AGRICULTURAL PRODUCTION AND SUSTAINABILITY

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Presented at USDA Agricultural Outlook Forum, Feb. 22, 2013

WHAT AGRICULTURE (COTTON) FACES

- **MULTIPLE INITIATIVES AND DRAFT STANDARDS**
  - **LEONARDO ACADEMY/ANSI DRAFT STANDARD**
  - **THE SUSTAINABILITY CONSORTIUM**
  - **INTERNATIONAL COTTON ADVISORY COMMITTEE – EXPERT PANEL ON SOCIAL, ENVIRONMENTAL AND ECONOMIC PERFORMANCE OF COTTON *(ICAC-SEEP)***
  - **BETTER COTTON INITIATIVE**
- **AND MANY MORE INITIATIVES (>30)**

WHO/WHAT ARE DRIVERS

- **WALMART, UNILEVER, NESTLE**
- **LEVI STRAUSS, H&M, MARKS & SPENCER, GAP AND LIKE BRANDS AND RETAILERS**
- **CONSUMERS (?)**
- **GOVERNMENTS (SWITZERLAND, SWEDEN, NETHERLANDS, et al)**
- **NGO's**

- **ALL ULTIMATLY WITH GOAL TO DRIVE THEIR AGENDA(s) THROUGHOUT THE MARKETING CHAIN, USUALLY INCLUDING USE OF CERTIFICATION**

WHAT COTTON HAS AND IS DOING

- **FIELD TO MARKET ALLIANCE**
- **CONDUCTED LIFE CYCLE INVENTORY(LCI) AND LIFE CYCLE ANALYSIS(LCA)**

Field to Market

The Alliance for Sustainable Agriculture

Field to Market Membership

How We Define Sustainable Agriculture

Meeting the needs of the present while improving the ability of future generations to meet their own needs

- **Increasing productivity to meet future food and fiber demands**
- **Improving the environment**
- **Improving the social and economic well-being of agricultural communities**

Field to Market

National Indicators Report:

The Sustainability Story of U.S. Agriculture

2012 Indicators Report

Criteria

- National scale trends over time
- Transparent and credible science, public data
- Outcomes-based
- Practice/technology neutral
- On-farm production outcomes within a grower's control

Data & Methods

- Crops: corn, cotton, potatoes, rice, soybeans, and wheat
- Indicators: environmental and socioeconomic
- Data: publicly available, 1980-2011
- Methods: based on available science
- Peer reviewed

2012 Indicators Report

Environmental Indicators

- Production and Yield
- Land Use
- Soil Erosion
- Irrigation Water Applied
- Energy Use
- Greenhouse Gas Emissions

Socioeconomic Indicators

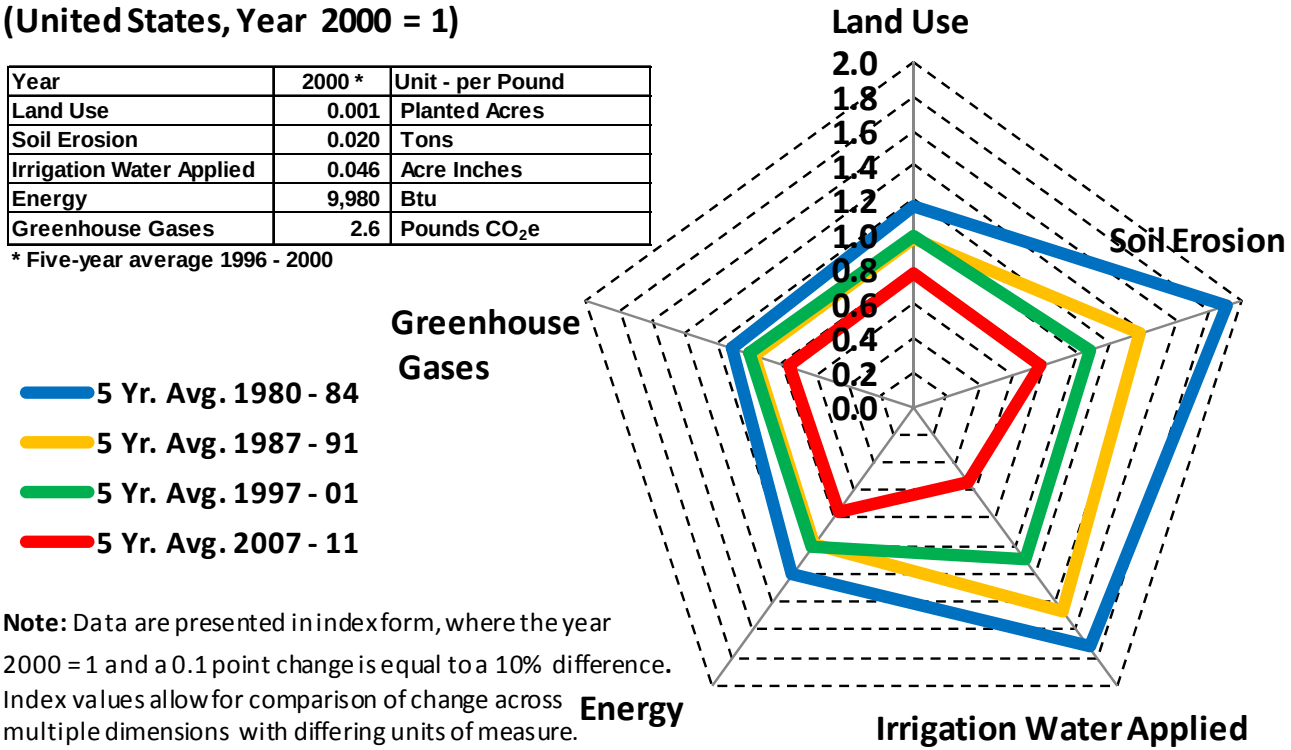
- Debt to Asset Ratio
- Returns Over Variable Costs
- National and State Gross Domestic Product
- Non-fatality Injury
- Fatality
- Labor Hours

