



Field to Market®

WHEAT: SUSTAINABILITY INDICATORS

Understanding Wheat Trends in Field to Market's 2021 National Indicators Report

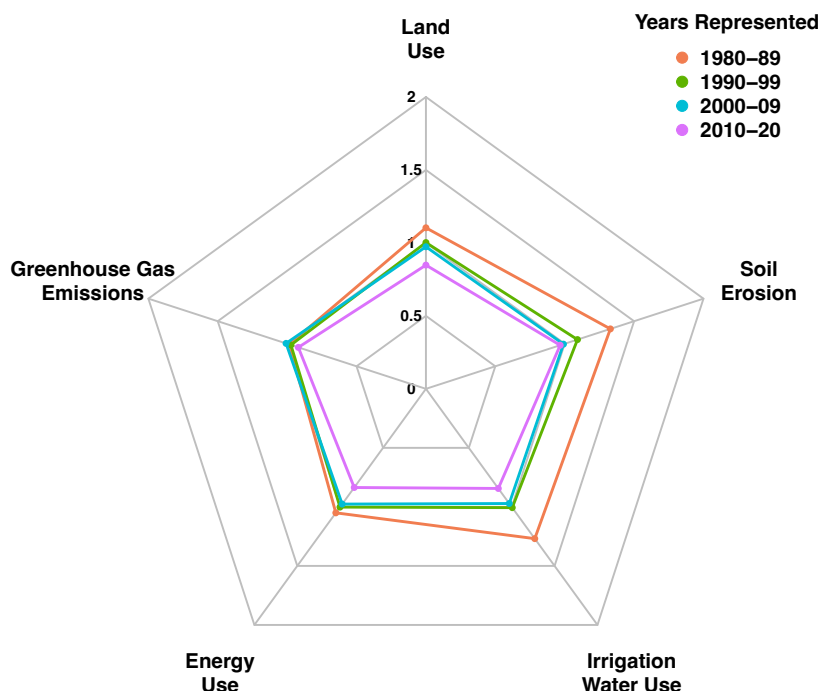
Field to Market's 2021 National Indicators Report – *Environmental Outcomes from On Farm Agricultural Production in the United States* – analyzes sustainability trends from 1980-2020 at the national scale for 11 commodity crops. Released every five years since 2009, the fourth edition of this peer-reviewed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

Wheat is grown in almost every state in the continental U.S. We calculate indicators for all wheat production, including winter wheat, which is planted in fall and harvested in spring, and spring wheat, (including durum) which is planted in spring and harvested in summer. The type of wheat grown depends primarily on climate conditions. Across the U.S., wheat production acreage is greatest in the central plains, including Kansas, Texas, the Dakotas, and Montana.

This figure illustrates the difference in the average indicator value for each decade and demonstrates clear improvement over time in Land Use and Irrigation Water Use. The figure also illustrates the plateauing (no change) of Soil Erosion in the past two decades and relatively small changes in Energy Use and Greenhouse Gas Emissions. Smaller values, closer to the center of the figure, represent a smaller environmental impact and more sustainable production of wheat.



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

Indicator	Value	Units
Land Use	0.0299	Planted Acres Per Bushel
Irrigation Water Use	0.5	Acre-inches Per Bushel
Soil Erosion	5.48	Tons Soil Loss Per Acre
Energy Use	99,200	BTU Per Bushel
Greenhouse Gas Emissions	23.6	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	0.0322	0.7438	102,814	22.8	7.6
1990	0.032	0.5328	102,011	23.1	6.6
2000	0.0295	0.4971	100,417	24	5.5
2010	0.0271	0.4577	88,165	22.4	5.3
2020	0.024	0.3871	83,586	22.7	5.4

- The Land Use efficiency indicator shows a modest improvement over time, reflecting increasing crop yields.
- Irrigation Water Use efficiency for wheat has improved over the study period, with a small reversal period in the 1990s followed by a steady improvement since 2000.
- Energy Use efficiency for wheat improved somewhat in the early 2000s, following a level trend through the 1980s and 1990s, and again staying largely static since 2010. A steady increase in no-till adoption from 2000 through 2020 contributed to this improvement.
- Greenhouse Gas Emissions per bushel of wheat are largely flat across time with some interannual variations. Emissions per acre have increased, driven by increasing N₂O emissions due to increased nitrogen fertilizer applications.
- Soil Erosion for wheat decreased markedly in the 1990s, and erosion estimates since 2000 have been steady at approximately 5 tons of lost loss per acre per year

While substantial progress has been made since 1980 in the Land Use and Water Use Efficiency of wheat production, progress has not been continuous across all indicators. The National Indicators Report highlights some areas to focus on to encourage and incentivize adoption of conservation practices that will lead to continuous improvement in 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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