



# BARLEY: SUSTAINABILITY INDICATORS

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

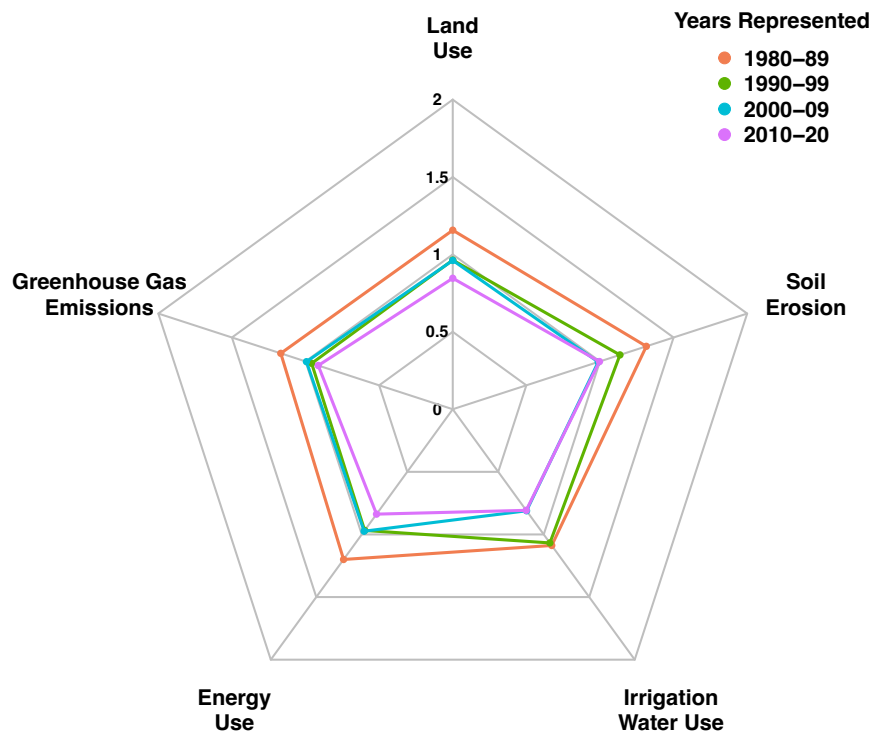
Field to Market’s 2021 National Indicators Report – *Environmental Outcomes from On Farm Agricultural Production in the United States* – analyzes sustainability trends from 1980-2020 at the national scale for 11 commodity crops. Released every five years since 2009, the fourth edition of this peer-reviewed 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 Barley, 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](http://www.fieldtomarket.org/Report).

## KEY FINDINGS FOR BARLEY

Barley is a small grain crop predominantly grown in the north and west of the U.S., with the highest planted acreage in North Dakota, Montana, and Idaho in 2020.

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



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

Indicator	Value	Units
Land Use	0.0193	Planted Acres Per Bushel
Irrigation Water Use	0.421	Acre-inches Per Bushel
Soil Erosion	5.85	Tons Soil Loss Per Acre
Energy Use	67,300	BTU Per Bushel
Greenhouse Gas Emissions	16.9	Pounds of CO <sub>2</sub> 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 <sub>2</sub> e Per Bushel	Tons of Soil Loss Per Acre
1980	0.0213	0.4663	79,797	19.4	7.8
1990	0.0208	0.4524	73,345	18.1	7.2
2000	0.0187	0.4041	65,276	16.4	6
2010	0.0173	0.3239	61,266	16.3	5.5
2020	0.0159	0.3562	52,189	14.6	6.6

- Land Use reflects increases in barley yield over time which contributes to improvements in the efficient use of energy and irrigation water resources.
- Irrigation Water Use efficiency for barley has also improved over the past decade, further contributing to reduced GHG emissions per bushel produced.
- Improvements in Energy Use can largely be attributed to declines in energy used to operate farm equipment and declines in energy used for fertilizer production in the last five years.
- These same factors, in particular the recent reduction in fertilizer use, also contribute to the reduction in GHG Emissions.
- While reductions in Soil Erosion were made from 1980 through 2010, the 2020 results point to recent increases in this important indicator of soil health.

While substantial progress has been made since 1980 in the sustainability of barley production, 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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