



CORN: SUSTAINABILITY INDICATORS

Understanding Corn for Grain Trends in Field to Market’s 2021 National Indicators Report

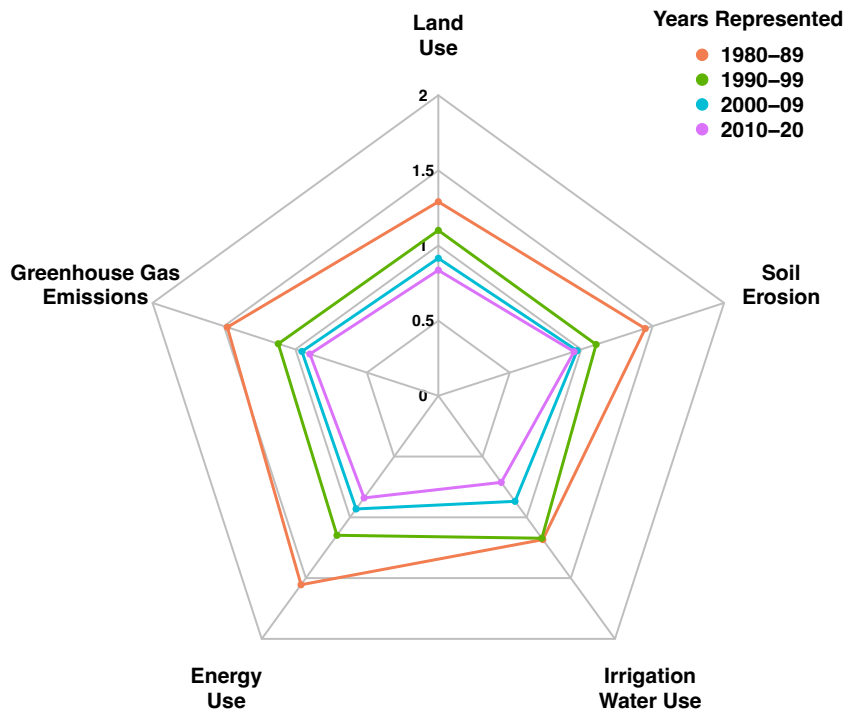
Field to Market’s 2021 National Indicators Report – *Environmental Outcomes from On Farm Agricultural Production in the United States* – analyzes sustainability trends from 1980-2020 at the national scale for 11 commodity crops. Released every five years since 2009, the fourth edition of this peer-reviewed 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 Corn for Grain, 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 CORN FOR GRAIN

Corn is one of the most extensively grown crops in the United States with some production in almost every state. The highest acreage of corn harvested for grain occurs in the Midwest states of Iowa, Illinois, Indiana, Minnesota and Nebraska, with production area in South Dakota and Kansas increasing over the past 15 years.

This figure illustrates the difference in the average indicator value for each decade and demonstrates improvements in Land Use, Energy Use, GHG and Soil Erosion, most notably in the 1980s and 1990s. The figure also illustrates improvement in Irrigation Water Use in 2000-2020 compared to 1980-2000. Smaller values, closer to the center of the figure, represent a smaller environmental impact and more sustainable production of corn for grain.



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

Indicator	Value	Units
Land Use	0.00757	Planted Acres Per Bushel
Irrigation Water Use	0.254	Acre-inches Per Bushel
Soil Erosion	4.88	Tons Soil Loss Per Acre
Energy Use	48,700	BTU Per Bushel
Greenhouse Gas Emissions	12.8	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 Planted Acres Per Bushel	Irrigation Water Use Acre Inches Per Bushel	Energy Use BTU Per Bushel	Greenhouse Gas Emissions Pounds of CO ₂ e Per Bushel	Soil Erosion Tons of Soil Loss Per Acre
1980	0.0104	0.3497	83,276	20.6	7.8
1990	0.009	0.2865	64,551	16.3	6.1
2000	0.0075	0.2638	48,094	12.6	4.8
2010	0.0066	0.1998	42,873	11.9	4.6
2020	0.0058	0.1533	37,791	10.7	4.7

- Land Use reflects increases in corn grain yield over time which contributes to improvements in the efficient energy use and irrigation water resources.
- Irrigation Water Use efficiency for corn grain has also improved throughout the study period.
- Improvements in Energy Use were most rapid in the first half of the study period with modest reductions since 2000 as increases in yield are somewhat offset by increases in crop inputs.
- The GHG Emissions indicator follows the Energy Use indicator with a slower rate of decline since 2000 largely attributed to increases in nitrogen fertilizer application and associated emissions.
- While progress has been made in reducing Soil Erosion from 1980 through 2000, this indicator has largely plateaued since 2000.
- While substantial progress has been made since 1980 in the sustainability of grain corn production, the majority of that improvement occurred in the period of 1980-2000. The National Indicators Report highlights some areas of focus to accelerate adoption of sustainable practices and achieve further environmental improvements.

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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