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Pathways to Progress

Measuring Improvement Towards the 10-Year Sustainability Goals

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With hundreds of easily searchable resources, we're your go-to textile tool for discovering what's possible with cotton.

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Today's Speakers

Dr. Jesse Daystar
Vice President &
Chief Sustainability Officer

Cotton Incorporated

Allison Thomson
Vice President
Science & Research

Field to Market®

Webinar Support

Type your questions using the Q&A feature at any time during the webinar.

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Measuring Improvements Towards the 10-Year Sustainability Goals

Climate Change in the Headlines

More Than a Third of Heat Deaths Are Tied to Climate Change, Study Says

Sweeping new research found that heat-related deaths in warm seasons were boosted by climate change by an average of 37 percent.

Source: Getty Images

Consumers demand action on climate change — and it's time for retailers to listen

Published Feb. 21, 2020

Source: Getty Images

SUSTAINABILITY

Fashion and carbon emissions: Crunch time

The international fashion industry must urgently cut emissions by 50 per cent to reach a 1.5 °C target, says a new report from McKinsey and the Global Fashion Agenda.

BY BELLA WEBB

26 AUGUST 2020

https://www.nytimes.com/2021/05/31/climate/heat-deaths-climate-change.html

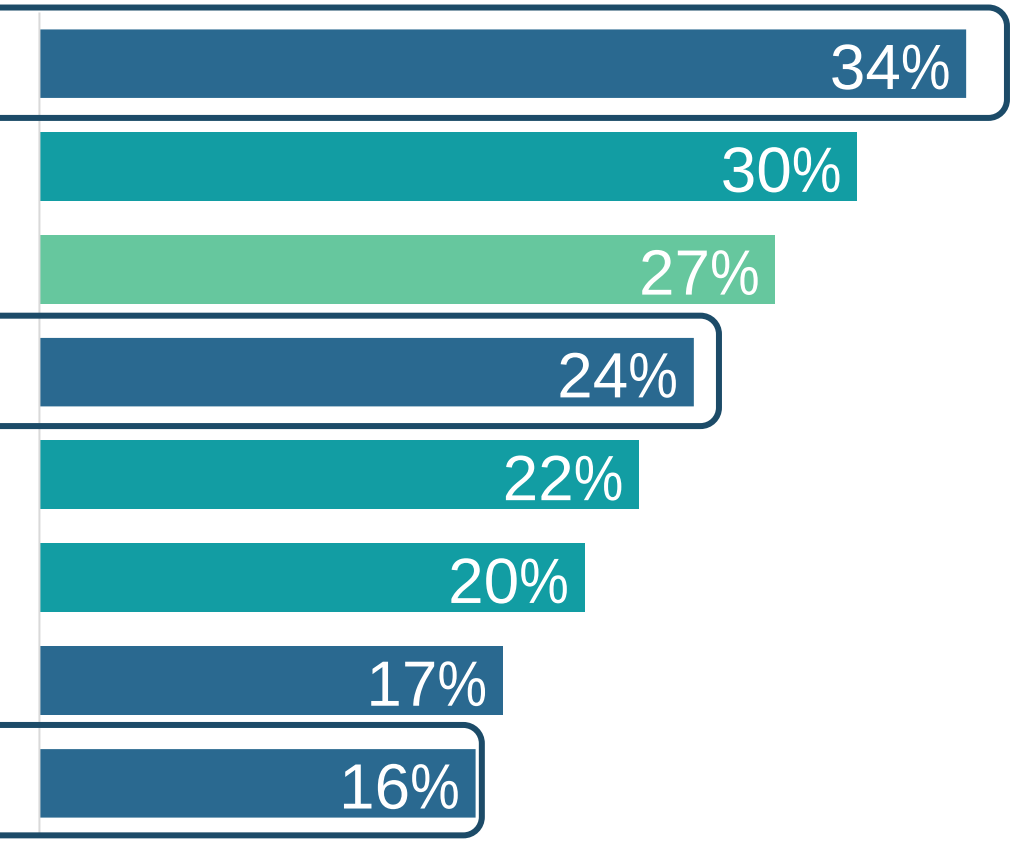
https://www.retaildive.com/spons/consumers-demand-action-on-climate-change-and-its-time-for-retailers-to/572572/

https://www.voguebusiness.com/sustainability/fashion-and-carbon-emissions-crunch-time

Generation Z Highly Concerned About Climate

Environmental issues top list of Gen Z concerns

Most important challenges facing our world today:



Source: Getty Images

- *Environmental*
- *Social*
- *Health*
- *Political*

Source: CCI & Cotton Incorporated's 2017 Global Environment Survey

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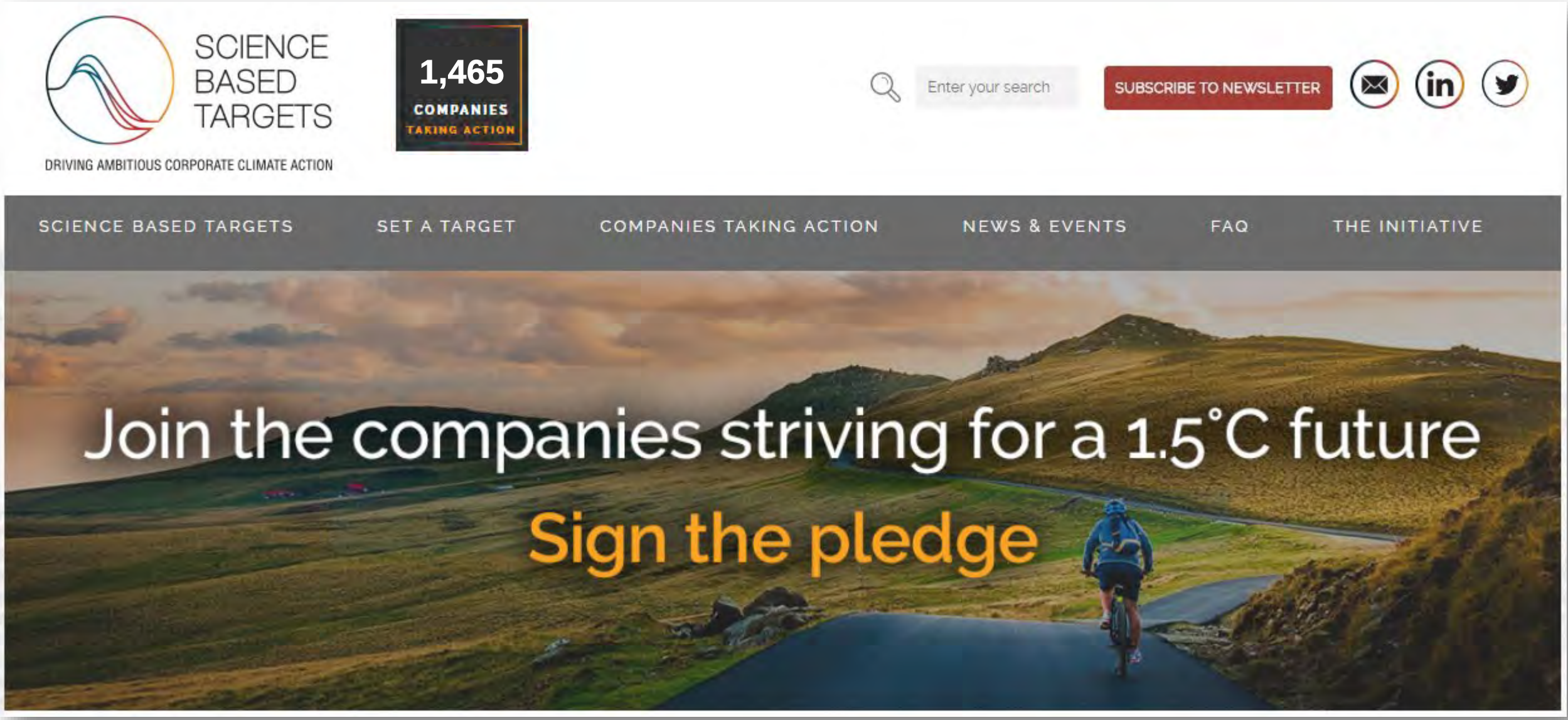
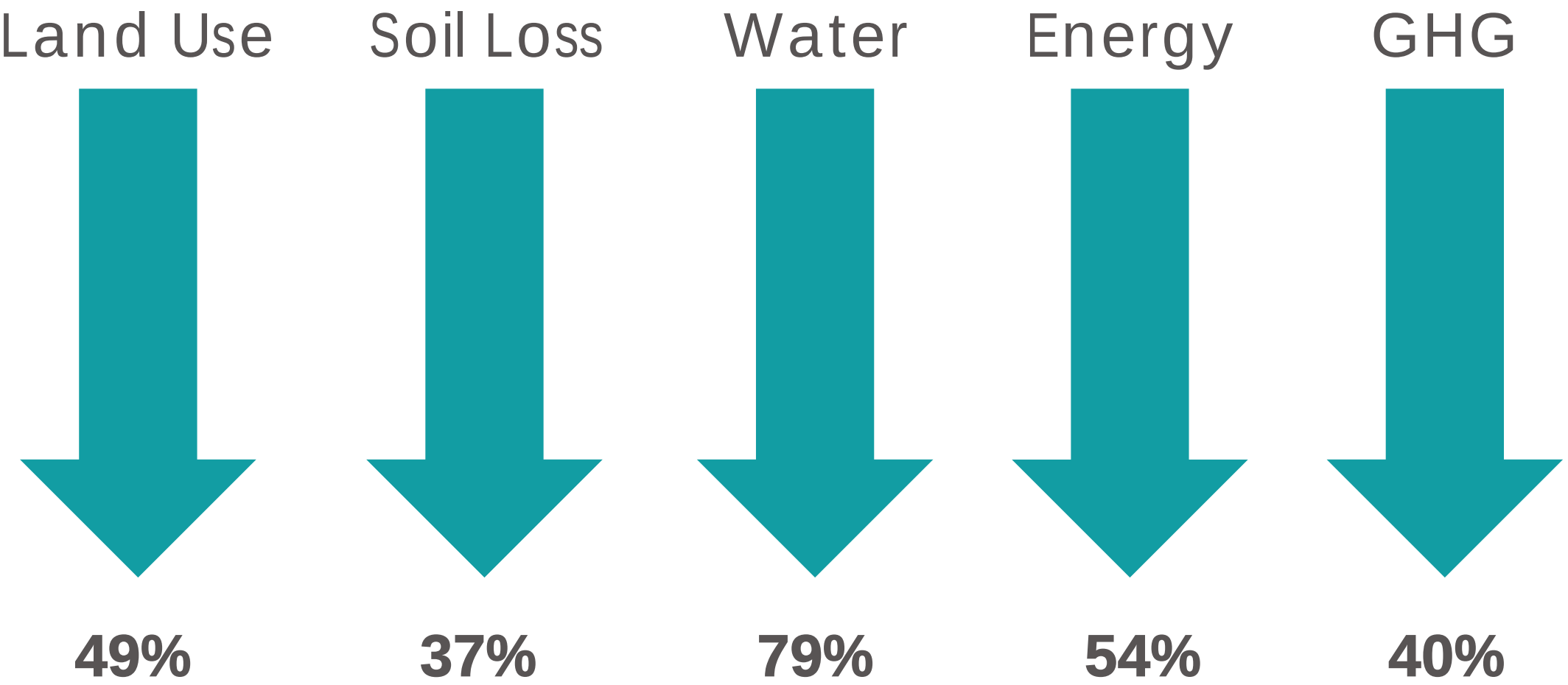
Science-Based Targets Initiative