Cotton Results

Index of Per Pound Resource Impacts to Produce Cotton Lint (United States, Year 2000 = 1)

Year	2000 *	Unit - per Pound
Land Use	0.001	Planted Acres
Soil Erosion	0.020	Tons
Irrigation Water Applied	0.046	Acre Inches
Energy	9,980	Btu
Greenhouse Gases	2.6	Pounds CO_2e

* Five-year average 1996 - 2000



Note: Data are presented in index form, where the year 2000 = 1 and a 0.1 point change is equal to a 10% difference. Index values allow for comparison of change across multiple dimensions with differing units of measure.

Improved:

- All per pound measures
- All soil erosion and irrigation water applied measures
- Yield and total production

Decreased:

- Total land use
- Total energy use
- Total GHG emissions

Field to Market

IN SUMMARY

U.S. Producers Have a Great Story to Tell…

- Efficiency gains over time, along with increased production
- Improvements on a number of economic and social indicators

…As well as opportunities for continued improvement

- Continued challenges ahead for meeting increased demand within limits of natural resources and social and economic needs
- With the collaboration of U.S. farmers, tools and metrics are emerging to help track and communicate progress and identify opportunities for continued improvement

Field to Market

The Fieldprint Calculator:

Measuring Field Level Outcomes and Identifying Opportunities for Improvement

What is the Fieldprint Calculator?

- An online education and awareness tool
- Free, voluntary, and confidential
- Helps growers evaluate their farming decisions in the areas of:
  - Current:
    - Land use
    - Soil conservation
    - Soil carbon
    - Water use
    - Energy use
    - Greenhouse gas emissions
  - In development:
    - Water quality
    - Biodiversity

Field to Market

Field to Market Pilot Projects

- **Demonstrate use of calculator on the ground**
- **Test utility at the grower level and through the supply chain**
- **Member-led pilots engaging farmers across geographies, crops, and supply chains**

