing agricultural machinery.

The cover crop must be 'terminated' prior to cotton planting. This process involves crushing the plants and laying them on the soil to ensure they remain in place throughout the year. We use a 'roller crimper' to carry out the cover crop termination, a piece of equipment specifically designed to accommodate the unique conditions of the terrain. Additionally, we apply compost to promote the growth and development of beneficial microorganisms, such as bacteria and fungi, which are invisible to the naked eye but play a vital role in soil health. During compost application, we have also made appropriate design modifications to the cotton sowing machine to prevent bacteria and fungi from being damaged by the pressure generated during the spraying process, ensuring their survival.

ACHIEVEMENTS IN PILOT APPLICATIONS

After a three-year implementation period, our pilot applications demonstrated numerous benefits of regenerative agriculture. Earthworms—key indicators of healthy soil and rarely observed in cotton fields in Söke—were seen within the first year. Improvements in soil structure were evident, including increased aggregate stability and pH values approaching optimal levels. Additionally, the organic carbon content in the soil rose from low to medium levels. In the first year of the pilot, farmers experienced a 20 percent reduction in gross input costs. These results align with the expected benefits of regenerative agriculture, such as improved soil health, increased biodiversity, and reduced input costs.

ANNUAL IMPLEMENTATION CYCLE FOR WWF-TÜRKİYE'S REGENERATIVE AGRICULTURE PRACTICES IN COTTON PRODUCTION



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PILOT IMPLEMENTATION RESULTS ALIGN WITH THE EXPECTED BENEFITS OF REGENERATIVE AGRICULTURE, SUCH AS IMPROVED SOIL HEALTH, INCREASED BIODIVERSITY, AND REDUCED INPUT COSTS.

SCORECARD FOR REGENERATIVE AGRICULTURE IN COTTON PRODUCTION

WHAT IS IT?

The Regenerative Agriculture Scorecard is a tool designed to bridge the gap between theoretical knowledge of regenerative agriculture and its practical application. It supports farmers and agricultural engineers in developing, monitoring, and evaluating regenerative agriculture practices at the field level.

It provides a comprehensive and detailed framework of various regenerative agricultural practices, enabling the transition from 'baseline' (Level 0) to 'best' (Level 4) in the process of improving soil health.

The Scorecard establishes minimum standards for regenerative agriculture practices, ensuring the monitoring and enhancement of soil health within these practices.

Additionally, it acts as a platform for sharing regenerative agriculture expertise and best practices among farmers.

The Scorecard also serves as an educational resource for the textile supply chain and consumers, enabling them to learn about, understand, and adopt the principles of regenerative agriculture.

The Regenerative Agriculture Scorecard has been developed based on regenerative agriculture practices documented in the literature, incorporating insights from WWF-Türkiye's experiences in regenerative agriculture pilot studies. It is important to note that the levels of practices outlined in the Scorecard may vary depending on the conditions of cotton production in different countries and regions. The Scorecard is not intended to serve as a definitive framework but rather as a dynamic document open to refinement and updates.

WHAT IS IT NOT?

While the Regenerative Agriculture Scorecard outlines various levels of regenerative agriculture practices, it is not designed to determine an overall single level. Each of the 16 practices in the Scorecard is evaluated independently within its own category. For instance, one practice may be assessed at the highest level (Level 4), while another may be at a lower level. In summary, the Scorecard does not assign an overarching regenerative agriculture level (e.g., Level 1, 2, 3, or 4) to a field.

The Regenerative Agriculture Scorecard supports verification processes but is not a verification tool. It provides a framework for different levels of regenerative agriculture practices. It is not intended for use as a reference for printing 'regenerative cotton' labels and similar labels on textile end products.

WHO CAN BENEFIT AND HOW?

The Regenerative Agriculture Scorecard is a valuable resource for farmers, agricultural engineers, textile supply chain professionals, public institutions, organisations in the agricultural sector, chambers of agriculture, cooperatives, academics, students, and consumers.