35 Years of Reduced Environmental Impact



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Source: Field to Market: The Alliance for Sustainable Agriculture National Indicators Report (2016). https://fieldtomarket.org/national-indicators-report-2016/

Life Cycle Assessment Overview

Source: Cotton Incorporated (2017). LCA Update of cotton fiber and fabric life cycle. https://cottontoday.cottoninc.com/wp-content/uploads/2019/11/2016-LCA-Full-Report-Update.pdf

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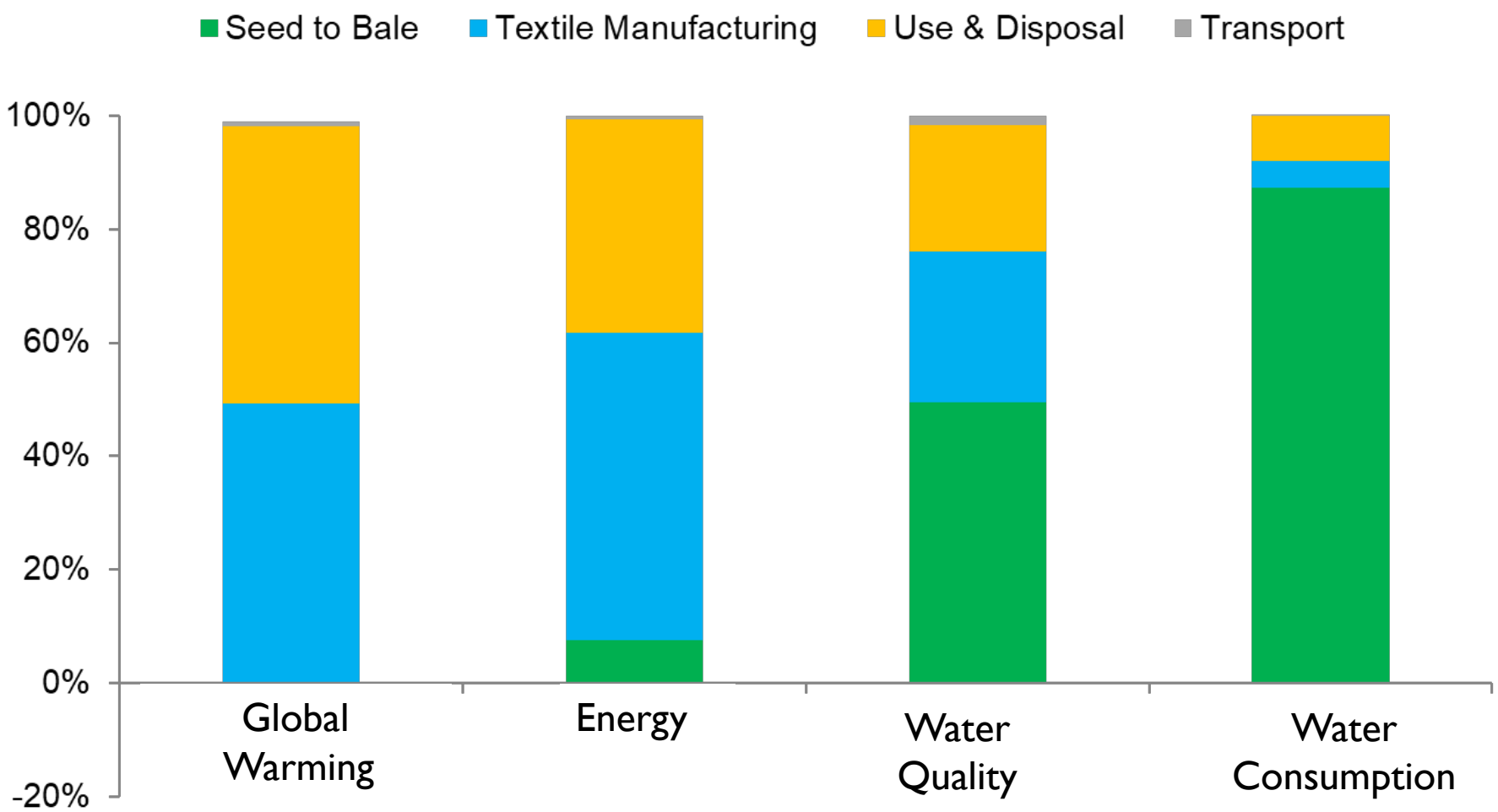
Overall Results for a Knit Collared Shirt



Source: Cotton Incorporated (2017). LCA Update of cotton fiber and fabric life cycle. https://cottontoday.cottoninc.com/wp-content/uploads/2019/11/2016-LCA-Full-Report-Update.pdf

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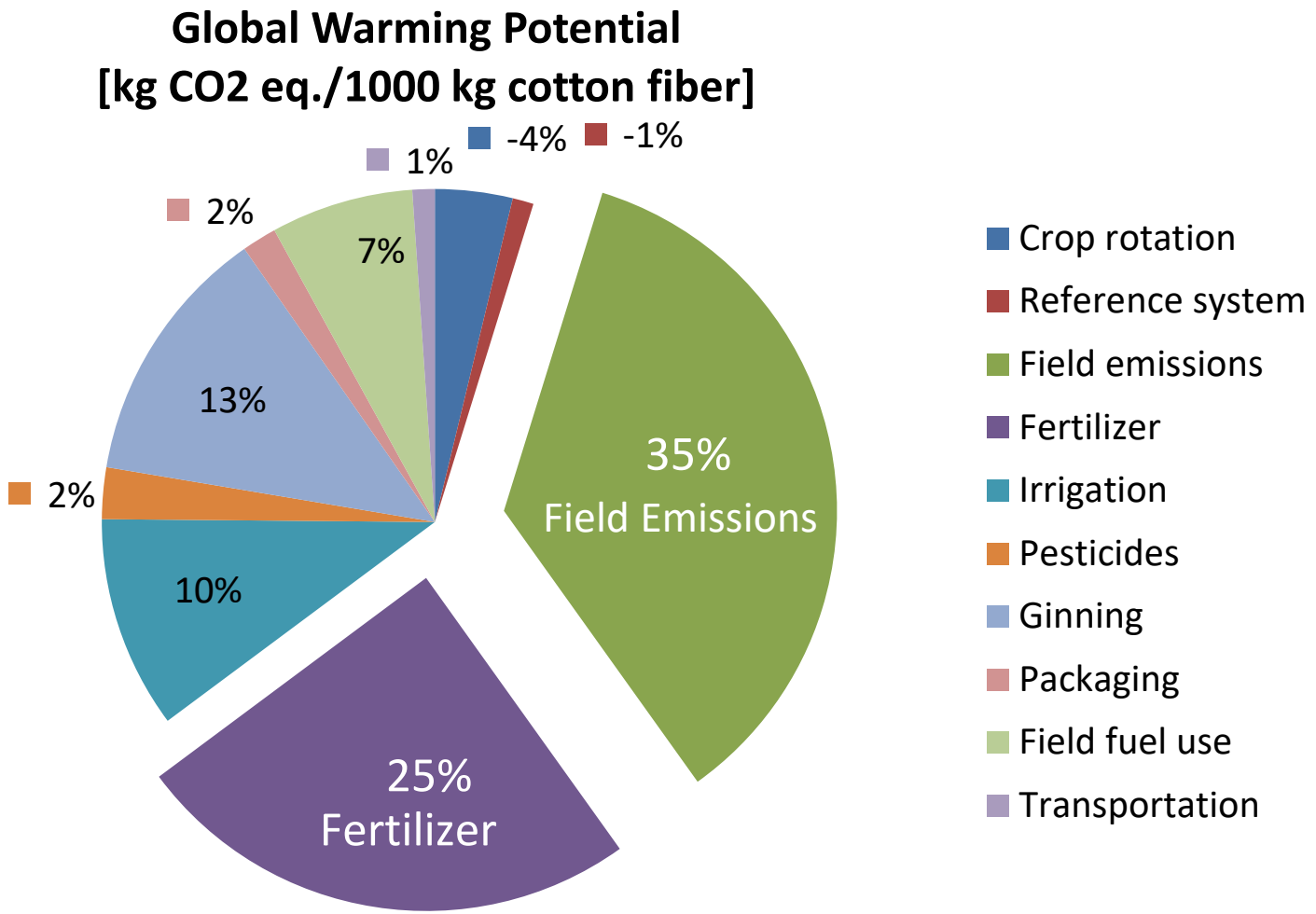
Nitrogen Fertilizer Contribution to GHG Emissions

Fertilizer contributes 60% to the overall global warming potential of cotton production

35% of GWP from nitrous oxide emissions from N volatilization



Source: Cotton Incorporated (2017). LCA Update of cotton fiber and fabric life cycle. https://cottontoday.cottoninc.com/wp-content/uploads/2019/11/2016-LCA-Full-Report-Update.pdf

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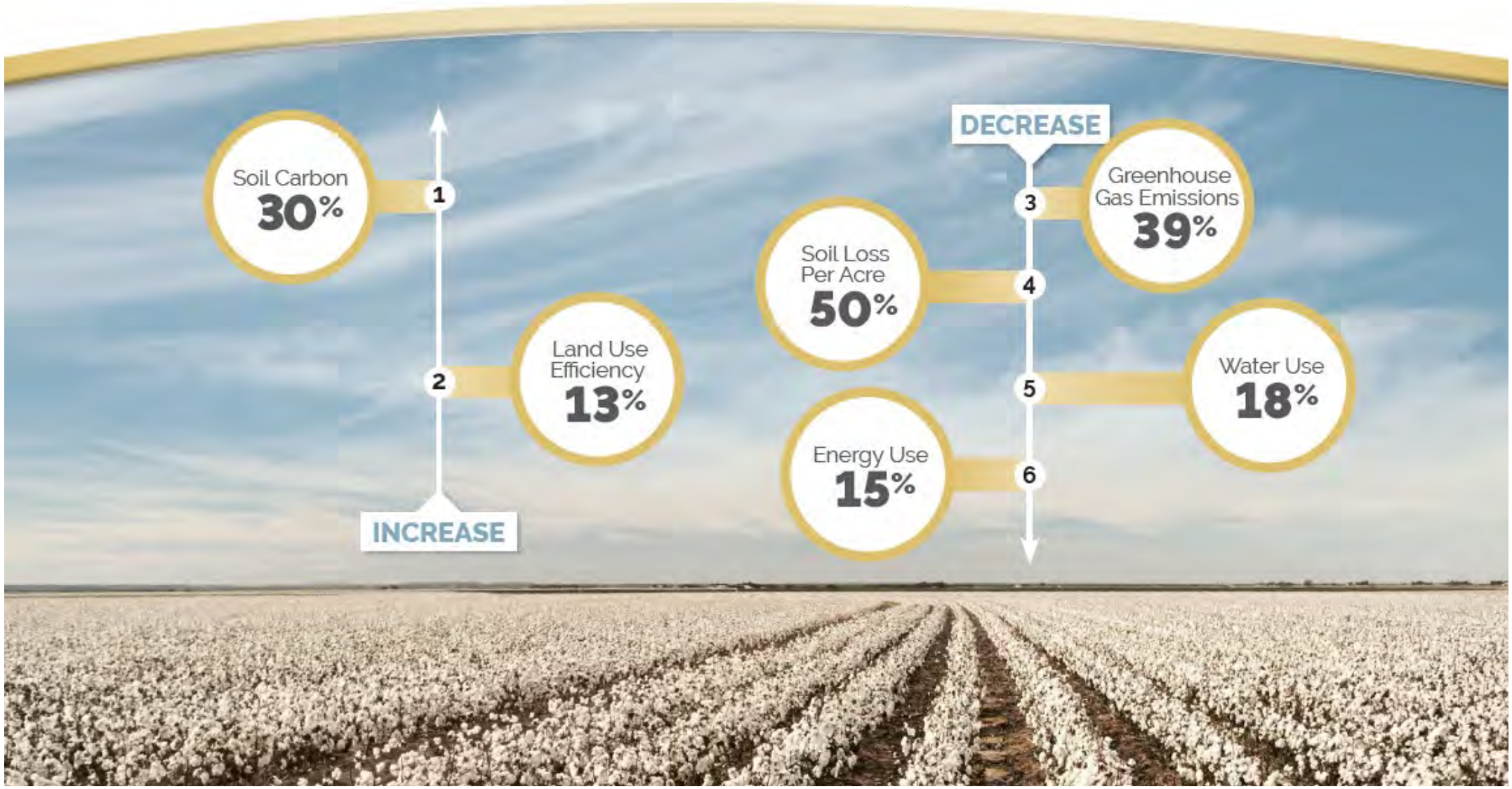
U.S. Cotton's Sustainability Goals for 2025



