Field to Market®

CORN: SUSTAINABILITY INDICATORS

Understanding Corn for Silage Trends in Field to Market's 2021 National Indicators Report

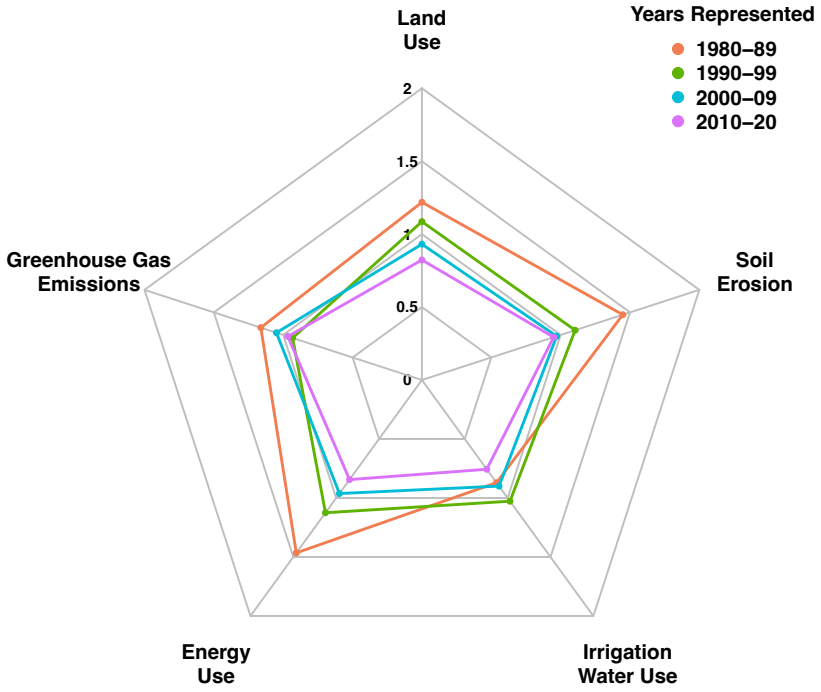
Field to Market's 2021 National Indicators Report – *Environmental Outcomes from On Farm Agricultural Production in the United States* – analyzes sustainability trends from 1980-2020 at the national scale for 11 commodity crops. Released every five years since 2009, the fourth edition of this peer-reviewed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

Corn is grown for silage for animal feed in almost every U.S. state, with high production in the upper Midwest states and large dairy states, including New York, Pennsylvania, and California. Corn for silage production practices are similar to those for corn grain in the first part of the growing season, but the entire stalk is harvested earlier in the season leaving far less crop residue on the field. A producer may decide partway through the season to harvest the corn crop as silage, rather than wait to harvest as grain, depending on market and weather conditions.

This figure illustrates the difference in the average indicator value for each decade and demonstrates clear improvement over time in Land Use and Energy Use. The figure also illustrates a more dynamic trend for GHG Emissions and Irrigation Water Use. Smaller values, closer to the center of the figure, represent a smaller environmental impact and more sustainable production of silage corn.



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

Indicator	Value	Units
Land Use	0.064	Planted Acres Per Ton
Irrigation Water Use	2.79	Acre-inches Per Ton
Soil Erosion	4.88	Tons Soil Loss Per Acre
Energy Use	398,000	BTU Per Ton
Greenhouse Gas Emissions	141	Pounds of CO_2 Eq. Per Ton

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 Ton	Acre Inches Per Ton	BTU Per Ton	Pounds of CO_2e Per Ton	Tons of Soil Loss Per Acre
1980	0.0761	2.801	595,859	168.9	7.8
1990	0.0756	2.5028	520,679	147.2	6.1
2000	0.0629	2.8568	392,724	136.2	4.8
2010	0.0557	2.2506	358,846	147	4.6
2020	0.0493	2.109	312,716	122.2	4.7

- The Land Use efficiency of corn silage production has steadily improved since 1990, indicating increasing yields per acre harvested.
- Irrigation Water Use efficiency for corn silage does not show a clear trend and in 2020 is lower than that in the late 1980s, following variable patterns in the intervening years.
- Overall Energy Use efficiency has improved throughout the time period of analysis.
- GHG Emissions associated with corn silage production do not show a clear trend, with emissions per unit of yield lower in 2020 than in 1980, but with the lowest values achieved in the 1990s. Emissions have increased since 2000, likely due to nitrous oxide emitted from higher manure applications.
- While progress has been made in reducing Soil Erosion from 1980 through 2000, this indicator has largely plateaued since 2000.

While progress has been made since 1980 in the sustainability of corn for silage production, the National Indicators Report illustrates variability over time associated with shifts in production practices and the underlying weather and market conditions that influence the decision to harvest corn as silage.

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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