Farmers and agricultural engineers:

- To establish a plan for transitioning from traditional practices to regenerative agricultural practices.
- To identify the technical and financial support needs for practices targeted for transition to regenerative agriculture.
- To determine the level of soil health improvement resulting from regenerative agricultural practices.
- To identify areas needing improvement and plan the necessary applications accordingly.

Textile supply chain:

- To be informed about improvements in soil health through a monitoring and evaluation mechanism for supplied products, enabling assessments that focus not only on implementation (activity-oriented) but also on impact (outcome-oriented).
- To use the Scorecard as a supporting tool for determining terms of agreement in regenerative agriculture contracts with farmers.
- To collaborate directly with farmers to identify activities requiring investment and to determine the amount of investment needed, particularly for machinery and equipment.

Public Administrations, Chambers of Agriculture, and Cooperatives:

- To gain insights into the impact of regenerative agricultural practices.
- To use the Scorecard as a reference for developing regenerative agriculture support programs.
- Agricultural cooperatives can utilize the Regenerative Agriculture Scorecard to monitor the performance of their member farmers and make collective decisions about advancing to higher levels of regenerative agriculture.

Academics:

- The Scorecard can serve as a valuable resource when developing curricula on regenerative agriculture.

Consumers

- The Scorecard provides insights into the scope and practices of regenerative agriculture, offering a clear understanding of the minimum conditions.

HOW TO USE IT?

The Regenerative Agriculture Scorecard focuses on five key outputs: soil health, water management, mitigation of climate change impact, biodiversity elements, and input management, along with different practices and levels within each of these outputs.

The five main outputs of the Regenerative Agriculture Scorecard and the framework of regenerative agriculture practices associated with them are as follows:

REGENERATIVE OUTCOME	REGENERATIVE PRACTICE
1. Soil Health	Cover Crop
	Tillage
	Soil Cover
	Year-Round Living Roots
	Crop Rotation
	Animal Integration & Grazing Management
2. Water Management	Reducing the Amount of Irrigation Water Needed
	Irrigation Water Management
3. Mitigation of Climate Change Impact	Reducing Field Traffic Carbon Emissions
	Carbon Sequestration
4.Biodiversity Elements	Diversity of Non-Crop Species and Habitats
	Soil Biodiversity
5. Input Management	Plant Nutrients Management
	Pesticide Management
	Weed Management
	Biological Inoculation Applications

The Regenerative Agriculture Scorecard details the various levels within these five outcomes, with the 16 regenerative agriculture practices in the Scorecard categorized between level 0 and level 4. According to the Scorecard, the 'basic requirements' of regenerative agriculture are met at level 1. Practices that can be implemented to reach the best practice level, i.e. level 4, under each practice can be identified from this card.

The Regenerative Agriculture Scorecard outlines the minimum conditions for regenerative agriculture. It identifies situations where the level of soil health improvement is assessed as zero (0). In other words, regardless of how high the level of each of the 16 practices in the Scorecard is within its category, certain minimum conditions must be met for the practice to be considered regenerative agriculture.

According to the Scorecard, production cannot be considered 'regenerative agriculture' if none of the following practices are included. At least one of them must be implemented:

- Cover crop sowing
- Ensuring that living roots remain in the soil year-round
- Application of conservative tillage
- Using biological soil amendments
- Animal integration
- Crop rotation (alternation)
- Agroforestry
- Use of pressurised irrigation systems

If any of the following conditions are present, the production will not be considered **'regenerative agriculture'** under any circumstances:

- Leaving the soil completely bare outside the growing season, such as not allowing local flora to grow or not planting any cover crops.
- Deep tillage of the soil, e.g., ploughing.
- Using methods involving burning, herbicides, or deep tillage to manage cover crops or local flora (weeds).
- Failing to implement 'Integrated Pest Management' practices. This includes applying pesticides habitually or in combination without determining the economic damage threshold, without recording the applications, and without adhering to the list of prohibited active substances.

The above-mentioned issues are highlighted in 'red' within the 16 practices of the Regenerative Agriculture Scorecard.

Provided that the minimum conditions are met, farmers can implement the practices outlined in the Regenerative Agriculture Scorecard based on the conditions, resources, and possibilities of their region.