Source: Cotton Incorporated (2018). U.S. Cotton ten-year sustainability goals, Pathways to progress. https://www.cottoninc.com/wp-content/uploads/2018/02/Cotton_Sustainability_2018.pdf

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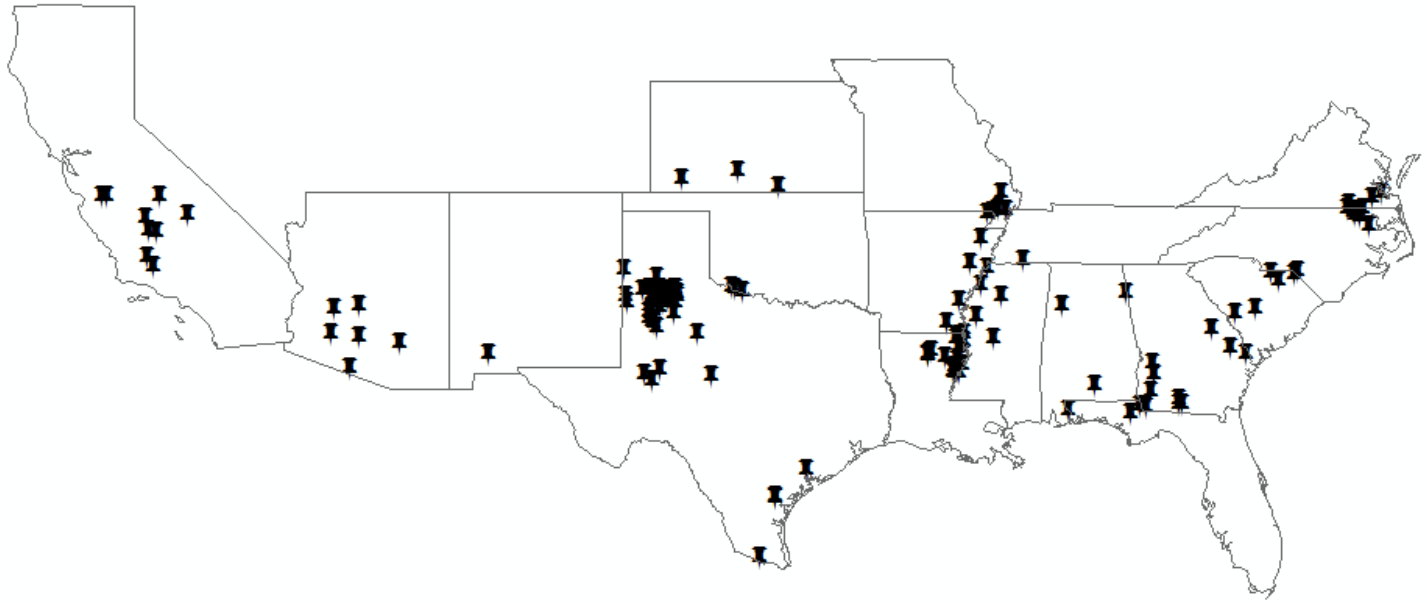
Field to Market Fieldprint Calculator Adoption

Goal is 2,500,000 Cotton acres

- Goal: Enroll 2.5 million acres in 10-years
- When cotton producers conduct a Fieldprint on 10% of their fields they benchmark environmental impacts and identify areas for improvement on their entire farm



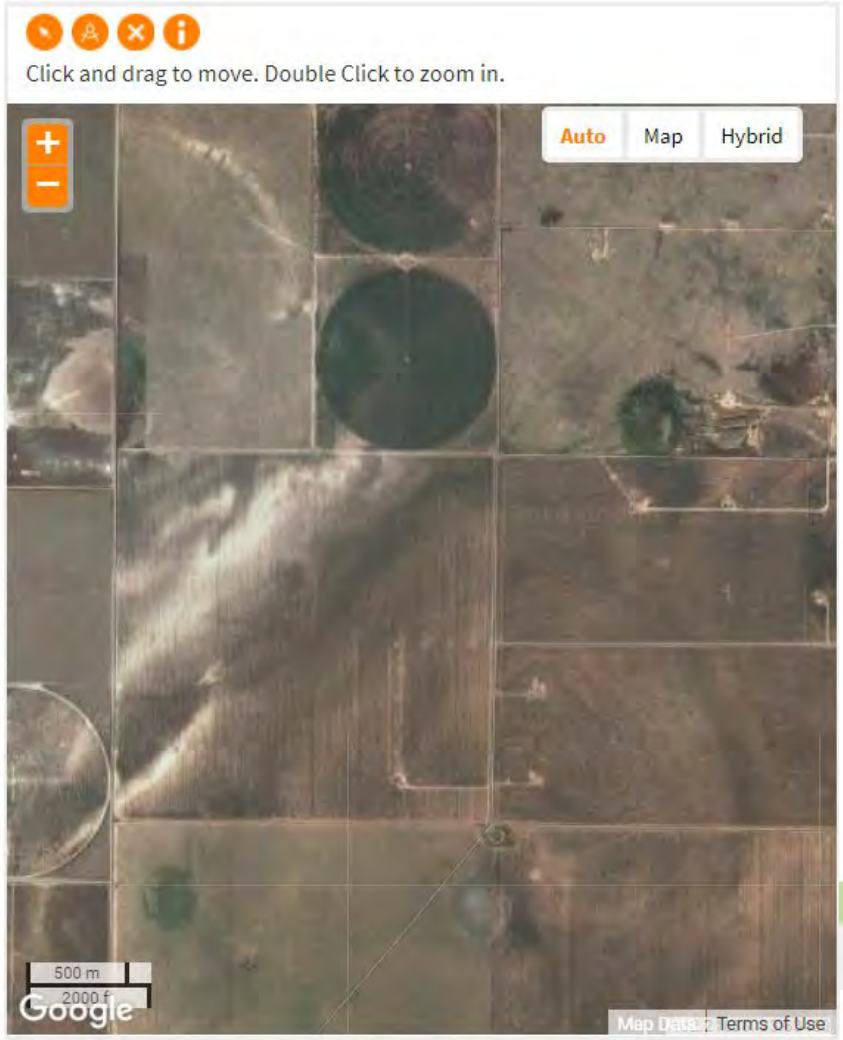
Fieldprint Calculator

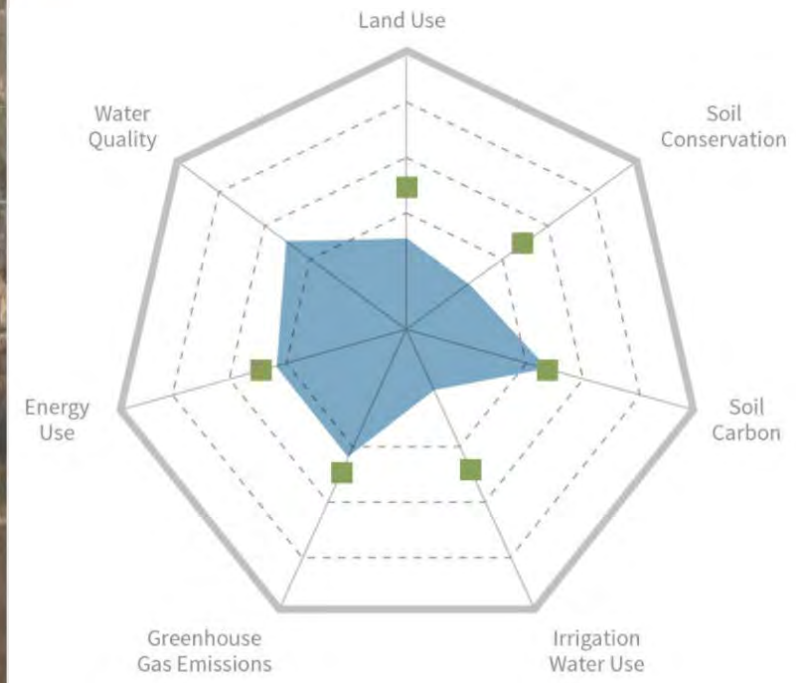
Field to Market®
The Alliance for Sustainable Agriculture

seconds per year of data entered causing longer than normal results processing times. Selecting "No" will turn WEPS off. Please click on for more information.

Save

- Location
- Soil
- Crop Rotation
- Management
- Product Transportation/Hauling
- Drying
- Planted But Not Harvested
- Conservation Practices
- Farm Demographics





Grower Index | National Average | State Average

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Field to Market®

Measuring Sustainable Agriculture

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www.fieldtomarket.org


BUILDING a bridge between science and business to deliver sustainable outcomes for agriculture, people, and the planet.

