



SORGHUM: SUSTAINABILITY INDICATORS

Understanding Sorghum Trends in Field to Market’s 2021 National Indicators Report

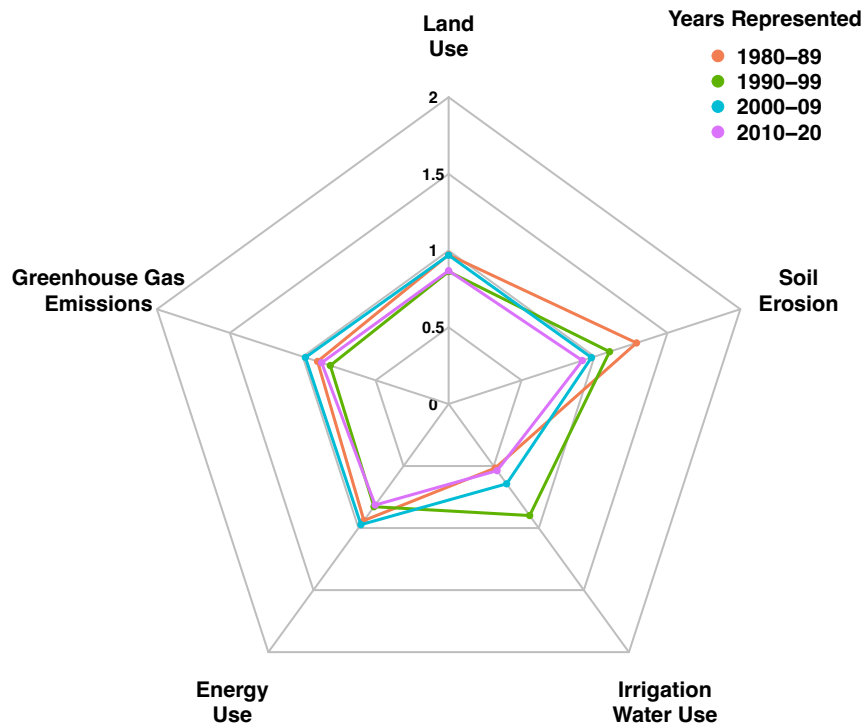
Field to Market’s 2021 National Indicators Report – *Environmental Outcomes from On Farm Agricultural Production in the United States* – analyzes sustainability trends from 1980-2020 at the national scale for 11 commodity crops. Released every five years since 2009, the fourth edition of this peer-reviewed report analyzes trends over time in sustainability performance for U.S. commodity crop systems, providing a critical assessment of where U.S. agriculture has made progress in driving improved environmental outcomes, and where additional efforts are needed to advance industry-wide sustainability goals.

Use this factsheet to explore key findings from the report for Sorghum, identifying trends in Land Use, Irrigation Water Use, Energy Use, Greenhouse Gas Emissions (GHG) and Soil Erosion. Explore the full findings and learn how to properly cite the 2021 National Indicators Report at www.fieldtomarket.org/Report.

KEY FINDINGS FOR SORGHUM

Sorghum is a drought tolerant crop currently grown primarily in the Central Plains states and Texas. Over the study period, the region of production has become more tightly centered on these states with only six states producing sorghum in 2020 compared to 24 states in 1980.

This figure illustrates the difference in the average indicator value for each decade and demonstrates clear improvement in Soil Erosion. Mixed results for the other indicators indicate fluctuations over time in region of production, weather conditions and practice adoption. Smaller values, closer to the center of the figure, represent a smaller environmental impact and more sustainable production of sorghum.



Indicator averages for 1998-2002 used to scale data for display on radar chart

Indicator	Value	Units
Land Use	0.0192	Planted Acres Per Bushel
Irrigation Water Use	0.701	Acre-inches Per Bushel
Soil Erosion	6.95	Tons Soil Loss Per Acre
Energy Use	73,500	BTU Per Bushel
Greenhouse Gas Emissions	17.8	Pounds of CO ₂ Eq. Per Bushel

The table below provides the value for each indicator at the beginning of each decade (estimated from a fitted trend line).

Year	Land Use	Irrigation Water Use	Energy Use	Greenhouse Gas Emissions	Soil Erosion
	Planted Acres Per Bushel	Acre Inches Per Bushel	BTU Per Bushel	Pounds of CO ₂ e Per Bushel	Tons of Soil Loss Per Acre
1980	0.0217	0.3108	81,596	18.9	9.3
1990	0.0166	0.4903	60,349	14.2	8.3
2000	0.0181	0.6394	69,638	16.9	7
2010	0.0183	0.3474	66,703	16.7	6.5
2020	0.0136	0.4897	51,447	14	6.3

- Land Use efficiency is relatively static across the time period in this study, indicating no significant trend in sorghum yields. Yield varies between years, likely reflecting changes in water availability.
- There is no clear trend in Irrigation Water Use efficiency. Sorghum is a drought tolerant crop frequently grown in water-limited regions and requiring little supplemental irrigation except in very dry years. From the 1980-2000, Irrigation Water Use efficiency showed a downward trend, followed by some efficiency gains through 2010.
- Energy Use efficiency for sorghum has improved slightly over the study period, with wide interannual variation. Increased applications of nitrogen and phosphorus fertilizers and herbicides on sorghum over the study period were a major contributor to higher energy consumption.
- GHG Emissions for sorghum follow a pattern similar to energy use, with relatively high interannual variability but no strong trend. Increases in manure and synthetic nitrogen fertilizer use has led to increased nitrous oxide emissions since 2010.
- Soil Erosion for sorghum has consistently declined since 1980, with the greatest improvement occurring in the 1990s. Sorghum has the greatest adoption rate of no tillage among crops considered in this study.

Substantial progress has been made since 1980 in reducing Soil Erosion on sorghum acreage. Progress on other indicators has not been realized due to unchanging yields and increases in some fertilizer and crop chemical inputs. The National Indicators Report highlights areas to focus on to encourage and incentivize adoption of conservation practices that will lead to continuous improvement across these environmental outcomes.

Field to Market: The Alliance for Sustainable Agriculture brings together a diverse group of grower organizations; agribusinesses; food, beverage, restaurant, and retail companies; conservation groups; universities; and public sector partners to create opportunities across the agricultural supply chain for continuous improvement in sustainable agriculture. Field to Market offers America's food and agriculture industries an essential tool for unlocking shared value for all stakeholders—a common framework for sustainability measurement that farmers and the supply chain can use to better understand and assess environmental performance. Together, Field to Market and its members work to collectively meet the challenge of producing enough food, feed, fiber and fuel for a rapidly growing population while conserving natural resources and improving the ability of future generations to meet their own needs.



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