Some calculations are necessary for evaluating certain practices in the Scorecard. The relevant calculation tables are provided separately in the annex of the Scorecard.

Regenerative Outcome	Regenerative Practice	Practice Component	Description	Level 0	Level 1	Level 2	Level 3	Level 4
SOIL HEALTH	Cover Crop	Cover Crop Termination	Determine your level according to the method you use to terminate your cover crop.	I use a chemical (herbicide), or I plow up the cover crop.	I use a heavy disk harrow to bury the residue after mowing the cover crop.	I use a heavy disk harrow to bury the residue without mowing the cover crop.	I mow the cover crop and leave the residue on the soil surface.	I use a roller-crimper.
		Cover Crop Diversity	Determine your level according to the number and diversity of functional groups (grains/legumes/root crops/brassicas) in your cover crops.	I do not leave weeds on the field or plant cover crops.	I leave weeds on the field, or I plant one cover crop species.	I plant two cover crop species.	I plant three cover crop species.	I plant at least four cover crop species.
	Tillage	Tillage Method	Determine your level according to the tillage method you use.	I turn the soil with a plow.	I till vertically with a heavy disk harrow or a rototiller.	I till by ripping the soil with a chisel plow or heavy chisel plow.	I only do strip tillage on the planting row (25-30 cm wide) or only till with a heavy disk harrow to eliminate any irregularities in the field.	I do not till.
		Tillage Frequency	Determine your level according to the number of passes for tilling the soil.	Five passes or more.	Four passes.	Three passes.	Two passes at most.	None.
	Soil Cover		Determine your level according to the percentage of soil cover right after you seed your main crop (cotton).	The surface of my soil is not covered.	My soil is less than 30% covered.	My soil is 31-60% covered.	My soil is 61-90% covered.	My soil is 91% or more covered.
	Year-Round Living Roots		Determine your level according to the presence of living plants outside of 21 days before and 21 days after harvest.	I do not plant anything outside the growing season, I leave the soil bare.	I plant winter crops.	I leave the main crop residue in the field after harvest and let weeds replenish outside the growing season.	I plant annual cover crops and terminating them only after >50% bloom.	I protect perennial vegetation and tree and shrub species, or I plant them when not present (I practice agroforestry).
	Crop Rotation		Determine your level according to the number of crops you plant throughout the five growing seasons.	I do not practice crop rotation.	I plant a winter crop and a main crop, or I use two crop rotations with main crops.	I plant a cover crop and a main crop.	I plant a cover crop and use two crop rotations with main crops.	I plant cover crops and use three or more crop rotations with main crops.
	Animal Integration & Grazing Management		If you are practicing animal integration, determine your level according to grazing frequency, percentage of grazing area and your grazing system.	I am causing soil compaction by overgrazing or continuously grazing without any grazing plan.	I practice grazing on less than 25% of my farm land, less than twice a year with no grazing plan.	I practice rotational grazing on less than 50% of my farm land more than twice a year.	I graze 50-75% of my farm land, more than twice a year with rotational and adaptive grazing management (e.g., Holistic Planned Grazing).	I graze more than 75% of my farm land, more than twice a year, with adaptive and contextual grazing management (e.g. Holistic Planned Grazing).
WATER MANAGEMENT	Reducing the Amount of Irrigation Water Needed		Determine your level according to how many practices you implement to increase soil organic matter and reduce surface evaporation (cover crops/year-round living roots/conservation tillage/biological soil amendments/animal integration/crop rotation/agroforestry/pressurized irrigation).	I do not implement any of these practices.	I implement one of these practices.	I implement two of these practices	I implement three of these practices.	I implement four or more of these practices.
	Irrigation Water Management		Determine your level according to the water source and irrigation method you use.	I do flood irrigation and pond the fields with ground or surface water.	I do flood irrigation with surface water without ponding.	I do flood irrigation with only surface water, without ponding provided that there is a surface cover (cover crop residue).	I do pressurized irrigation (sprinkling, mini-spring, drip, underground drip) only with surface water.	I do pressurized irrigation (sprinkling, mini-spring, drip, underground drip) only with surface water, according to the water need of the plants and I keep records.