UNITING THE VALUE CHAIN

Multi-Stakeholder Program Development and Implementation

Credibility

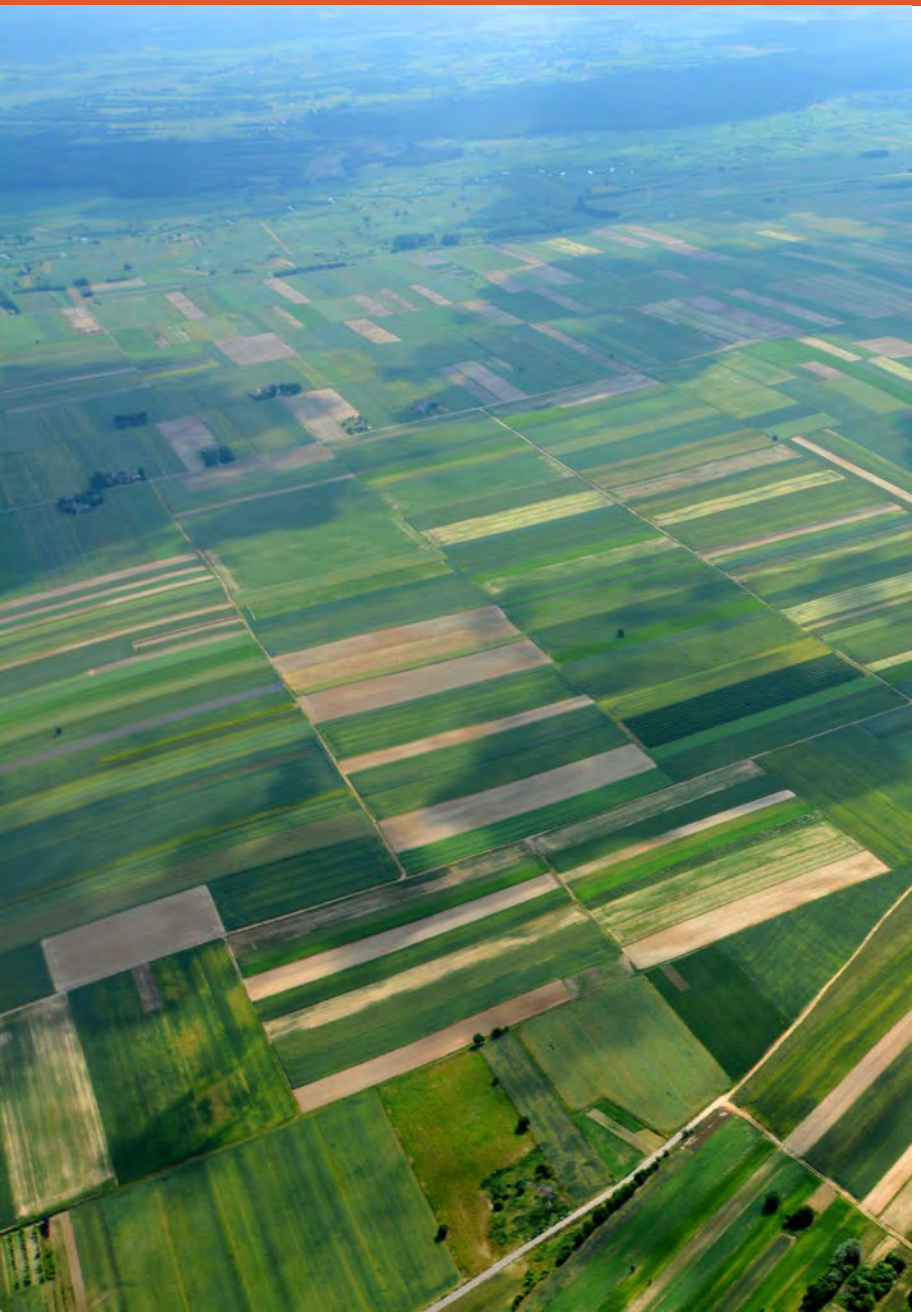
Leading universities and conservation groups are actively engaged in Field to Market's science-based approach to improve the environmental performance of U.S. agriculture.

Harmonization

Field to Market creates clear agreed upon terms and definitions and develops metrics and benchmarks that can be universally adopted by all stakeholders.

Efficiency

By providing a common framework to measure the sustainability of U.S. commodity crop production, Field to Market minimizes duplication of efforts and reduces the farmer burden.



GROUNDED IN SCIENCE

OUTCOMES-BASED

TECHNOLOGY NEUTRAL

Eleven Crop and Feed Pathways

Current Sustainability Metrics

Analyzing multiple metrics simultaneously enables farmers to consider trade-offs across sustainability outcomes:

Biodiversity

Land Use

Energy Use

Soil Conservation

Greenhouse Gas Emissions

Soil Carbon

Irrigated Water Use

Water Quality

Why We Establish Metrics

- An **industry-standard** measurement framework has value for the full value chain
- Provides a **science-based foundation** for sustainability tools and programs:
  - Fieldprint® Platform
  - Continuous Improvement Accelerator
- Guides development of **educational programs** and materials
- Objective measures enable farmers to identify opportunities for **continuous improvement**

Field to Market Metric Principles

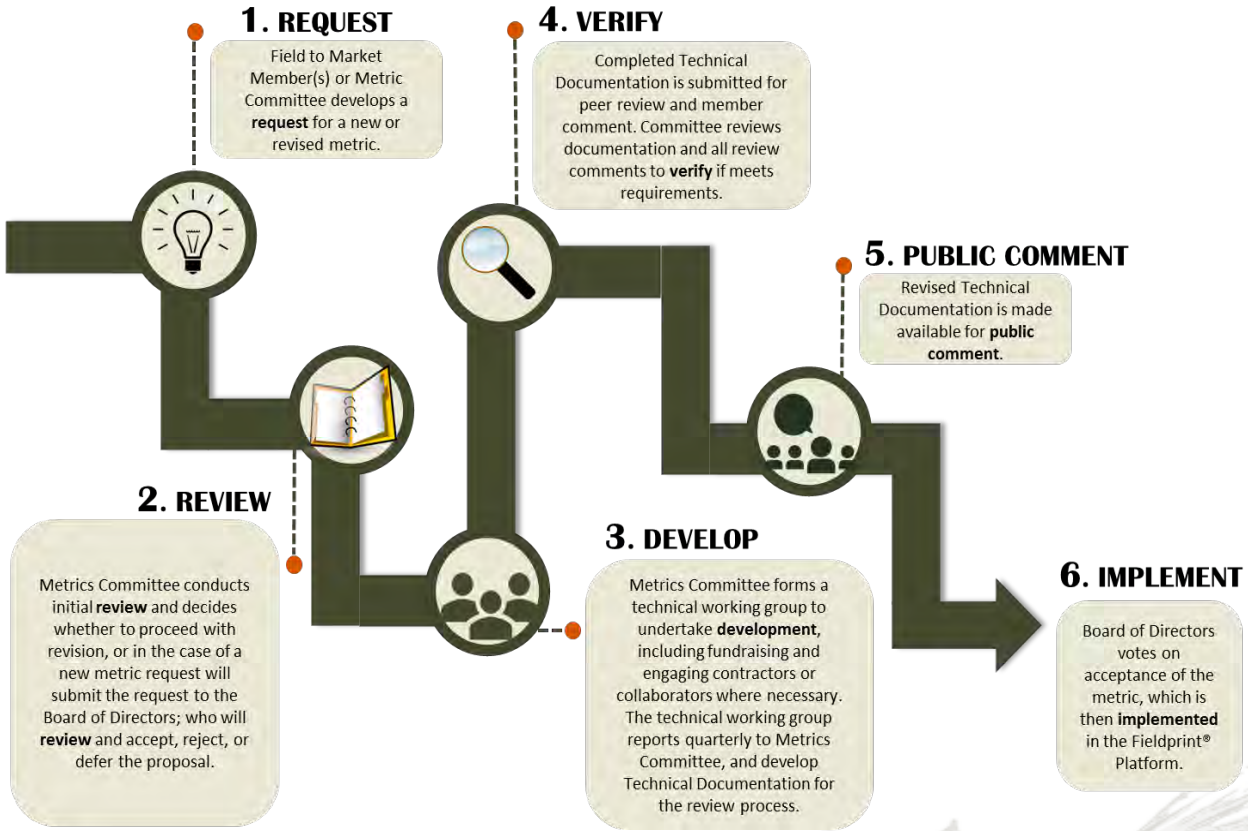
Each Metric measures a specific environmental outcome:

- Important for environmental sustainability
- At the scale of a farm
- Responsive to changes in farm management
- Where robust science supports accurate modeling of environmental impact

Metrics are reviewed at least once every 3 years and revised as needed.

About Metric Revisions

- As science developments arise, Field to Market will revise the metrics
- Science updates that impact metric scores will happen once a year
- Previous years should be re-calculated with updated metrics for prior years to update metric scores
  - Ensure that the metric scores across years were calculated with the same method
  - “Apples to apples”



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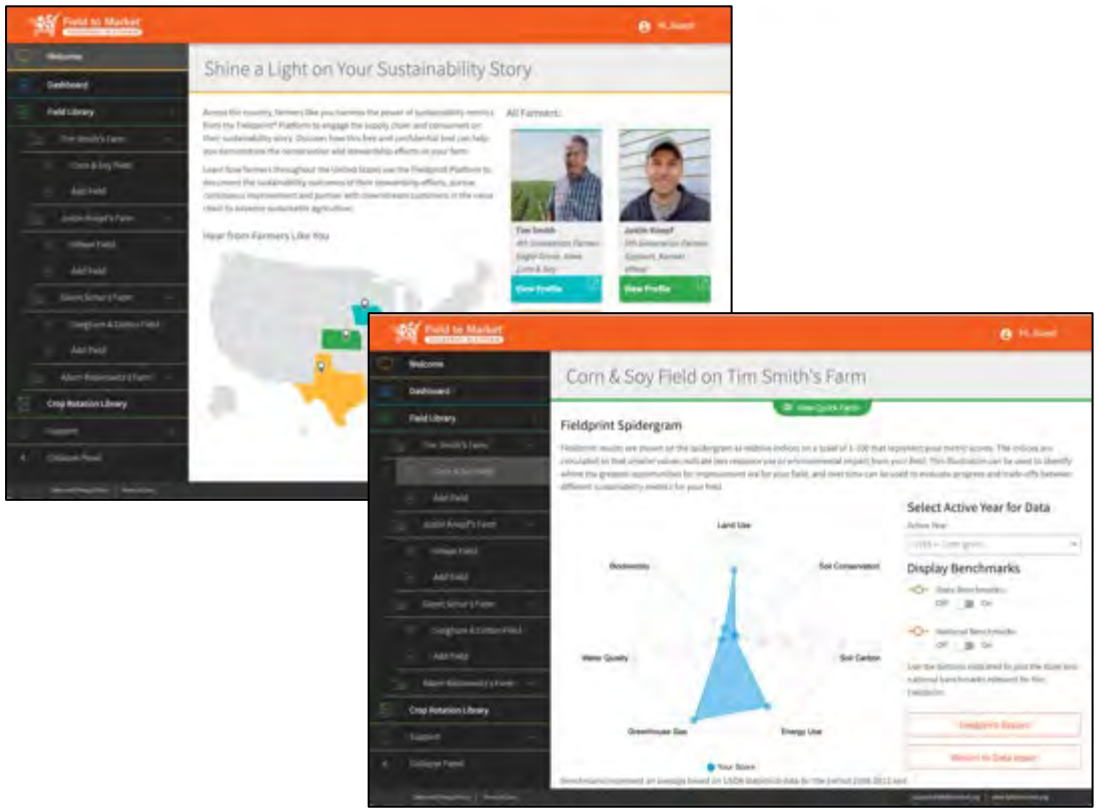
FIELDPRINT PLATFORM