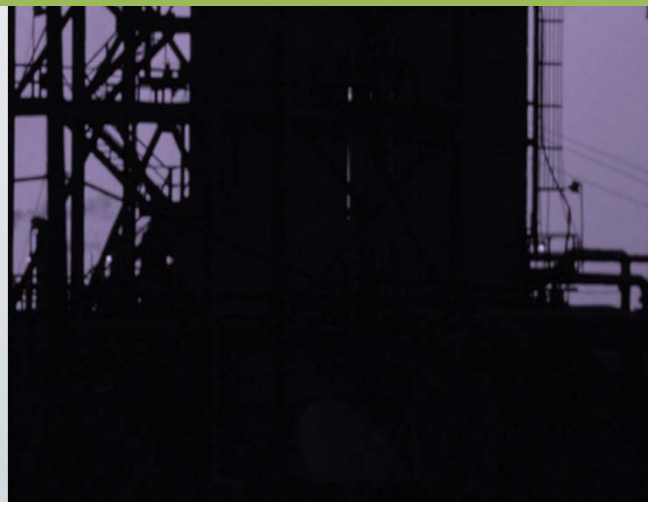
Field to Market



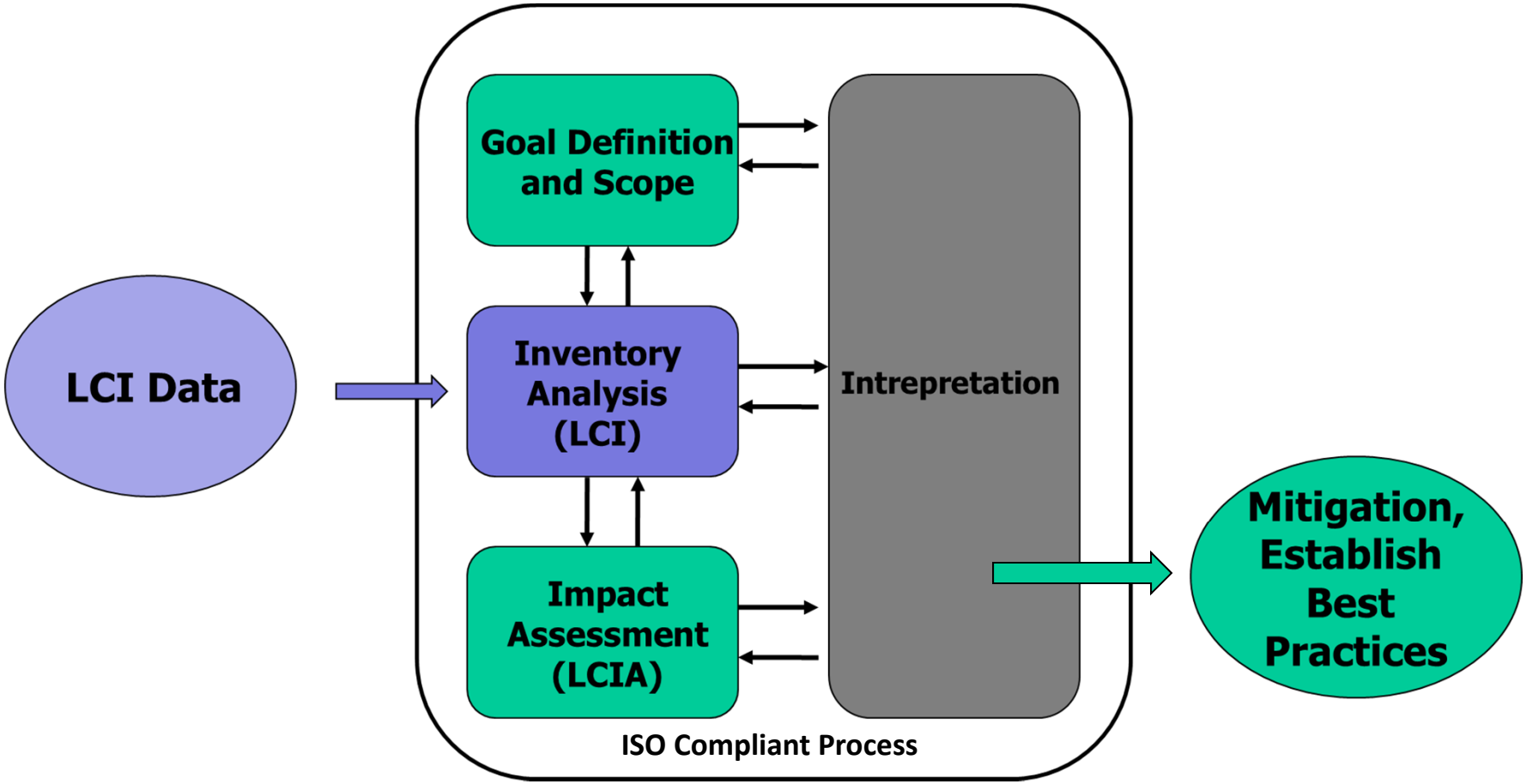
VISION 21, A Cotton Foundation Project
Cotton Life Cycle Assessment

Conducted by COTTON INCORPORATED





Components of a Life Cycle Assessment



Data Integrity

- **ISO Complaint Data/Report -**
  - **Expert Critical Review Panel**

- **Carbon Trust Certification**

Research Directives

- Continue water & nitrogen use efficiencies
- Improve LCI toxicity methodology:
  - Further analysis of pesticide models
  - Work with the USETox community to improve pesticide data
- Fill data gaps in foreign cotton production:
  - India
  - China

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