Regenerative Outcome	Regenerative Practice	Practice Component	Description	Level 0	Level 1	Level 2	Level 3	Level 4
MITIGATION OF CLIMATE CHANGE IMPACT	Reducing Field Traffic Carbon Emissions	Fuel Consumption (Only for Cotton Production)	Determine your level based on the amount of fuel used by all machines throughout the year, depending on the number of passes (such as soil cultivation, plant protection, plant nutrition, biological soil amendment applications, etc.) Use the “Fuel Requirement for Mechanization Operations Table” (Table 1) for this purpose	≥13.5	8.1–13.4	6.6-8	5.6–6.5	≤5.5
		Fuel Consumption (Cover Crop and Cotton Production)	Determine your level according to the amount of fuel you use depending on the total number of passes per year for tillage, plant protection, plant nutrition, biological soil amendments, etc.. Use the “Fuel Requirement for Mechanization Operations Table” (Table 1) to determine this amount.	≥13.7	10.9–13.6	9.1–10.8	7.7-9	≤7.6
	Carbon Sequestration		Determine your level according to the number of practices you implement to increase soil organic carbon (cover crop/year-round living roots/ conservation tillage/biological soil amendments/animal integration/ crop rotation/agroforestry).	I do not implement any of these practices.	I implement one of these practices.	I implement two of these practices.	I implement three of these practices.	I implement four or more of these practices.
BIODIVERSITY ELEMENTS	Diversity of Non-Crop Species and Habitats	Local Flora and Fauna Management	Determine your level according to how you manage the local flora and fauna in and around your fields.	I eliminate the local flora by burning, using (herbicides) or by tillage.	I mow the local flora without waiting for it to bloom or go to seed.	I mow the local flora after it blooms or goes to seed.	I protect at least 1.5 meter wide local flora areas on field borders without intervention. I implement practices that encourage biodiversity in my fields such as making stone piles on field borders, leaving unbroken lumps of soil for reptiles, digging holes in the ground for mammals such as foxes and badgers, leaving small ponds or some water in earthen/ concrete channels for wild animals and making sure that the fencing around my fields is suitable for animals.	I protect at least 3-6 meter wide local flora areas on field borders without intervention. In addition to the practices mentioned in level 3, I implement practices such as protecting especially flowering species for butterflies, bees and predator/beneficial insects that feed on harmful invertebrates, planting various flowering species annually, if their numbers are low, and protecting tall trees in and around my fields.
		Biodiversity Elements	Determine your level according to the percentage of the biodiversity elements on your farm using the “Biodiversity Elements Evaluation Table” (Table 2).	≤1%	2%-5%	6%-7%	8%-10%	>10%
	Soil Biodiversity		Determine your level according to the number of practices you implement to increase and develop soil life (cover crops/year-round living roots/ conservation tillage/biological soil amendments/animal integration/ crop rotation/agroforestry/ biodiversity focus areas/integrated pest management).	I do not implement any of these practices.	I implement one of these practices.	I implement two of these practices.	I implement three of these practices.	I implement four or more of these practices.