AGRIBLE®

Landdb

Centerfield

PCM Precision Conservation Management

MyFarms

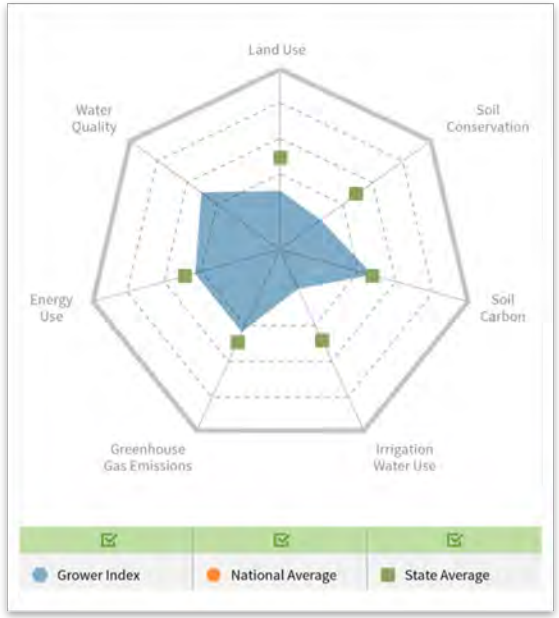
TRUTERRA

The Seam®

Field to Market®
FIELDPRINT PLATFORM

Data Entry

Metric Overview

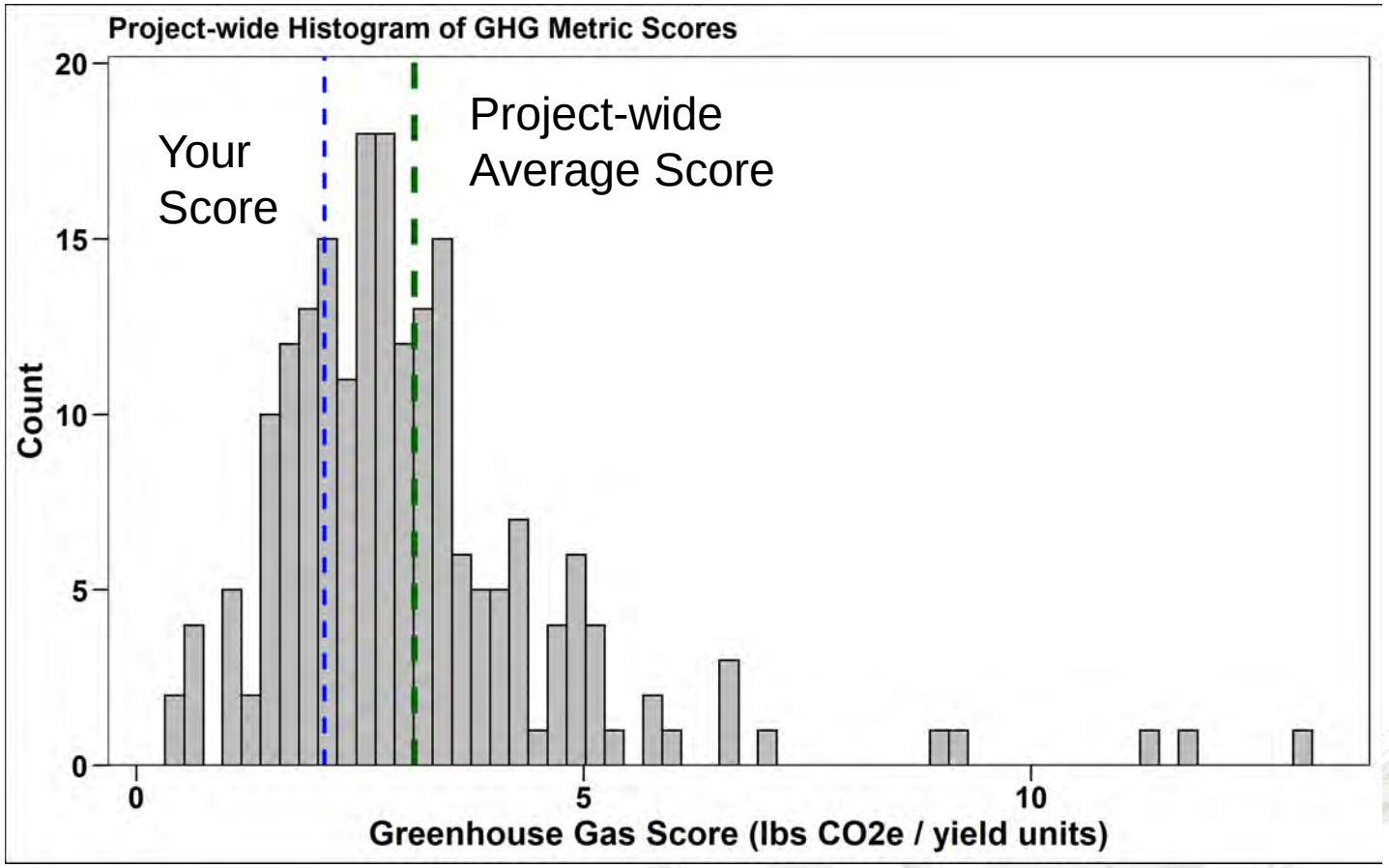


Detailed Analysis

Component	GHG Emissions (lbs_co2e / acre)	GHG Emissions (lbs_co2e / lb)
Emissions associated with energy used on the Farm		
Management Energy Emissions	74.5	0.1
Application Energy Emissions	565.8	0.4
Manure Loading Energy Emissions	0	0
Seed Energy Emissions	33.2	0
Irrigation Energy Emissions	1,767.1	1.3
Post-Harvest Energy Emissions	18.6	0
Transportation Energy Emissions	20.3	0
Subtotal Energy Emissions	2,479.5	1.8
Soil N2O emissions	971	0.7
Methane emissions (rice only)	0	0
Residue burning emissions	0	0
Total GHG Emissions	3,450.5	2.5

Exploring Metric Scores Across Fields

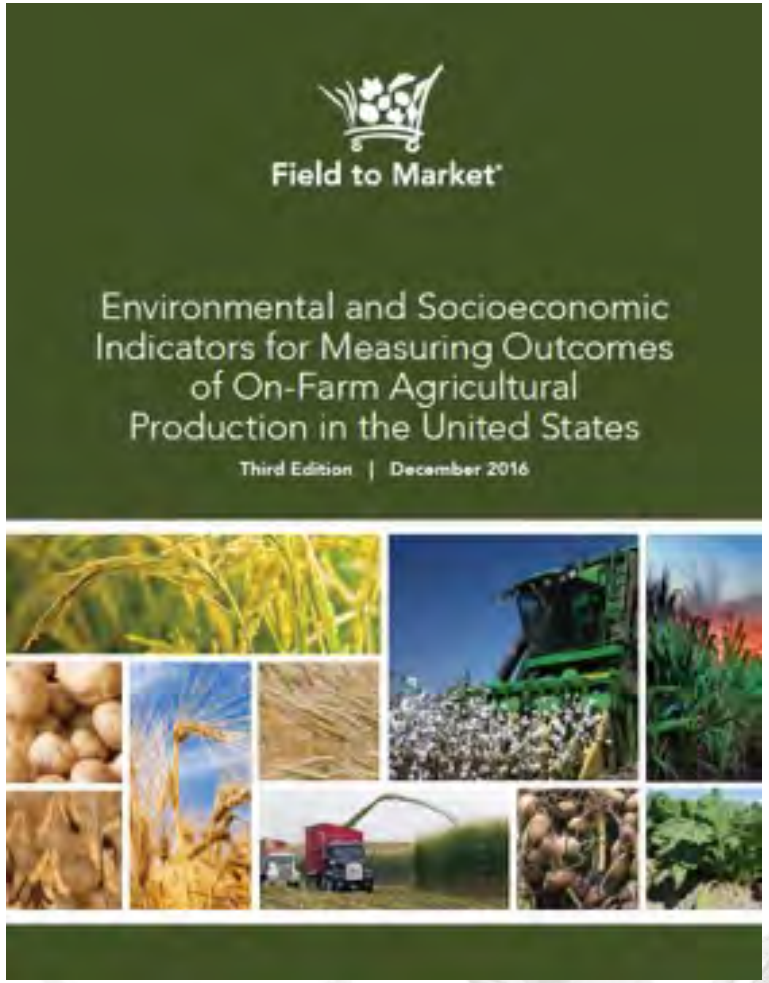
- Understand the variation between growers
- Over time, look for improvement in the average scores
- Work with farmers on adopting practices that will improve scores



Analyzing Sustainability Trends

In 2016, Field to Market released the third edition of the National Indicators Report, which analyzes sustainability metrics focused on U.S. agriculture and the science-based measurements of outcomes associated with commodity crop production.

- The report evaluated national-scale metrics focused on biodiversity, energy use, land use, soil carbon, greenhouse gas emissions, soil conservation, irrigation water use, and water quality.
- Currently working on the 4th version



www.fieldtomarket.org/report

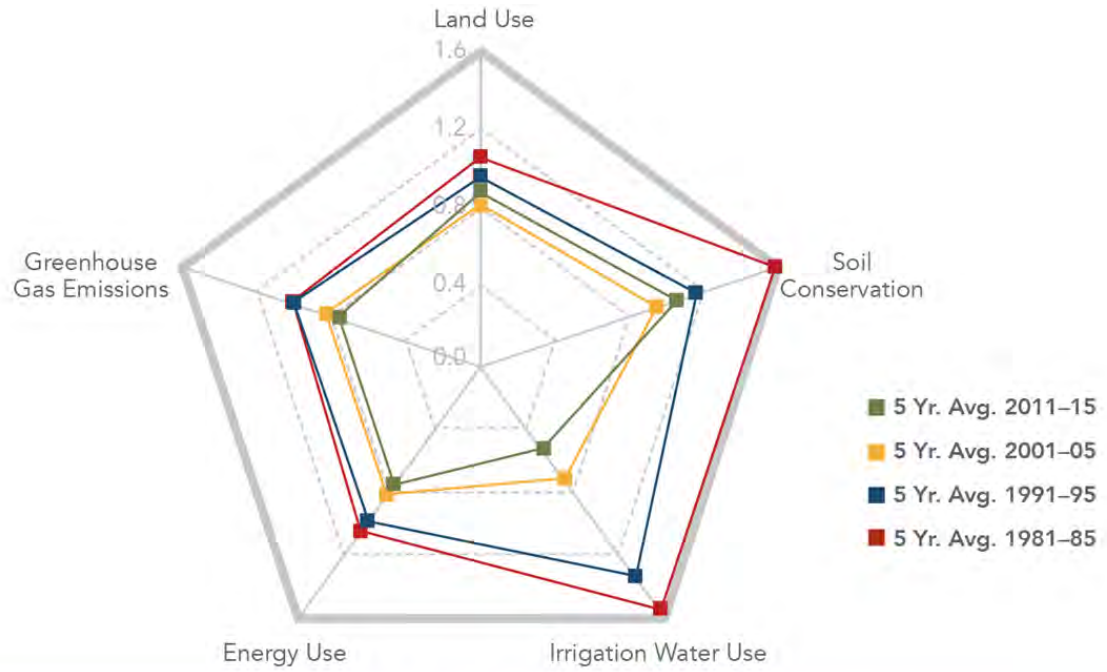
Analyzing Sustainability Trends

Criteria

- Best available data at a national scale
- Transparent and credible science

Data & Methods

- Analyze publicly available data, 1980-2020
- USDA surveys, EPA reports, research publications
- Align the national indicators with our field level metrics
- Peer-reviewed

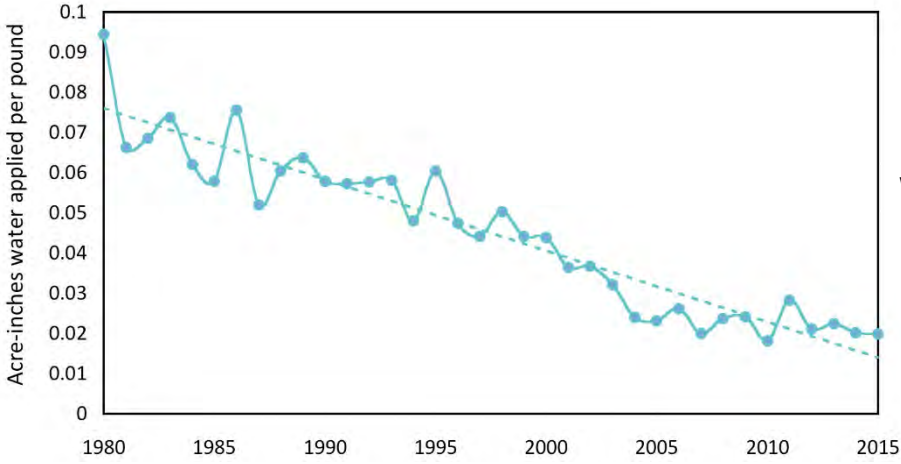


	2000 *	Unit
Land Use	0.001	Acres per pound
Soil Conservation	13.1	Tons per acre
Irrigation Water Use	0.046	Acre-in per pound
Energy Use	8,964	BTU per pound
Greenhouse Gas Emissions	2.313	Pounds CO_2e per pound