Regenerative Outcome	Regenerative Practice	Practice Component	Description	Level 0	Level 1	Level 2	Level 3	Level 4
INPUT MANAGEMENT	Plant Nutrients Management	Plant Nutrition Sources and Management	Determine your level according to your plant nutrition source and method of application.	I apply plant nutrients without any soil tests, based on habit and in the form of synthetic fertilizers.	I apply plant nutrients in the form of synthetic fertilizers, according to soil test results (including minimum OM, NPK).	I apply plant nutrients in the form of synthetic fertilizers, according to soil test (including minimum OM, NPK) and leaf test results.	I apply plant nutrients according to soil test (including minimum OM, NPK) and leaf test results using 4R's (Right Source, Right Rate, Right Time, Right Place) Nutrient Management. I support my crops' nitrogen needs with biological sources from nitrogen-fixing species in my cover crop mix.	I apply plant nutrients according to soil test (including minimum OM, NPK) and leaf test results, only in the form of organomineral fertilizer if necessary, preferably in the form of biologically active soil amendments (microbial fertilizer, compost, compost extract, etc.).
		Manure Management	If you are using manure, determine your level according to your timing and method of manure application.	I lay the manure on the field long before planting and leave it there.	I mix manure into the soil after leaving it on the surface for longer than two weeks.	I mix manure into the soil after leaving it on the surface for less than two weeks.	I apply manure before rain/ irrigation without mixing it into the soil, or I calculate the amount of manure with the help of fertilizer and soil test results.	I apply manure by composting it.
	Pesticide Management		Determine your level according to your plant protection practices.	I apply pesticides without determining the economic damage threshold[4], based on habit, without keeping records and without taking the prohibited active ingredient list[5] into account, on their own or as a cocktail.	I apply pesticides without determining the economic damage threshold, only through simple observation, taking the prohibited active ingredient list into account and keeping records.	I apply pesticides taking the economic damage threshold into account and within the framework of Crop Protection Criteria[6] that is set forth in the Better Cotton Standard.	I apply pesticides with the integrated pest management method[7] (A trap method, visual examination method, cultural method, bait method), in a way that will minimize chemical applications, within the framework of a management plan that includes the Crop Protection Criteria that is set forth in the Better Cotton Standard. I apply pesticides using precision agriculture technologies.	In addition to the practices mentioned in Level 3, I control pest populations with increased diversity of predator and beneficial species in the field ecosystem by planting cover crops, doing crop rotation and supporting biodiversity elements on field borders. I apply biological pesticides by taking the economic loss threshold into account. I release predator insects.
	Weed Management		Determine your level according to your weed management decision.	I terminate weeds with a total herbicide application.	I eliminate weeds by tilling the soil before seeding or I apply local and species-specific herbicides and between main crop rows.	I apply targeted herbicides using a selective herbicide machine on and between main crop rows.	I cover the soil surface with cover crops to prevent weed growth. I use hoeing machine to till between main crop rows. I use hand hoe on main crop rows.	I cover the soil surface with cover crops to prevent weed growth. I terminate weeds between main crop rows mechanically, without touching the soil. I integrate allopathic species between rows. I rip the soil with cultivator between rows. I manually hoe on main crop rows.
	Biological Inoculation Applications		Determine your level according to your biological inoculation applications.	I do not apply any biological inoculations.	I coat seeds regardless of plant species (e.g. effective microorganisms, milk and molasses treatment etc.).	I coat main crop, winter crop or cover crop seeds with only one biological inoculant such as mycorrhizal, rhizobium or compost extract, that is suitable for the plant species.	I coat main crop, winter crop or cover crop seeds with two biological inoculants such as mycorrhizal, rhizobium or compost extract.	I coat main crop, winter crop or cover crop seeds at least two biological inoculants such as mycorrhizal, rhizobium or compost extract. Then I apply mycorrhizal inoculation, compost extract etc. to the soil.

4 The point where the pest population reaches a density level below the economic damage threshold that requires precautions to be taken (Stern, V.M., Smith, R.F., Van den Bosch, R.R. & Hagen, K. (1959). The integration of chemical and biological control of the spotted alfalfa aphid: the integrated control concept. Hilgardia, 29(2), 81-101.)
5 Prohibited Plant Protection Product Active Ingredient List:
https://www.tarimorman.gov.tr/konu/934/yasaklanan-bitki-koruma-urunleri-aktif-madde-listesi

6 Better Cotton Principles and Criteria v.3.0
https://bettercotton.org/documents/better-cotton-principles-and-criteria-v-3-0/
7 Cotton Integrated Pest Control Technical Instruction, 2017 (In Turkish)