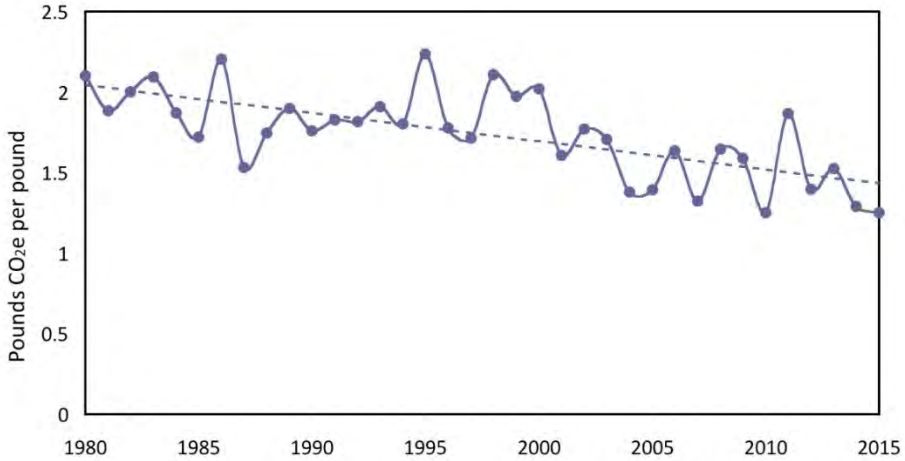
** Five year average 1996–2000*

2016 Cotton Indicators

- We have updated methodology for the 2021 report:
  - Improved data on manure applications, energy efficiency, and energy sources for irrigation and fertilizer production
  - New visualizations of how the trends have evolved over 4 decades
- All years are calculated using the same consistent methods and time series of data inputs.
- Objective is to identify the trends over time, not the absolute value.



Irrigation Water Use Efficiency



Greenhouse Gas Emissions

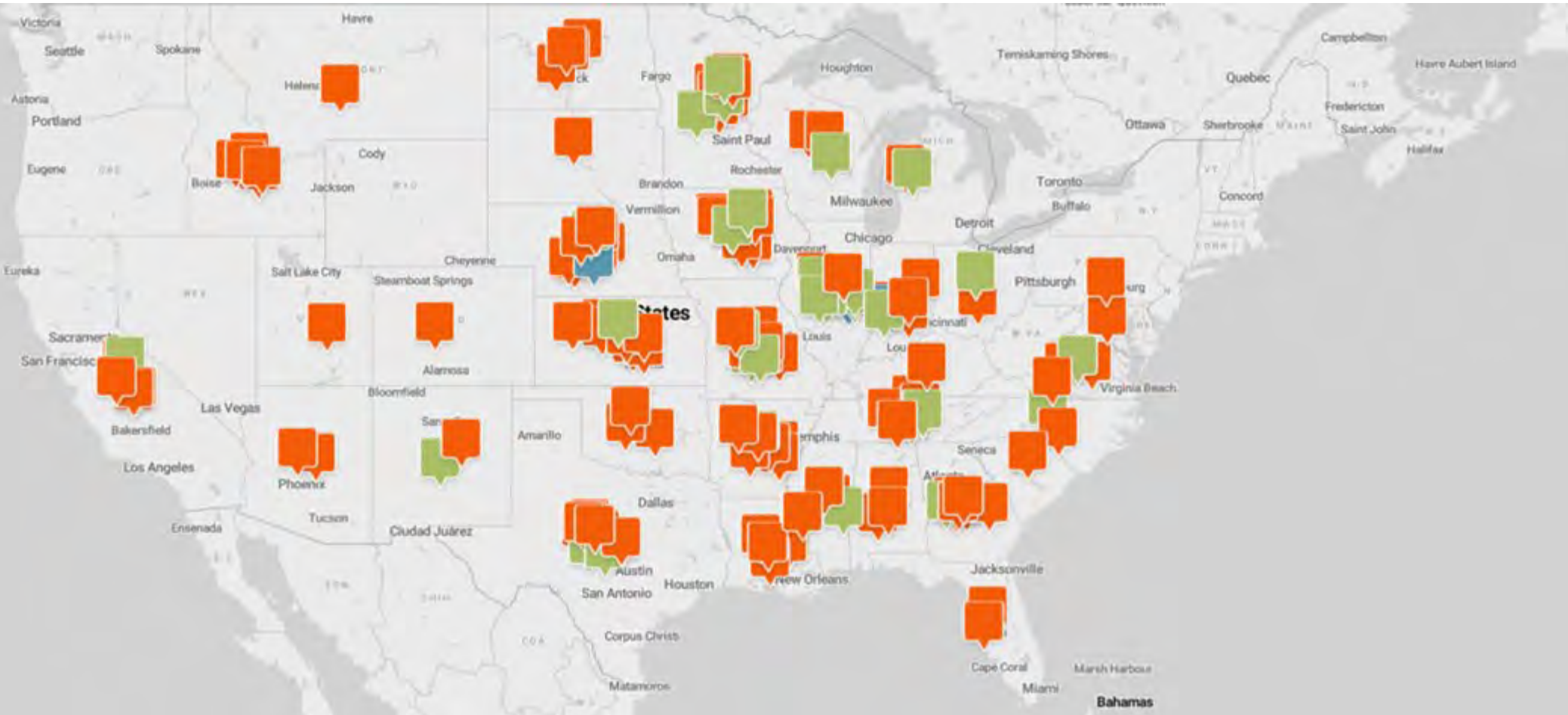
Field to Market
CONTINUOUS IMPROVEMENT
ACCELERATOR

72 Projects Across 35 States

Project Search

Apply

See the full results below the map



U.S. COTTON
TRUST PROTOCOL®
Trust in a smarter cotton future

The U.S. Cotton Trust Protocol:
The Data-Driven Sustainability System for U.S. Cotton

Setting a New Standard for More Sustainable Cotton Production

U.S. COTTON TRUST PROTOCOL®

The U.S. Cotton Trust Protocol:

- ✓Provides brands and retailers the critical assurances they need that the cotton fiber element of their supply chain is more sustainably grown with lower environmental and social risk, and full supply chain transparency
- ✓Proves, measures, and verifies U.S. cotton's continuously improving sustainability credentials
- ✓Builds on the efforts of U.S. growers over the past 35 years
- ✓Works to constantly improve growing practices through innovation, knowledge sharing, and advancements.

Trust Protocol Status

U.S. COTTON TRUST PROTOCOL®

- 1.5 million bales secured in the Trust Protocol from the 2020 crop (10% of U.S. cotton)
- 2021 enrollment has already begun: Goal of 3 million bales
- By 2025 we are targeting 50% of U.S. cotton (over 8 million bales) enrolled
- Over 450 brand, retailer, mill, and manufacturer members have joined the Trust Protocol in less than a year

GILDAN® TESCO Levi's® LEVI STRAUSS & CO. next DOCKERS® EST. 1986 GAP OLD NAVY Byford LONDON ATHLETA BANANA REPUBLIC

Supporting Global Goals

U.S. COTTON TRUST PROTOCOL®

FASHION PACT

G7 FRANCE

United Nations Climate Change

Global Climate Action

A Preferred Fiber

Sustainable cotton 2025 challenge

“We’re pleased to add Trust Protocol cotton to our list of preferred fiber and materials, which will give brands and retailers another option to source sustainable cotton as they integrate preferred fibers into their business strategy.”

- La Rhea Pepper, Managing Director of Textile Exchange

Cotton 2040 initiative

“We’re happy to include the Trust Protocol as a new sustainability standard.”

- Sally Uren, CEO at Forum for the Future

Collaborating for Change

U.S. COTTON TRUST PROTOCOL®

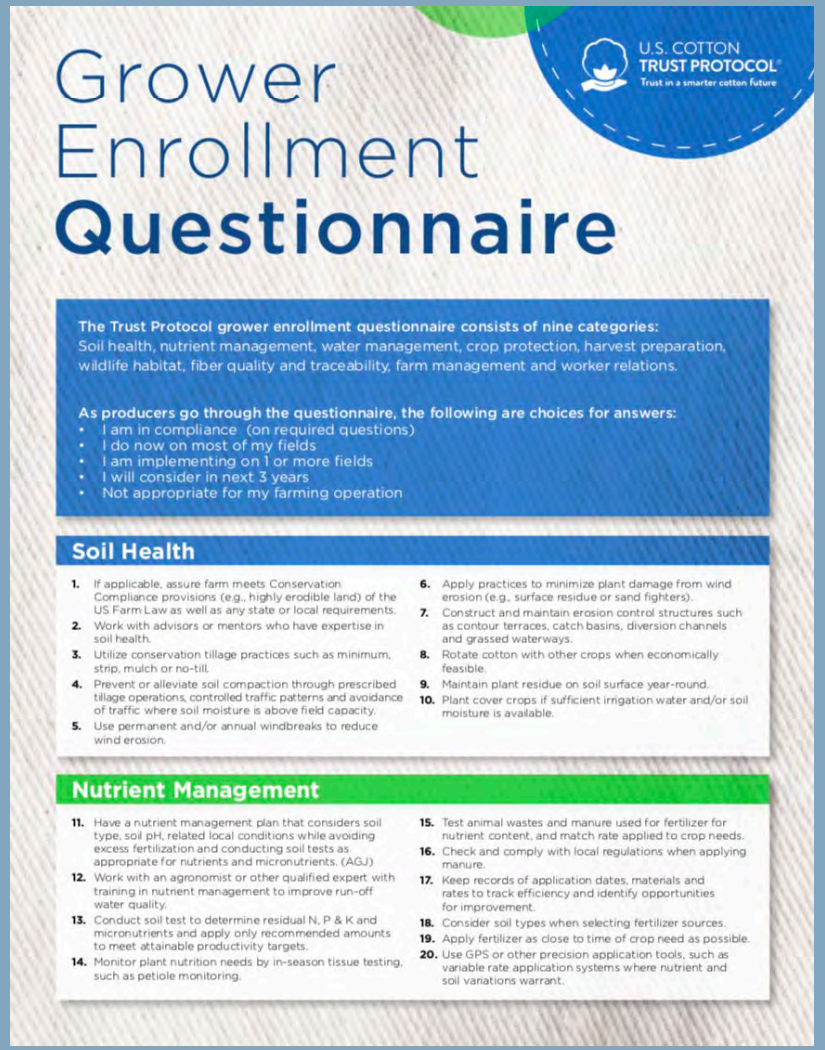
Sustainable Apparel Coalition

Partnership for Sustainable Textiles

Data from the Fields

Requirements for Growers

1. Review and sign the privacy statement
2. Select a gin and marketer
3. Complete the farming profile
4. Complete the self-assessment
5. Commit to continuous improvements that the Trust Protocol has developed and confirm to have their data verified by second- and third-parties
6. Complete their Fieldprint Analysis on the Field to Market platform



U.S. COTTON TRUST PROTOCOL® Trust in a smarter cotton future

Grower Enrollment Questionnaire

The Trust Protocol grower enrollment questionnaire consists of nine categories:
Soil health, nutrient management, water management, crop protection, harvest preparation, wildlife habitat, fiber quality and traceability, farm management and worker relations.