Table 1: Fuel Needs for Mechanized Jobs

ACTIVITY	LITERS PER DECARE
Stalk cutting	0.35
Ripping the soil with a chisel plow	1.5
Pesticide application (before seeding)	0.2
Fertilizer application (before seeding)	0.2
Seed bed preparation (Double disk harrow, raking, roller)	3.5
Seeding (traditional)	0.4
Direct seeding	0.6
Terminating a cover crop	0.4
Direct seeding your main crop	0.6
Plant maintenance (Single plow (inter-row ripping), hoeing machine, fertilizer application)	2.9
Pesticide application	1
Rotary tilling (with a four-pointed chisel plow in the front)	1.5
Rotary tilling	0.8
Burying cover crops with a notched disk harrow	0.8
Plowing	2.1

Table 2: Biodiversity Elements Evaluation

		Please fill in only the white parts of the table.					
Biodiversity Elements (Ecological Focus Areas)	Definition of Biodiversity Elements	Please enter the size of the area (hectares).	Please enter the linear length (meters) or area (square meters).	Please enter the amount.	Multiply by the conversion factor.	Multiply by the weighting factor.	Complete the division for the biodiversity area result in hectares.
Ecological Feature							
Buffer Strips	Buffer Strips (or zones) / Riparian areas (area directly adjacent to waterways with trees and shrubs)				x 6	x 1.5	/10,000=
Fallow Land	Fallow land: Land previously (at least 1 year ago) used for agricultural production but now left untouched (e.g. no machinery driven on it, no chemicals or inputs of any kind applied to it)					x 1	=
Wildflower Areas	Borders, in-field strips and patches managed for wildlife or specific fauna (herbaceous border, protection of nests, wildflower strips, local seed mix, unharvested crops) (per 1 m^2)					x 2	/10,000=
Specific Landscape Features							
Hedges	Hedges and wooded strips i.e windbreaks: a line of closely spaces shrubs and / or trees, often multi-story in structure, planted in a continuous line) (per 1 m)				X 3	x 2	/10,000=
Isolated Trees	Isolated trees (per tree)				X 20	x 1.5	/10,000=
Trees in Lines	Trees in lines (per 1 m)				X 4	x 2	/10,000=
Trees in Groups	Wood margins, grove, group of trees (e.g. a small group of trees or edges of forests disconnected from larger forested areas) (per 1m^2)					x 1.5	/10,000=
Field Margins	Field margins: green edges between 1 and 20 meters wide with grass or other living plants that are not cut or sprayed with chemicals and with no agricultural production (per 1 m)				X 6	x 1.5	/10,000=
Ditches	Ditch, water point, and irrigation channels in the soil (per 1 m)				X 3	x 2	/10,000=
Ponds	Ponds (per 1 m^2)					x 1.5	/10,000=
Traditional Stone Walls	Small walls, terraces, old rural buildings that could be inhabited by insects, birds, small mammals or other wildlife (per 1 m^2)					x 1	/10,000=
Crop Diversification							
Crop Rotation	At least three crops, the main crop covering a maximum of 75%					x 0.3	=
Cover Crop, Winter Crop, Catch Crop	Cover Crop, Winter Crop or Catch Crop					x 0.3	=
Nitrogen-Fixing Crops	Nitrogen-Fixing Crops (Leguminous productive crops)					x 0.7	=
Total Biodiversity Area (hectares):	**Please sum the results of the biodiversity area in hectares.**						

Production Area (hectares): Please enter your total production area in hectares.	
Percentage of Biodiversity Elements (%): Divide your total Biodiversity Area result by your Production Area, and multiply the obtained result by 100. Enter the result in the relevant section of the Scorecard.	

REGENERATIVE AGRICULTURE IN COTTON PRODUCTION SCORECARD

%100
RECYCLED

77%

Of the world's water resources, 72% are used for agricultural purposes, this figure is 77% in Türkiye

1%

Only 1% of all agricultural land is classified as high quality and fertile agricultural soil.

84%

Of cotton's water footprint in Türkiye, 84% consists of surface and underground water resources, which means irrigation.

37%

From production to consumption, the food system as a whole is responsible for approximately 37% of global greenhouse gas emissions.

50 tons

In Türkiye, forests store approximately 56 tons of carbon per hectare, pastures store about 50 tons per hectare, and agricultural soils store about 36 tons per hectare.

WWF

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