As producers go through the questionnaire, the following are choices for answers:
- I am in compliance (on required questions)
- I do now on most of my fields
- I am implementing on 1 or more fields
- I will consider in next 3 years
- Not appropriate for my farming operation

Soil Health

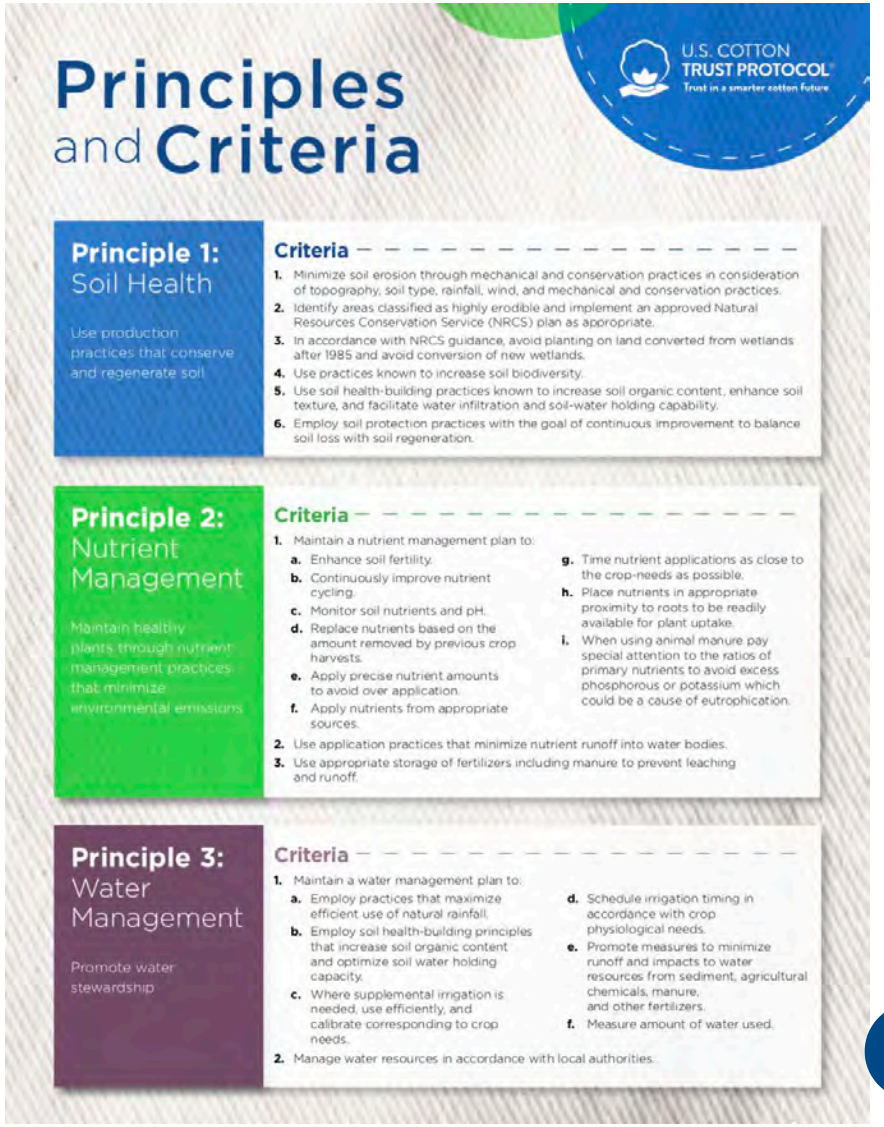
1. If applicable, assure farm meets Conservation Compliance provisions (e.g., highly erodible land) of the US Farm Law as well as any state or local requirements.
2. Work with advisors or mentors who have expertise in soil health.
3. Utilize conservation tillage practices such as minimum, strip, mulch or no-till.
4. Prevent or alleviate soil compaction through prescribed tillage operations, controlled traffic patterns and avoidance of traffic where soil moisture is above field capacity.
5. Use permanent and/or annual windbreaks to reduce wind erosion.
6. Apply practices to minimize plant damage from wind erosion (e.g., surface residue or sand fighters).
7. Construct and maintain erosion control structures such as contour terraces, catch basins, diversion channels and grassed waterways.
8. Rotate cotton with other crops when economically feasible.
9. Maintain plant residue on soil surface year-round.
10. Plant cover crops if sufficient irrigation water and/or soil moisture is available.

Nutrient Management

11. Have a nutrient management plan that considers soil type, soil pH, related local conditions while avoiding excess fertilization and conducting soil tests as appropriate for nutrients and micronutrients. (AGJ)
12. Work with an agronomist or other qualified expert with training in nutrient management to improve run-off water quality.
13. Conduct soil test to determine residual N, P & K and micronutrients and apply only recommended amounts to meet attainable productivity targets.
14. Monitor plant nutrition needs by in-season tissue testing, such as petiole monitoring.
15. Test animal wastes and manure used for fertilizer for nutrient content, and match rate applied to crop needs.
16. Check and comply with local regulations when applying manure.
17. Keep records of application dates, materials and rates to track efficiency and identify opportunities for improvement.
18. Consider soil types when selecting fertilizer sources.
19. Apply fertilizer as close to time of crop need as possible.
20. Use GPS or other precision application tools, such as variable rate application systems where nutrient and soil variations warrant.

Trust Protocol Guiding Principles

1. Soil health
2. Nutrient management
3. Water management
4. Crop protection
5. Harvest preparation
6. Biodiversity
7. Fiber quality, data management, and traceability
8. Farm management
9. Worker well-being



Trust Protocol Worker Well-being

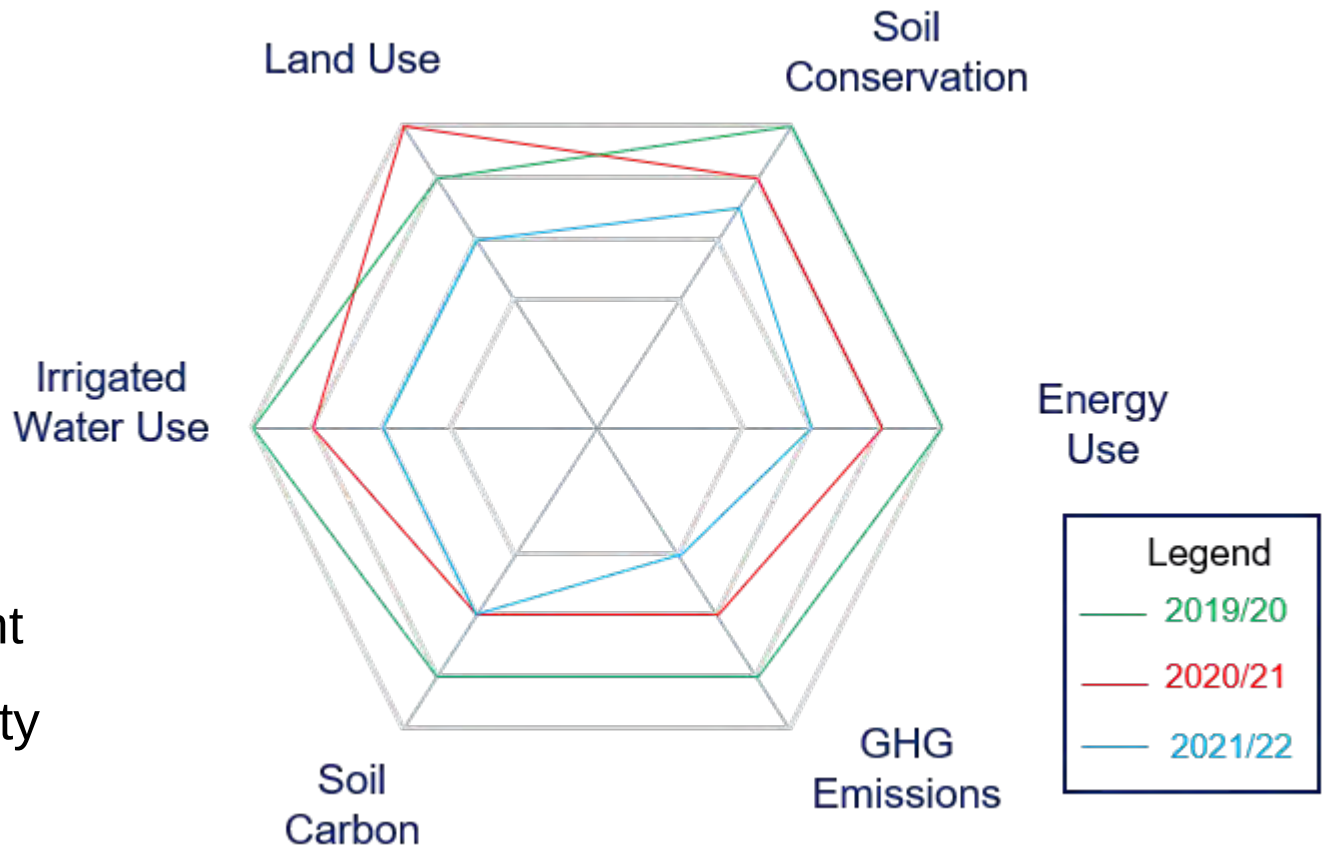
- Migrant & Seasonal Worker Protection Act
- Agriculture Worker Protection Standard
- Equal Employment Opportunity Act
- Fair Labor Standards Act
- Occupational Safety & Health Act

A robust regulatory environment where legal requirements are strictly enforced.

Collecting Robust Data

U.S. COTTON TRUST PROTOCOL®

Annual quantitative measurement of farm level sustainability metrics.



The Fieldprint Calculator allows participant growers to compare their own sustainability performance against state and national benchmarks.

Field to Market FIELDPRINT PLATFORM

Trust Protocol Verification

U.S. COTTON TRUST PROTOCOL®

Second and Third-party Verification

Control Union expertise in field level data integrity

- Enables growers to monitor success
- Ensures the question set remains applicable
- Allows growers to understand any gaps between self-declaration and actual data
- Provides our members the critical assurance that their cotton is more sustainably grown

In Conclusion

The U.S. Cotton Trust Protocol provides brands and retailers the critical assurances they need to ensure the cotton element of their supply chain is more sustainably grown with reduced environmental and social risk.

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Trust in a smarter cotton future

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To join or get more info, visit:
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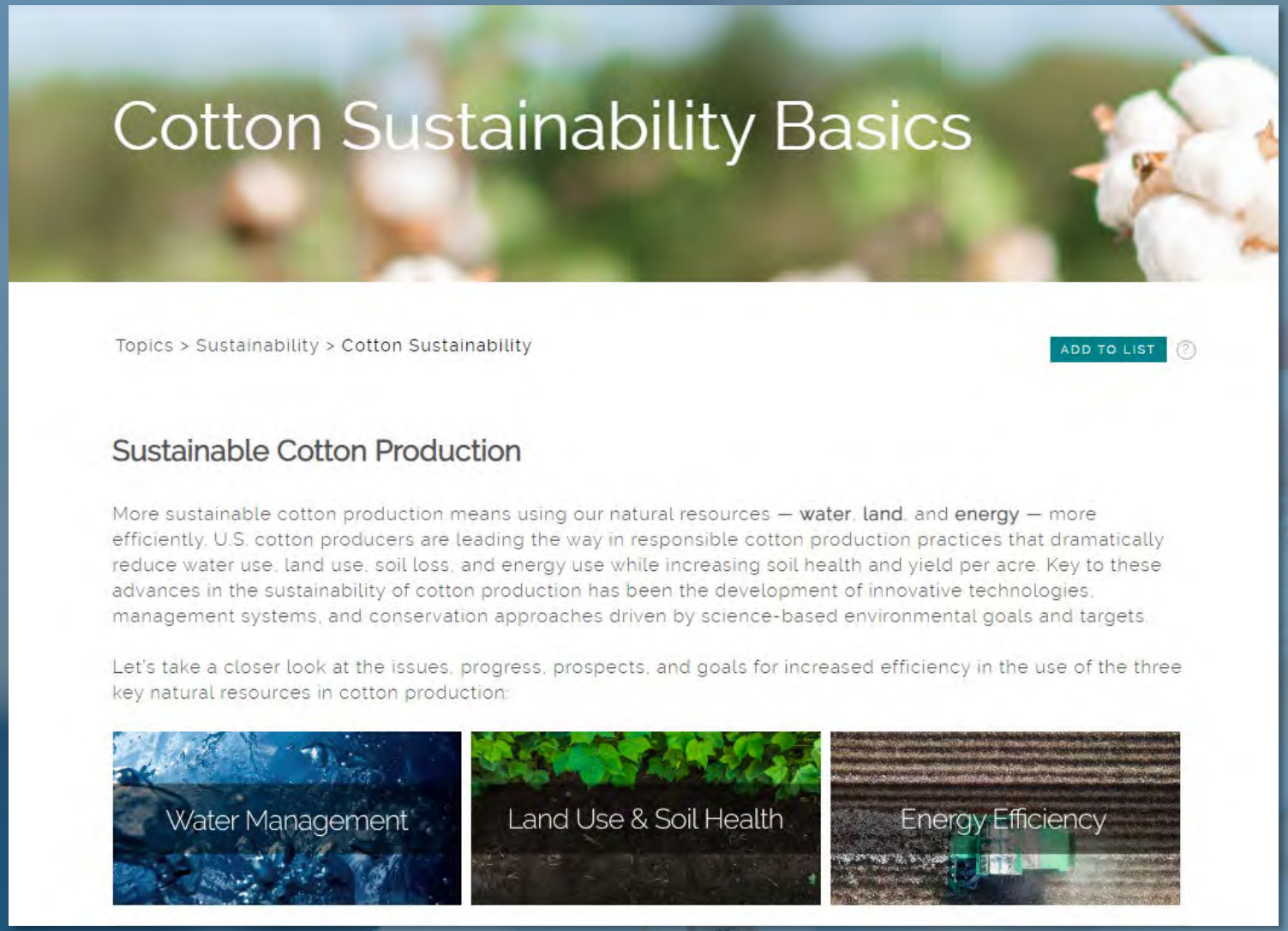
Measuring Improvements Towards the 10-Year Sustainability Goals

Sustainability Goals for U.S. Cotton

U.S. cotton producers are leading the way in responsible cotton production practices.

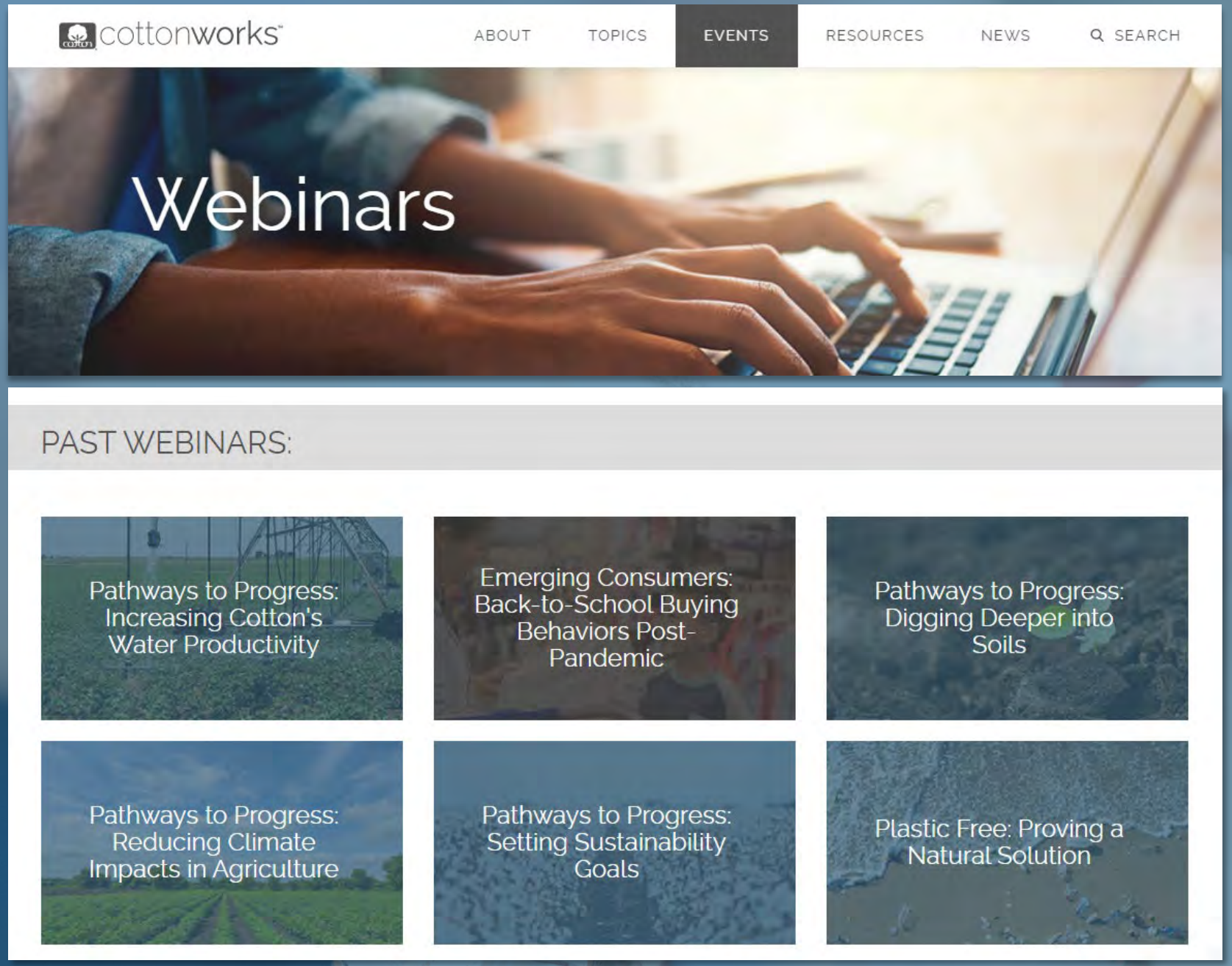
Learn more at **cottonworks.com/sustainability-goals-us-cotton**



Cotton Sustainability Basics

Learn more about the issues, progress, prospects, and goals for increased efficiency in the use of the three key natural resources in cotton production: **water**, **land**, and **energy**.

Go to **cottonworks.com/cotton-sustainability-basics**



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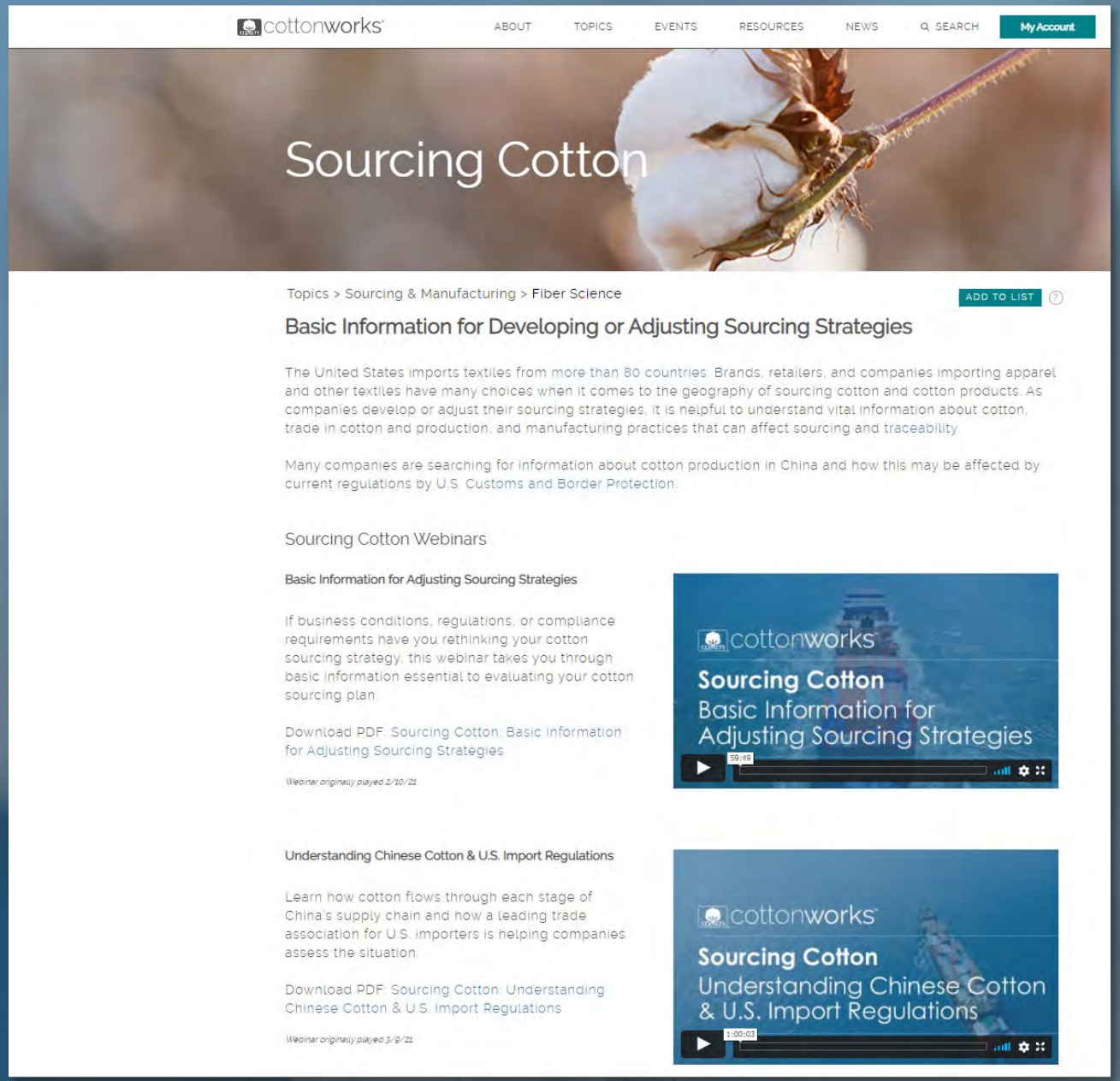

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Submit all final questions now using the Q&A feature.

Please take our brief survey on today's presentation prior to exiting the webinar.